Hernia
The World Journal of Hernia and Abdominal Wall Surgery

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Hernia
The World Journal of Hernia and Abdominal Wall Surgery

Aims and Scope
“Hernia” was founded in 1997 with the purpose of promoting clinical studies and basic research as they apply to groin hernias, internal hernias, the abdominal wall (anterior and postero-lateral aspects), the diaphragm and the perineum. “Hernia” is the official organ of the European Hernia Society (GREPA), established in 1979, and of the Americas Hernia Society (AHS) established in 1997 and of the Asia Pacific Hernia Society (APHIS) established in 2004. These associations have common objectives:
- the advancement of abdominal wall and hernia surgery in all aspects,
- the study of anatomical, physiological, pathological and therapeutic issues concerning the abdominal wall and hernias,
- the creation of associated groups which will promote research and teaching in this field,
- the development of interdisciplinary relations.
“Hernia” is a journal written by surgeons who have made abdominal wall surgery their special field of interest.

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Federica Polverosi
Springer Verlag Italia Srl
Via Decembrio, 28
20137 Milan, Italy
Tel.: +39-02-54259775
Fax: +39-02-54259701
E-mail: federica.polverosi@springer.com

Journal Website
www.springer.com/10029
Electronic edition: link.springer.com/journal/10029

Subscription Information
Hernia is published 6 times a year.
Volume 22 (6 issues) will be published in 2018.
ISSN: 1265-4906 print
ISSN: 1248-9204 electronic
For information on subscription rates please contact Springer Customer Service Center: customerservice@springer.com
The Americas (North, South, Central America and the Caribbean)
2018 International Hernia Congress
March 12–15, 2018
Miami, FL

Monday, March 12, 2018

8:00–8:10 am  Welcome/Opening Remarks
Gina Adrales, MD, MPH
USA

9:55–10:00 am  Introduction of AHS President
Gina Adrales, MD, MPH
USA

10:00–10:25 am  IP-1424: AHS Presidential Address
Alfredo Carbonell, DO
USA

10:25–10:30 am  Recognition of EHS and AHS Presidents
Diego Cuccurullo, MD (Italy) & Gina Adrales, MD, MPH (USA)

10:30–11:00 am  Break/Poster Presentations

Session 2A  Outcomes in Hernia Healthcare Disparity Research

Moderators: Dana Telem, MD (USA), Diego Cuccurullo, MD (Italy)

11:00–11:15 am  FP-1277: Award recipient presentation: health care disparity age and race disparity in minimally invasive inguinal hernia repair
Joceline Vu, MD
USA

11:15–11:30 am  FP-1280: Award recipient presentation: female factors in hernia who knew? Females are at a greater risk of morbidity and readmission after ventral hernia repair
Melanie Howell, MD
USA

11:30–11:45 am  IP-1425: Racial disparities in surgical outcomes and predictors of emergency hernia repair
Adil Haider, MD, MPH
USA

11:45–12:00 pm  IP-1426: Gender differences in patient reported and clinical outcomes after hernia repair
Nadia Henriksen, MD
Denmark

12:00–12:10 pm  Advisory Council & Gina Adrales, MD, MPH
USA

12:10–12:30 pm  Panel discussion

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<th>Hernia, Skin and Soft Tissue and Plastic Surgery Considerations</th>
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<td>Moderators: Jeff Janis, MD (USA), Giampiero Campanelli, MD (Italy)</td>
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<td>Jeffrey Janis, MD USA</td>
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<td>Alastair Windsor, MD United Kingdom</td>
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<td>IP-1428: Soft tissue infection after hernia repair: Prevention and treatment</td>
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<td>Moderators: Sharon Bachman, MD (USA), Maarten Simons, MD (The Netherlands)</td>
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<td>11:30–11:50 am</td>
<td>Maurice Nahabedian, MD USA</td>
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<td>IP-1368: Rectus diastasis: View from a plastic surgeon</td>
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<td>IP-1432: Penetration of laparoscopic inguinal hernia repair</td>
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<td>11:30–11:50 am</td>
<td>Flavio Malcher de Oliveira, MD USA</td>
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<td></td>
<td>IP-1429: Rectus diastasis: View from a MIS surgeon</td>
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<td>IP-1433: Techniques for avoiding and treating chronic groin pain after hernia repair</td>
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<td>John Fischer, MD, MPH USA</td>
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<td>IP-1407: Value of primary inguinal hernia repair</td>
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<td>12:05–12:20 pm</td>
<td>Antonio Espinosa de los Monteros, MD Mexico</td>
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<td>Binggen Li, MD China</td>
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<td>IP-1394: Bulge and hernia after breast reconstruction</td>
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<td>IP-1413: Laparoscopic internal ligation</td>
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<td>Diego Cuccurullo, MD Italy</td>
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<td>Scientific Abstracts: Hernia Prevention</td>
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<td>Tomas Bureš, MUDr Czech Republic</td>
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<td>Moderators: William Hope, MD (USA), Jean François Gillion, MD (France)</td>
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<td>IP-1435: The difficult inguinal hernia: scrotal, prior plug, prior lap and open repair</td>
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<td>Carlos San Miguel Méndez, MD, PhD Spain</td>
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<td>FP-1227: First long-term results reported on prophylactic mesh closure of midline laparotomies</td>
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<td>Session 3B</td>
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<td>11:15–11:30 am</td>
<td>José Antonio Pereira, MD, PhD Spain</td>
<td>1:45–2:00 pm</td>
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<td>FP-1244: Cost-effectiveness of using mesh augmentation for incisional hernia prevention in colorectal surgery</td>
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<td>Moderators: Kristi Harold, MD (USA), José Antonio Pereira, MD, PhD (Spain)</td>
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<td>11:30–11:45 am</td>
<td>Michael Arnold, MD USA</td>
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<td>Dieter Birk, MD, PhD Germany</td>
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<td>FP-1319: Prophylactic absorbable synthetic mesh (ASM) does not prevent hernia after deep inferior epigastric perforator (DIEP) flap breast reconstruction</td>
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<td>IP-1405: Mesh repair of hiatal hernia: when, how, why?</td>
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<td>Frederik Berrevoet, MD, PhD Belgium</td>
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<td>Kristi Harold, MD USA</td>
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<td>FP-1217: Treatment and prevention of parastramal hernias by bilateral transverse abdominis release and relocation of the ostomy: the new way to go?</td>
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<td>IP-1379: Repair of the difficult hiatus: re-do, s/p esophagectomy, bridging repair</td>
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<td>William Hope, MD USA</td>
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<td>James Bittner, MD USA</td>
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<td>FP-1226: A survey on attitudes and knowledge relating to hernia prevention</td>
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<td>IP-1420: Laparoscopic and robotic outcomes for PEH repair +/- fundoplication/ gastropexy</td>
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2:45–3:00 pm  David Webb, MD
USA
IP-1436: Parapubic and atypically located ventral hernias

3:00–3:15 pm  Igor Belyansky, MD
USA
IP-1437: Parastomal hernia repair: intraperitoneal and laparoscopic and robotic techniques

3:15–3:30 pm  Eric Pauli, MD
USA
IP-1391: Parastomal hernia repair: Open retromuscular and Onlay techniques

3:30–3:45 pm  Panel Q/A

**Session 3C**

**Scientific Abstracts Ventral Hernia**

Moderators: Guy Voeller, MD (USA), Jérome Loriau, MD (France)

1:45–2:00 pm  Jeff Blatnik, MD
USA
FP-1510: Efficacy of robotic transversus abdominis release in a porcine model

2:00–2:15 pm  Gina Adrales, MD, MPH
USA
IP-1509: Automated surgical coaching for technical skills acquisition in incisional hernia repair

2:15–2:30 pm  Harm Winters, BSc
The Netherlands
FP-1270: Pre-operative CT-scan variables for predicting complications in patients undergoing large ventral hernia repair using the component separation technique

2:30–2:45 pm  Karla Bernardi, MD
USA
FP-1253: Is nonoperative management warranted in ventral hernia patients with comorbidities? A 3 year follow up

2:45–3:00 pm  Niklas Nygaard Baastrup, BSc.Med
Denmark
FP-1233: Visceral obesity as a predictor of hernia recurrence after abdominal wall reconstruction

3:00–3:15 pm  Joshua Halka, MD
USA
FP-1298: Hybrid robotic assisted transversus abdominis release is associated with a significantly decreased length of stay without increased complications compared to open transversus abdominis release in patients with large ventral hernias

3:15–3:30 pm  Susanne van der Velde, MD, PhD
The Netherlands
FP-1278: Expansion methods for midline closure of the abdominal wall in cases of loss of domain ventral or incisional hernia

3:30–3:45 pm  Panel Q/A

**Session 4A**

**Ventral Hernia Repair**

Moderators: Vedra Augenstein, MD (USA), Flavio Malcher, MD (Brazil)

4:15–4:30 pm  Andrew Wright, MD
USA
IP-1438: Components separation: which technique and when?

4:30–4:45 pm  Wolfgang Reinpold, MD, PhD
Germany
IP-1439: MILOS and eMILOS

4:45–5:00 pm  Guy Voeller, MD
USA
IP-1440: Revisiting onlay ventral hernia repair: Patient selection, technique and outcomes

5:00–5:15 pm  Kent Kercher, MD
USA
IP-1442: Care of the hernia in the morbidly obese patient

**Session 4B**

**What would you do? Expert Panel**

Moderators: Igor Belyansky, MD (USA), Salvador Morales-Conde, MD, PhD (Spain), Pierluigi Ipponi, MD (Italy), Yuri Novitsky, MD 79 (USA), Diego Cuccurullo, MD (Italy), Sergio Roll, MD (Brazil) Alfredo Carbonell, DO (USA)

4:15–4:30 pm  Case 1: Acute strangulation with loss of domain

4:30–4:45 pm  Case 2: Recurrence after components separation

4:45–5:00 pm  Case 3: Fourth inguinal hernia recurrence with scrotal component after open and laparoscopic repair

5:00–5:15 pm  Case 4: Large hiatal hernia after esophagectomy

5:15–5:30 pm  Case 5: Flank/lumbar hernia in immunosuppressed patient

**Session 4C**

**Video Abstracts: Inguinal**

Moderators: David Earle, MD (USA), Leandro Totti Cavazzola, MD, PhD (Brazil)

4:15–4:30 pm  Jane Keating, MD
USA
V-1111: Delayed diagnosis and laparoscopic repair of a traumatic diaphragmatic hernia
4:30–4:45 pm  Joshua Halka, MD  
USA  
V-1304: Robotic giant prosthetic reinforcement of the visceral sac: an innovative technique for minimally invasive repair of inguinal hernias

4:45–5:00 pm  Marcelo Furtado, MD, PhD  
Brazil  
V-1190: Laparoscopic approach of incarcerated femoral hernia with acute appendicitis (Garangeot)

5:00–5:15 pm  Chad Copper, MD  
USA  
V-1084: Robotic repair of incarcerated pelvic kidney in inguinal hernia

5:15–5:30 pm  Guo Jiantong, MB  
China  
V-1149: Laparoscopic large inguinal hernia repair in children

5:30–7:00 pm  Welcome Reception  

Tuesday, March 13, 2018

6:30–7:30 am  Breakfast & Learns  

Session 5  Collaborative Hernia Research and Quality Improvement Around the Globe  
Moderators: Michael Rosen, MD (USA), Salvador Morales-Conde, MD, PhD (Spain), Changfu Qin, MD, PhD (China)

7:45–8:00 am  Marc Miserez, MD  
Belgium  
Hernia. The World Journal of Hernia and Abdominal Wall Surgery: leading the way in Hernia repair—updates from the Editorial Board

8:00–8:15 am  Benjamin Poulose, MD, MPH  
USA  
IP-1443: AHSQC: Innovative Collaboration of surgeons, patients, industry, and the FDA

8:15–8:30 am  Davide Lomanto, MD, PhD  
Singapore  
IP-1444: Inguinal hernia repair: toward Asian guidelines

8:30–8:45 am  Maciej Pawlak, MD, PhD  
Poland  
IP-1445: Implementation of HerniaSurge guidelines

8:45–9:00 am  Ferdinand Köckerling, MD  
Germany  
IP-1446: Germany: The Importance of registries in the postmarketing surveillance of surgical meshes

9:00–9:15 am  Gabriel Sandblom, MD, PhD  
Sweden  
IP-1388: Swedish Registry: Improving patient outcomes

9:15–9:30 am  Sergio Roll, MD, PhD  
Brazil  
IP-1378: Innovation and quality in Brazil
11:15–11:30 am Marc Miserez, MD
Belgium
IP-1451: The use of laparoscopy and biological mesh in clean ventral hernia repair

11:30–11:45 am Jie Chen, MD, PhD
China
IP-1452: Adhesion barrier prosthetics: Limitations and comparative analysis

11:45–12:00 pm Bruce Ramshaw, MD
USA
IP-1453: Recalled mesh: What happened? What can we learn?

12:00–12:15 pm Neil Smart, MBBS, FRCSEd
United Kingdom
IP-1454: Patient specific mesh: The new frontier

12:15–12:30 pm Panel Q/A

Session 6C Scientific Abstracts
Moderators: Charles Filipi, MD (USA), Wolfgang Reinpold, MD, PhD (Germany)

11:00–11:15 am Andrew Bates, MD
USA
FP-1256: It matters: Surgeon volume in ventral hernia repair in New York State

11:15–11:30 am Andrew Bates, MD
USA
FP-1256: It matters: Surgeon volume in ventral hernia repair in New York State

11:30–11:45 am Annol Chattha, BA
USA
FP-1032: The impact of hospital volume on clinical and economic outcomes in ventral hernia repair: an analysis with national policy implications

11:45–12:00 pm Christopher Harryman, BS
USA
FP-1063: Cost evaluation of enhanced recovery after surgery protocol for open ventral hernia repair

12:00–12:15 pm Leonard Kroese, MD
The Netherlands
FP-1106: External validation of the European Hernia Society classification for postoperative complications after incisional hernia repair—a cohort study of 2,191 patients

12:15–12:30 pm John McNelis, MD
USA
FP-1050: Factors predictive of the development of surgical site infection in hernia surgery—an analysis of the NSQIP database

12:30–1:30 pm Lunch & Learns

Session 7A Robotic Hernia Repair
Moderators: Anthony Gonzales, MD (USA), Leandro Totti Cavazzola, MD, PhD (Brazil)

1:45–2:00 pm Conrad Ballecer, MD
USA
IP-1455: Robotic skills acquisition: What is the best approach?

2:00–2:15 pm Ajita Prabhu, MD
USA
IP-1456: Robotic Inguinal

2:15–2:30 pm Filip Muyssoms, MD, PhD
Belgium
IP-1415: Robotic IPOM and extraperitoneal ventral hernia repair

2:30–2:45 pm Ricardo Abdalla, MD, PhD
Brazil
IP-1457: Robotic retromuscular

2:45–3:00 pm Alfredo Carbonell, DO
USA
IP-1370: Robotic transversus abdominis release

3:00–3:15 pm Daniel Marcus, MD
USA
IP-1458: Talking with hospitals, payors and patients: economics and value of robotic hernia repair

3:15–3:30 pm Igor Belyansky, MD
USA
IP-1459: The laparoscopic equivalent: Lap eTEP, Lap AWR

3:30–3:45 pm Sharon Bachman, MD
USA
IP-1460: Current evidence for robotic hernia repair and best practice

Session 7B Rapid Fire Scientific Abstracts
Moderators: Brent Matthews, MD (USA), Jan Kukleta, MD (Switzerland)

1:45–1:56 pm Justin Doble, MD
USA
FP-1265: Outcome differences following incisional herniorrhaphy in older patients: an AHSQC analysis

1:57–2:08 pm Matthew Burstein, MD, PhD
USA
FP-1252: Comparison of absorbable and nonabsorbable tack fixation in laparoscopic ventral hernia using the Americas Hernia Society Quality Collaborative (AHSQC)

2:09–2:20 pm Jordan Bilezikian, MD
USA
FP-1194: Prophylactic mesh placement to avoid stoma related hernias: A systematic review

2:21–2:32 pm Sebastiaan van Steensel, MD
The Netherlands
FP-1194: Prophylactic mesh placement to avoid stoma related hernias: A systematic review
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<td>2:33–2:44 pm</td>
<td>Zachary Sanford, MD</td>
<td>USA</td>
<td>FP-1349: Comparative analysis of perioperative outcomes of robotic versus laparoscopic transversus abdominis release (TAR)</td>
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<td>2:45–2:56 pm</td>
<td>Michael Lew, MD</td>
<td>USA</td>
<td>FP-1294: Evaluating the use of nerve blocks in abdominal wall reconstruction</td>
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<td>2:57–3:08 pm</td>
<td>Karla Bernardi, MD</td>
<td>USA</td>
<td>FP-1254: Gender disparity in hernia surgery research</td>
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<td>3:09–3:20 pm</td>
<td>Nadine Van Veenendaal, MD, MSc, DMCC The Netherlands</td>
<td>USA</td>
<td>FP-1273: Global consensus on the international guidelines on groin hernia management</td>
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<td>3:21–3:32 pm</td>
<td>Joseph Helm, MD</td>
<td>USA</td>
<td>FP-1203: Perioperative blood transfusions increase the risk of surgical site infections in ventral hernia repairs</td>
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<td>3:33–3:45 pm</td>
<td>Wen Hui Tan, MD</td>
<td>USA</td>
<td>FP-1195: Evaluation of porcine dermal collagen and polypropylene meshes in an infected field</td>
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**Session 7C Scientific Abstracts**

Moderators: Matthew Goldblatt, MD (USA), Nele Van De Winkel, MD (Belgium)

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<td>1:45–2:00 pm</td>
<td>Jared McAllister, MD</td>
<td>USA</td>
<td>FP-1271: Effect of transversus abdominis plane (TAP) block versus thoracic epidural analgesia (TEA) on length of stay and inpatient narcotic use following open transversus abdominis release (TAR)</td>
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<td>2:00–2:15 pm</td>
<td>Katherine Poruk, MD</td>
<td>USA</td>
<td>FP-1266: Negative pressure wound therapy (NPWT) decreases surgical site infections after open ventral hernia repair (VHR) in patients with methicillin-resistant staphylococcus aureus (MRSA)</td>
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<td>2:15–2:30 pm</td>
<td>Charlotte Young, BA</td>
<td>USA</td>
<td>FP-1334: Contamination does not increase risk for recurrence in complex ventral hernia repair with synthetic mesh</td>
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<td>2:30–2:45 pm</td>
<td>An Jairam, MD</td>
<td>The Netherlands</td>
<td>FP-1261: Prevention of incisional hernias after midline laparotomy with prophylactic mesh reinforcement: A meta-analysis and trial sequential analysis</td>
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<td>2:45–3:00 pm</td>
<td>Marta Cavalli, MD, PhD</td>
<td>Italy</td>
<td>FP-1238: New anatomic finding in pubic inguinal pain syndrome</td>
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**Session 8A Hernia Repair and Innovation**

Moderators: Yuri Novitsky, MD (USA), Francesco Gossetti, MD (Italy)

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<td>Rene Fortelny, MD</td>
<td>Austria</td>
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<td>Nele Van De Winkel, MD</td>
<td>Belgium</td>
<td>IP-1462: Is there a future for abdominal wall transplantation in complex hernia patients?</td>
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**Session 8B Video Abstracts**

Moderators: David Webb, MD (USA), Jie Chen, MD, PhD (China)

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<td>4:15–4:30 pm</td>
<td>Andrew de Beaux, MD</td>
<td>United Kingdom</td>
<td>IP-1464: Peritoneal flap technique in abdominal wall reconstruction obviates the need for component separation</td>
</tr>
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<td>4:30–4:45 pm</td>
<td>Emanuele Lo Menzo, MD, PhD</td>
<td>USA</td>
<td>V-1209: Laparoscopic repair of recurrent parastomal hernia after abdominal wall reconstruction with bilateral transversus abdominis release (TAR)</td>
</tr>
<tr>
<td>4:45–5:00 pm</td>
<td>Providencia García-Pastor, MD</td>
<td>Spain</td>
<td>V-1315: Nebulized cyanoacrylate for prostheses fixation in retromuscular rives-type eventroplasty. Usefulness of mri-visible meshes for safety and effectiveness control</td>
</tr>
</tbody>
</table>

Panel Q/A
5:15–5:30 pm  Claudio Renato P. De Luca Filho, MD  
Brazil  
V-1094: Video-assisted surgical abdominal intercostal hernia approach

Session 8C  Resident and Young Faculty Development  
Moderators: David Krpata, MD (USA), Reinhard Bittner, MD (Germany)

4:15–4:30 pm  Hobart Harris, MD, MPH  
USA  
IP-1465: Infiltrating research funding: A guide to grant funding from local sources up to the NIH

4:30–4:45 pm  Jake Greenberg, MD, EdM  
USA  
IP-1472: Work life balance: Executing on all fronts

4:45–5:00 pm  Matthew Goldblatt, MD  
USA  
IP-1393: Becoming a masterful educator: The art of providing feedback

5:00–5:15 pm  Brent Matthews, MD  
USA  
IP-1467: Leadership skills to establish a solid foundation for the future

5:15–5:30 pm  Reinhard Bittner, MD  
Germany  
IP-1468: What an expert has to say to a young surgeon in abdominal wall surgery?

5:30–6:30 pm  Student, Resident and Fellow Meet and Greet

Wednesday, March 14, 2018

6:30–7:30 am  Breakfast & Learns

6:45–7:00 am  Johannes Jeekel, MD  
The Netherlands  
IP-1469: The importance of standardized fascial closure

7:00–7:15 am  Panel Q/A

7:15–7:30 am  Panel Q/A

7:30–8:00 am  Johannes Jeekel, MD  
The Netherlands  
IP-1469: The importance of standardized fascial closure

7:45–8:00 am  Johannes Jeekel, MD  
The Netherlands  
IP-1469: The importance of standardized fascial closure

8:00–8:15 am  Hobart Harris, MD, MPH  
USA  
IP-1390: Hernia prevention and management: What is important to patients?

8:15–8:30 am  José Antonio Pereira, MD, PhD  
Spain  
IP-1417: Prophylaxis of incisional hernias during emergent laparotomy

8:30–8:45 am  Panel Q/A

8:45–9:00 am  John Fischer, MD, MPH  
USA  
IP-1470: Value of hernia prevention

9:00–9:15 am  Manuel López Cano, MD, PhD  
Spain  
IP-1395: Parastomal hernia prevention
11:45–12:00 pm  
Talar Tejirian, MD  
USA  
IP-1481: Connecting with patients through social media  
2:15–2:30 pm  
Bruce Ramshaw, MD  
USA  
IP-1484: Cognitive therapy and a multidisciplinary, patient-centered approach

12:00–12:15 pm  
Brent Matthews, MD  
USA  
IP-1482: Protecting the patient when using social media: HIPPA and beyond  
2:30–2:45 pm  
Lars Jørgensen, MD, DrMSc  
Denmark  
IP-1414: Smoking Cessation and hernia repair outcomes: What is the evidence?

12:15–12:30 pm  
Panel Q/A  
2:45–3:00 pm  
Julie Holihan, MD  
USA  
IP-1373: Decision making for hernia repair: what factors are important to patients?

Session 10C  
Scientific Abstracts

Moderators: Ajita Prabhu, MD (USA), Manuel Lopez Cano, MD, PhD (Spain)  
3:00–3:15 pm  
Panel Q/A

11:00–11:15 am  
Luciano Guilherme Tastaldi, MD  
USA  
FP-1512: AHSQC resident research award: AHSQC-embedded randomized controlled trial: Telescopic dissection vs. balloon dissection for laparoscopic TEP inguinal hernia repair  
1:45–2:00 pm  
Pilar Hernandez Granados, MD  
Spain  
IP-1387: Intraperitoneal polypropylene mesh: Another perspective

11:15–11:30 am  
Angela Kao, MD  
USA  
FP-1513: AHSQC Resident research award: Comparison of outcomes after partial (PME) versus complete mesh excision (CME)  
2:00–2:15 pm  
Claudio Brandi, MD  
Argentina  
IP-1372: Intraperitoneal polypropylene mesh: Another perspective

11:30–11:45 am  
Tim Tollens, MD  
Belgium  
FP-1224: International hernia mesh registry (Ihmr): 10 years  
2:15–2:30 pm  
Johannes Jeekel, MD  
The Netherlands  
IP-1486: Primary suture versus glued mesh augmentation

11:45–12:00 pm  
Margaret Plymale, DNP, RN  
USA  
FP-1124: Outside facility resource utilization following open ventral hernia repair performed at a tertiary care facility  
2:30–2:45 pm  
Robert Bendavid, MD  
Canada  
IP-1376: Experience in mesh explantations

12:00–12:15 pm  
Erling Oma, MD  
Denmark  
FP-1216: Ventral hernia in women of childbearing age: A systematic review of observational studies  
3:00–3:15 pm  
Franz Mayer, MD  
Austria  
FP-1295: Mid term results of a double-blind randomized clinical trial of mesh fixation with glue or sutures for lichtenstein hernia repair: No differences in recurrence rate

Session 11B  
Impact of Mesh

Moderators: Sharon Bachman, MD (USA), Frederik Berrevoet, MD, PhD (Belgium)  
1:45–2:00 pm  
Harry van Goor, MD, PhD  
The Netherlands  
IP-1485: Reoperation after mesh repair

2:00–2:15 pm  
Claudio Brandi, MD  
Argentina  
IP-1372: Intraperitoneal polypropylene mesh: Another perspective

2:15–2:30 pm  
Pilar Hernandez Granados, MD  
Spain  
IP-1387: Intraperitoneal polypropylene mesh: Another perspective

Session 11A  
Patient Optimization and Patient-Driven Outcomes

Moderators: Archana Ramaswamy, MD (USA), David Lomanto, MD, PhD (Singapore)  
2:00–2:15 pm  
Franz Mayer, MD  
Austria  
FP-1279: Groin hernia repair in women: is there a best option for treatment? Results of a registry-based propensity-score-matched analysis

1:45–2:00 pm  
Shirin Towfigh, MD  
USA  
IP-1483: Patient advocacy  
2:15–2:30 pm  
Carlos Hoyuela, MD  
Spain  
FP-1295: Mid term results of a double-blind randomized clinical trial of mesh fixation with glue or sutures for lichtenstein hernia repair: No differences in recurrence rate

2:00–2:15 pm  
Jeremy Warren, MD  
USA  
EP-1384: ERAS: Outcomes of ventral hernia pathways and multimodal pain treatment
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<tr>
<th>Time</th>
<th>Name</th>
<th>Country</th>
<th>Abstract</th>
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<tbody>
<tr>
<td>2:30–2:45 pm</td>
<td>Gurteshwar Rana, MD</td>
<td>USA</td>
<td>USA FP-1301: Outcomes and impact of laparoscopic inguinal hernia repair versus open inguinal hernia repair on healthcare spending and employee absenteeism</td>
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<td>2:45–3:00 pm</td>
<td>Ralph Lorenz, MD</td>
<td>Germany</td>
<td>Germany FP-1123: Incarcerated inguinal hernias: analysis Of 5209 emergency cases in the German hernia database “Herniamed”</td>
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<td>3:00–3:15 pm</td>
<td>Andrew Bates, MD</td>
<td>USA</td>
<td>USA FP-1260: Effect of patient and surgeon age on utilization of laparoscopic inguinal hernia repair</td>
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<tr>
<td>3:15–3:45 pm</td>
<td>Break/Poster Presentations</td>
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<tr>
<td><strong>Session 12A</strong></td>
<td>AHSQC</td>
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<tr>
<td>3:45–4:00 pm</td>
<td>Moderators: Benjamin Poulose, MD, MPH (USA), Michael Rosen, MD (USA)</td>
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<tr>
<td>3:45–3:50 pm</td>
<td>Michael Rosen, MD</td>
<td>USA</td>
<td>Introduction</td>
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<tr>
<td>3:50–4:00 pm</td>
<td>Benjamin Poulose, MD, MPH</td>
<td>USA</td>
<td>USA IP-1487: AHSQC benchmarks: How do we measure up?</td>
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<tr>
<td>4:00–4:10 pm</td>
<td>Jacob Greenberg, MD, EdM</td>
<td>USA</td>
<td>USA IP-1474: Primary fascial closure during laparoscopic ventral hernia repair: Long term outcomes</td>
</tr>
<tr>
<td>4:10–4:20 pm</td>
<td>Michael Rosen, MD</td>
<td>USA</td>
<td>USA IP-1488: Venous thromboembolism reduction Initiative</td>
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<td>4:20–4:30 pm</td>
<td>David Chen, MDUSA</td>
<td>USA</td>
<td>USA IP-1489: AHSQC inguinal hernia repair: preliminary outcomes</td>
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<td>4:30–4:40 pm</td>
<td>Ivy Haskins, MDUSA</td>
<td>USA</td>
<td>USA IP-1381: ORACLE decision support tool update</td>
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<td>4:40–4:50 pm</td>
<td>John Fischer, MD, MPH</td>
<td>USA</td>
<td>USA IP-1490: Patient reported outcomes in ventral hernia</td>
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<td>4:50–5:00 pm</td>
<td>Q&amp;A</td>
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<tr>
<td><strong>Session 12B</strong></td>
<td>Economic Considerations</td>
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<td>3:45–4:00 pm</td>
<td>Moderators: Gabrielle van Ramshorst, MD, PhD (The Netherlands), Gregory Dumanian, MD (USA)</td>
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<td>3:45–4:00 pm</td>
<td>Archana Ramaswamy, MD</td>
<td>USA</td>
<td>USA IP-1491: Supply cost containment: What are the options</td>
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<td>4:00- 4:15 pm</td>
<td>Sean Orenstein, MD</td>
<td>USA</td>
<td>USA IP-1492: Prehabilitation and return on investment</td>
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<td>4:15–4:30 pm</td>
<td>Jan Kukleta, MD, FMCH</td>
<td>Switzerland</td>
<td>Switzerland IP-1389: Mesh utilization and suture closure in Europe: Value analysis</td>
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<td>3:00–3:15 pm</td>
<td>J. Scott Roth, MD</td>
<td>USA</td>
<td>USA IP-1493: Healthcare reform and hernia repair: What makes sense for patients and surgeons?</td>
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<td>3:15–3:45 pm</td>
<td>Break/Poster Presentations</td>
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<tr>
<td><strong>Session 12C</strong></td>
<td>Scientific Abstracts</td>
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<tr>
<td>3:45–4:00 pm</td>
<td>Moderators: Claudio Brandi, MD (Argentina)</td>
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<td>4:00–4:15 pm</td>
<td>Paul Tenzel, MDUSA</td>
<td>USA</td>
<td>USA FP-1320: An evaluation of tension measurements during retromuscular incisional hernia repair</td>
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<tr>
<td>4:15–4:30 pm</td>
<td>Alexander Petter-Puchner, MD</td>
<td>Austria</td>
<td>Austria FP-1276: A new animal model in experimental hernia repair</td>
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<tr>
<td>4:30–4:45 pm</td>
<td>Shuo Yang, Master</td>
<td>China</td>
<td>China FP-1164: A novel rabbit model of giant abdominal wall hernia and intra-abdominal hypertension</td>
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<td>4:45–5:00 pm</td>
<td>Bruce Tulloh, MD</td>
<td>Scotland</td>
<td>Scotland FP-1033: Peritoneal flap hernioplasty for reconstruction of large ventral hernias: Long term outcome from 251 patients</td>
</tr>
<tr>
<td>5:00–5:15 pm</td>
<td>Deboshr Sharma, MS, MRCS(Edin)</td>
<td>India</td>
<td>India FP-1159: Prospective randomized trial comparing laparoscopic ventral hernia repair using absorbable or non-absorbable fixation device!</td>
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<td><strong>Thursday, March 15, 2017</strong></td>
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<tr>
<td>6:30–7:30 am</td>
<td>Breakfast</td>
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<tr>
<td><strong>Session 13A</strong></td>
<td>Complex Abdominal Wall Reconstruction</td>
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<tr>
<td>8:00–8:15 am</td>
<td>Yuri Novitsky, MD</td>
<td>USA</td>
<td>USA IP-1494: TAR: Current indications and physiology</td>
</tr>
<tr>
<td>8:15–8:30 am</td>
<td>Allen Buenafe, MD</td>
<td>Philippines</td>
<td>Philippines IP-1495: Anterior components separation: Current indications and best practices</td>
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8:30–8:45 am Vedra Augenstein, MD  
USA  
IP-1496: Components separation: Impact on QoL. Is it overused?

8:45–9:00 am René Fortelny, MD  
Austria  
IP-1497: Delayed abdominal closure: Options and outcomes

9:00–9:15 am Leandro Totti Cavazzola, MD  
Brazil  
IP-1498: Laparoscopic approaches to the complex hernia defect

9:15–9:30 am Gabrielle van Ramshorst, MD, PhD  
The Netherlands  
IP-1398: Acute evisceration: Salvage and damage control

9:30–9:45 am Claudio Birolini, MD, PhD  
Brazil  
IP-1383: Mesh placement in contaminated fields: Current best practice

9:45–10:00 am Eduardo Parra-Davila, MD  
USA  
IP-1402: Concomitant colorectal surgery and hernia repair

10:00–10:15 am Panel Q/A  

Session 13B  
Hernia Education and Skills Acquisition  
Moderators: Jacob Greenberg, MD, EdM (USA), Aali Sheen, MD (UK)

8:00–8:15 am Ralph Lorenz, MD  
Germany  
IP-1508: Fascial closure/hernia prevention education

8:15–8:30 am Adrian Park, MD  
USA  
IP-1499: Ethical introduction of new techniques and financial stewardship

8:30–8:45 am Alisa Coker, MD  
USA  
IP-1500: Credentialing and skills acquisition in robotic surgery: Is it a tool or specialized practice?

8:45–9:00 am Kent van Sickle, MD  
USA  
IP-1501: Systematic training model for teaching, development and training of instructors in hernia repair

9:00–9:15 am Maciej Śmiateński, MD, PhD  
Poland  
IP-1502: How to reach the different parts of the world in hernia education?

9:15–9:30 am Mercedeh Baghai, MD  
USA  
IP-1503: Introducing a new technique into practice: training your team

8:30–9:45 am Wolfgang Reinpold, MD  
Germany  
IP-1504: European Hernia School

9:45–10:00 am David Chen, MD  
USA  
IP-1505: Remote telementoring

10:00–10:15 am Panel Q/A  

Session 13C  
Scientific Abstracts  
Moderators: Kent van Sickle, MD (USA), Diya Alaedeen (USA)

8:00–8:15 am Steven Lanier, MD  
USA  
FP-1257: Incisional hernia rates in patients undergoing colectomy for benign vs. malignant disease

8:15–8:30 am Alexander Schroeder, MD  
USA  
FP-1339: Capacity building in global hernia surgery: A systematic review

8:30–8:45 am Salvador Dobbie, MD  
USA  
FP-1327: Multicenter outcomes of modified retromuscular sugarbaker parastomal herniorrhaphy

8:45–9:00 am Salvatore Docimo, DO  
USA  
FP-1306: Component separation is safe among all age groups despite a higher incidence of surgical site infection among younger patients

9:00–9:15 am Emanuele Lo Menzo, MD, PhD  
USA  
FP-1291: Does transverse abdominis plane (TAP) block increases the risk of developing postoperative urinary retention after an inguinal hernia repair?

9:15–9:30 am Pedro Henrique Amaral, MD  
Brazil  
FP-1202: Combined laparoscopic and open approach for flank hernia repair. Technique description and long-term outcomes of 16 cases

9:30–9:45 am Paul Szotek, MD  
USA  
FP-1268: Utilization of hipaa compliant group messaging application to optimize efficiency, productivity, quality, & patient experience in hernia care delivery

10:00–10:15 am Richard Pierce, MD  
USA  
FP-1198: Early repair of ventral incisional hernia improves quality of life after surgery for abdominal malignancy: A prospective, case-controlled study
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<tr>
<td>10:15–10:30 am</td>
<td>Scientific Awards Presentation</td>
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<td>10:30–11:00 am</td>
<td>Break</td>
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<tr>
<td><strong>Session 14A</strong></td>
<td><strong>Imaging and Hernia</strong></td>
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<tr>
<td>11:00–11:15 am</td>
<td>Jacob Greenberg, MD, EdM USA</td>
<td>IP-1477: Should paraesophageal hernia patients be followed routinely with imaging?</td>
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<td>11:15–11:30 am</td>
<td>Jean François Gillion, MD France</td>
<td>IP-1412: Preoperative ultrasound examination of groin hernias: RCT v reality</td>
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<td>11:30–11:45 am</td>
<td>Shirin Towfigh, MD USA</td>
<td>IP-1506: When the radiology report fails us: differences between imaging and operative findings</td>
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<tr>
<td>11:45–12:00 pm</td>
<td>Pablo Ortega Deballon, MD, PhD France</td>
<td>IP-1396: Results of complex abdominal-wall repair with a biologic cross-link mesh: a retrospective multicentric study including 250 patients</td>
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<tr>
<td>12:00–12:15 pm</td>
<td>Francesco Gossetti, MD Italy</td>
<td>IP-1382: Risk factors influencing longterm outcomes of biologic implants in abdominal wall reconstruction</td>
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<tr>
<td>12:15–12:25 pm</td>
<td>Panel Q/A</td>
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<tr>
<td><strong>Session 14B</strong></td>
<td><strong>Alternative Approaches to Challenging Hernias</strong></td>
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<tr>
<td>11:00–11:15 am</td>
<td>Jose Macario Faylona, MD Philippines</td>
<td>IP-1401: Self adhering mesh for incisional hernia repair: The Philippine experience</td>
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<td>11:15–11:30 am</td>
<td>Greg Dumanian, MD USA</td>
<td>IP-1385: Mesh sutured repairs</td>
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<td>11:30–11:45 am</td>
<td>George Yang, MD Hong Kong</td>
<td>IP-1507: PPOM: An alternative approach in laparoscopic ventral/incisional hernia repair</td>
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<td>11:45–12:00 pm</td>
<td>Takehiro Hachisuka, MD Japan</td>
<td>IP-1511: Management of recurrent inguinal hernia</td>
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<td>12:00–12:15 pm</td>
<td>Jaideepraj Rao, MD Singapore</td>
<td>IP-1396: Hernia repair in the cirrhotic patient</td>
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<td>12:15–12:25 pm</td>
<td>Panel Q/A</td>
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<td><strong>Session 14C</strong></td>
<td><strong>Video Abstracts</strong></td>
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<tr>
<td>11:00–11:15 am</td>
<td>Jose Macario Faylona, MD Philippines</td>
<td>V-1206: Robot-assisted approach with open anterior component separation for multiple recurrent incisional hernia</td>
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<tr>
<td>11:15–11:30 am</td>
<td>Paulo Henrique Barros, MD Brazil</td>
<td>V-1232: Desmoid tumor, giant, the rectus abdominis muscle. a multipronged approach in the reconstruction of the abdominal wall</td>
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<td>11:30–11:45 am</td>
<td>Miranda Mendes, MD Brazil</td>
<td>V-1127: Robotic intraperitoneal onlay mesh for a multiply recurrent inguinal hernia</td>
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<td>12:00–12:15 pm</td>
<td>Sara Holden, MD USA</td>
<td>-transition of AHS and EHS presidency and conclusion of congress</td>
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<td>12:15–12:25 pm</td>
<td>Panel Q/A</td>
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<td>12:30 pm</td>
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Monday, March 12, 2018
Session 1: State of the Union

IP-1421
AHS: Innovation and adoption of new technology in abdominal wall reconstruction. What to keep and when to let go?
Heniford B
Carolinas Medical Center

IP-1377
Hernia Essentials and the academic mission of APHS
Sharma A
Max Super Speciality Hospital

Asia Pacific Hernia Society (APHS) was founded in Bali in 2004 and has exponentially grown since to include 1200 life members from 46 countries and 14 National hernia societies. The primary mission of APHS is to promote the art and safe practice of herniology in the region. Asia Pacific region constitutes a majority of mankind inhabiting Earth with tremendous diversity of population, regions, cultures and languages. There exists a disparity in surgical practice across the region and hence the requirement for a standardized, uniform and coherent approach to hernia repair. The Hernia Essentials (HE) training program of APHS is structured around international hernia guidelines and current evidence for best hernia practice. A set of core faculty presentations on hernia repair based on present international guidelines have been prepared in advance. These presentations are delivered each time to ensure standardization and uniformity of course content. The HE training program consists of 3 components viz HE Basics (1 day didactics), HE Practical (2 days, Live surgery, Endotraining and Soft cadaver/animal workshop) and HE Fellowship (2 weeks at APHS accredited centers of excellence in hernia repair). On satisfactory completion of these components, candidates are eligible for Diploma in Hernia Essentials presented at the Annual Congress of APHS. The HE Basics training program of APHS is validated, supported and endorsed by Royal College of Surgeons of Edinburgh. The present vision of APHS is to train about 40–50 surgeons every year for the award of Diploma in Hernia Essentials. The Annual Congress of APHS is the showpiece event to showcase regional expertise and debate on best hernia practices with leading experts in herniology.

IP-1422
AHS: State of open ventral hernia repair: have we come full circle?
Rosen M
Cleveland Clinic Foundation

IP-1416
EHS: Hernia prevention—are we doing enough?
Muysoms F
Maria Middelares Ghent

Incisional hernias are a problem. But not everybody sees the problem. The occurrence of an incisional hernia is too often considered collateral damage of a surgical act that is considered live saving like cancer surgery or aortic vascular surgery. Because of improved survival of many of these patients, a growing number present afterwards with often complex incisional hernias in patients with many comorbidities. The impact on the quality of life for the patients of an incisional hernia and the frequency of incisional hernia is grossly underestimated by most surgeons.

We also know that repair of incisional hernias despite the use of meshes still has a high rate of recurrence with long term follow up. And the repair of incisional hernias carries a high burden on medical facilities and financial resources. Therefore prevention of incisional hernias should have our highest attention.

Some methods of prevention are easy and not costly. It has been shown that a correct surgical technique and material to close an abdominal wall has an important impact on the rate of incisional hernias. Using the correct principles of abdominal wall closure should be thought and implemented across all surgical specialities performing abdominal surgery.

A lot of research has been done on the prevention of incisional hernias with the use of prophylactic mesh during the closure of laparotomy incisions. Both mesh augmentation in a retro-muscular and in an onlay position have been shown to be effective and safe in patients with a high risk of incisional hernias. Further research is needed to be able to define those patients where a prophylactic mesh has to be recommended.
Surgery has no frontiers. In fact many groups were abandoning laparoscopic ventral hernia repair in many surgical scenarios since it has been observed a tendency toward open repair. In this sense, it seems that we can observe a turn toward minimal invasive surgery with an important message behind. This message is rather based on philosophical aspects than on technical ones. We have moved from laparoscopic ventral hernia repair (LVHR) to minimally invasive abdominal wall reconstruction.

LVHR has been around for many years, since this technique was originally described by K. A. LeBlanc in the early 90s. In those years, the expectations on this new procedure performed by laparoscopy was very high due to the great success of laparoscopic cholecystectomy. At the same time, the need of using expensive meshes was an attractive business for companies who really pushed surgeons to preform this procedure.

But many doubts have arised in relation to this procedure and the debates have been around during the last years. One of the main points of discussion have been related to the fact that the abdominal wall was not reconstructed, since the technique is performed bridging the defect. For this reason the solution proposed to solve this problem was to close the defect. Closing the defect was proposed to reconstruct the abdominal wall. The criticism to this technical gesture was that tension was increased and therefore the postoperative pain was increased, but new alternatives and techniques are being developed to reconstruct the línea alba as we do in open repair, which will guarantee another revolution on the present and on the future of the use of minimally invasive surgery to repair ventral hernia.
Monday, March 12, 2018

Session 2A: Outcomes in Hernia Healthcare Disparity Research

**FP-1277**

**Age and race disparity in minimally invasive inguinal hernia repair**

Vu J, Gunaseelan V, Krapohl G, Campbell D, Dimick J, Telem D

*University of Michigan/Michigan Medicine*

**Background:** There is suboptimal adoption of minimally invasive surgery (MIS) for inguinal hernia repair. In a study conducted across the state of Michigan, we found certain populations were less likely to receive MIS inguinal hernia repair. To further explore factors influencing delivery of MIS repair, we investigated the relationship between these identified disparities and MIS utilization.

**Methods:** A retrospective cohort study was performed in a 73-hospital collaborative in patients undergoing elective primary open and MIS inguinal hernia repair from 2012 to 2016. Primary outcomes were differences in MIS utilization by age and race, controlling for clinical, hospital, and geographic factors using a hierarchical logistic regression model. Propensity score analysis controlling for gender, hospital, and comorbidities was then used to isolate the effect of age and race on the likelihood of receiving MIS repair.

**Results:** In 6185 inguinal hernia repairs, MIS utilization ranged from 13.5 to 42.8% across six geographic regions. Following multivariate analyses, patients aged 65+ were less likely to receive MIS compared to patients aged 18–44 and 45–64. Black patients were less likely to receive MIS than white patients. After propensity score matching, older age (OR 0.77, p = 0.001) and black race (OR 0.69, p = 0.013) were independently associated with decreased likelihood of receiving MIS repair.

**Conclusion:** We found disparity in receiving MIS inguinal hernia repair for older adults and black patients independent of comorbidities, geography, or hospital-level factors. Causes of this variation are likely multifactorial and may be related to provider implicit bias. Additionally, older or black patients may have different awareness of surgical options or less likely to request MIS when open repair is offered. Despite analytical rigor, identification of some factors driving disparity may not be facilitated by rigid quantitative frameworks. We have begun qualitative work to explore age and racial barriers to MIS repair on the organization, provider and patient-level.

**FP-1280**

**Who knew? Females are at a greater risk of morbidity and readmission after ventral hernia repair**

Howell M, Stem M, Coker A, Nguyen H, Adrales G

*Johns Hopkins University School of Medicine*

**Introduction:** Half of ventral hernia repair (VHR) patients are females. While gender has been reported as a complication risk factor after other surgical procedures, this is often overlooked in VHR. We aimed to assess the impact of gender on 30-day outcomes after VHR.

**Methods:** Subjects were patients who underwent elective VHR (ACS-NSQIP, 2005–2015). Outcomes included morbidity, readmission, reoperation, LOS and operative time. Stratification method was used to address the interaction between gender and BMI, and multiple logistic regression models were run for each BMI group. Separate analyses were performed for primary, recurrent, laparoscopic and open VHR.

**Results:** Of 270,551 patients (52.1% males, 47.9% females, p < 0.001), 51,146 (47.3, 52.7%, p < 0.001) underwent primary laparoscopic VHR, 186,804 (55.2, 44.8%, p < 0.001) primary open VHR, 6598 (43.1, 56.7%, p < 0.001) recurrent lap VHR, and 26,003 (41.5, 58.5%, p < 0.001) recurrent open VHR. Females had significantly greater LOS, operative time, wound infection, organ space SSI, UTI, and bleeding requiring transfusion. Unadjusted findings persisted on adjusted analyses. In comparison to males of the same BMI, females had significantly increased risk of morbidity after primary laparoscopic VHR [BMI < 30: OR 1.27, (95% CI 1.06–1.51); BMI 30–34: OR 1.34 (CI 1.11–1.63)], primary open VHR [BMI < 30: OR 1.27, (CI 1.18–1.37); BMI 30–34: OR 1.71, (CI 1.56–1.87); BMI 35–39: OR 1.69, (CI 1.52–1.88); BMI ≥ 40: OR 1.77, (CI 1.60–1.96)], and recurrent open VHR [(BMI ≥ 40: OR 1.35, (CI 1.14–1.59)]. Similar findings were observed for readmission, and reoperation.

**Conclusion:** Nearly four times more open than laparoscopic VHRs have been performed in the last decade with more females undergoing primary and recurrent laparoscopic repairs. Females are at a greater risk of complications after various types of VHR. Gender and BMI should be considered as part of preoperative risk assessment and patient consultation. Further study is warranted to assess anatomic and physiologic differences that may account for this gender disparity.
IP-1425
Racial disparities in surgical outcomes and predictors of emergency hernia repair
Haider A
USA

IP-1426
Gender differences in patient reported and clinical outcomes after hernia repair
Henriksen N
Denmark
The etiology of diastasis recti is usually the result of increased intraabdominal pressure that is typically observed with pregnancy; however, obesity and prior abdominal operations can also cause diastasis. Diastasis recti is characterized by attenuation of the linea alba and in severe cases, the linea semilunares. Multiparous women are at highest risk for developing diastasis recti because of the repetitive stretching of the anterior abdominal wall. Diastasis recti presents as a midline bulge without a fascial defect that can occur above or below the umbilicus. It is amplified by having the patient lie flat and perform a straight leg raise. Classification systems have been proposed and based on the degree of rectus abdominis separation and myofascial deformity. Management options vary and depend on the degree of separation between the rectus abdominis as well as the oblique musculature. There are several options for management of diastasis recti ranging from exercise to simple plication of the linea alba and anterior rectus sheath to more advanced excisional techniques with or without the use of a mesh. Endoscopic and laparoscopic techniques can also be used in select situations where a small midline hernia is present as well. In many cases, an abdominoplasty is also frequently considered to excise the redundant adipocutaneous layer. Complications following rectus diastasis repair are infrequent and include infection, mesh extrusion, recurrence, nerve injury, seroma, complex scar, skin necrosis, contour abnormality, and visceral injury.
IP-1430
Patient selection for combined abdominoplasty and ventral hernia repair
Fischer J
University of Pennsylvania

IP-1394
Bulge and hernia after breast reconstruction
Espinosa-de-los-Monteros A
Instituto Nacional de Ciencias Medicas y Nutricion

The use of abdominal-based flaps for breast reconstruction may be associated with the development of abdominal wall bulgings in 7–63%, and ventral hernias in 9–18% of patients when mesh reinforcement is not used during donor area closure. This latter measure reduces bulgings and hernias to 6 and 2%, respectively, and its cost-utility has been well established. The presence of bulgings and hernias in this subset of patients are best treated by closing the remaining abdominal myofascial structure and adding a mesh, preferably in the retromuscular plane. To obtain this, a transversus abdominis release technique is performed. This allows for mesh fixation to strong structures, appropriate overlapping, and full muscle closure on top of the mesh without requiring further subcutaneous undermining.
FP-1227
First long-term results reported on prophylactic mesh closure of midline laparotomies
Hospital Universitario del Henares

Background: The prevalence of incisional hernias (IH) is still high after midline laparotomy. Up to date, there are two main contributions for improving these results: implementing “small bytes” technique and the use of prophylactic meshes. This study aims to describe our long-term experience in the use of prophylactic meshes.

Methods: Observational prospective study including all patients undergoing the use of prophylactic onlay polypropylene mesh for the closure of midline laparotomy since 2008–2014, with a minimum follow-up of 2 years.

Results: 172 patients were analyzed in an intention to treat: 75% elective, 25% emergency. Mean age was 68 years (62–77). Men, 56%. Mean BMI was 28.6 kg/m² (25.2–30.8). Wound classification: clean-contaminated (90.7%), contaminated (1.2%) and dirty (8.1%). Follow-up of patients was up to 8 years (mean: 5 ± 1.6 years). Two meshes were removed due to chronic infection in first six postoperative months. None of them have developed IH to date. Surgical morbidity: 10% SSI, 13% seromas and 5% of organ/space infection, solved by medical treatment. 13 patients developed IH (7.6%), 5/13 have been reoperated for IH repair by retromuscular technique without any trouble related to previous onlay mesh. The other 8 patients remain asymptomatic and have not accepted reoperation. Statistical analysis found differences in the development of IH with urgent operations (RR 3.5, 95% CI 1.24–9.84; p = 0.02) and obesity (p < 0.05).

Conclusions: In our setting, the use of polypropylene prophylactic meshes in midline abdominal incisions is safe, efficient and durable. Emergency operations and obesity are also the main risk factors despite the use of prophylactic meshes.

FP-1244
Cost-effectiveness of using mesh augmentation for incisional hernia prevention in colorectal surgery
Hospital del Mar

Purpose: Incisional hernia (IH) after colorectal surgery is highly prevalent, adding considerably to the costs and health care resource utilization. The objective of this study is to assess the utility and cost-effectiveness of an algorithm to decide on prophylactic mesh augmentation after a midline laparotomy for colorectal resection to prevent IH in high-risk patients.

Methods: A prospective cohort study was conducted including all patients undergoing a midline laparotomy for colorectal cancer resection between January 2011 and June 2014, after the implementation of a decision algorithm for prophylactic mesh augmentation in high-risk patients. Total hospital cost and resource expenses during index laparotomy and subsequent related hospital admissions or incisional hernia repairs were obtained. The sample was divided in two groups depending on the application of the algorithm in the initial operation.

Results: During the study period 226 patients, mean age 77 (11) years, 61% male, were included in the analysis. The mean follow-up was 31.5 months (12–60). 160 patients were treated following the algorithm at a mean cost of 12.038 (5.194) USD. In 66 patients the algorithm was not followed and the cost was 13.072 (5695) USD. The incidence of incisional hernia dropped from 43.9 to 10% when the algorithm was applied (p = 0.0001).

Conclusions: The implementation of the algorithm to use prophylactic mesh augmentation in selected patients reduced the incidence of IH and the total hospital costs per patient. Based on our analysis, need for incisional hernia repair adds substantially to total hospital costs and resource utilization.
FP-1319  
Prophylactic absorbable synthetic mesh (ASM) does not prevent hernia after deep inferior epigastric perforator (DIEP) flap breast reconstruction  
Carolinas Medical Center  

Introduction: The purpose of this study was to compare the long-term outcomes using a ASM for prevention of postoperative abdominal bulge following DIEP flap breast reconstruction.  
Methods: Medical records were reviewed for all patients undergoing DIEP reconstructions from January, 2010 to January, 2015. Patients were divided into two groups: primary closure versus primary closure with an ASM onlay, (Phasix [monofilament poly-4-hydroxybutyrate], Bard Inc., Warwick, RI). Rates of postoperative abdominal bulge, hernia, complications, OR supply cost were compared between the groups utilizing standard statistical methods.  
Results: During the study period, 319 patients underwent 553 DIEP reconstructions, 161 (50.5%) used mesh and 158 (49.5%) did not (nonmesh). The mean follow-up 41.5 ± 18.4 months. There was no difference in age (48.9 ± 9.3 years), diabetes, or nicotine use between groups(p > 0.05). There were more obese patients (BMI > 30) in the mesh group (45.3 vs. 32.9%; p = 0.02). Abdominal bulge rates (3.7 vs. 5.1%; p = 0.56) and hernia formation were similar between groups (3.7 vs. 3.8%; p = 0.97). Time to hernia development was 21.3 months in the mesh group. Donor site complications were more frequent in the mesh group (42.2 vs. 27.9%; p = 0.0071), including infection (21.1 vs. 5.7%; p < 0.0001), wound dehiscence (18.6 vs. 8.9%; p = 0.011), and fat necrosis (18.0 vs. 7.0%; p = 0.003). Operating room supply cost was significantly higher in the mesh group (2.2:1; p < 0.0001). With logistic regression modeling controlling for obesity, there is no still difference in hernia between mesh and no-mesh groups.  
Conclusion: Reinforcement of the anterior rectus with an onlay ASM is associated with increased wound complications and surgical supply cost. An ASM did not reduce the risk of postoperative bulge or hernia in patients undergoing DIEP reconstruction.  

FP-1217  
Treatment and prevention of parastomal hernias by bilateral transverse abdominis release and relocation of the ostomy: the new way to go?  
Berrevoet F, Colpaert J, Abreu de Carvalho L, Vanlander A  
Ghent University Hospital  

Introduction: Recent data from the AHSQC on parastomal hernia treatment showed the use of the Sugarbaker technique in only 25%. Recurrences occur in up to 1/3 of patients. As prophylaxis has been proven to decrease the incidence of parastomal hernias, we evaluated the bilateral transverse abdominis release with relocation of ostomy (TARRO) as both repair and prevention technique in the treatment of parastomal hernias.  
Methods: Over a 2-year period (9/2014–9/2016) all consecutive patients with a symptomatic parastomal hernia were treated using TARRO. A large sheet of monofilament polypropylene mesh was used. Pre-, peri- and post-operative data were collected. The objectives included basic patient and hernia characteristics, operating time, length of hospital stay, post-operative complications and hernia recurrence after both early and 12 months follow-up. Follow-up was done clinically and CT-imaging when a recurrence was suspected or for oncological reasons.  
Results: In total 16 patients were operated using this technique, 6 male/10 females with BMI of 28 kg/m². A concomitant incisional hernia was present in 10 (62.5%) patients. Eleven patients had an end-colostomy, 3 an ileostomy and 2 an ileal conduit. Nine patients (56%) underwent previous parastomal hernia repair. The main indication for surgery were pain and stoma care problems. TARRO could be performed in all cases. Immediate complications included 1 hematoma with surgical drainage and one deep wound dehiscence with mesh infection treated with negative pressure therapy. Stoma function was good in all patients and 88% of the patients were satisfied with their new stoma location. Twelve months follow-up with CT imaging did not show any recurrence yet.  
Conclusion: TARRO with prevention on one hand and treatment of the former defect on the other, seems a promising technique with acceptable morbidity and possibly achieving excellent results in terms of mesh prophylaxis for parastomal hernias.
FP-1226
A survey on attitudes and knowledge relating to hernia prevention
Hope W, Williams Z, Tenzel P, Fischer J, Lopez Cano M
New Hanover Regional Medical Center

The purpose of this study was to evaluate attitudes towards hernia prevention.
A 20 question survey was sent via email and social media. Questions related to area/type of practice and knowledge and attitudes related to hernia prevention.
A total of 497 surgeons responded to the survey. The majority of respondents were from the US (47%) and Europe (40%). Respondents performed > 100 laparotomies/closures (25%), 51–100 (26%), 16–50 (36%), < 16 (13%) with the majority closing using a running slowly absorbing suture (81%). The majority responded that they practiced but did not measure their suture to wound length closure of > 4:1 (63%) and practiced but did not measure their number of stitches (58%). For surgeons not performing the short stitch closure they responded the reasons were does not apply to patient population (19%) not familiar enough with the methods to correctly perform (25%), takes too long (13%), not reimbursed (4%), concerned about a closure related complications (27%), and other (22%). Regarding familiarity with prophylactic mesh respondents stated they were not familiar with literature (11%), familiar with literature but wouldn’t use (24%), familiar with literature and interested in using (45%), familiar with literature and already doing (15%), and other (5%). Reasons for not performing prophylactic mesh included does not apply to my patient population (13%), not familiar enough with the methods to correctly perform (12%), takes too long (6%), not reimbursed for performing (14%), not convinced of benefit (23%), concerned about the possibility of mesh infection/mesh related complications (46%), and other (14%). For respondents performing prophylactic mesh the majority were using synthetic mesh (64%) as a sublay (51%).

There appears to be some uptake of hernia prevention principles most notably in fascial closure. The use of prophylactic mesh appears to still be controversial with few surgeons actually practicing these techniques.

FP-1263
An evaluation of the use of prophylactic mesh augmentation in ileal conduit formation
Tenzel P, Milligan J, Williams Z, McCarthy R, Hope W
New Hanover Regional Medical Center

Parastomal hernias are a common complication following the formation of stomas. These hernias are very difficult to treat with high recurrence rates and no clear consensus on ideal surgical treatment. The use of prophylactic mesh at the time of ostomy creation has been proposed in attempts to prevent parastomal hernias from forming. The purpose of this project is to evaluate our experience in the use of prophylactic mesh in the creation of ileal conduits.
A retrospective review of all patients receiving prophylactic mesh in creation of ileal conduits was performed from 3/2011 to present. Outcomes and recurrence rates were determined from physical exam or by computed tomography (CT) scanning. Demographic information, technique, type of mesh, and outcomes were reviewed.
A total of 26 patients meet inclusion criteria with an average age of 61 years (range 54–83 years). Males made up 81% of patients and 92% were Caucasian. All patients underwent ileal conduit for bladder cancer. Biosynthetic meshes were used in 88% of patients and biologic mesh in 12%. All patients had prophylactic mesh augmentation in either the retrorectus or preperitoneal space. There have been no recurrences noted at an average follow up of 277 days (range 18–1320) with 69% of patients have CT scan follow up. There have been no mesh related complications.
The use of biologic/biosynthetic mesh may have a role in prophylactic mesh augmentation during the creation of ileal conduits in bladder cancer. Further study is needed to evaluated long term efficacy.
Monday, March 12, 2018

Session 3A: Controversies in Inguinal Hernia

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IP-1431
Which technique should I use? Best practices and high-value care
Bonjer J
The Netherlands

IP-1432
Penetrance of laparoscopic inguinal hernia repair
Montgomery A
Sweden

IP-1433
Techniques for avoiding and treating chronic groin pain after hernia repair
Chen D
UCLA

IP-1407
Value of primary inguinal hernia repair
Conze J
UM Herniacenter

Mesh free techniques have become unpopular in herniology. Registry data from the Danish Herniabase confirm proof a high recurrence rate in the long follow up. But we usually overlook that the group of suture repair is very heterogenous, pooling all different kind of primary inguinal hernia repair, leaving the classification without consideration. Also the Cochrane Review from Amato et al., willingly cited by promoters of mesh techniques, has its flaws and limitations. Nevertheless the message of the International Guidelines is clear: mesh-repair for all patients with an inguinal hernia!

The opposition to this recommendation is rising, new science is evolving, new evidence to underline and re-establish the role of tissue repair in inguinal hernia surgery. Retrospective data from the Aachen Hernia School and recent matched pair analysis from the Herniamed Registry demonstrate the benefits of tailoring the mesh indication according to the risk profile of the patient and the morphology of the hernia. The open approach in inguinal hernia repair allows an intra-operative decision of the mesh necessity. Not every patient needs a mesh. But this seems to be forgotten. Young surgeons do not even learn open mesh-free techniques anymore. But even a laparoscopic hernia surgeon needs a plan B from time to time. The “one fits for all” approach in inguinal hernia repair does not meet the challenges of individualized “tailoring” according to the patients risk profile. We need to reconsider the value of primary tissue-based, mesh-free techniques in the armory for inguinal hernia repair.
IP-1413
Laparoscopic internal ring high ligation surgery for treatment of pediatric inguinal hernia (PIH): 15 years evolution in a Chinese institute
Li B
The Affiliated Hexian Memorial Hospital, Southern Medical University

Background: Laparoscopic internal ring high ligation surgery is an alternative procedure for pediatric inguinal hernia (PIH), with a major trend towards increasing use of extracorporeal knotting and decreasing use of working ports. We utilize laparoscopic technique to treat all spectrum of PIH (including the incarcerated cases). We now report our 15 years experience of this minimally invasive technique.

Methods: Since 2002, more than 5000 children with indirect inguinal hernia were treated by laparoscopic surgery. All patients underwent high ligation surgery with a modified single-port laparoscopic technique. We use different suture device and technique to achieve this ligation, with an aim of simplify and standardize this procedure.

Results: All surgery was successful without serious complications. Between 2002 and 2006, we utilized a homemade sled needle to perform this suture. Modification was made in 2006, we use a combination of taper needle and Endoclose needle to operate. It is a proven technique with more than 4000 cases of successful experience. In 2017 we made a further modification. Just a taper needle could fulfill this ligation. The preliminary result is gratifying.

Conclusion: Laparoscopic internal ring high ligation technique for the repair of PIH is a safe and reliable procedure with minimal invasion and satisfactory outcome. It is easy to perfect and perform and therefore is a worthy choice for PIH.

Keywords: Pediatric inguinal hernia; Laparoscopic surgery; Closure of internal ring; High ligation

IP-1434
Single-port robotic TAPP
Cucurullo D, Angelini P
Monaldi Hospital/Department of General Laparoscopic and Robotic Surgery

Purpose: Like for laparoscopy, we adopted robotic repair in cases of recurrent, bilateral or primary monolateral hernias concomitant with other pathologies. The initial multiports approach was followed by the robotic single port one.

Methods: 18 patients underwent robotic single incision TAPP between February 2014 and July 2017. The Da Vinci Si monoport operative system was adopted with transumbilical port positioning. 5 recurrent, 10 bilateral (with 3 recurrences) and 3 monolateral primary hernias (associated to 2 cholecystectomies and 1 hiatal hernia repair) were treated. A double docking was necessary in the 3 associated pathologies and prefered in last 5 bilateral, in which the monoport was alternatively rotated of 30–40° towards both sides. The 30° robotic optic was facing up in all procedures. An articulated needle holder was adopted in the last 8 cases to help peritoneal flap closure. The mesh was fixed using fibrin sealant. Umbilical incisions were sutured by 0 PDS running suture. Patients were reviewed at week 1 and month 4. Patient satisfaction and pain were assessed using a standard Visual Analog Scale.

Results: Operative time (mean 52’ for side) was slightly higher than laparoscopy. LoS was 1 day except for concomitant hiatal hernia (2 days). Patient 2 (bilateral with recurrent hernia) was converted to laparoscopy. At week 1 were observed two hematomas, both conservatively treated. There was no major morbidity. The mean length of the umbilical incision was 21 mm. At month four no umbilical or inguinal hernia was noted; one patients (6%) experienced chronic groin pain while 15 (94%) were either satisfied or very satisfied with their outcome.

Conclusions: Robotic single port TAPP is safe and reliable with a high satisfaction index. Operative time is longer than laparoscopic TAPP. An articulated needle holder and

IP-1435
The difficult inguinal hernia: scrotal, prior plug, prior lap and open repair
Bures T
EUC Klinika Kladno

...
Mesh repair in hiatal hernia: when, how, why?
Birk D, Sandra H, Sebastian H
Kliniken Ludwigsburg/Bietigheim

The use of meshes after repair of a crural defect is still under debate. In the light of a recurrence rate up to 40% in larger defects the augmentation of the hiatal closure with a mesh prosthesis seems to be advisable. However severe complications due to mesh migration and erosion have been reported.

There are several options in dealing with this potential problem. Accepting the high recurrence rate and not using any kind of prosthesis is one and probably the most common used approach. When a implant is uses the options are non resorbable, fully resorbable, biological or the newest trend: bio-resorbable implants.

This talk will give an overview on the most common used materials and implants. It will give the rational on how and when using implants.

A possible algorithm for best decision making is presented.

Repair of the difficult hiatus: Re-Do S/P esophagectomy, bridging repair
Harold K
Mayo Clinic

Disruption of normal anatomic factors predisposes the postesophagectomy patient to diaphragmatic herniation (DH). DH can have significant morbidity and mortality. Postesophagectomy DH may be higher after minimally invasive esophagectomy (MIE).

A review of our cases involving post-MIE diaphragmatic hernias and the published literature is presented.
**IP-1392**  
**Lumbar hernia and denervation of the abdominal wall**  
Renard Y, De Mestier L, Meffert J, Kianmanesh R, Palot J  
*Robert Debre University Hospital*

**Purpose:** Lumbar hernias are a rare wall defect, whose surgical management is challenging due to the absence of precise recommendations. Lumbar hernias can be divided into congenital (18%) or acquired (82%). Among acquired lumbar hernias, lumbar incisional hernias (LIH) represent 31% of the etiologies. Moreover, lumbotomies induce the incisional injury of the main trunks of the intercostal nerves, leading to a denervation-caused abdominal wall atrophy in 40–50% of reported cases, clinically described as a flank bulging. We argue that this denervation should always be taken into account during LIH surgical repair, implying open surgery [1].

**Methods:** The same open technique was performed for all 31 patients, i.e., using a mesh into the retroperitoneal space posteriorly, placed with the largest overlap inferiorly and posteriorly, and fixed through the contralateral abdominal wall muscles under strong tension to correct the flank bulging.

**Results:** The mesh was totally extraperitoneal in 65% of patients. The postoperative mortality rate was null. The rate of specific surgical complications was 32.3%, and the rate of overall postoperative morbidity (Clavien–Dindo classification) was 38.7%. After a median follow-up of 27.5 months, the recurrence rate was 6.5 and 9.7% reported chronic pain.

**Conclusion:** The open approach for LIH repair was safe and enabled treating flank bulging simultaneously in all patients. This method allows normal anatomical restoration of the abdominal wall. The crucial point of LIH repair is the position of the mesh posteriorly and inferiorly, which constitute the greater risk of recurrence. An extraperitoneal approach of LIH repair is also possible laparoscopically. Among the most relevant series reported in the literature, laparoscopic LIH repair is technically more difficult due to the extensive dissection, with equivalent specific surgical morbidity. Good results are reported but only if there was no associated muscle atrophy [2, 3].

**IP-1391**  
**Parastomal hernia repair: Open retromuscular and onlay techniques**  
Pauli E  
*Penn State Hershey Medical Center*

Parastomal hernias are a common post-operative complication of ostomy formation. A variety of open and laparoscopic options for parastomal hernia repairs have been described. Unfortunately, recurrence after repair remains a persistent problem.

This presentation will review the key considerations for open parastomal hernia repair including primary repair versus mesh repairs, mesh selection, mesh configuration, stoma relocation and recurrence rates after various repair. We discuss patient selection and indications for surgery as well as when to offer a laparoscopic or open repair.

Posterior component separation with transversus abdominis release for repair of parastomal hernia will also be described. We discuss points of the postoperative care and complications that are unique to the patient with an ostomy.

After attending this lecture, the reader will have a better understanding of the options for open parastomal hernia repairs and the proper patient selection for each method.

**IP-1436**  
**Parapubic and atypically located ventral hernias**  
Webb D  
*Memphis, TN*

**IP-1437**  
**Parastomal hernia repair: Intraperitoneal and laparoscopic and robotic techniques**  
Belyansky I  
*Anne Arundel Medical Center*
**IP-1510**

**Efficacy of robotic transversus abdominis release in a porcine model**

Blatnik J, Tan W, McAllister J  
*Washington University in St. Louis School of Medicine*

**Background:** Transversus abdominis muscle release (TAR) is a novel approach to hernia repair that combines retromuscular mesh placement with posterior component separation (PCS) and muscle release. TAR is usually an open technique for abdominal wall reconstruction; however, several centers have begun successfully performing this operation robotically and claim similar operative times, decreased blood loss, fewer wound infections, shorter hospital stay, and decreased total hospital costs when compared to open surgery.

**Research plan:** We will compare robotic and open TAR methods in a porcine model. Performing the TAR operation on a porcine model will allow us to isolate the differences between the open and robotic approaches and examine tissue 4 weeks post-repair, which is not possible in human subjects. This approach will also allow us to exclude confounding factors that are found in human subjects, such as widely differing hernia size and hernia location. Our center has unique capabilities to perform this type of study through the combination of our laboratory’s robotic equipment with in-house animal facilities and operating rooms. Sixteen pigs will be randomized to open vs. robotic TAR with mesh placement. At 4 weeks post-surgery, animals will be sacrificed and the abdominal wall and mesh harvested en bloc.

**Specific aims and outcomes:** Our specific aims are to characterize adhesive burden, mesh incorporation, mesh flatness, and mesh shrinkage. Operative variables such as time will also be analyzed. We hypothesize that performance of the TAR operation robotically will decrease adhesion formation while providing similar operative times, mesh contraction, and mesh incorporation.

**IP-1509**

**Automated surgical coaching for technical skills acquisition in incisional hernia repair**

Adrales G, Malpani A  
*Johns Hopkins Hospital, Department of Surgery*

While laparoscopic incisional hernia (IH) repair effectively decreases the risk of infection, a major shortcoming of the laparoscopic bridging mesh repair is a higher rate of adverse hernia-site events, including recurrence, compared to laparoscopic repair with fascial closure. Fascial closure via intracorporeal suturing from lateral instrumentation is technically challenging. This has fostered interest in robotic repair as a minimally invasive abdominal wall reconstruction approach. Robotic hernia surgery requires intense training to achieve proficiency. Value can be driven by ensuring surgical competence to efficiently deliver effective and safe care through simulation. While teaching in the OR is limited by time and patient safety concerns, simulation training is constrained by access to experienced surgical educators. Based on prior work, we hypothesize that training hernia skills in virtual reality (VR) simulation can be augmented through an automated virtual coach (VC). Our previous VC objectively assessed performance on critical learning elements in a needle passing task and provided feedback through teaching cues. In a pilot randomized controlled trial (RCT) 2, we demonstrated that VC led to fewer errors in performing critical task elements versus self-directed practice. We propose to adapt the existing VC to teach intracorporeal suturing of the anterior abdominal wall in IH repair. We will evaluate effectiveness of VC in a RCT among novices learning the task in VR simulation and testing them on bench-top and porcine models. Our research aims to provide automated technology to efficiently impart technical skill in IH repair and thus eventually improve value in hernia care.
**FP-1270**

Pre-operative CT-scan variables for predicting complications in patients undergoing large ventral hernia repair using the component separation technique

Winters H, van Geffen E, Buyne O, Hummelink S, Ulrich D, van Goor H, Slater N  
Radboud UMC

*Background*: The component separation technique (CST) is considered the golden standard for large ventral hernia repair. However, postoperative complication and reherniation rates are significant. Risk factor analysis for postoperative complication and reherniation has focused mostly on patient history and co-morbidity. The use of CT scan variables to assist in risk assessment seems a promising adjunct. The aim of this study is to determine the predictability of reherniation and surgical site infections by using pre-operative CT variables.

*Methods*: The electronic patient system was searched for patients who underwent CST between 2000 and 2013 and had a pre-operative CT scan available. Visceral fat volume (VFV), subcutaneous fat volume (SFV), loss of domain (LOD), rectus thickness and width (RT, RW), abdominal volume, hernia sac volume, total fat volume (TFV), sagittal distance (SD) and waist circumference (WC) were measured or calculated. Relevant variables were entered into multivariate regression analysis to determine their effect on reherniation and SSI.

*Results*: Sixty five patients were eligible for inclusion. The use of a mesh (p = 0.005, OR = 0.15) and VFV per 1000 cm³ (p = 0.047, OR = 1.92) were significant predictors regarding reherniation. With regard to SSI, LOD per five percent (p = 0.037, OR = 2.05) and SFV per 1000 cm³ (p = 0.018, OR = 0.22) were significant predictors.

*Conclusion*: Quantifiable preoperative CT scan variables can be used to predict complications and reherniation in patients undergoing large ventral hernia repair using CST.

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**FP-1253**

Is nonoperative management warranted in ventral hernia patients with comorbidities? A 3 year follow up

Bernardi K, Holihan J, Cherla D, Flores J, Kao L, Ko T, Liang M  
University of Texas Health Science Center at Houston

*Introduction*: Individuals with comorbid conditions are not only at increased risk to develop ventral hernias but also at increased risk for complications (including recurrence) following repair. There is limited high-quality prospective data on the safety and efficacy of nonoperative management of these patients. Our objective was to determine long term clinical and patient reported outcomes of nonoperative management of patients with comorbidities and ventral hernias.

*Methods*: This is the 3-year follow-up to a prospective observational single institution study of patient with comorbidities and ventral hernias. Patients completed a standardized interview by phone. Primary outcome was proportion of patients who underwent urgent or emergency surgery. Secondary outcomes were the change in quality of life (QoL) from their baseline interview and proportion of patients undergoing elective repair. QoL was measured utilizing the modified activities assessment scale (AAS), a validated, hernia-specific QoL survey. The minimal clinically important difference was a change of 7 points on a scale of 1–100 where 1 = poor QoL and 100 = perfect QoL.

*Results*: Overall, 60 patients were followed to completion (Table below). At the end of 3 years, 3 (5%) patients had died due to non-hernia related causes, 16 (26.7%) patients had at least one emergency room visit related to their hernia, 4 (6.7%) patients underwent urgent/emergent ventral hernia repair, and 15 (25%) patients underwent elective repair. On average, non-operatively managed patients experienced no change in their QoL, while those who crossed over to operative management experienced a substantial improvement in their QoL.

*Discussion*: Non-operative management for patients with ventral hernias appears safe; however, there was substantial crossover to operative intervention. For most patients who successfully completed non-operative management, their QoL did not change over 3 years. On the other hand, patients who underwent ventral hernia repair had a major improvement in their QoL.
FP-1233
Visceral obesity as a predictor of hernia recurrence after abdominal wall reconstruction
Baastrup N, Jensen K, Jorgensen L
Digestive Disease Center, Bispebjerg University Hospital

Introduction: High body mass index (BMI) increases the risk of postoperative complications and recurrence after abdominal wall reconstruction (AWR). However, BMI is an anthropometric measure that does not provide specific information on mass and placement of different tissues. We hypothesized that visceral fat volume (VFV), measured on computed tomography (CT) scans, was a better predictor than BMI for recurrence after AWR.

Method: Consecutive patients undergoing AWR at our institution from 07.10.2010 to 05.12.2016 were included in this study. Data was collected from a prospective database and all patients were summoned for clinical follow-up. VFV was calculated from preoperative CT scans using an automatic segmentation tool. The primary and secondary outcomes were hernia recurrence and 30-day postoperative surgical site occurrences (SSO), respectively.

Results: We included 155 patients undergoing AWR for a mean hernia defect of 11.4 cm × 15.5 cm (transverse × longitudinal). Forty-three patients (28%) developed recurrence during follow-up. VFV was significantly associated with hernia recurrence (5.1 vs. 4.1 L, P = 0.014, univariable analysis). After multivariable Cox-regression, VFV remained significantly associated with hernia recurrence (HR 1.09 per 0.5 L increase of VFV, 95% CI 1.02–1.16, P = 0.018). In contrast, BMI was not associated with hernia recurrence in the uni- or multivariable analyses. Forty-five patients (29%) developed a SSO. VFV was significantly higher in the group of patients who developed SSO compared to those who did not (mean 5.1 vs. 4.1 L, P = 0.011). A multivariable logistic regression model showed that VFV was significantly associated with the development of SSO (OR 1.12 per 0.5 L increase of VFV, 95% CI 1.12–1.23, P = 0.009).

Conclusion: VFV was significantly predictive of both hernia recurrence and SSOs after AWR. This study suggests VFV as a promising risk assessment tool for patients undergoing AWR.

FP-1298
Hybrid robotic assisted transversus abdominis release is associated with a significantly decreased length of stay without increased complications compared to open transversus abdominis release in patients with large ventral hernias
Halka J, Vasyluk A, DeMare A, Iacco A, Janczyk R
Beaumont Hospital

Background: Prior data shows robotic-assisted transversus abdominis release (TAR) allows repair of complex ventral hernias with shorter LOS compared to open TAR. For large ventral hernias we describe a hybrid robotic TAR (hrTAR) technique consisting of a robotic TAR dissection followed by open debridement and closure of fascia and skin/subcutaneous tissue through a midline incision. We compare LOS and wound morbidity in our hrTAR cohort with open TAR in patients with similar hernia characteristics.

Methods: All hrTAR performed in our institution between November 2015 and July 2017 contained in a prospectively maintained robotic database and/or in the Americas Hernia Society Quality Collaborative (AHSQC) database were analyzed. Open TAR patients maintained in a prospective database and/or in the AHSQC from September 2013 to August 2016 were similarly analyzed and compared with hrTAR patients.

Results: 135 TAR patients and 49 hrTAR patients were analyzed. Age, gender, BMI, co-morbidity, and proportion of recurrent hernia were not significantly different. Hernia width (14 vs. 13.9 cm, p = 0.93) and length (20.0 vs. 21.5 cm, p = 0.18) were similar between groups. Median operative times were longer in the hrTAR group (5.2 vs. 4.32 h, p = 0.009). 30-day Surgical site occurrences requiring intervention were similar between groups (7.3 vs. 2.3%, p = 0.15). Wound and major complications were similar. LOS was significantly shorter in the hrTAR group (3 vs. 7 days, p = <0.001).

Conclusion: Our data shows that hrTAR can be performed with substantially lower length of stay and similar wound morbidity to open TAR in patients with large ventral hernias. We hypothesize that the improvement in LOS is due to decreased pain associated with the robotic dissection compared with open TARs.
**FP-1278**

Expansion methods for midline closure of the abdominal wall in cases of loss of domain ventral or incisional hernia

Blonk L, Van Veenendaal N, van der Velde S, Bonjer H  
VU University Medical Center

**Aims:** Large incisional hernias remain a surgical challenge due to lateral retraction of the abdominal wall musculature and loss of domain. Tension free abdominal wall restoration should be pursued to prevent abdominal compartment syndrome. The aim of this study was to investigate techniques for expansion of the abdominal wall prior to incisional hernia repair, to facilitate closure of the midline.

**Methods:** A systematic review of literature was performed to identify studies describing preoperative progressive pneumoperitoneum (PPP), tissue expanders (TE) or botulinum toxin (BTX) to expand the abdominal wall prior to ventral hernia repair. The primary outcome measure was primary fascial closure rate. Secondary outcomes included effect of expansion on the abdominal wall, postoperative outcomes and patient satisfaction.

**Results:** Sixteen studies were selected, including 435 patients (BTX: 101, PPP: 299, TE: 19, combination BTX and PPP: 16). Eight studies reported primary fascial closure rates. After BTX a closure rate of 83 and 100% was reported in 35 patients. PPP lead to a mean closure rate of 92.3% (range 83.0–100.0%) in 199 patients. A 100% closure rate in 16 patients was reported after combining BTX and PPP. 32 patients received TE, of these 68.4% achieved fascial closure. The main difference in protocol was the time consuming aspect of PPP and TE. Complication rates after expansion was 0% for BTX, 17.8% for PPP (catheter problems, subcutaneous abscess and emphysema, pneumomediastinum and pneumothorax) and 26.3% for TE (skin necrosis).

**Conclusion:** High rates of primary fascial closure were achieved. The absence of complications after BTX and the less invasive character of this technique is promising for further research. Due to the dissimilarity in study protocol, small study populations and non-randomized studies a definite answer for preferred method of abdominal wall expansion to facilitate midline defect closure cannot be concluded from this study.

**FP-1275**

Rives–Stoppa vs Ramirez vs TAR: an anatomical study comparing anterior components separation and transverse abdominis release

Sneiders D, Kroese L, Jeekel J, Lange J, Muysoms F, Kleinrensink G  
Erasmus University Medical Center Rotterdam

**Introduction:** Incisional hernia is a common complication after midline laparotomy. For large incisional hernias, additional medialization of the rectus abdominis muscles is needed to facilitate tension-free closure. To achieve this the Rives–Stoppa, anterior components separation (Ramirez), or transverse abdominis release (TAR) techniques are used. Objective of this study is to compare the three techniques with respect to their medializing potencies in situ, using post mortem human specimens.

**Methods:** In total human 10 specimens will be included. After the Rives–Stoppa procedure, the Ramirez and TAR were performed in the same specimen, each on one side of the abdomen. Lateral advancement was measured at different steps of the procedure and at three different levels of the linea alba through attaching three 1 and 2 kg weights. Lateral advancement after medialization was measured relative to the initial lateral advancement after cleavage of the linea alba.

**Results:** To date, 5 specimens were included. After attaching 1 kg weights, the median relative lateral advancement of the posterior rectus sheath at the umbilical level, after the Rives–Stoppa procedure was 1.8 cm (IQR: 0.65, n = 10). Median relative lateral advancement after the Ramirez and TAR procedures were respectively: 2.6 cm (IQR: 1.0, n = 5) and 5.5 cm (IQR: 1.7, n = 5). After attaching 2 kg weights, the median absolute lateral advancement after the Ramirez and TAR procedures increased to respectively: 4.2 cm (IQR: 2.7, n = 5) and 7.4 cm (IQR: 1.3, n = 5), relative lateral advancement did not differ significantly between measurements with 1 and 2 kg.

**Conclusion:** Compared to the Rives–Stoppa and Ramirez technique the TAR showed a superior lateral advancement in 5 post-mortem human specimens. At the congress all results in all 10 specimens will be presented.
Monday, March 12, 2018

Session 4A: Ventral Hernia Repair

IP-1438
Components separation: which technique and when?
Wright A
University of Washington Medical Center

IP-1439
MILOS and EMILOS
Reinpold W
Germany

IP-1440
Revisiting onlay ventral hernia repair: patient selection, technique and outcomes
Voeller G
Memphis, TN

IP-1441
The value of laparoscopic versus open incisional hernia repair
Krpata D
Cleveland Clinic

IP-1442
Care of the hernia in the morbidly obese patient
Kercher K
Carolinas Medical Center
Monday, March 12, 2018

Session 4C: Video Abstracts: Inguinal

V-1111
Delayed diagnosis and laparoscopic repair of a traumatic diaphragmatic hernia
Keating J, Kirkland M
University of Pennsylvania

Background: Injury of the diaphragm is often subtle following thoracoabdominal trauma, and imaging studies may be nondiagnostic. A high index of suspicion for diaphragmatic injury is imperative, because delayed diagnosis may result in herniation and strangulation of intrabdominal contents. This video case report demonstrates the presentation, surgical repair and outcome of a missed diaphragmatic injury resulting in intrathoracic herniation of the stomach, duodenum and colon.

Methods/results: The patient is a 29 year-old Spanish-speaking man who suffered a stab wound to his left thoracoabdomen fourteen years prior in Mexico. The patient reports that he was stabbed with a kitchen knife and was treated with local wound exploration only. He presented to our hospital in acute abdominal pain and shortness of breath and was found on CT scan to have a left-sided diaphragmatic defect with herniation of the stomach, proximal duodenum and a portion of the left colon without evidence of ischemia or necrosis. We performed a laparoscopic reduction and repair of the posttraumatic left diaphragmatic hernia using a 4 inch x 6 inch piece of prosthetic mesh and placed a 20-french thoracostomy tube. He tolerated the procedure well and was discharged home on hospital day 7.

Discussion: Early diagnosis and treatment of diaphragmatic injury following thoracoabdominal injuries is ideal. This case details the successful diagnosis and repair of a diaphragmatic injury resulting in herniation of abdominal contents several years following injury.

V-1304
Robotic giant prosthetic reinforcement of the visceral sac: an innovative technique for minimally invasive repair of inguinal hernias
Halka J, DeMare A, Vasyluk A, Iacco A, Janczyk R
Beaumont Hospital

Introduction: With the use of prosthetic mesh being championed by Usher in the late 1950s, Rene Stoppa applied this development to the treatment of complex hernias of the myopectineal orifice. The important principles of the technique being the wide entrapment of the visceral sac with a bilateral large piece of prosthetic mesh, termed “Giant Prosthetic Reinforcement of the Visceral Sac” or GPRVS, and the use of the natural intra-abdominal pressure to push the mesh against the posterior portion of the anterior abdominal wall. This technique proved to be efficacious in repair of these hernias with Stoppa’s 1998 patient series reporting a global recurrence rate of 1%. With the adoption of robotic assistance into hernia repair, complex dissections can be performed in a minimally invasive manner with ergonomic advantages over laparoscopic surgery.

Methods: Using the robotic surgery system, GPRVS can be performed in a manner similar to what Stoppa originally described, with smaller incisions and less abdominal wall retraction. This video details the surgical approach to giant prosthetic reinforcement of the visceral sac using the robotic surgery system. Using this technique allows placement of a large bilateral piece of mesh into the preperitoneal space.

Discussion: The giant prosthetic reinforcement of the visceral sac as original described by Stoppa has been validated as an effective technique for repair of hernias of the myopectineal orifice. This technique can be performed minimally invasively using a robotic system to afford placement of a large mesh without a large midline or suprapubic incision.
Laparoscopic approach of incarcerated femoral hernia with acute appendicitis (Garangeot)


Hospital Pitangueiras

Incarcerated femoral hernia with an appendix in its sac is a rare condition of acute abdomen. This condition is called De Garangeot Hernia, and it was described for the first time in 1731. Since then, there are only about a hundred cases reported. They estimate an incidence of 0.024% of all hernias.

We report the case and show the video of an 80-year-old female presented to the emergency department with painful lump over her right groin region with local phlogistic signs. Due to clinical diagnosis of incarcerated femoral hernia, it was proceed an exploratory laparoscopy which found the cecal appendix in the crural defect (De Garangeot Hernia) with acute appendicitis.

She was treated with laparoscopy appendectomy and TAPP hernia repair simultaneously with low-weight polypropylene mesh.

The patient was discharged on postoperative day two without any complication.

Into our literature review, we are the second Brazilian case reported of De Garangeot Hernia, and the first to proceed laparoscopy access. Although is a rare condition, De Garangeot hernia has to be thought as a differential diagnosis of incarcerated femoral hernia, because early surgical management is crucial to avoid associated complications.

Robotic repair of incarcerated pelvic kidney in inguinal hernia

Copper C

Longstreet Clinic, Northeast Georgia Medical Center

Although inguinal hernias are quite common (about 500,000 per year), the incidence of a pelvic kidney is rare (1/3000 people). An 82 year old gentleman had an open bilateral inguinal hernia repair last year. He presented this year with a new large mass in his left scrotum which was not reducible. A CT scan demonstrated the patient’s left pelvic kidney down in the scrotum without evidence of ischemia or ureteral obstruction.

This video demonstrates the first reported robotic repair of a pelvic kidney incarcerated in a recurrent inguinal hernia.
Tuesday, March 13, 2018

Session 5: Collaborative Hernia Research and Quality Improvement around the Globe

IP-1443
AHSQC: Innovative Collaboration of surgeons, patients, industry, and the FDA
Poulose B
Vanderbilt University Medical Center.

IP-1444
Inguinal hernia repair: toward Asian guidelines
Lomanto D
Singapore.

IP-1445
Implementation of hernia surge guidelines
Pawlak M
Poland.

IP-1446
Germany: the importance of registries in the postmarketing surveillance of surgical meshes
Köckerling F
Germany.

IP-1388
Swedish Registry: improving patient outcomes
Sandblom G
Södersjukhuset, Department of Surgery.

Background: Patient registries provide real-life data that may help to understand reasons for variations in incidence and treatment of a disease; to examine factors that influence the treatment outcome; to describe care patterns and disparities in the delivery of care; and to measure quality of care. Large patient-based studies may also help to identify factors influencing the risk of rare but serious adverse outcomes.

Methods: The Swedish Hernia Register (SHR) was started in 1994 and now covers more than 95% of all inguinal and femoral hernia repairs performed in Sweden on patients 15 years and older. Data in the SHR is prospectively registered online after each operation and includes variables such as hernia anatomy, primary repair or reoperation for recurrence, method of repair, type of anesthesia and complication within 30 days after surgery. Based on the Swedish personal Identification numbers, it has been possible to match data from other registers and to track each patient having undergone hernia surgery to record reoperations for recurrence.

Results: Studies based on the SHR have shown that the relative benefit from laparoscopic repair is greater in women than in men; that the risk of infertility after mesh repair is so low that it lacks clinical relevance, that the risk of recurrence is greater in case a light-weight mesh is used, that hernia surgery should be avoided within 6 months after a myocardial infarct but that the risk is greater following a non-STEMI infarct than after a STEMI infarct.

Conclusion: The SHR has provided data that has had great increase on the management of groin hernias. Although the observational design of the register-based studies has some limitations, the SHR may serve as a base for studies addressing issues that are extremely difficult to answer in randomised controlled trials.
IP-1378  
**Innovation and quality in Brazil**  
*Santa Casa University Hospital*

A model of training conducted in a University Hospital in Brazil focused on developing enhancement surgeons in the Lichtenstein technique:  
**Proposal:** Technical excellence, Education, Research and development of the hernia repair by Lichtenstein technique. After some lectures to review the evolution of the Lichtenstein technique, video sessions demonstrating the technique step-by-step: comments and discussions, standardization of Modified Lichtenstein technique under local anesthesia and sedation, cases are discussed beforehand with proctors. Five sequential proctored cases were performed, first operation was performed by the tutor and aided by the training surgeon. Training surgeon performs others four operations and Demonstrate knowledge, skill and ability to realize the operative steps.  
**18 surgeons:** In 4 days, we realized a total of 79 hernias repair in 74 patients.  
**Results:** 70 males and 4 females, 15 and 84 years (49 ± 15 years). Local anesthesia associated with sedation in 71 cases, 3 general anesthesia with a laryngeal mask airway, 5 bilateral hernias, 41 right and 28 left hernias, Nyhus classification: 23 type II, 32 type IIA, 16 type IIIB and three type IV. Details of hospital stays: 6 h (29 patients), 8 h (13 patients), 12 h (17 patients), 24 h (12 cases being one with bilateral hernia), 36 h (2 cases—severe pain) and 132 h (1 case). Immediate complications: none (67), large hematoma (3) (two in use of anticoagulant), bronchospam (1), intense pain (1), paresthesia (2). Complications at 7 PO: none (56), mild pain (6), moderate pain (2), small hematoma (1), inguinoescretal hematoma (1), drainage of hematoma (1), seroma (2), scrotal paresthesia (2) and superficial wound infection (2).  
**Conclusions:** The Hernia for the Underserved organization, focused on building infrastructure and “training trainers” by standardization a surgical technique (Lichtenstein) and a building a teaching program. The collective effort for local communities is a huge opportunity for building infrastructure and “training trainers” by standardization a surgical technique (Lichtenstein) and a building a teaching program. 

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**IP-1409**  
**Chinese Hernia Registry: scientific rigor and quality improvement in a populous nation**  
Qin C, Shen Y, Chen J  
*Beijing Chao-Yang Hospital, Capital Medical University*

The introduction of the tension-free hernia repair concept open a new chapter for Chinese hernia surgery. Since 1997, we experienced 20 years of dramatic development with fruitful achievement, including implementation of new surgical techniques and medical devices, experiences accumulation and establishment of treatment guidelines. Now in China, more than 1 million inguinal hernia procedures and around 100,000 abdominal wall hernia operations are carried out each year. But China is such a vast country with imbalanced development. The quality of medical health care in hernia surgery is not uniform due to various kinds of irregular operations. How to change this situation?

Hernia registry is an application-oriented outcome research tool, which could monitor and evaluate our daily clinical practice, ultimately, investigate its effectiveness (outcome research). Many hernia societies in European and American nations have built up their own hernia database. Great quality improvement has been achieved. The successful experience of Germany hernia database—Herniamed, is worth learning and introducing.

Follow the example of Herniamed, we designed a new Internet-based Chinese- and English language registry system. Via the Internet, all relevant patient data (comorbidities, previous operations, staging, specific surgical technique, medical devices used, perioperative complications and follow-up data, specimen of special and infected cases of hernia, and so on) can be entered into this registry database. Furthermore, some special issues are added according to China’s conditions; especially the issues have not been clarified or still remain controversial in the latest guidelines. It will also include a pediatric hernia database. We hope that there will be a consensus on these issues in the future.

Now, the prototype of the Internet based Chinese hernia database has been established, with this framework was built and participants were enrolled, we believe this system will provide continuous improvement for Chinese hernia surgery.

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**IP-1447**  
**Canadian experience: cost containment while minimizing risk**  
Klassen D  
*Halifax, Nova Scotia, Canada*

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**IP-1408**  
**Quality collaborative in Australia**  
Chan Draratna H, Karatassas A, Hensman C, Slater K  
*St John of God - Perth*

The AHSQC has provided the perfect framework for auditing hernia repair and outcomes. For legal reasons (relating to data collection and international law) it has been available only to surgeons from the United States. It would seem appropriate to grow the AHSQC further and with the support of the AHSQC we are creating an Australian franchise. This has not been as straightforward as first thought and we will outline the issues that we have faced in setting up AHSQC in Australia.

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**IP-1448**  
**Improving quality of care in the developing world**  
Filipi C  
*Omaha, NE*

Developing country medicine is plagued by many short comings but primarily government disinterest and underfunding. Capacity building from outside organizations comes in many forms, some of which are ineffectual or even damaging. Therefore the World Bank is encouraging more thoughtful approaches to health care aide. We have identified several methods but how to influence local governments to assume health care responsibilities is the deeper question. When the United States enacted Medicaid and Medicare legislation, the free market system was replaced and a larger percent of the population became eligible for paid healthcare. The overall quality of care improved. In fact the World Health Organization rankings of country health care correlates well with the amount of government funding. To help underserved country governments to understand that financially supplementing health care is a priority is the topic of this presentation.
The giant scrotal hernia
Beitler J
Hospital Municipal da Piedade

Although they are not common they do occur. We have been doing those repairs, using Stoppa technique for large and giant hernias, since 1993 on a regular basis. We have been performing 12 to 18 cases every year, that is, 347 cases. We have 114 patients with giant inguinal hernias repaired—unilateral or bilateral.

There is no a specific classification for giant inguinal hernia, but we consider that once it reaches the knee or beyond, it is giant.

For all giant hernias, we use progressive preoperative pneumoperitoneum as a routine method to avoid content and continent disparity. Every day it is introduced 1–1.5 L of atmospheric air. The average amount is between 8 to 12 L.

A midline infra-umbilical incision is used.

Dissection at the preperitoneal plane begins near the pubis, and Cooper ligament is recognized bilaterally. Lateral dissection is done until psoas muscle is found bilaterally. Between these dissected areas are the peritoneum, the cord, and the wall defect.

The peritoneum is opened anteriorly, and the hernia contents are reduced. We divide the peritoneum and left over the hernia sac opened in the scrotum, and then we close the peritoneum in the abdominal cavity.

In the preperitoneal space a 30 × 23 cm high-density mesh is used and sutured with three stitches on both sides of Cooper’s ligament, and proximally the mesh is fixed at the umbilical area. The midline incision is sutured.

We use closed suction drains inserted into the scrotum to decrease seromas.

Our follow-up shows one recurrent hernia, and 2 cases of infection, that responded to antibiotics. Seroma formation is almost ever-present.

We never try to do anything about the excess scrotum skin during the first procedure. Two to three months later this is done.
**IP-1369**

**Laparoscopic approaches to chronic pain in athletes**
Sheen A, Paajanen H, Simon T, Montgomery A
Manchester University Foundation Trust

**Introduction:** Traditionally chronic ‘groin’ pain in athletes has been associated with various clinical entities such as: Inguinal disruption/posterior wall weakness, adductor tendinopathy, chronic osteitis pubis and/or a hip pathology e.g. impingement. Surgery for the inguinal canal disruption has been carried out by both open and laparoscopic approaches.

**Laparoscopic surgery:** Laparoscopic surgery has been described as a repair for inguinal disruption in athletes by both the totally extra preperitoneal (TEP) and trans-abdominal preperitoneal (TAPP) methods. A total of 598 cases of TAPP have been reported with the majority of patients returning to their chosen sport after 4 weeks with a 74–93% success rate. The TAPP technique has been described with an inguinal ligament release procedure, but this carries a slightly higher morbidity. TEP has been reported in 248 patients to date with return to sport ranging from 3 weeks to 3 months and a success rate of 74–100%. Laparoscopic approach allows inspection of the iliotibial tract, obturator internus fascia, femoral and inguinal canal defects and lipomata of cords. It does though require the use of mesh but can also prophylactically repair the contralateral side.

The world’s first randomized controlled trial comparing open v lap surgery (NCT02297711) with 66 patients recruited depicted 4 patients pain free in the TEP group after 4 weeks, but none in the OMR group. Pain scores after 1, 2 and 4 weeks were not statistically different between the two groups (p = 0.4236, 0.8371 and 0.2406 respectively). Return to full sporting activity after 1 month was achieved in 51 v 50% (TEP v OMR) (p = 0.9904) and 91 v 80% (TEP v OMR) after 3 months (p = 0.4038).

**Conclusion:** Despite the randomised trial showing no difference in outcome between open and lap approaches, there appears to be a trend of a quicker return to sport with the laparoscopic approach.

**IP-1450**

**Giant ventral hernia with loss of domain: progressive pneumoperitoneum and BOTOX**
Berrevoet F
Belgium

**Introduction:** Mesh related complications are not common in inguinal hernia repair. We report the management of mesh infection and migration by laparoscopic assisted method.

**Methods:** All together 10 patients who developed infected mesh grafts after inguinal hernia repair and two had mesh migration to the urinary bladder underwent laparoscopic treatment. Acute mesh infection can be preserved by continued drainage using laparoscopic trocar insertion method, while chronic infection should be removed under laparoscopic guided technique. For mesh migration to the bladders might be removed by laparoscopic technique directly.

**Results:** Over last 8 years, 10 patients developed infected mesh grafts post-inguinal hernia repair surgery and 2 had mesh migration. Infected meshes are Plug in 4, Kugle 1 patient, 3D meshes 5. 4 had mesh salvages due to acute infection. Patient their mesh removed stayed in hospital from 2 weeks to 3 months after operation, while mesh salvaging their hospital stay between 1 to 2 months. The migrated mesh removed discharge from hospital with 3–4 days. There were no complications such as bleeding, injury of bowel or urinary bladder.

**Conclusion:** This report indicates that laparoscopic management of inguinal hernia mesh infection and migration is likely to be successful. The most advantage is to voiding visceral injury during the procedure of mesh removing and salvaging.

**Keywords:** Inguinal hernia; Mesh; Infection; Migration; Laparoscopic

**IP-1408**

**Laparoscopic management of mesh related complications after inguinal hernia repair**
Ji Z
Zhongda Hospital, Southeast University/Professor

**Introduction:** Mesh related complications are not common in inguinal hernia repair. We report the management of mesh infection and migration by laparoscopic assisted method.

**Methods:** All together 10 patients who developed infected mesh grafts after inguinal hernia repair and two had mesh migration to the urinary bladder underwent laparoscopic treatment. Acute mesh infection can be preserved by continued drainage using laparoscopic trocar insertion method, while chronic infection should be removed under laparoscopic guided technique. For mesh migration to the bladders might be removed by laparoscopic technique directly.

**Results:** Over last 8 years, 10 patients developed infected mesh grafts post-inguinal hernia repair surgery and 2 had mesh migration. Infected meshes are Plug in 4, Kugle 1 patient, 3D meshes 5. 4 had mesh salvages due to acute infection. Patient their mesh removed stayed in hospital from 2 weeks to 3 months after operation, while mesh salvaging their hospital stay between 1 to 2 months. The migrated mesh removed discharge from hospital with 3–4 days. There were no complications such as bleeding, injury of bowel or urinary bladder.

**Conclusion:** This report indicates that laparoscopic management of inguinal hernia mesh infection and migration is likely to be successful. The most advantage is to voiding visceral injury during the procedure of mesh removing and salvaging.

**Keywords:** Inguinal hernia; Mesh; Infection; Migration; Laparoscopic

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Pregnancy and risk of ventral hernia repair recurrence

Jensen K
Bispebjerg University Hospital

Some 15% of patients undergoing ventral hernia repair are women of childbearing age, and thus represent a common clinical challenge. The local changes in abdominal wall physiology as well as the increase in weight observed during pregnancy may play a relevant role for surgeons choosing who to offer ventral hernia repair to.

Two large-scale studies have assessed how post-hernia repair pregnancy affects the risk of recurrence, reporting some 50–70% increased risk of ventral hernia recurrence in women who become pregnant subsequent to hernia repair, suggesting that this specific patient group needs certain attention. Assuming pre-pregnancy repair indeed is needed, the question remains as to how to perform the repair. It seems that open and laparoscopic repair are equal in terms of risk of recurrence in this patient group, however it has been suggested that suture repair may be associated with a reduced risk of recurrence for these women.

The quality of life in women undergoing hernia repair prior to pregnancy remains uncharted area. Hypothetically the stretching of the abdominal wall during pregnancy may interfere with the incorporation of an otherwise non-symptomatic mesh in the abdominal wall and thus cause symptoms, however no studies on this have been published to date. Further, any impact of ventral hernia repair on the obstetrical outcome of a subsequent pregnancy remains to be assessed properly.

In conclusion, women of childbearing age represent an often overlooked challenge, which will be discussed in detail in the current presentation.
Resorbable biosynthetic mesh: indications and limitations
Blatnik J
Washington University School of Medicine

The utilization of resorbable biosynthetic mesh has steadily increased over the last several years with the availability of several new products onto the market. These meshes are designed to provide similar handling to more familiar permanent synthetic meshes, have a durability from 6 to 18 months and resorb in ideally a controlled method. To date significant data on the use and outcomes following hernia repairs with these products has been limited due to the fact they are still relatively new onto the market. The purpose of this talk will be to review the currently available products and their strengths and weaknesses. Finally, within the confines of currently available literature, we plan to review their current indications and limitations for clinical use.

The use of laparoscopy and biological mesh in clean ventral hernia repair
Miserez M
Belgium

Recalled mesh: what happened? What can we learn?
Ramshaw B
University of Tennessee Medical Center

There is a massive amount of information online about hernia mesh, hernia mesh complications, hernia mesh lawsuits and hernia mesh recalls. In general, any device can be recalled (removed from the market) in three ways: the company can independently remove the product, the FDA can mandate removal of the product or the FDA and company can work together to remove the product. Much confusion has occurred through misunderstandings and misinformation about hernia mesh complications and hernia mesh recalls over the past decade. In fact, the majority of hernia mesh recalls by the FDA were for non-patient related reasons, primarily, packaging issues and counterfeit mesh products discovered on the market. The only recall related to patient complications was a group of Bard Kugel Composix products that according to the recall notice, the “memory recoil ring could break and potentially lead to bowel perforation and or chronic enteric fistula”. Other than this hernia mesh recall, there have been no hernia mesh recalls related to patient complications.

Despite the paucity of hernia mesh recalls related to patient complications, the use of permanent synthetic hernia mesh has been related to a number of patient complications including, mesh infection, chronic pain and mesh contraction or mechanical failure resulting in hernia recurrence. This presentation will discuss the history of hernia mesh regulation, hernia mesh recalls, both FDA and voluntary, and the complex issue of mesh products contributing to patient complications, including what we have learned about the complex interaction between a permanent synthetic hernia mesh and the human body.

Patient specific mesh: the new frontier
Smart N
UK
**Tuesday, March 13, 2018**

**Session 6C: Scientific Abstracts**

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**FP-1256**  
It matters: surgeon volume in ventral hernia repair in New York State  
Bates A, Yang J, Nie L, Spaniolas K, Docimo S, Pryor A  
Stony Brook University Hospital

**Background:** The recent rise of hernia surgery as a subspecialty within general surgery has fueled the development and adoption of new open and minimally-invasive techniques. Another effect of this rise is the creation of high-volume “hernia centers” at many academic centers nationwide, which promise improved outcomes via higher volume and experience. This study examines the effect of surgeon volume on outcomes in open and laparoscopic ventral hernia repair.

**Methods:** A retrospective review using the New York State longitudinal hospital claims database (SPARCS). We examined patients aged ≥ 18 years who underwent ventral repair, as well as collected claims information for individual surgeons performing ventral hernia repair. Association between surgeon volume and clinical outcomes were assessed using generalized linear mixed model for readmission, recurrent hernia, infection, bleeding and linear mixed model for length of stay.

**Results:** There were 4210 surgeons included in the analysis. Based on the distribution of surgeon volumes, the definition of laparoscopic volumes was: low (< 5/year), medium (5–15), and high (> 15). Open hernia volumes were: low (< 10), medium (10–19), and high (> 19). Univariate analysis showed that patients operated on by low-volume surgeons for both open and laparoscopic cases had highest 30-day readmission, recurrent hernia, infection, bleeding and linear mixed model for length of stay.

**Conclusion:** Laparoscopic ventral hernia surgery by high volume surgeons is associated with lower surgical site infection, hospital resource utilization and long term recurrence. The effect of volume on open hernia repair outcomes is less clear, likely as a result of individual procedural and patient complexity, not captured in the dataset.

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**FP-1156**  
Litigation claims following laparoscopic and open inguinal hernia repairs  
Varley R, Lo C, Alkhaffaf B  
Central Manchester University Hospitals NHS Foundation Trust

**Background:** Inguinal hernia repair is one of the most commonly performed general surgical procedures worldwide. Complications of laparoscopic and open repairs are well-recognized; however differences between the two approaches have yet to be considered in relation to litigation.

**Methods:** This was an analysis of administrative data obtained from the NHS Litigation Authority of all claims from 1995 to 2016. Where identification was possible, claims related to open and laparoscopic repairs were grouped and compared.

**Results:** In total, 880 claims were initiated resulting in a total cost of 33,251,627 GBP/43,913,245 USD/36,895,884 EUR. 88 and 241 could be clearly identified as laparoscopic and open repairs respectively. Claims associated with laparoscopic repairs were successful in 65% of cases with an average cost of 82,824 GBP/109,866 USD/91,881 EUR. Claims following open repair were successful in 63% of cases with an average cost of 66,796 GBP/88,596 USD/74,087 EUR. 54% of claims following laparoscopic repair involved a visceral or vascular injury compared to 13% of open repairs. In the open group 35% of claims involved a testicular complication or chronic pain. The highest average payouts were associated with visceral injury (laparoscopic—116,482 GBP/154,389 USD/129,228 EUR; open—199,103 GBP/263,848 USD/220,830 EUR), vascular injury (laparoscopic—88,624 GBP/117,448 USD/98,281 EUR; open—64,460/ 85,424 USD/71,481 EUR) and nerve injury at (laparoscopic—71,284 GBP/94,498 USD/79,079 EUR; open—109,904 GBP/145,653 USD/121,888 EUR). A significant proportion of claims were associated with the need for further procedures (laparoscopic 48%; open 44%). These procedures was resulted in average payouts of 93,352 GBP/123,721 USD/103,552 EUR (laparoscopic cases) and 60,408 GBP/80,050 USD/67,008 EUR (open cases). The commonest additional procedures were corrective visceral or vascular repairs, orchidectomy and recurrent hernia repair.

**Conclusions:** On average, litigation following laparoscopic inguinal hernia repair is more costly than open surgery due to the types of injuries sustained, which often require the need for corrective procedures. Nonetheless, the impact of complications following open surgery should not be underestimated as this approach constitutes the majority of litigation claims.
FP-1032
The impact of hospital volume on clinical and economic outcomes in ventral hernia repair: an analysis with national policy implications
Chattha A, Patel A
Albany Medical Center

Introduction: In ventral hernia repair, there has been a paucity of studies assessing the association between procedure volume and patient outcomes. The objectives of this study are to evaluate the associations between elective hospital ventral hernia repair procedure volume and patient outcomes, including both clinical and economic outcomes.

Method: The 2014 National Inpatient Sample was queried for patients who underwent elective, open ventral (incisional) hernia repair with or without mesh. Outcomes included occurrence of major or wound-based in-hospital complications, extended length of stay (>4 days), and increased costs (> $12,816). High-volume hospitals were defined as the 90th percentile of case volume or higher (>60 cases/year). Multivariate regression was performed to access the outcomes associated with high-volume hospitals.

Results: 54,075 patients at 2049 hospitals were retrieved. 41.4% of patients were treated at high-volume hospitals. There were significant differences in mesh use (67.2 vs 63.8%; p < 0.001), smokers (30.4 vs 27.9%; p < 0.001), unadjusted major complications (9.5 vs 8.6%; p < 0.001), and unadjusted wound-based complications (6.2 vs 5.0%; p < 0.001) between HV and non-HV. After adjustments for clinical and hospital characteristics, patients treated at high-volume hospitals were less likely to experience a major complication (OR 0.882; 95% CI 0.815–0.955; p = 0.002) or wound-based complication (OR 0.838; 95% CI 0.763–0.920; p < 0.001). However, in terms of resource utilization, patients treated at high-volume hospitals were more likely to experience an extended length of stay (OR 1.143; 95% CI 1.090–1.199; p < 0.001) and an increase in costs (OR 1.225; 95% CI 1.166–1.287; p < 0.001).

Conclusion: Hospitals that perform a larger number of ventral hernia repairs may provide better patient outcomes than lower-volume hospitals. However, these same high volume centers demonstrate an extended length of stay and increased costs thus conflicting with the idea that concentration of resources in high volume centers generates cost-savings.

FP-1063
Cost evaluation of enhanced recovery after surgery protocol for open ventral hernia repair
Harryman C, Plymale M, Stearns E, Tancula C, Davenport D, Chen W, Roth J
University of Kentucky

Introduction: A comprehensive enhanced recovery after surgery (ERAS) protocol for open ventral hernia repair (VHR) is associated with improved clinical outcomes including more rapid return of bowel function and reduced infections. The purpose of this study was to evaluate cost of ERAS implementations and postoperative care compared to a pre-ERAS cohort.

Methods: With IRB approval, clinical characteristics and post-operative outcomes data were obtained via retrospective review for patients 2 years prior and 14 months post ERAS implementation. Hospital costs were obtained from cost accounting system inclusive of initial hospitalization and 180 days postoperatively. Clinical data and hospital costs were compared between groups.

Results: 178 patients (127 pre-ERAS, 51 post-ERAS) were identified. Pre-operative and operative characteristics—including gender, ASA class, co-morbidities, BMI—were similar between groups. Quicker return of bowel function (p = 0.001) and decreased incidence of superficial surgical site infection (p = 0.003) were seen in ERAS patients. No significant difference in hospital readmission and length of stay were found. Inpatient pharmacy costs were increased in ERAS group ($2673 vs. $11176, p = < 0.001) but total hospital costs (14,692 vs 15,151, p = 0.538) were less in the ERAS group and other costs were similar.

Discussion: Standardization of care via the ERAS protocol increased inpatient pharmacy costs without increasing total costs of care, and improved clinical outcomes. Further care adjustments based on study findings will be evaluated in an effort to reduce length of stay and further reduce costs.
FP-1106
External validation of the European hernia society classification for postoperative complications after incisional hernia repair—a cohort study of 2191 patients
Kroese L, Kleinrensink G, Lange J, Gillion J
Erasmus MC

Background: Incisional hernia is a frequent complication after midline laparotomy. Surgical hernia repair is associated with complications, but no clear predictive risk factors are identified. The EHS classification offers a structured framework to describe hernias and to analyze postoperative complications. Because of its structured nature, it might prove to be useful for preoperative patient or treatment classification. The objective of this study was to investigate the European Hernia Society (EHS) classification as a predictor for postoperative complications after incisional hernia surgery.

Study design: An analysis was performed using a registry-based, large-scale, prospective cohort study, including all patients undergoing incisional hernia surgery between September 1st 2011 and February 29th 2016. Univariate analyses and multivariable logistic regression analysis were performed to identify risk factors for postoperative complications.

Results: A total of 2191 patients were included, of whom 323 (15%) patients had one or more complications. Factors associated with complications in univariate analyses (p < 0.20) and clinically relevant factors were included into the multivariable analysis. In the multivariable analysis, EHS width class, incarceration, open surgery, duration of surgery, Altemeier wound class, and therapeutic antibiotic treatment were independent risk factors for postoperative complications. Third recurrence and emergency surgery were associated with fewer complications.

Conclusion: Incisional hernia repair is associated with 15% complications. The EHS width classification is associated with postoperative complications. To identify patients at risk for complications, the EHS classification is useful.

FP-1050
Factors predictive of the development of surgical site infection in hernia surgery: an analysis of the NSQIP database
McNelis J, Sereysky J, Parsikia A, Castaldi M, Stone M
Jacobi Medical Center

Introduction: Surgical site infection (SSI) is a rare complication of hernia repair. Thorough an inquiry to the ACS National Surgical Quality Improvement Program (NSQIP) database, the authors sought to identify risk factors predictive of SSI development in patients undergoing inguinal herniorrhaphy.

Materials and methods: The NSQIP participant use File (PUF) was queried for cases entered between 2012 and 2015. The authors limited the search to repair initial reducible inguinal hernia (CPT 49505) in patients over the age of 18 and which were designated as clean wounds (class 1). The variables examined included 144 preoperative, intraoperative and post-operative points entered into the NSQIP database. To simplify analysis adjustments were made. Regional anesthesia was defined as regional, local, epidural, and monitored anesthesia care/IV sedation. Outcome was superficial infection, deep infection and organ space infection. Antibiotic administration is not tracked by NSQIP. Concurrent procedures (CP) were considered a risk factor in our logistic regression testing. The prognostic ability of the select baseline characteristics were tested with univariate and a subsequent multivariate logistic regression testing. Calibration of the multivariate logistic regression was calculated.

Results: Of 60,737 total patients, 57,951 patients were eligible for inclusion. SSI incidence was 0.4% (254/57,951) on Univariate analysis, age strata 40–49 years, 60–60, male gender, COPD, smoking, transfusion, hypoalbuminemia, diabetes, BMI ≥ 35 kg/m², CHF, CP, ASA class 1 and 3, regional and spinal anesthesia type were statistically significant for infection. On multivariate analysis only diabetes, BMI ≥ 35 kg/m² and smoking remained statistically significant (p value < 0.05). BMI ≥ 35 kg/m² had the greatest odds ratio (2.8, 95% confidence interval 1.2–6.4; p value = 0.016). The model was calibrated with a Hosmer–Lemeshow test value of 0.986.

Conclusion: The authors demonstrate that in a cohort of 57,951 patients, Diabetes, BMI > 35 and smoking are associated with increased risk of SSI.
Minimal invasive surgery (MIS) for repair of ventral hernia is associated with decreased wound infections and has become a popular approach since its conception in the early nineties. Traditionally a laparoscopic ventral hernia is performed using an intra-peritoneal mesh covering the hernia defect and the mesh is fixed with tackers and/or sutures. This technique is often referred to as an IPOM repair. More recently many have considered closure of the defect before placement of the intra-peritoneal mesh advantageous, also called IPOM plus repair. A mesh augmentation is preferred to a mesh bridging as it is considered a more durable repair. Therefore, since about a decade many advise to perform an open surgical repair in patients where the hernia defect is considered too wide for laparoscopic closure. These patients often need some form of component separation to close the defect and reconstruct the abdominal wall.

More recently we have seen changes in the approach to MIS ventral hernia repair with the conception of surgical techniques where the mesh is no longer placed in an intra-peritoneal position, but is placed either pre-peritoneal or retro-muscular position. This might be preferred because of possible long term adverse events of intra-peritoneal meshes and the problems encountered during subsequent abdominal operations.

Moreover MIS posterior component separation has been introduced and it is now possible to perform this extensive surgery with laparoscopy, get an abdominal wall reconstruction with closure of wide defects and placement of large retro-muscular meshes.

Robotic surgery is a catalyst in both trends, moving the mesh outside of the peritoneum and preforming laparoscopic component separation techniques. Hereby the enhanced visualization, the increased suturing proficiency with the wristed instruments and improved surgeons ergonomics all have their distinct role in advancing these two trends in MIS ventral hernia repair.
Technologic advances in surgery are often received with equal parts enthusiasm and skepticism. Perhaps no such advancement has created as much heated debate as the introduction of the robotic platform in general surgery. The limited clinical benefit and greater expense of robotic surgery for surgeons already adept in minimally invasive techniques draws the ire of many, while the promise of increased instrument dexterity, enhanced visualization, and ergonomic advantages continue to attract new users. Robotic hernia repair has recently experienced exponential growth nationally despite the ongoing debate. The majority of robotic ventral hernia repairs (rVHR) being performed are essentially duplicating a standard laparoscopic repair, with some variations in defect closure and mesh fixation. Our group has developed a technique to duplicate an open retromuscular hernia repair as described by Rives and Stoppa robotically, fully utilizing the capabilities of the robotic platform to perform a procedure otherwise not possible with a standard laparoscopic approach. This talk will review the currently available literature on applications of robotics in ventral hernia repair, and focus primarily on advanced robotic abdominal wall reconstruction using the robotic retromuscular technique.
Tuesday, March 13, 2018

Session 7B: Rapid Fire Scientific Abstracts

FP-1265
Outcome differences following incisional herniorrhaphy in older patients: an AHSQC analysis
Doble J, Phillips S, Pauli E
Penn State Milton S. Hershey Medical Center

Introduction: The aging population presents a surgical challenge and little data exists about herniorrhaphy-specific outcomes in older populations. Medical comorbidities often found in older patients can increase the risk of detrimental outcomes and may cause elective herniorrhaphy to be deferred. We hypothesize that age-related outcome differences exist following elective herniorrhaphy.

Methods: A retrospective review of the Americas Hernia Society Quality Collaborative (ASHQC) database was used to compare younger (< 65 years) and older (≥ 65) incisional herniorrhaphy groups. Post-operative morbidities and recurrences were the primary endpoints. Pearson test and Wilcoxon test were used for statistical analysis.

Results: A total of 6438 patients (n = 2117 ≥ 65 years-old) who underwent elective incisional hernia repair were identified. The ≥ 65 group were statistically older (52 vs 70 years, p < 0.001), had higher rates of medical comorbidities (diabetes, pulmonary disease), higher ASA scores (ASA ≥ 3, 51 vs 69%, p < 0.001) and wider hernias (6 vs 7 cm, p = 0.009). The < 65 group had a higher body mass index (32.9 vs 30.4 kg/m², p < 0.001), more nicotine abuse (14 vs 5%, p < 0.001), and higher modified ventral hernia working group scores (p < 0.001). There were no differences between surgery specific factors; laparoscopic approach (28 vs 29%, p = 0.3), mesh use (93 vs 93%, p = 0.9), mesh type (permanent synthetic 90 vs 91%; p = 0.39), and myofascial release (48 vs 46%, p = 0.26) There were no differences in 30-day post-operative morbidities (surgical site occurrences, urinary infections, thrombo-embolism) or recurrences between the groups. The ≥ 65 group, however, had an increased 30-day mortality (13 vs 19 deaths, p = 0.001).

Conclusion: Elective incisional herniorrhaphy in patients ≥ 65 years old has similar post-operative morbidity and recurrence rates to patients > 65 years old despite differences in patient risk factors. Complications in the ≥ 65 group were more likely to result in death, however, suggesting that frailty may play a role.

FP-1231
Wound dehiscence following general surgical laparotomy: development of a predictive model using the NSQIP data set
Burstein M, Rosen M, Morris-Stiff G
Cleveland Clinic Foundation

Wound dehiscence following laparotomy is a major morbidity, increasing patient suffering, admission duration, and management costs. The aim of this study was to build a model that could predict such events based on analysis of the NSQIP data set.

Non-laparoscopic cases completed by general surgeons from the NSQIP database spanning the period 2011–2014 were filtered for non-missing data and chronologically split into discovery (n = 135,318 with 1616 wound disruption events) and validation (n = 167,567 with 1921 events) data sets. Covariates identified during CoxPH modeling of the discovery set were selected using stepwise AIC, and a model was built to predict time to wound disruption.

The most significant predictor of wound disruption was incisional SSI, with a hazard ratio (HR) of 2.3 (p = 2e-16) in the Discovery set. Inpatient case status had a HR of 3.64 (p = 2e-15) and BMI increases carried a HR of 1.02 (p = 2e-13). Higher surgical wound class, ASA class, emergency, current smoker, male gender, steroid use, and insulin dependent diabetes were all significantly associated with increased relative risk (RR) of wound disruption. Model based risk for cases that resulted in wound disruption were on average two times higher in both the discovery and validation sets (p = 2e-16).

The disruption complication rate increased with predicted risk, at 0.2, 1.5 and 4.2% for low, medium, and high risk. Validation demonstrated 0.3, 1.5, and 4.2% respectively.

Factors associated with wound disruption were not unexpected. Further work is required to simplify these models into tools for risk stratification and patient selection specific to the intended operation.
FP-1252
Comparison of absorbable and nonabsorbable tack fixation in laparoscopic ventral hernia using the Americas Hernia Society Quality Collaborative (AHSQC)
New Hanover Regional Medical Center

Mesh fixation in ventral incisional hernia is currently a topic of considerable debate. Tacking only fixation is an accepted method however little is known related to permanent compared to absorbable tack fixation. The purpose of this study was to compare outcomes of permanent tack fixation versus absorbable in laparoscopic incisional hernia repairs.

A retrospective review of all patients undergoing laparoscopic ventral hernia using tack fixation (absorbable/permanent) was queried from the AHSQC database. Outcome measures included hernia recurrence rate, pain, quality of life, wound related issues, and length of stay. Propensity match scoring was performed to compare patients undergoing tack only fixation versus tack and suture fixation with a p value of < 0.05 considered significant.

A total of 320 patients were identified after propensity match scoring with 160 who underwent repair with permanent tacks and 160 who underwent repair with absorbable tacks. Following matching there were no differences in BMI, age, hernia width/length, or baseline pain/quality of life. There were no significant differences found in outcomes measures including recurrence rates, pain and quality of life outcomes at 30 days, 6 moths, and 1 year, surgical site infection (SSI), and postoperative length of stay (p > 0.05). There was a significant increase in surgical site occurrences (SSO) in the permanent tack fixation group compared to the absorbable tack fixation group (18 vs. 5%, p < 0.001) which is likely due to the increase in seroma noted the permanent tack fixation group (14 vs. 4%, p = 0.003).

Based on this large data set, there are no significant differences in postoperative outcomes in permanent versus absorbable fixation in laparoscopic hernia repair except in surgical site occurrences. Further study is needed to see if this increase in seroma rate/SSO is clinically significant and should drive changes in practice for fixation in laparoscopic ventral hernia repair.

FP-1194
Prophylactic mesh placement to avoid stoma related hernias: a systematic review
van Steensel S, van den Hil L, Schreinemacher M, Bouvy N
Maastricht University Medical Centre

Purpose: To provide an overview of the available literature on prevention of stoma related hernias, with the use of prophylactic meshes.
Methods: A literature search of Pubmed, MEDLINE and EMBASE was performed. Search terms for stoma, enterostomy, mesh, prophylaxis and hernia were used. No time limitations and language restrictions were used. The primary outcome was the incidence of parastomal or incisional hernia formation during follow-up. Secondary outcomes were mesh related complications. Data on study design, sample size, patient characteristics, stoma and mesh characteristics, duration of follow-up and outcomes were extracted from the included articles.

Results: A number of 171 articles were identified and 25 studies with 1439 patients were included. In the studies regarding parastomal hernia, 1142 patients were included and 725 of them received a mesh (58%). In the mesh group 115 patients (17%) developed a parastomal hernia, while in the control group 179 parastomal hernias (38%) were detected. The duration of follow-up varied from 3 months to a median of 60 months. In four studies, a prophylactic mesh was placed in 94 patients to prevent incisional hernias after stoma reversal. Only four patients developed an incisional hernia (4%), while in the control groups 28 out of 100 patients (28%) developed a hernia. Follow-up ranged from 30 days to 79.7 months. No mesh infections were observed.

Conclusions: The use of a prophylactic mesh seems to reduce the risk on development of stoma related hernias, without an increased risk of mesh related complications.

Keywords: Stoma reversal; incisional hernia; parastomal hernia; prophylactic mesh
FP-1349
Comparative analysis of perioperative outcomes of robotic versus laparoscopic transversus abdominis release (TAR)
Sanford Z, Gedz J, Weltz A, Belyansky I
Anne Arundel Medical Center

Introduction: Transversus abdominis release (TAR) technique is a safe and effective in experienced hands. Minimally invasive approach to TAR has been reported to facilitate faster recovery, reduced postoperative pain, and decreased length of hospital stay compared to open techniques. To date there are no studies comparing outcomes between laparoscopic and robotic TAR procedures.

Methods: A retrospective review was conducted identifying hernia repair patients who underwent either laparoscopic TAR (LTAR) or robotic TAR (RTAR) procedures from August 2015 to June 2017 at a single hospital center. Postoperative outcomes between the two groups were interrogated and quality of life measures assessed using the Carolina Comfort Scale.

Results: Of the 69 patients qualified, 34 underwent LTAR (61.7% for recurrent hernia) and 35 underwent RTAR (97.1% for recurrent hernia). The LTAR cohort had a mean BMI, defect area, mesh area, and operative time of 32.0, 163.6, 896.2 cm², and 243 min, respectively, compared to 33.3, 174.4, 855.5 cm² and 265 min in the RTAR group. The majority of implantable mesh materials selected were synthetic polypropylene, 88.2% in LTAR and 94.3% in RTAR, with fibrin glue utilized in 76.5% of LTAR cases and 60.0% of RTAR cases. Hernia recurrence was identified in 2.9% of LTAR cases and none of the RTAR group at 6 months. There were no statistically significant differences in outcomes between the two cohorts.

Conclusion: In the hands of an experienced surgeon patients benefit similarly from either laparoscopic or robotic TAR. How this translates to a wider surgical community is yet to be determined in future studies.

FP-1294
Evaluating the use of nerve blocks in abdominal wall reconstruction
Lew M, Grimsley L, Vetrano V, Forman B, Ramshaw B
University of Tennessee Medical Center

Background: Patients with complex abdominal wall problems such as multiple recurrences, loss of domain, and chronic mesh infection can be challenging to treat. Multimodal peri-operative pain management strategies, including long-acting local anesthetic infiltration, have been used in various surgical procedures attempting to improve outcomes and decrease reliance on opioid medications to manage post-operative pain.

Methods: We implemented a clinical quality improvement (CQI) program for abdominal wall reconstruction patients to better measure and improve outcomes. Between 8/2011 and 9/2015, 101 patients underwent 102 of these operations. Patients received either only a transversus abdominus plane (TAP) block, only an intraoperative (IO) block, both TAP and IO blocks, or no nerve block. We evaluated these blocks for differences in outcomes.

Results: Forty patients received TAP block. Two patients received IO block. Thirty-six patients received both TAP and IO blocks. Twenty-four patients received no nerve block. Average operative time was shortest without nerve block (176.5 min) and longest in patients who received IO block (388.5 min). Hospital length of stay was shortest in patients who received TAP block (6.25 days) and both TAP and IO blocks (6.3 days). Average hospital length of stay was longest in patients who received IO block (16 days) and no nerve block (10.5 days). Total time in the post anesthesia care unit (PACU) was shortest in patients who received TAP block (6.25 days) and both TAP and IO blocks (6.3 days). Average hospital length of stay was longest in patients who received IO block (16 days) and no nerve block (10.5 days). Total time in the PACU was shortest in patients who received both TAP and IO blocks (112 min). Patients who received the lowest morphine equivalents in PACU were those who received IO block (7.5 units) both TAP and IO blocks (8.04 units) and TAP block (9.95 units) compared with patients who received no block (17.52 units).

Discussion: These results suggest patients who received both TAP and IO blocks were more likely to have lower morphine equivalents in the PACU, shorter time in the PACU and a shorter hospital length of stay.
FP-1254
Gender disparity in hernia surgery research
Bernardi K, Holihan J, Cherla D, Ko T, Duncan C, Liang M
University of Texas Health Science Center at Houston

Introduction: Although the number of female surgeons and surgery residents has increased over time, women remain under-represented in surgery and academic surgery leadership positions (24%). Surgical research and publications are used as a determinant of hiring and promotion. We hypothesize that among hernia research, female surgeons are highly under-represented.


Results: Of the hernia publications reviewed, only 12.5% of first authors and 7.5% of last authors were female surgeons. However, the proportion of female authors has increased over time (Fig. 1).

Discussion: Female hernia surgeons are under-represented in hernia research. Although this has improved over time, the improvement has been slow and inadequate. The under-representation of research on female related issues in hernia surgery such as peri-partum hernias or diastasis recti may be due to lack of female leadership in hernia academics.

FP-1273
Global consensus on the international guidelines on groin hernia management
VU University Medical Center

Introduction: Groin hernias are one of the most common surgical conditions globally. The burden of disease in low- and middle income countries, where a majority of the groin hernia patients live, is large. Working group HerniaSurge developed the first international guidelines on groin hernia management to provide the international surgical community with evidence-based and expert consensus-based recommendations. We aimed to determine the level of consensus on the key statements and recommendations.

Methods: During an expert consensus meeting a selection of key statements and recommendations was made. Four plenary consensus meetings were organized at congresses of the EHS, EAES, APHS and AHS to obtain international agreement on the statements and recommendations. Additionally, a web survey was sent out to all society members so that every surgeon could vote online on the key statements and recommendations. Consensus was defined as ≥ 70% agreement among the participants.

Results: At the expert consensus meeting 46 items were considered as most important and renewing. In total 787 surgeons cast their vote on all key statements and recommendations during the four plenary consensus meetings or online via the web survey. Consensus was reached on six statements and 34 recommendations, which is 87% (40/46). No consensus was obtained on one statement and five recommendations.

Conclusion: A unique method was used to determine the level of consensus on key statements and recommendations of the first international guideline on groin hernia management. International consensus was obtained on a majority of the key statements and recommendations.
FP-1203
Perioperative blood transfusions increase the risk of surgical site infections in ventral hernia repairs
Helm J, Helm M, Goldblatt M, Gould J, Higgins R
Medical College of Wisconsin

Introduction: Surgical site infections (SSI) are a significant quality indicator and remain a concern in patients undergoing ventral hernia repair. Perioperative blood transfusions may result in immunomodulation that can decrease host immunity and increase the risk of SSI. The aim of this study was to determine the impact of perioperative blood transfusions on SSI development in patients undergoing ventral hernia repair (VHR).

Methods: The American College of Surgeons National Surgery Quality Improvement Program datasets (2013–2015) were queried for laparoscopic and open VHRs. Univariate and multivariate regression analyses were used to determine the impact of perioperative variables, including blood transfusions, on the development of post-operative SSIs.

Results: In total, 53,242 patients underwent VHR of which there were 77.3% open and 23.4% laparoscopic VHR. 2373 (4.5%) patients developed a surgical site infection: 1363 (2.6%) superficial, 576 (1.1%) deep incisional, and 487 (0.9%) organ/space SSIs. More patients developed an organ/space SSI than any other type of SSI following blood transfusion within 72-h of surgery. The risk of organ/space SSI increased 6.9-fold (95% CI 5.1–9.5), deep incisional 6.1-fold (95% CI 4.5–8.2), and superficial 2.7-fold (95% CI 2.1–3.6) following perioperative blood transfusion (all p < 0.0001). Overall, perioperative blood transfusion increased the risk of any SSI development 4.8-fold (p < 0.0001; 95% CI 4.0–5.7).

Conclusions: Patients undergoing ventral hernia repair are at an increased risk of developing SSIs following perioperative blood transfusions, of which organ/space are the most prevalent. The modulated immune response after a blood transfusion, in combination with poor penetration of antibiotics and immune cells into organ spaces, may be responsible for the increased susceptibility to organ/space infections compared to superficial or deep incisional infections.

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FP-1195
Evaluation of porcine dermal collagen and polypropylene meshes in an infected field
Tan W, McAllister J, Kahan L, Frisella M, Feaman S, Blatnik J
Washington University in St. Louis School of Medicine

Background: Biologic meshes are commonly used to repair hernias in infected fields, despite concerns about their ability to reduce bacterial bioburden. Recently, there has been anecdotal evidence suggesting synthetic mesh can be placed in an infected field with good outcomes. This study compared two commercially available meshes, a biologic mesh made of porcine dermal collagen and a synthetic mesh made of polypropylene, in an infected field. The primary outcome was bacterial clearance. Secondary outcomes included tensile strength and adhesive burden.

Methods: Male 400 g Sprague-Dawley rats (N = 24) underwent implantation of one of the two meshes. A 5 x 2 cm piece of mesh was placed in a dorsal subcutaneous pocket and inoculated with MRSA to mimic a contaminated field. Animals were sacrificed at 14 or 28 days and the mesh explanted for bacterial recovery, mechanical testing, and histologic analysis.

Results: There was no statistically significant relationship between mesh type and bacterial clearance at both timepoints. At 14 days, 66.7% of each mesh group (N = 4) had negative cultures at explant. At 28 days, 50.0% (N = 3) of the porcine dermal collagen mesh group had negative cultures at explant compared to 66.7% (N = 4) in the polypropylene mesh group. There was no statistically significant difference in adhesive burden or severity between mesh groups at both 14 and 28 days. Similarly, there was no statistically significant difference in tensile strength at 14 and 28 days. At both timepoints, the polypropylene mesh group had significantly more cellular repopulation and depth of inflammation. At 28 days, the polypropylene mesh had significantly more neovascularization.

Conclusion: In a rodent model of a MRSA-contaminated field, there was no significant difference in bacterial clearance, adhesive burden, or tensile strength between the porcine dermal collagen and polypropylene meshes. There were significant differences in inflammatory response.
**FP-1271**

**Effect of transversus abdominis plane (TAP) block versus thoracic epidural analgesia (TEA) on length of stay and inpatient narcotic use following open transversus abdominis release (TAR)**

McAllister J, Tan W, Feaman S, Frisella M, Blatnik J
Washington University in St. Louis School of Medicine

**Background:** TEA is a commonly used analgesia after abdominal surgery, but has potential complications including urinary retention and hypotension that may increase overall length of stay (LOS). TAP block is a method of analgesia that targets peripheral nerves supplying the anterior abdominal wall with local anesthetic agents and is easily performed during open TAR. We hypothesize that this technique may reduce LOS and inpatient narcotic requirement after open TAR in comparison to TEA.

**Methods:** The Americas Hernia Society Quality Collaborative (AHSQC) database was used to collect retrospective data on all open TARs performed by one surgeon from 2016 to present. The primary outcomes were median length of stay and total inpatient opioid consumption in oral morphine equivalents (OMEs). The study included all patients in the AHSQC database who underwent open TAR with either TEA placement or TAP block using 0.25% bupivacaine.

**Results:** Twenty-five patients underwent TEA placement, and sixty-one underwent TAP block. There were no statistically significant differences between groups in regards to mean age (58 vs. 62 years, \( p = 0.163 \)), BMI (32.4 vs. 33.0, \( p = 0.664 \)), gender (\( p = 0.97 \)), hernia width (15.8 vs. 14.8 cm, \( p = 0.419 \)), and hernia area (1014 vs. 982 cm\(^2\), \( p = 0.791 \)) for the TAP block and TEA groups, respectively. The median LOS for the TAP block group was 4 days (IQR 3–4.5 days), compared with 5 days (IQR 4–7 days) for the TEA group, (\( p = 0.004 \)). There was no statistically significant difference in median inpatient narcotic usage between the TAP block and TEA groups (218 vs. 273 OMEs, \( p = 0.635 \)), respectively.

**Conclusion:** In our retrospective study, TAP block led to a significant reduction in length of stay in comparison to TEA after open TAR surgery. There were no significant differences in inpatient opioid consumption postoperatively. This data suggests that TAP block is a reasonable alternative to TEA after open TAR.

**FP-1266**

**Negative pressure wound therapy (NPWT) decreases surgical site infections after open ventral hernia repair (VHR) in patients with methicillin-resistant staphylococcus aureus (MRSA)**

Poruk K, Galvez Lima D, Eckhauser F, Adrales G
Johns Hopkins University School of Medicine

**Background:** VHR is associated with a high risk of surgical site occurrences (SSO) and infections (SSI) in patients with MRSA. NPWT using a hybrid vacuum closure device (HVAC) has been shown to decrease post-operative SSI and SSO after open VHR. We assessed 30- and 90-day outcomes for VHR patients to determine the impact of prior MRSA and incision closure method.

**Methods:** A retrospective analysis of patients undergoing open VHR with standard or HVAC closure between January 2008 and February 2015 was conducted using Student’s t test and Fisher’s exact test.

**Results:** 361 patients underwent open VHR including 40 (11%) with prior MRSA colonization. There was no significant difference in key demographics between patients with or without MRSA, including prior wound infection, hernia grade 2–3, and the use and location of mesh (\( P > 0.05 \), all). Average length of stay for all patients was 11 days (range, 2–67 days), with an overall rate of 30-day SSI and SSO of 9.9 and 18.2%, respectively. There was a higher incidence of SSI (28 vs. 8%, \( P = 0.001 \)) and SSO (33 vs. 17%, \( P = 0.01 \)) in MRSA patients without an associated difference in seroma, wound dehiscence, or enterocutaneous fistula. Patients with MRSA had a higher 30-day readmission rate (23 vs. 8%, \( P = 0.007 \)) irrespective of closure type. MRSA patients with HVAC had lower 30-day morbidity (25 vs. 64%, \( P = 0.03 \)) and SSI (18 vs. 55%; \( P = 0.04 \)) with a trend toward lower SSO (25 vs. 55%; \( P = 0.13 \)).

**Conclusion:** Patients with history of MRSA who undergo open VHR have a higher incidence of 30-day post-operative complications, including SSO, SSI, and hospital readmission. The use of HVAC after open VHR in patients with prior MRSA may prevent the development of SSI in this high-risk group. Further study is needed to assess whether this improves long term outcomes such as hernia recurrence.
FP-1334
Contamination does not increase risk for recurrence in complex ventral hernia repair with synthetic mesh
Young C, Lyo V, Tufaga M, Primus F, Shin U, Fong S, Harris H
UCSF General Surgery

Importance: There is considerable controversy regarding the use of synthetic mesh in one-stage repair of ventral hernias in contaminated wounds. Emerging data suggest synthetic mesh may outperform expectations in these circumstances.

Objective: To compare the outcomes of open ventral hernia repair using synthetic mesh in clean versus contaminated wounds and thus determine the relevant risk factors associated with surgical site occurrence (SSO) and recurrence.


Measures: Primary outcomes were SSO and hernia recurrence. Risk factors of BMI > 25, diabetes, active smoking, previous repair, bridged repair, and fascial defect size > 10 cm were analyzed via Cox proportional hazard model for SSO and recurrence. A Kaplan–Meier curve compared hernia recurrence for clean versus contaminated repairs.

Results: Overall, the hernia recurrence rate for the patients was 18% with a mean follow up of 17 months. Contamination was not significantly associated with recurrence when analyzed by Fisher Test (18 vs. 19% p = 1.00), Kaplan–Meier Log-rank test for survival (p = 0.36), or via Cox proportional hazard model when individually controlling for selected risk factors. On multivariate analysis, diabetes, active smoking and fascial defect size > 10 cm were significantly associated with a greater risk of recurrence (Hazard ratios = 2.14, 2.37; 3.99; p = 0.04, 0.03, 0.005, respectively) when controlling for contamination. Only hernia size > 10 cm was significantly associated with SSO when controlling for contamination (HR = 2.17; p = 0.01).

Conclusions: Contrary to conventional wisdom, our results indicate that the one-stage repair of ventral hernias with synthetic mesh in contaminated wounds is not associated with an increased rate of recurrence or SSO. A prospective, randomized trial to confirm these findings is underway.

FP-1261
Prevention of incisional hernias after midline laparotomy with prophylactic mesh reinforcement: a meta-analysis and trial sequential analysis
Maasstad Ziekenhuis

Introduction: Incisional hernia is one of the most frequent complications after abdominal surgery, and can increase up to more than 40% in high-risk groups. The aim of this review and meta-analysis was to evaluate the evidence from randomized controlled trials (RCT) comparing Mesh-augmented reinforcement (MAR) of midline laparotomy incisions with suture only. The primary endpoint was incisional hernia and the secondary endpoints were postoperative complications (seroma, wound infection, hematoma, burst abdomen), immediate postoperative reoperation, chronic pain and other complications.

Method: A meta-analysis was conducted following the PRISMA guidelines. The primary outcome was the incidence of incisional hernia with mean follow up of at least 12 months. Secondary outcomes were postoperative complications: seroma, surgical site infection, hematoma and burst abdomen. Only randomised controlled trials (RCTs) were included.

Results: Twelve RCTs encompassing 1.815 patients were included. The incisional hernia rate was significantly lower in patients with prophylactic mesh reinforcement compared with sutured closure (RR 0.35, 95% CI 0.21–0.57, I^2 = 69%, p < 0.0001). Both onlay (RR 0.26, 95% CI 0.11–0.67, p = 0.005) and retromuscular (RR 0.28 95% CI 0.10–0.82, p = 0.02) prophylactic mesh reinforcement lead to a significant reduction of the incisional hernia incidence compared with sutured closure. The occurrence of seromas was significantly higher in patients who underwent onlay prophylactic mesh reinforcement (RR 2.23, 95% CI 1.10–4.52, p = 0.03), compared with patients who underwent sutured closure. Patients with PMR do not have a higher incidence of SSI.

Conclusion: Prophylactic mesh reinforcement of a midline laparotomy leads to a significantly lower incidence of incisional hernias in high risk patients both for onlay and retromuscular mesh positions, with a larger size of the effect in the onlay group. Onlay mesh was associated with significant postoperative morbidity in form of seroma. Further research is needed to define the discriminating risk factors where prophylactic mesh reinforcement has to be recommended.
New anatomic finding in pubic inguinal pain syndrome
Cavalli M, Bruni P, Lombardo F, Zanghì G, Campanelli G

Istituto Clinico Sant' Ambrogio, Milano Hernia Center, University of Insubria

The Pubic Inguinal Pain Syndrome, also called “sportsman’s hernia”, commonly presents as a ‘painful groin’ in those sports that involve kicking and twisting movements while running particularly in rugby, football, soccer and ice hockey players. Moreover, sportsman’s hernia can be encountered even in normally physically active people. The pain experienced is recognized at the common point of origin of the rectus abdominis muscle and the adductor longus tendon on the pubic bone and the insertion of the inguinal ligament on the pubic bone. It is accepted that this chronic pain caused by abdominal wall weakness or injury occurs without a palpable hernia. Patients suffer prolonged pain and it become a seriously debilitating condition and may place an athlete’s career at risk.

According our etiopathogenetic theory pain is caused from three factors: (1) the compression of the three nerves of the inguinal region. (2) The imbalance in strength of adductor and abdominal wall muscles caused by the hypertrophy and stiffness of the insertion of rectus muscle and adductor longus muscle. (3) The partial weakness of the posterior wall

Our surgical procedure, after a reasonable time of FKT, includes the release of all three nerves of the region, the correction of the imbalance in strength with the partial tenotomy of the rectus and adductor longus muscles and the repair of the partial weakness of the posterior wall with a lightweight or biological mesh.

This original procedure permitted the new finding of a thickening “pseudo aponeurosis”, found posteriorly to the abdominal rectus muscle, where the preperitoneal fat is usually only present: its incision induces a clear release.

This treatment reported excellent results with complete relief of symptoms after resume of physical activity in large majority of the cases.

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Core stability following complex abdominal wall construction requiring transversus abdominis muscle release: are we doing more harm than good?
Haskins I, Jensen K, Krpata D, Tastaldi L, Perez A, Tu C, Rosenblatt S, Prabhu A, Rosen M

Cleveland Clinic

Introduction: The effect of separation of components on core stability, which is primarily controlled by the transversus abdominis muscle, remains unknown. The purpose of our study was to investigate the effect of complex abdominal wall reconstruction using a posterior separation of components with a transversus abdominis release technique on patient quality of life and core stability function.

Methods: All patients undergoing complex abdominal wall reconstruction requiring transversus abdominis release from June 2016 through October 2016 at our institution were eligible for study inclusion. Back and hernia quality of life measures, including the Quebec Back Pain Scale and the Hernia Quality of Life Survey (HerQLes), in addition to patient core stability, as measured using the prone test and the Sahrmann Core Stability Test, were collected at the preoperative evaluation and at 6 months following surgery. Student’s t test was used to determine the effect of complex abdominal wall reconstruction on quality of life and core stability.

Results: A total of 33 patients met inclusion criteria with 20 (60.6%) patients available for six-month follow-up. Back pain scores significantly improved postoperatively overall and within each of the six subcategories measured using the Quebec Back Pain Disability Score (p = 0.002). There was also a statistically significant improvement in patient quality of life as reflected by HerQLes scores (p < 0.001). There was no statistically significant difference in core stability as reflected in the average prone score (p > 0.99) or the Sahrmann Core Stability Test average score (p = 0.43).

Conclusion: Posterior separation of components with transversus abdominis release leads to improved back and hernia quality of life and does not negatively impact of core stability over the short-term. Additional studies are needed to determine the long-term affect of this procedure on patient quality of life and core stability.
FP-1328
Volumetric analysis of patients undergoing abdominal wall reconstruction after preoperative progressive pneumoperitoneum
Allen J, Warren J, Bittle J
Greenville Health System/Minimally Invasive Surgery

Introduction: Preoperative progressive pneumoperitoneum (PPP) is a method of increasing abdominal cavity volume prior to repair of massive incisional hernias with loss of abdominal domain (LOD). We hypothesize that the increase in abdominal cavity volume after PPP is adequate to accommodate the initial hernia contents.

Methods: Retrospective review of all PPP patients over a 9 year period. Volumetric analysis was performed prior to and after PPP as described previously. The accommodating volume (AV) was defined as the abdominal cavity volume (ACV) – (pre PPP ACV + pre PPP hernia sac volume). Primary outcomes were AV, change in length abdominal wall musculature. Secondary outcomes were LOS, SSO, SSI, recurrence, and readmission.

Results: Twenty-seven patients underwent PPP. Mean hernia width was 17.9 cm, with an ACV:HSV ratio of 39%. Mean time of PPP was 7.7 days. The mean increase of ACV after PPP was 3.6 L with mean AV of 0.45 L. All repairs were open with the majority having mesh in retro-muscular position (81.5%). Average increase in oblique muscle complex length and rectus muscle width was 3.1 and 1.2 cm respectively. Fascial closure was achieved in 66.7%. The AV significantly impact fascial closure, with a mean AV of 2.4 L when fascial closure was achieved and — 1.5 L when closure was not achieved. Similarly, increasing hernia width impacted closure, with a mean width of 23.3 cm in those unable to be closed and 15.2 cm when closure was possible. Complications included SSO in 44%, SSI in 25.9%, and SSO requiring intervention in 29.6%. Recurrence was 22.2% with mean 26.7 month follow-up.

Conclusion: Patients with LOD benefit from PPP by increasing ACV and lengthening abdominal wall musculature to accommodate initial herniated contents. Greater hernia width, ACV:HSV and AV predict ability to close fascia.

FP-1269
Direct visualization tap block are superior to ultrasound-guided tap blocks
Doble J, Winder J, Witte S, Pauli E
Penn State Milton S. Hershey Medical Center

Transversus abdominis plane (TAP) blockade with long-acting anesthetic can be used during posterior component separation ventral hernia repair (PCS-VHR). TAP-block can be performed under ultrasound guidance (US-TAP) or under direct visualization (DV-TAP). We hypothesized that US-TAP and DV-TAP would provide equivalent postoperative analgesia for open PCS-VHR patients.

A retrospective review of prospectively collected data for patients undergoing open PCS-VHR from 2012 to 2017 was performed. All patients receiving TAP-blocks with 20 ml liposomal bupivacaine were included. Data collection included demographics, comorbidities, length of stay (LOS), interval pain scores for each postoperative day (POD), and total narcotic use (normalized to mg of morphine). Statistical analysis was performed using Student’s t test and Fisher’s exact test.

During the study, no changes were made to the PCS-VHR recovery pathway. Thirty-nine patients were identified (21 DV-TAP). There were no significant differences between populations with respect to age, ASA score, co-morbidities, pre-operative pain medication usage (narcotic and non-narcotic). The average POD#0 pain score (2.46 vs. 4.28, p = 0.02) and narcotic requirements (50.3 vs. 101.1 mg, P = 0.033) were lower for the DV-TAP group. Similarly, narcotic requirements on POD#1 (133.5 vs. 267.5 mg, p = 0.04), POD#4 (54.3 vs. 159.9 mg, p = 0.04) and during the complete hospitalization (425.8 vs. 853.5 mg, p = 0.02) were lower in the DV-TAP group. There were no differences between initiation of diet (66.4 vs. 74.8 h, p = 0.38) or LOS (110.8 vs. 111.4 h, p = 0.85).

Surgeon-performed TAP blocks appear to provide superior analgesia in the immediate postoperative period. To achieve similar post-operative pain scores, patients in the US-TAP group required more total narcotics throughout the entire hospitalization. The study was underpowered to detect differences in LOS, but highlights SP-TAP as a valuable addition to PCS-VHR recovery pathways.
IP-1461
Sutureless repair
Fortelny R
Wilhelminenspital

IP-1462
Is there a future for abdominal wall transplantation in complex hernia patients?
Van De Winkel N
Belgium

IP-1463
Autologous augmentation with filtered platelet concentrate
Telem D
University of Michigan

Introduction: Autologous augmentation of wound remodeling with platelet concentrate is a burgeoning field with promising results. We hypothesized that the addition of filtered platelet concentrate (fPC) to an acellular biologic graft would improve crural healing and tissue integrity in hiatal hernia repair.

Methods: Sixteen healthy Yorkshire female pigs were divided into three groups: hiatus repair (HR) (n = 7), HR with biologic graft (HRM; n = 8, and HR with biologic graft and fPC (fPC; n = 9). Surgeries were performed by a single surgeon. Animals were euthanized at 8 weeks, and the distal esophagus with hiatus was harvested en-block. Tissue was graded by a histopathologist on collagen deposition, vascularization, and inflammation at the graft-hiatal interface. Tensile strength testing was performed using the Teststar IIs (MTS), coupled with a strain extensometer (Epsilon). Samples of equal dimensions were preloaded to 1 N and deformed at a constant rate of 0.2 mm/s. Statistical analysis was performed via Kruskal–Wallis one-way analysis of variance.

Results: Aspirate analysis revealed a mean platelet count of 3 million platelets/1 mL of aspirate. Animals in the fPC group had significantly increased mean chronic inflammation (3.1 ± 1.1 vs. 1.8 ± 1.6, 1.2 ± 1.2, p = 0.04) compared to HR alone and HR + biologic graft. Vascular deposition did not differ between groups (p = 0.8). A trend toward increased collagen deposition was demonstrated for the fPC group (1.4 ± 1.1 vs. 2.0 ± 0.6 in HR group and 3.0 ± 1.2 in HRM group, p = 0.06). There was a statistically significant increase in tensile strength, yield force, and Young’s modulus in the fPC group compared with HR and HR + biologic mesh (p < 0.01).

Conclusion: A trend toward increased collagen deposition and vascularity of the fPC group was demonstrated. In addition, there was an increase in tensile strength and yield force in the fPC group. Use of autologous fPC appears a safe and promising adjunct to wound remodeling and healing in a swine model.
IP-1464
Peritoneal flap technique in abdominal wall reconstruction obviates the need for component separation
de Beaux A
UK
Laparoscopic repair of recurrent parastomal hernia after abdominal wall reconstruction with bilateral transversus abdominis release (TAR)
Cleveland Clinic Florida

Background: Abdominal wall reconstruction (AWR) using a posterior component separation via transversus abdominis release (TAR) has become a widely used approach to large Ventral hernias with a recurrence rate documents between 10 and 15%. Little data exists regarding optimal repair of these recurrences after TAR. We present a case of laparoscopic repair recurrent parastomal hernia after AWR with TAR.

Methods/procedures: A 63-year-old female with a past medical history significant for diverticulitis, underwent a robotic assisted laparoscopic low anterior resection (2014). She then had a segmental colon resections secondary to acute ischemic colitis and sepsis (2015), leaving her with a right sided colostomy. She developed a prolapse of this stoma, which was surgically revised twice and she developed a midline ventral incisional hernia as well as a parastomal hernia. She underwent an AWR with TAR with retro muscular placement of polypropolene mesh (30 cm × 30 cm) in 2016 and subsequently developed a symptomatic lateral recurrence at her parastomal site. The patient underwent laparoscopic repair of the recurrent parastomal hernia. Access to the abdominal cavity was achieved via left upper quadrant Hasson cannula. After lysis of adhesions the hernia was reduced. The repair was done with primary closure of the hernia defect and placement of a 10 cm × 15 cm Polypropylene mesh using the “key hole” technique.

Results: The patient did very well postoperatively and was discharged home on POD 3. There was no perioperative complications and follow up at 6 months showed no recurrence of the hernia.

Conclusion: Laparoscopic repair of recurrent parastomal/ventral hernia after AWR with TAR is both technically feasible and safe with good results in complex re-operative situations.
Nebulized cyanoacrylate for prostheses fixation in retromuscular Rives-type eventroplasty. Usefulness of MRI-visible meshes for safety and effectiveness control


Introduction: In our unit, the technique of choice for the treatment of moderate-size midline incisional hernias is the retromuscular Rives eventroplasty. We have amended the standard technique, avoiding the use of transmuscular stitches and using synthetic glue (cyanoacrylate) to fasten the mesh, first with isolated drops and then applied with spray and nebulizer. We started this change 5 years ago, with very good clinical results; we shortened the time of surgery and reduced pain and local complications without detriment to security, since the rate of relapse was acceptable. The manufacture of prostheses visible by imaging techniques has allowed us to use in a series of patients operated on with this no-stitches technique and check the safety of fixing mesh using MRI and its 3D reconstruction. In addition, we intend to remove doubts raised in some experimental work on local complications associated with the use of cyanoacrylates in spray form.

Material-method: The video presents the step-by-step technique applied as we have been doing regularly and also using the visible mesh and the MRI images, 6 weeks later, to control the mesh fixation system. A case of folding at the distal end of the mesh (error attributable to the surgical technique itself), and (not suspected clinically) casual discovery of a seroma were the only discordant notes. In all the other patients, the mesh was properly attached, without displacements, wrinkles, folds, or complications associated with its use or the fixation system used.

Conclusions: The use of visible mesh enabled us to confirm that fixation of retromuscular prostheses exclusively with spray-nebulized cyanoacrylate glue is safe and effective in the short term. Not associated with unexpected displacements or local complications due to the use of the cyanoacrylate, clearing the doubts which have given rise to some experimental works.

Video-assisted surgical abdominal intercostal hernia approach


Introduction: Abdominal intercostal hernia is a rare occurrence, with few cases reported in the literature, and results from diaphragmatic discontinuity and/or intercostal muscle, with protrusion of abdominal contents by this area. It can occur spontaneously or after local trauma, the latter being the most common form. We present a case of spontaneous abdominal intercostal hernia on the right, corrected by video-assisted surgery.

Case report: Female, 81 years old, with progressive bulging in the thoracic wall in right hypochondrium in the last 4 months, reducible, associated with pain to movement. Refers to bulging relation with episode of prolonged cough. No local trauma. The chest and abdomen tomography showed a hernia in the 9th right intercostal space, which is continued inferiorly by the lateral wall of the abdomen, between the external and internal oblique muscles, with a neck of 10.5 × 7.5 cm, where there is a protrusion mesenteric fat, the hepatic angle of the colon and part of the hepatic segment VIII. The patient underwent video-assisted surgery, evidencing a defect in the transverse abdominal muscle and diaphragmatic insertion. The hole was closed and the diaphragm reinserted in its original position. A cellulose-coated polypropylene mesh was placed in the intraperitoneal position and fixed with staples. The patient developed uncomplicated right pleural effusion, being discharged on the 3rd postoperative day. She did not present recurrence until the 6th month.

Conclusion: Spontaneous intercostal hernias are rare abdominal wall defects, and video-assisted surgery is a possible procedure for correction of these cases.
Tuesday, March 13, 2018

Session 8C: Resident and Young Faculty Development

IP-1465
Infiltrating research funding: a guide to grant funding from local sources up to the NIH
Harris H
University of California, San Francisco

IP-1472
Work life balance: executing on all fronts
Greenberg J
University of Wisconsin

Surgery is arguably one of the most rewarding professions that one can pursue for their career. Unfortunately, it is also one of the most challenging due to the long hours, stressful situations, and poor patient outcomes. Not surprisingly, surgeons are at high risk for burnout, which is defined as a state of mental exhaustion caused by one’s professional life. Burnout has been associated with job dissatisfaction as well as poor performance at one’s work. Additionally, the effects of burnout extend far beyond the operating room and the hospital and can have significant impact on one’s personal happiness and family life. There is a variety of strategies to combat burnout and optimize the balance between one’s professional and personal life. In this presentation, I will review my own experience of balancing work and life in a dual professional academic couple.

IP-1393
Becoming a masterful educator: the art of providing feedback
Goldblatt M
Medical College of Wisconsin

Learners today live in a society where they have grown accustomed to immediate feedback. A Facebook post or Tweet gets met with near instantaneous approval, disapproval or commentary. And yet, when residents or students enter the operating room or clinic, they can go months without hearing about how they performed. This often leads to frustration from the learner as they don’t know how to adapt if they don’t know how they are doing. This presentation will attempt to describe and demonstrate the most effective ways to provide feedback to today’s learners.

IP-1467
Leadership skills to establish a solid foundation for the future
Matthews B
Carolinas Medical Center

Leadership skills can be developed and refined. When cultivated, combined, and applied, these skills will foster sustained long-term change in an organization. This lecture will discuss important leadership skills that are foundational to effective leadership.
Hernias of the abdominal wall are the most frequent diseases in general surgery. Hernia repair is very far from to be as spectacular as cancer surgery. However, for the vast majority of the patients any surgical intervention is a severe interference in his life. And keep in mind, after a successful operation the hernia patient will praise your work for the following decades, the cancer patient for years only, if at all. In so far, the performance of an excellent operation is of utmost importance. The young surgeon starting with hernia surgery must pay attention to the following 10 rules indispensable for success: (1) deep knowledge of anatomy. (2) Perfectly familiar with the pathophysiology of hernia disease. (3) Acquire profound skills in open visceral and laparo-endoscopic surgery. (4) Learn, best from an expert, and practice a strictly standardized technique. (5) Start with easy cases, but do not operate on patients complaining about severe pain but presenting with a small hernia only. (6) Gradually proceed to more difficult cases. (7) Document your operations and analyze the results on a regular basis. (8) Do a follow-up of your patients. (9) You should know the guidelines, but you should not follow blindly. (10) To be familiar with the respective literature, attend meetings, and to be open for new developments.
IP-1469
The importance of standardized fascial closure
Jeekel J
Erasmus University Medical Center

IP-1390
Hernia prevention and management: what is important to patients?
Harris H
University of California, San Francisco

Prevention of disease is a universally endorsed concept, yet practiced with considerably less enthusiasm than it would seemingly merit. During this presentation the prevention of incisional hernias will be explored with a focus on the challenges to adoption and practice of effective preventative measures, the perspectives of multiple stakeholders regarding the importance of hernia prevention, and the perceived priorities of different patient populations. Accordingly, we will highlight the difference between primary and secondary prevention, examine the different levels at which prevention can take place, and identify several of the barriers that can effectively neutralize preventative measures.

IP-1417
Prophylaxis of incisional hernia during emergent laparotomy
Pereira J
Hospital del Mar

We hypothesized that using a prophylactic mesh may be useful to prevent abdominal wall complications without increasing the number of complications in emergency laparotomies.

We compare the results in two groups of patients in which a prophylactic mesh was used (Group M) or not (Group S).

The results, after a median follow-up of 16.7 months, showed a low frequency of incisional hernia in the group M (5.9%) vs. Group S (33.3%).

The use of a prophylactic suprafascial mesh in emergency laparotomy is feasible to prevent incisional hernia without adding morbidity even if a high grade of contamination or infection is present.

IP-1470
Value of hernia prevention
Fischer J
University of Pennsylvania
The incidence of parastomal hernias is very high and its prevention by mesh augmented reinforcement at the time of stoma creation has been tested in several observational, randomized studies (RCTs) and systematic reviews and meta-analysis of RCTs. The aim of this presentation is to analyze the current level of evidence regarding parastomal hernia prevention.

Incisional hernia prevention represents a hot topic in current abdominal wall surgery literature. Mesh implantation at the time of laparotomy has offered convincing results in particular in subset of high risk patients. Similar results have been obtained in the reinforcement of other surgical sites at high risk for incisional hernia development. Several mesh type have been proposed for prevention synthetic, biologic and the newly bio absorbable. Biologic meshes have been tested in several conditions midline prevention, parastomal hernia prevention, stoma site closure after ostomy reversal and perineal closure after Abdominoperineal Excision. A systematic literature search was conducted using Medline, Scopus, Central and Web of Science including publications until December 2017.

The available evidences for the use of meshes is very sparse and inconclusive, currently it is not possible to recommend in favor or against the use of bioprosthetics for the prophylaxis of any type of incisional hernia over synthetic non absorbable meshes irrespective of clean and clean contaminated fields.
Wednesday, March 14, 2018

Session 10A: Guidelines, RCTs and Registries: What have we learned and what is needed?

IP-1473
Challenge of developing and implementing guidelines: what have we learned
Simons M
The Netherlands

IP-1399
Challenges of conducting a robust and ethical RCT
Hope W
New Hanover Regional Medical Center

The need for randomized controlled trials (RCT's) remains of utmost importance as they provide the highest level of evidence and allow for minimization of bias. In the era of evidence based medicine the RCT remains at the cornerstone of how surgeons and physicians make decisions and often a well done RCT can change practice.

Despite the wide acknowledgement of the importance of RCT's in gaining evidence the amount of RCT's done in the surgical field and in hernia surgery remains quite low and is due to several factors. Challenges discussed will included funding issues, applicability and generalizability issues, patient accrual, and procedural issues relating specifically to hernia surgery such as means and methods of follow up and minimizing differences in surgical technique.

Very few centers are successful in performing RCT's for hernia surgery and to them we owe a deep gratitude as the information gained is extremely important. Improvements in the ability to perform RCT's in the hernia space will require improvement in collaboration and funding mechanisms. With the improvement in hernia registries in most countries some questions may be able to be addressed, however there will always be a need for a well done RCT to answer the many questions that still exist in hernia surgery.

IP-1475
Challenges for generating high quality data from a hernia register
Dietz U
Bürgerspital Solothurn

IP-1476
Hernia RCT'S in the last year and research gaps
Sanders D
UK

IP-1410
Guidelines and RCTS: what have we learned and what is needed?
Fitzgibbons R, Miserez M
Creighton University Department of surgery

Following the three formal presentations dealing with guidelines, randomized controlled trials, and registries, this session is planned as a robust interactive audience participation discussion of these important disciplines as they relate to quality of the care we provide to patients in need of abdominal wall reconstruction.

IP-1478
RCTS: clear definitions and standardized datasets are needed
Miserez M
Belgium
There’s no doubt that in 2018, any health professional, any care structure, any scientific society can avoid considering the web as a daily tool in his practice and development. In only a few decades the web has provided unimaginable ways to share existing knowledge, make people and society able to share points of views and easily work together. Behind the screen of a computer stands now millions of books, and where it takes days to send a letter to a colleague or moreover a surgical picture or movie on the opposite side of the world it only needs a second now to send an e-mail; post a note on a social media that any of our own world social or professional net can see and share.

But does only the one we’d like to see our posts, films, datas? Are we totally sure that our screen is not a kind of Trojan Horse in our personal and professional datas? Am I totally sure that one of my patients won’t recognize it’s case discussed on the web and that might lead to a legal issue? Must we consider the web as a freedom sanctuary or do we have, in our exercise or as scientific society to establish specific rules in order to warranty safety and quality of our shared spaces? What role can we imagine for the web in healthcare as Artificial Intelligence arises and medical decision in the future (maybe already today) can no more be only based on the experience or knowledge of a single or a small group of physicians?

Defining a balance between freedom and safety is one of the key points of the growing place of the web but as we’re dealing with the most “sensible” datas, health, we ought to.
IP-1481
Connecting with patients through social media
Tejirian T
Kaiser Permanente Los Angeles Medical Center

IP-1482
Protecting the patient when using social media: HIPPA and beyond
Matthews B
Carolinas Medical Center

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) was established to maintain the privacy and security of medical records that contain Protected Health Information (PHI). HIPAA lists 18 categories of identifying information that must be removed from a record or patient story in order for it to be considered de-identified. Social media provides ease with which substantial opportunities for direct, personal, and time sensitive communication can occur between health care providers. Although these platforms have the opportunity to advance patient care, disseminate medical/surgical knowledge, and disrupt current norms in collaboration between health care providers, social media can infringe on the regulatory aspects of HIPAA. This lecture will explore issue related to patient privacy and social media platforms.
AHSQC-embedded randomized controlled trial: telescopic dissection vs. balloon dissection for laparoscopic TEP inguinal hernia repair
Guilherme Tastaldi L
Cleveland Clinic

Creation of the initial working space during laparoscopic totally extraperitoneal inguinal hernia repair (TEP) can be performed using either telescopic dissection or with a balloon dissector [1–4]. Telescopic dissection is the creation of the preperitoneal space using blunt dissection with the laparoscopic probe [5]. In order to facilitate this surgical step, disposable balloon dissectors have been developed and are commercially available. In fact, balloon dissection is now the most commonly used method for dissection of the preperitoneal space for TEP in the United States [4]. Although largely utilized, there is paucity of data assessing the benefits of the routine use of a balloon dissector for TEP when compared with telescopic dissection. The use of balloon dissectors increases the direct cost of the procedure. On the other hand, the potential significant decrease in operative times might make its routine utilization still economically advantageous. In order to assess the impact of the type of dissection of the preperitoneal space during TEP, we aim to use the Americas Hernia Society Quality Collaborative (AHSQC) as our platform to conduct a prospective randomized controlled trial comparing telescopic dissection versus balloon dissection for TEP with respect to operative times, postoperative pain scores, surgical complications, hernia recurrence and patient quality of life.

Comparison of outcomes after partial (PME) versus complete mesh excision (CME)
Kao A
Carolinas Medical Center

Introduction: Mesh infection occurs in up to 10% of abdominal wall hernia repairs and remains one of the most difficult complications, leading to prolonged duration of antibiotics and often reoperation. CME is usually difficult due to inflammation and may lead to bowel, vascular and abdominal wall injury; however, the remaining foreign body predisposes the patient to risk for persistent infection. Consequently, the surgeon must weigh the option of potential for chronic infection versus complications from mesh excision.

Methods: Our study population includes AHSQC database patients with mesh infection after ventral hernia repair (VHR) and mesh excision. Patients will be divided into cohorts based on PME vs. CME and outcomes between two groups will be directly compared. Primary outcomes of interest include surgical site infection, readmission, recurrence, reoperation and other postoperative complications. Univariate and multivariate logistic regression analyses will be performed.

Data: Differences in short and long-term morbidity between PME and CME remains poorly understood. Previous single-institution studies have suggested that PME frequently leads to treatment failure and often require additional interventions. In one study, postoperative complications and hernia recurrence was more common after CME, however persistent mesh infection was observed significantly more often following PME.

Conclusion: We anticipate that a retrospective study comparing outcomes after PME and CME will provide further evidence to guide decision-making in this complex scenario. We hope a robust database, AHSQC, will help elucidate the treatment algorithm for patients with mesh infection.
FP-1224
International Hernia Mesh Registry (IHMR): 10 years
Tollens T, Doerhoff C, Romanowski C, Schmitz N
Imeldaziekenhuis

Introduction: Registries can provide a real world view of clinical practices, safety and patient reported outcomes in a disease or condition being studied. One such registry, the IHMR was initiated in 2007 to gather clinical results and patient reported outcome data.

Methods: The IHMR, an international observational prospective ongoing multi-center registry, sponsored by Ethicon was designed to collect patient reported, longitudinal data on various hernia mesh products and fixation methods. Data collection includes baseline characteristics, perioperative details, complications, and safety variables. Patients were contacted by a contract research organization (CRO) for completion of questionnaires post-surgery which included the Carolinas Comfort Scale™ (CCS). A symptomatic CCS™ patient was defined as responding \[ > 1 \] to any question. Improvement from baseline was assessed with McNemar’s test and recurrence rate was estimated with Kaplan–Meier methods.

Results: Overall, 4750 patients (safety analysis set) were enrolled with assortment of synthetic mesh products from 13 countries (51 centers). Of these, 4240 patients were in the effectiveness (full_24) analysis set. Demographics: mean age 55.9 (14.6 SD) years; mean BMI 27.8 (5.6 SD) kg/m^2; males (78.7%); non-smokers (46.1%). Majority of hernias were inguinal (59.8%) and most were open procedures (59.0%). Mesh fixation was primarily with sutures (53.0%). CCS™ data is available on 3452, 3008, 3409, 2906 patients at 1, 6, 12, 24 months post-surgery, respectively. Symptomatic pain and movement limitation scores improved from baseline to 24 months (57.7–14.0%, \( p < 0.0001 \); 48.1–10.8%, \( p < 0.0001 \)), respectively. The recurrence rate was 4.5% (95% CI 3.8–5.2%). Data has been utilized for post market clinical follow-up (PMCF) and re-registration to the regulatory bodies.

Conclusions: The IHMR was initiated to accelerate availability of clinical evidence across several regions and enabled patients to rate their outcome without surgeon bias. Ten years later, IHMR is actively enrolling and serves as a mechanism for PMCF.

FP-1124
Outside facility resource utilization following open ventral hernia repair performed at a tertiary care facility
Plymale M, Wade A, Mastoroudis E, Davenport D, Tancula C, Johnson S, Roth J
University of Kentucky

Introduction: Same site emergency room visits and hospital readmissions are not uncommon following open repair of ventral and incisional hernia (VHR). The percentage of patients that report to outside facilities for care is not known. The purpose of this telephone survey of VHR patients was to determine the number who sought care at an outside facility during the 6-month postoperative period and the number requiring home health services.

Methods: From October 2011 through September 2014, 308 patients underwent VHR at a single academic tertiary referral medical center. Previously same-site surgeon office visits during the 180 days post-operation were evaluated. With IRB approval, patients were contacted by telephone to elicit information concerning offsite facility office visits, emergency room visits, hospital admission, and home health care services required during the 6 month postoperative time period.

Results: A total of 100 patients (32.5%) completed the survey. Reasons for survey non-participation included inability to reach, no working telephone number, and declined to participate. Gender, geographic market proximity, insurance type, perioperative characteristics, and postoperative surgical site occurrences were similar between patients who completed the survey and those who did not. Eleven respondents (11%) visited an offsite emergency department; 8 (8%) visited an offsite physician’s office, and 3 (3%) were admitted to an offsite hospital for surgery-related reasons, most commonly surgical wound complications. More than half of the patients seen at an offsite emergency room or admitted to offsite facility were from the tertiary market. Twelve patients (12%) required home health care services for a median of 6 weeks.

Conclusions: This study provides the first estimates of offsite facility usage and home health utilization within 6 months of VHR. Previous estimates of post-VHR emergency room visits and hospital readmissions most likely are underreported due to the number of patients that seek care at outside facilities.
FP-1216
Ventral hernia in women of childbearing age: a systematic review of observational studies
Oma E, Henriksen N, Jensen K
Bispebjerg Hospital

Background: Ventral hernia repair is commonly performed on women of childbearing age. Recent studies suggest that all repairs should be performed with mesh reinforcement. However, these studies do not consider pregnancy as an exposure, and consensus lacks concerning management of ventral hernia in women of childbearing age. The aim of this study was to summarize the literature on ventral hernia in women of childbearing age.

Methods: PubMed, Embase, Cochrane CENTRAL, CINAHL and Web of Science were searched systematically for RCTs, analytical observational studies and large case-series on ventral (umbilical, epigastric or incisional) hernia repair in relation to pregnancy. Included studies were assessed with quality appraisal checklists.

Results: Four cohort, three case–control studies and one case-series were included. No RCTs were identified. One study found a 0.08% prevalence of umbilical hernia in pregnant patients, and repair during pregnancy was associated with minimal 30-day morbidity. Three case–control studies found that combined cesarean section and umbilical hernia repair was not associated with major complications compared to cesarean section alone, and with low recurrence rates. Two studies reported that subsequent pregnancy following ventral hernia repair was associated with 56–73% increased risk of recurrence. One study found that mesh repair did not lower the risk of recurrence compared to suture repair in women with subsequent pregnancy after primary ventral hernia repair.

Conclusions: Ventral hernia during pregnancy seems very rare and seldom requires repair. Umbilical hernia repair during pregnancy and in combination with cesarean section seems safe, however, the combined procedure should be evaluated in more robust studies before recommendation for routine practice can be made. There is good-quality evidence to support that pregnancy following ventral hernia repair is associated with recurrence. Whether mesh reinforcement should be avoided for smaller hernia defects in women who might become pregnant should be confirmed in future studies.

FP-1314
Smoking not an independent risk factor for wound morbidity after open ventral hernia repair: an Americas Hernia Society Quality Collaborative (Ahsqc) analysis
Petro C, Haskins I, Tastaldi L, Krpata D, Rosen M, Prabhu A
Cleveland Clinic

Introduction: Smoking is frequently implicated as a risk factor for wound morbidity after surgery. We aimed to characterize the impact of smoking specifically on wound morbidity after open ventral hernia repair (OVHR) using a multi-institutional database.

Methods: Patients undergoing an OVHR with at least 30-day follow-up in the AHSQC database were separated into 2 comparable groups matched on confounding factors using a propensity scoring algorithm. Unmatched variables will be adjusted for using multivariate logistic regression. Current smokers (within 30 days of surgery) were compared to patients who have never smoked. Primary outcomes included surgical site occurrence (SSO), surgical site infection (SSI), and surgical site occurrences requiring a procedural intervention (SSOPI).

Results: A total of 354 active smokers were matched in a 1:1 fashion with 354 patients who had never smoked. Rates of SSO, SSI and SSOPI were not statistically different between current smokers and never smokers (4.5 vs 4.5 p = 0.99; 7.4 vs 7.9 p = 0.27; 12.4 vs 11.0 p = 0.64). Multivariate logistic regression—used to adjust for imperfect matching—only identified the use of drains as a risk factor for SSI (OR 1.1 95% CI 1.08–1.14 p = 0.01).

Conclusion: Active smokers and patients who never smoked had no difference in their rates of postoperative wound morbidity. There may be a role for allowing perioperative smoking. This should first be studied prospectively in a select low-risk group of patients.
Wednesday, March 14, 2018

Session 11A: Patient Optimization and Patient-Driven Outcomes

IP-1483
Patient advocacy
Towfigh S
Beverly Hills Hernia Center

Patient advocacy is intrinsic to any attempt at patient-driven outcomes. The goal is to attend to the needs of patients and help patients fight for excellence in their healthcare. Ultimately, we are all potential patients, and we would wish that surgeons have an active role in their patients’ betterment. We will review the AHS’s role in patient advocacy, illustrating various programs in place, including resources on their website, the AHSQC, website and their direct patient outreach. We will also provide avenues for the audience to be active in their role for patient advocacy.

IP-1384
Eras: outcomes of ventral hernia pathways and multimodal pain treatment
Warren J
University of South Carolina School of Medicine Greenville

Enhanced recovery after surgery (ERAS) protocols focus on patient optimization and standardization of perioperative management to improve recovery after surgery. While this is well established in several surgical disciplines, there is little data specific to ventral hernia repair (VHR). The goals of ERAS after VHR are prevention of surgical complications, particularly wound complications, earlier resumption of normal diet and bowel function, reducing length of hospital stay, and reduction in opioid analgesia. As such, hernia ERAS protocols primarily target preoperative management of patient comorbidities and perioperative multimodal analgesia. Preoperative weight loss, smoking cessation and diabetes optimization all potentially impact operative risk, length of stay and readmission rates. Preoperative “pain cocktail”, use of epidural catheters or transversus abdominis plane block for post-operative analgesia, avoidance of preoperative and intraoperative narcotics, and multimodal analgesia postoperatively with neuromodulators, non-steroidal anti-inflammatory medications, and other non-narcotic medications mitigate the need for excessive opioid use. This aides in earlier resumption of normal bowel function, earlier ambulation, and decreased need for opioid analgesia post-discharge. Much of the evidence currently available for ERAS in hernia repair is derived from colorectal and gynecologic literature and potential benefits of risk-reduction by optimizing patient comorbidities. Much research is still needed to determine the optimal approach for ERAS after ventral hernia repair and abdominal wall reconstruction.
The care of any patient with a hernia or hernia related complication involves a complex care process, not a simple one. A complex process means there are many factors involved in producing a certain outcome, good or bad. In addition to treatment factors such as the approach, laparoscopic or open, and the type of mesh, or no mesh, there are also many patient factors that the patient brings into the process that may impact the outcome. Some of the factors that a patient brings into the process that impact outcomes, such as number of recurrences and size of the defect, may not be modifiable. The common factors addressed in a Prehabilitation program include modifiable factors such as smoking, BMI and diabetes. Typical Prehabilitation goals include weight loss, smoking cessation and control of hemoglobin A1C. However, there may be other factors that impact outcomes that are modifiable but have not yet been measured adequately. Using a patient-centered, multi-disciplinary team, we have applied the principles of systems and data science to hernia patient care process. These principles include the focus on measurement and improvement of the process. In reductionist science, the focus is on proving or disproving a static hypothesis.

By applying a systems and data science approach, clinical quality improvement methods and non-linear analytical tools led to the discovery of an unexpected modifiable factor that patients bring into the hernia care process, their emotional/cognitive state prior to surgery. This factor has been the modifiable factor having the highest weighted correlation to outcomes in both the ventral/incisional hernia repair and chronic pain after hernia repair patient care processes. This talk will discuss the science and research behind the patient’s cognitive state impacting outcomes and the use of cognitive therapy to...

Smoking has detrimental effects on outcomes after surgery including impaired wound healing, secondary hernia formation and pulmonary complications. Without information or support, only one of two surgical patients are aware of these effects, and less than 50% of patients will quit or reduce their smoking before surgery. The effects of peripерoperative smoking cessation (SC) in herniotomy patients has only been scarcely investigated in RCTs with inconclusive results due to underpowered studies. Moreover, non-RCTs are often confounded by the fact that smokers are characterized by other negative lifestyle factors. There are at least 13 RCTs that recruited > 2000 patients scheduled for various surgical procedures. Compared with standard care, both brief support and intensive behavioral support [multisession face-to face counseling for 4 weeks, nicotine replacement therapy (NRT) and special behavior change techniques] were effective as regards smoking at the time of surgery. The effect was larger for intensive than brief support. Only intensive support resulted in long-term postoperative SC. Predictive factors for successful SC include male gender, social network, regular exercise and high educational level. Compared to never-smokers, former smokers are at higher risk of postoperative healing complications (OR 1.30; 95% CI 1.07–1.59). The incidence of all healing complications combined is less in former smokers than current smokers (0.69; 0.56–0.85). For optimal efficacy, both experimental and clinical data suggest that the minimal duration of SC before surgery is 4 weeks. Compared to smoking controls, SC is an effective preventive measure against surgical site infection (0.43; 0.21–0.85), whereas the preventive role of SC against other healing complications including secondary hernia is less clear (0.51; 0.22–1.19). Although NRT leads to a positive urinary cotinine test, this therapy is not associated with postoperative healing complications. More RCTs are required in order to define the rationale for CS before specific procedures for abdominal wall hernia.
Decision making for hernia repair: what factors are important to patients?
Liang M, Bernardi K
University of Texas at Houston

Hernias are among the most common surgical pathology experienced by patients. Developing the best treatment strategy requires a careful balance of patient goals, patient expectations, clinical setting, outcomes data, and local resources.

When all of the requirements are aligned, choosing the optimal management strategy is straightforward. However, when there are conflicts, decision-making becomes more challenging. Common areas of limitations include gaps between patient expectations and outcomes data, conflicts in patient short-term and long-term goals, and accurate understanding of outcomes data and local resources.

Most patients with symptoms seek resolution of their pain and restoration of a normal function. In addition, abdominal wall appearance can affect a patient’s quality of life, social life, and even productivity in the work place. Cosmesis is commonly reported as the patient’s main desire when seeking surgery. However, it is unclear what most patients consider an “acceptable” duration for successful repair (1 year recurrence free or 10 years recurrence free) and if they are willing to accept short-term benefits for worse long-term outcomes (a number of years hernia free in exchange for bigger and more symptomatic hernia thereafter).

Patients with oligosymptomatic hernias often have concerns for incarceration, strangulation, or “rupture”. There is a lack of understanding of the risk of acute presentation or progression of symptoms among both patients and healthcare providers. In addition, the risk of developing chronic pain or symptoms following hernia repair should be carefully balanced with the concerns for acute presentation or disease progression.

Aligning patients, clinicians, and local resources to provide the optimal short- and long-term outcomes can be achieved through clear communication, educational resources, and systems based care.
Reoperation after mesh repair
van Goor H
Radboud University Medical Center

Intraperitoneal polypropylene mesh: another perspective
Brandi C
Hospital Italiano de Buenos Aires, Argentina

Purpose: To determine the incidence of enterocutaneous fistulas (ECFs) developed after elective incisional hernia (IH) repair using intraperitoneal uncoated polypropylene (PPE) mesh.

Methods: This is a retrospective descriptive study of a prospective cohort of patients undergoing elective IH repair using intraperitoneal uncoated PPE mesh at the Department of General Surgery of a high complexity University Hospital.

Results: Between January 1992 and December 2013, 695 IH repairs were performed using intraperitoneal uncoated PPE mesh. The omentum was placed between the mesh and bowel in 507 patients (73%). In 188 patients (27%) it was not possible to place the omentum between the mesh and bowel; therefore, in 69 patients (9.92%) the PPE mesh was placed over the bowel, whereas in 119 patients (17.12%) a Vicryl mesh was placed between the bowel and PPE mesh. Six hundred and seventy-eight (97.5%) IH repairs were open whereas 17 (2.5%) were laparoscopic. Postoperative complications consisted of seroma (5.9%), hematoma (4.3%), wound infection (4.8%), and mesh infection (4.0%). Recurrence of IH occurred in 52 patients (7.4%) after a mean follow-up of 59 months. Four (0.5%) patients required additional surgery due to intestinal occlusion. Neither acute nor chronic ECFs were encountered during follow-up in 695 patients.

Conclusion: Based on these results, the placement of intraperitoneal uncoated PPE mesh for elective IH repair might be a safe procedure that is not associated with ECF formation.
Mesh infection is one of the worst nightmares that a surgeon and a patient can suffer. It can appear even years after the surgery. The incidence is around 6–10%. Staphylococcus aureus is isolated in culture in 70% of cases. There are many risk factors for developing mesh infection; related to the patient (tobacco, obesity) and to the surgery (open surgery, emergent surgery, gastrointestinal surgery, microporous meshes). Some years ago, treatment of mesh infection led to mesh explantation in all cases. It can be a difficult surgery with high risk of visceral injury, leaving abdominal wall defects greater than the previous one and without possibility to close. Actually, conservative treatment is the preferred approach. The conservative management starts with debridement, cleansing, systemic antibiotics and negative pressure therapy. With this approach, about 80% of macroporous meshes could be salvaged. Some authors proposed use negative pressure therapy with instillation of saline and they report better results with less days of treatment and high rate of success. Laminar or composite meshes do not have this rate of salvage and some authors have tried to perform percutaneous drainage followed by antibiotic irrigation in selected cases. Other approach can be partial removal of mesh when there are chronic sinuses, removing only the piece of infected mesh identified after methylene blue injection.

If mesh infection cannot be controlled with conservative management, explantation is recommended. Controversy exists about single or two-staged surgery. Biologic meshes became the mesh of choice in one-staged approach, but later on, high rate of mesh infection, and recurrences has been reported. Now, synthetic macroporous meshes are recommended in contaminated cases with good results. Biosynthetic meshes would be used in some cases but there aren’t enough information yet.

More frequent than recurrences, chronic post-herniorrhaphy chronic pain has become the most common complication of mesh repairs. The incidence remains debatable as reports suggest a range of 0–60%. It would seem that 12%, as suggested by the EHS-Guidelines, does not reflect the reality since many of the studies report series too soon after mesh implantation. Our evidence suggests that 50% of such complications would take place by 4 years while 95% would occur by 10 years and our longest recorded interval has been 24 years.

Surgeons are loth to explant mesh for the relief of chronic pain. It is sometimes difficult to do so especially when the mesh has been inserted laparoscopically rather than through an anterior approach such as Lichtenstein. Many are convinced (with little evidence) that the pain is not relieved. Many patients however end up in pain clinics and psychiatrists’ offices without relief.

All precautions such as coating of mesh, avoidance of sutures, clips, tacks, glues have been ineffective.

Reality is otherwise. This presentation will discuss mesh removal and its relevance today.

R. Bendavid MD.
**Wednesday, March 14, 2018**

**Session 11C: Scientific Abstracts**

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**FP-1258**

Is round ligament varicosity during pregnancy a precursor for the later development of inguinal hernias? The prospective analysis of the long-term outcome in 28 patients over 9 years

Lechner M, Bittner R, Mitterwallner S, Borhanian K, Emmanuel K, Mayer F

Paracelsus Medical University, Department of Surgery

**Abstract:** Round ligament varicosity (RLV) in pregnancy leads to a dilation of the deep inguinal ring and can mimic inguinal hernias. Surgical exploration during pregnancy has been demonstrated to be avoidable through careful clinical and ultrasound examination. The long term effects, namely the later development of inguinal hernias in the area formerly affected by RLV are currently unknown. 28 pregnant women with RLV presented to our hernia clinic over 9 years. After initial clinical and ultrasound examination during pregnancy and publication of the early results in 2013 another structured follow up was conducted in 2017 after a mean 68 (12–105) months to evaluate potential long-term consequences of the condition.

Age, weight, height, Body Mass Index, smoking habits, diabetes, child’s weight at birth, presence of groin hernias, varicose veins of the legs, hemorrhoid complaints, onset of complaints by trimester, number of pregnancies and deliveries, way of childbirth and time of resolution after birth, as well as recurrence of RLV in subsequent pregnancies and family history for hernias were documented. Three patients are currently lacking long-term follow up.

We found only one newly developed groin hernia. Varicose veins of the legs or hemorrhoids were noted in 11/25 and 13/25 women respectively. Apart from abdominal stretch marks in 6 and rectus diastasis in 3 of the examined women no other clinical signs of possible soft-tissue alterations could be noted.

We conclude that temporary RLV-induced dilation of the deep inguinal ring in pregnancy is not a common precursor for the development of inguinal hernias later in life. The findings support the hinderance of venous blood flow caused by the gravid uterus as an underlying reason of the condition. An association of RLV in pregnancy with abdominal wall hernias could not be demonstrated.

**Keywords:** Round ligament varicosity; Inguinal hernia; Pregnancy

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**FP-1279**

Groin hernia repair in women: is there a best option for treatment? Results of a registry-based propensity-score-matched analysis


Paracelsus Medical University Salzburg, Department of Surgery

**Introduction:** According to guidelines laparo-endoscopic techniques are recommended as the primary option in repair of groin hernia in women mainly because of high rates of femoral hernias in case of recurrence after Lichtenstein-repair of inguinal hernia in women. Beside that excellent data concerning recurrence were recently reported after Shouldice repair which could be explained by routinely exploring the femoral canal in a standardized technique.

**Material and method:** Between September 2009 and February 2015 7457 female patients with primary unilateral groin hernia were included in the Herniamed®-Registry, consecutively operated by Lichtenstein (2.226), Shouldice (857), TAPP (2.652) or TEP (1.722) and follow-up was completed after 1 year in all cases. Pairwise propensity score matching analyses were performed to obtain homogeneous groups for adequate comparison of outcome.

**Results:** Comparing Shouldice vs. Lichtenstein 577 patients, Shouldice vs. TAPP 733 patients and Shouldice vs. TEP 694 patients could be matched pairwise. Non-matched comparison of all groups showed significant differences between the groups concerning defect size, risk factors, age, BMI etc. After matching comparison of Shouldice vs Lichtenstein showed difference only in pain at exertion after 1 year in favour of Shouldice (13.0 vs 18.5%; \( p = 0.021 \)). Comparing both laparo-endoscopic techniques (TAPP, TEP) vs Shouldice after creating matched-pairs no difference could be demonstrated in outcome parameters.

**Conclusion:** In highly selected patients (small defect, lower BMI) comparable results may be achieved by a standardized Shouldice-technique. The presence of femoral herniation must be detected pre- or (at least) intraoperatively. In general the recommendation of a preperitoneal mesh-augmentation remains unchanged whereas a Lichtenstein-repair in all cases seems to be not a favourable option.
FP-1295
Mid term results of a double-blind randomized clinical trial of mesh fixation with glue or sutures for lichtenstein hernia repair: no differences in recurrence rate
Hospital Platón Barcelona

Background: Pain is the most likely reason for delay in resuming normal activities after groin hernia repair. The primary aim of this study was to determine whether the use of glue to fix the mesh instead of sutures reduced acute postoperative pain after inguinal hernia repair. Secondary objectives were to compare postoperative complications, chronic pain and recurrence rates during follow-up.

Methods: Between November 2013 and November 2015, 370 patients who underwent Lichtenstein hernia repair were randomized to receive either glue (Histoacryl®) or non-absorbable polypropylene sutures for fixation of lightweight polypropylene mesh. Postoperative complications, pain and recurrence were evaluated by an independent blinded observer. Registration number: NCT02632097 (http://www.clinicaltrials.gov).

Results: Postoperative pain at 8, 24 h, 7 and 30 days was less when glue was used instead of sutures for all measures (P < 0.001). The operation was significantly quicker using glue [mean (SD) 35.3 (8.7) min versus 39.9 (11.1) min for sutures: P < 0.001]. There were no significant differences between the groups in terms of postoperative complications, chronic pain and mid term recurrence rate after a minimum 2-year follow-up.

Conclusion: Atraumatic mesh fixation with glue was quicker and resulted in less acute postoperative pain than sutures for Lichtenstein hernia repair, without increasing neither the postoperative complications nor the mid-term recurrence rate.

FP-1301
Outcomes and impact of laparoscopic inguinal hernia repair versus open inguinal hernia repair on healthcare spending and employee absenteeism
University of Nebraska Medical Center

Introduction: This study compares the impact of open (OIHR) versus laparoscopic (LIHR) inguinal hernia repair on healthcare spending and postoperative outcomes. Given the vast range of literature available for this ever-evolving surgery, few studies have addressed this aim.

Methods: The TRUVEN database was queried using ICD9 procedures codes for open, laparoscopic, and robotic-assisted inguinal hernia repair, from 2012 to 2013. Inclusion criteria consisted of patients older than 18 years of age and continuously enrolled for 12 months postoperatively. Data included demographics, patient comorbidities, postoperative complications, pain medication use, length of hospital stay, missed work hours, postoperative visits, and overall expenditure. Parameters were assessed at time of surgery and at 30-, 60-, 90-, 180- and 365-day postoperatively. Statistical analysis was conducted using SAS, with α = 0.05.

Results: 66,116 patients were included in the study (LIHR: N = 23,010; OIHR: N = 43,106). Robotic-assisted procedures were excluded due to small sample size (N = 61). As expected, the largest demographic was males between 55 and 64 years. LIHR had fewer surgical wound complications than OIHR (LIHR: 0.34%; OIHR: 0.48%, p = 0.007). LIHR also had less utilization of prescription pain medications postoperatively (LIHR: 23.31%; OIHR: 28.5%; p < 0.001) and decreased number of outpatient visits compared to OIHR. Additionally, within the immediate 90-day postoperative period, laparoscopy had significantly fewer missed work hours (LIHR: 12.1 ± 23.2 h; OIHR: 12.9 ± 26.7 h, p = 0.023). LIHR had higher postoperative urinary complications (LIHR: 0.18%; OIHR: 0.05%; p < 0.001), consistent with the current literature. Total expenditures for LIHR ($15,030 ± $25,906) was found to be costlier when compared to OIHR ($13,303 ± 32,014), p < 0.001.

Conclusion: The results highlight the benefits of laparoscopic repair in regards to surgical wound complications, postoperative pain, outpatient visits and missed work hours. These improved outcomes with respect to overall healthcare spending and employee absenteeism support the paradigm shift towards laparoscopic inguinal hernia repairs, in spite of higher overall expenditures.
Incarcerated inguinal hernias: analysis of 5209 emergency cases in the German Hernia Database “Herniamed”
Lorenz R, Koch A, Köckerling F
3+SURGEONS Hernia Center

Introduction: In various mostly Scandinavian Hernia Database-studies rates of 5–20% emergent cases are described. Female Gender and femoral hernias are more associated with incarcerations and strangulations and seems to have a high mortality.

Method: We analyzed the results of the German Hernia Database Herniamed including a 1 year Follow up and compare them to existing studies from other databases. Additional we try to answer the following questions of emergent inguinal hernias: (a) What types of Hernia have most of the emergencies? (b) What are the mortality rates? (c) Which operation techniques are used in practise? (d) What complication rates have emergency operations?

Results: From 2009 to 2016 we identify in the German Hernia Database 5209 inguinal emergency cases of all together 212,591 inguinal hernia cases (2.5%). We compare 2074 female emergency patients with 23,481 elective cases (8.1%) and 3135 emergency male patients with 183,901 elective male cases (1.6%). Females develop much more emergencies than male patients. Nevertheless bowel resections are even rare and less than 0.5%. The most dangerous hernia types are femoral and scrotal hernias. Most emergencies are in older age. The treatment options include open and endoscopic procedures. In case of an emergency most surgeons use an open technique. The percentage of pure tissue repairs raise in emergent female cases up to 14.5%. All together there are even more postoperative complications in emergent cases.

Summary: The emergency case rate of inguinal hernias in Germany is similar to Scandinavian Databases. Nevertheless incarcerations and strangulations are rare conditions in inguinal hernias with a very low mortality. The used repair is dependent on the experience of the surgeon.

Effect of patient and surgeon age on utilization of laparoscopic inguinal hernia repair
Stony Brook University Hospital

Background: Laparoscopic inguinal hernia repair has gained popularity by potentially decreasing postoperative pain, wound complications, and postoperative convalescence. Elderly patients have been shown to experience longer postoperative convalescence and greater alterations to baseline functional status after surgery. We chose to examine how patient and surgeon age influences the utilization of laparoscopic techniques.

Methods: We performed a retrospective review of a large-scale, state-based longitudinal hospital claims database (SPARCS) with mandatory reporting. Patient ages were stratified to 18–29, 30–49, 50–69, and 70+ years. The surgeons’ number of years since medical school graduation was used as a surrogate for surgeon’s age. Multivariable logistic regression analysis was used to examine the association between patients’ age or surgeon’s age and the likelihood undergoing laparoscopic inguinal hernia repair open repair after controlling for patients characteristics and comorbidities.

Results: 245,991 inguinal hernia repairs were performed in New York State from 2005 to 2014. Older patients (70+) were more likely to undergo surgery from older surgeons (p value < .0001). The likelihood of laparoscopic inguinal hernia repair was significantly associated, and inversely correlated with patient age (18–29: 30.1%; 30–49: 32.85%; 50–69: 29.07%; 70+: 17.5%, p < 0.0001) and surgeon’s age (p < 0.0001) after adjusting for age, race, race and any comorbidity. Also associated were gender (p < 0.0001), race/ethnicity (p < 0.0001), payment (p < 0.0001), and any comorbidity (p < 0.0001).

Conclusion: Despite documented benefits, laparoscopic inguinal hernia repair is much less commonly performed than open repair in elderly patients. Patients who are male, young, Caucasian, without comorbidity, or with commercial insurance are more likely to undergo laparoscopic repair. Older patients are also more likely to receive care from older surgeons, who perform laparoscopic repair less frequently.
Wednesday, March 14, 2018

Session 12A: AHSQC

IP-1487
Ahsqc benchmarks: how do we measure up?
Poulose B
Vanderbilt University Medical Center

Primary fascial closure during laparoscopic ventral hernia repair: long-term outcomes
Greenberg J
University of Wisconsin

The laparoscopic approach for the repair of ventral and incisional hernias is associated with similar rates of recurrence and decreased wound morbidity compared to open approaches. Despite these benefits, there is significant variability in surgeon technique for laparoscopic ventral hernia repair. While many surgeons advocate for defect closure during laparoscopic ventral hernia repair, the benefits of this technique are still debatable. Previous publications from the Americas Hernia Society Quality Collaborative (AHSQC) have shown no benefit to defect closure with respect to 30-day rates of surgical site infection, surgical site occurrence, or surgical site occurrence requiring procedural intervention. In this presentation, we will review the long-term outcomes of laparoscopic ventral hernia repair with and without defect closure in the AHSQC.

IP-1381
Oracle decision support tool update
Haskins I, Stewart T, Olson M, Rosen M, Poulose B
Cleveland Clinic Foundation

At the American College of Surgeons Meeting in September 2017, we launched the ORACLE Tool (Outcomes Reporting App for CLinician and Patient Engagement), which is the culmination of my work through the Americas Hernia Society Resident Research Grant that I was awarded in 2016. This tool is meant to serve as a decision support tool that clinicians and patients can use during preoperative evaluation and planning. This presentation will detail the changes made to the tool since its initial launch and the user engagement of this tool amongst AHS members. This presentation is meant to be interactive with audience engagement and feedback as to the utility of the tool and future direction of the tool.

IP-1488
Venous thromboembolism reduction initiative
Rosen M
Cleveland Clinic Foundation

Patient reported outcomes in ventral hernia
Fischer J
University of Pennsylvania
Introduction: The abdominal wall repair AWR is a frequent surgical task worldwide. Its substantial cost and clinical outcomes with lot of space for improvement require an ongoing analysis focused on effectivity of AWR techniques and improving patient’s quality of life, keeping in mind that financial resources are limited.

Objective: To mirror the status quo of different stages of AWR in various European countries in various health care systems with very different cultures and different standards of living. The value analysis should help to improve the outcomes besides optimizing or even lowering the overall cost.

Method: Survey of relevant literature, guidelines, national registries and consultations with various renowned hernia experts reflecting the routine AWR methods in their own countries.

Results: The most obvious fact is the lack of data. There are abdominal wall hernia registries in Sweden, Denmark, Germany, France and Spain. In contrary to registry of groin hernia (e.g. 96% of all repairs in Sweden) the number of departments included in registry of AWR is still limited. The collected data and expert information is representative neither for Europe, nor for individual countries, but very informative. The suture repair in incisional hernias shows a trend to slow extinction, but still barely survives (for cultural and economic reasons). In Denmark close to 0%, Spain 2.8%, Sweden 10%, Eastern Europe > 30%. The retromuscular sublay is the declared standard at the time, but the soft tissue complications allowed for growing acceptance of IPOM repair (0– > 40%). The necessity of linea alba reconstruction creates IPOM-Plus. Questioning the concept of intraperitoneal mesh is the driving force for development of “MINIM-repairs” (minimally invasive non-intraperitoneal mesh repair).

Conclusion: It seems, that incisional hernia prevention through improved laparotomy closure technique and/or prophylactic mesh use in selected patients will positively impact both the cost and the QoL.
IP-1493
Healthcare reform and hernia repair: what makes sense for patients and surgeons?
Roth J
Lexington, KY
FP-1320
An evaluation of tension measurements during retromuscular incisional hernia repair

New Hanover Regional Medical Center

One of the key tenets of abdominal wall hernia repair is a tension free repair. One of the most common repairs for ventral hernias is a retrorectus repair. Despite widespread use, the amount of tension reduction during this repair is unknown. The purpose of this project is to evaluate the tension reduction on the midline fascia following incising the posterior rectus sheath during a retrorectus repair.

Following IRB approval, patients undergoing ventral hernia were consented for tension measurements from 8/2013-present. Tension measurements were obtained following adhesiolysis at the mid-point of the incision or at the area with the largest width. This was done by placing two Kocher clamps on the fascia, attaching tensiometers on each Kocher clamp, and measuring the amount of tension when the clamps were brought to the midline. Tensions measurements were then performed after both sides of the posterior rectus sheath were incised and dissected to the linea semilunaris. Tension measurements at baseline were then compared to those after retrorectus dissection using paired sample t test, Sign, and Signed Rank t test with p value of \( < 0.05 \) considered significant.

There were 45 patients that met inclusion criteria with an average age of 58 years (range 29–81 years). Caucasian patients made up 78% of patients, 51% were female and average BMI was 35 (range 20–62). Hernias were recurrent in 38% of patients. Average size of hernia defects were 121.9 cm² and size of mesh was 607.8 cm². There was a significant decrease in tension following retrorectus dissection compared to baseline (5.6lbs vs. 3.1lbs, \( p < 0.0001 \)).

We describe the use of tension measurements during ventral hernia repair using a retrorectus repair. Incising the posterior sheaths during a retrorectus hernia repair significantly reduces tension compared to baseline. Further study is needed to assess the clinical relevancy of these tension measurements.

FP-1276
A new animal model in experimental hernia repair
Wilhelminenspital

Introduction: Experimental hernia repair so far mainly relied on animal models in rats and pigs. These trials raise ethical questions and are costly. We present a new model test hernia meshes in a chicken embryo model (CEM).

Methods: We tested meshes, coated and uncoated for vascularisation, ingrowth and biocompatibility in the CEM for max. 2 weeks.

Results: The CEM provided reliable and reproducible results in a (sub) acute timeframe, comparable with the data provided by classical animal testing.

Conclusion: The CEM could be game changing, offering various possibilities to assess important parameters of mesh testing in early postoperative settings. It does not involve conscious animals and dramatically cuts costs. Specific findings of the meshes tested will be shared as well as details of how to implement CEM.
FP-1164
A novel rabbit model of giant abdominal wall hernia and intra-abdominal hypertension
Yang S, Zou Z, Chen J, Shen Y
Beijing Chao-Yang Hospital, Capital Medical University

Background: With the abdominal surgery increasing, the morbidity of incisional and stoma hernia has gradually increased. Abdominal wall hernia, if not treated properly, may develop into a giant one. Repair surgery with mesh is the only method to cure giant abdominal wall hernia. However, complete reduction of the hernia contents may cause postoperative intra-abdominal hypertension, even the abdominal compartment syndrome, which is lethal. Therefore, the high mortality during perioperative period makes it necessary to adopt an animal model for researching. This study demonstrated a novel animal model of giant abdominal wall hernia and intra-abdominal hypertension in New Zealand rabbits.

Methods: 5 cm incision is carried down through skin to the external oblique muscle in the left abdominal wall. The whole muscular layer with diameter about 3 cm was dissected. Suture the subcutaneous tissue and skin without the muscle. Constipation due to lack of water was induced during perioperative period to increase the intra-abdominal pressure. The maximum diameter of the hernia sac was measured. A catheter was placed into the abdominal cavity in the second operation to measure the intra-abdominal pressure. The hernia sac was opened, and the contents were returned into the abdominal cavity. The hernia ring was measured and sutured with absorbable suture. The abdominal wall defect was repaired with the 4\(\times\)6 cm bovine pericardium biological mesh. The intra-abdominal pressure was measured after incision closed.

Results: The abdominal reducible bulge of the incision was formed 3–18 days after surgery. The maximum diameter of hernia was 8.73 ± 1.00 cm and the diameter of the hernia ring was 3.58 ± 0.52 cm. The abdominal pressure increased significantly after giant abdominal wall hernia repair (13.93 ± 1.61 vs. 4.66 ± 1.34 cmH\(_2\)O, \(P < 0.01\)).

Conclusion: Our study demonstrated a novel rabbit model of giant abdominal wall hernia and intra-abdominal hypertension.

FP-1033
Peritoneal flap hernioplasty for reconstruction of large ventral hernias. Long term outcome from 251 patients
Tulloh B, de Beaux A, Nielsen M
Royal Infirmary of Edinburgh

Background: Repair of large ventral hernias is challenging when primary fascial closure cannot be achieved. The peritoneal flap hernioplasty (PFH), a modification of the Rives-Stoppa retromuscular mesh repair, addresses this problem by using the hernial sac to bridge the fascial gap and isolate the mesh from both the intraperitoneal contents and the subcutaneous space. It is applicable to both midline and transverse hernias. We report long term results from 251 patients.

Methods: Patients undergoing PFH repair from Jan. 2010–Dec. 2014 were identified from the Lothian Surgical Audit system, a prospectively-maintained computer database of all surgical procedures in the Edinburgh region of south-east Scotland. Patient demographics, clinical presentation, location of the hernia and surgical treatment were obtained from the hospital case-notes. Follow-up data was obtained in July 2017 from hospital records and telephone interview.

Results: 251 patients (n = 119 male, 47.4%) underwent elective repair of either midline (n = 171, 68.1%) or transverse (n = 80, 31.9%) incisional hernias. Mean follow up time was 61 months (range 31–90 months) and mean postoperative stay was 6.3 days (range 1–33 days). 43 patients (17%) were recurrent hernias. Mean mesh size (OptiLeine Elastic, 48 g/m\(^2\), BBraun) was 752 cm\(^2\) (range 150–1760 cm\(^2\)). Some form of abdominoplasty was performed in 59% of cases. Altogether 53 patients (21.1%) developed postoperative complications. Three (1.2%) developed superficial skin necrosis and 27 (10.8%) a superficial wound infection. Twelve (4.8%) developed symptomatic seroma and 11 (4.4%) a hematoma requiring intervention. In one patient the mesh was removed due to flap necrosis. Seven (2.8%) patients developed recurrence within the 5 year follow up period.

Conclusion: The Peritoneal Flap Hernioplasty is an excellent and versatile method for reconstruction of large ventral hernias arising in both midline and transverse incisions. The technique is safe and associated with few complications and a very low recurrence rate.
FP-1159
Prospective randomized trial comparing laparoscopic ventral hernia repair using absorbable or non-absorbable fixation device
Sharma D, Gupta S, Agarwal L, Lal R
LHMC & Dr RMLH

Introduction: Laparoscopic Ventral hernia repair is becoming surgery of choice for ventral hernias however some question like fixation devices are still are unanswered. We analyse the results after using absorbable and non-absorbable fixation devices.

Aims and objectives: (1) Compare Quality of Life (QOL) using Carolina Comfort Scale (CCS) and asses pain scores in patients undergoing LVHR with absorbable or non-absorbable fixation device. (2) Cost analysis in terms of type and number of tackers used for mesh fixation.

Methods: Prospective randomized trial from January 2015 to June 2017. Total 188 patient underwent LVHR. These patients were randomized and divided into Group I (n = 96) Non-absorbable helical tackers and Group II (n = 92) absorbable two point fixation. Both these groups were compared in post-operative period in terms of pain using VAS score at 24 h and 48 h of surgery and CCS at POD7, POD30 and POD90.

Statistical methods: Randomization by computer generated numbers. Statistical student t test was used for analysis.

Results: Group II at 24 and 48 h had higher VAS scores which was significantly more at 24 h (p value 0.001). The QOL scores using CCS was significantly higher at POD7 (p value 0.007), POD30 (p value 0.022) and POD90 (p value 0.007) in group II as compared to Group I. At mean follow up of 18 months and there were no recurrences, no surgical site infection, no seroma formation and no mesh infection. Surgery with non-absorbable helical tackers as fixation device cost Rs. 18,091 less as compare to absorbable two point fixators per surgery.

Conclusion: In our study we have found that for fixation of mesh of similar size and short term follow up, non-absorbable tacks are better in having less post-operative pain, better quality of life and are more cost effective. Though long term follow up and further studies are required for better understanding of tackers.
Acute evisceration: salvage and damage control
van Ramshorst G
VU University Medical Center

Dehiscence of the abdominal wound, causing a defect in the fascia, is a complication with high morbidity and mortality rates of up to 35%. The incidence of dehiscence, or burst abdomen, has been reported to lie between 0.2 and 3.5%. Reported risk factors for dehiscence include surgical site infection, advanced age, male gender, chronic obstructive lung disease, anemia and type of surgical procedure. In some cases dehiscence can be treated conservatively, with a potential incisional hernia repair planned for the future. Evisceration of abdominal contents, which can occur in dehiscence, usually necessitates more aggressive treatment decisions. Operative treatment options include resuturing of the abdominal wall with or without releasing incisions, staged closure with mesh advancement with or without negative pressure wound therapy, or closure with biological meshes. In general, closure without mesh results in high rates of incisional hernia of up to 83%. Staged mesh advancement seems to result into lower rates of incisional hernia. If incisional hernia does occur, defects are usually smaller in size. Patients who survive abdominal wall dehiscence report low scores for cosmesis, body image, physical and mental quality of life compared to control patients. We will discuss treatment options for different scenarios, using the limited data in literature and a high level of ‘common sense’.
Mesh placement in contaminated fields: current best practice
Birolini C
Hospital das Clínicas - FMUSP

The repair of abdominal wall defects in contaminated fields remains controversial. The best approach must be feasible, reproducible, reversible, and cost-effective. But essentially it must promote a lifetime repair, with fewer wound events and recurrences. Among many alternatives, staged repairs, mesh less component separation techniques and component separation techniques associated with biological mesh have not proven to promote a durable repair, with recurrence rates ranging between 30 and 60%, besides an unexpectedly high incidence of wound events. A new cycle has recently begun, with the use of biosynthetic mesh. The preliminary results show higher rates of 30-day wound morbidity (when compared to polypropylene mesh) and hernia recurrence rates of 17% at 24-month follow-up. The use of synthetic mesh in contaminated repairs remains somewhat contra-indicated, despite favorable results, showing hernia recurrence rates below 10%. Recent data have suggested a potential for a paradigm shift, favoring the use of synthetic mesh at much lower costs when compared to other biologic and biosynthetic products. Literature regarding the use of mesh in infected repairs, including chronic mesh infection and mesh-related enteric fistulas, remains scarce. In dirty operations, suture repairs have shown hernia recurrence rates between 0 and 40%, while biologic mesh repairs presented rates of 30–40%, and synthetic mesh repairs, between 3 and 15%. Some facts about contaminated and infected hernia repairs are remarkable: more wound events are reported with biologic mesh, less hernia recurrence rates are observed with synthetic mesh, and wound events are expected to occur in up to 30% of the patients, no matter the technique employed. The essential end-point is to avoid the occurrence of hernia recurrence since it represents the complete failure of the repair. A minimum follow-up of 24 months is suggested, before presenting results in contaminated and infected operations.

Concomitant colorectal surgery and hernia repair
Parra Davila E, Malcher de Oliveira F, Hartmann C
Celebration Florida Hospital

Concomitant colorectal surgery and hernia repair has been a topic of controversy between surgeons due to the risks of infection of the materials used for the abdominal wall repairs. Discussion of literature and mesh options will be presented up to date as well as clinical cases and videos of procedures.
Thursday, March 15, 2018
Session 13B: Hernia Education and Skills Acquisition

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IP-1508
Fascial closure/hernia prevention education
Lorenz R
3+SURGEONS Hernia Center

IP-1499
Ethical introduction of new techniques and financial stewardship
Park A
Anne Arundel Health System

IP-1500
Credentialing and skills acquisition in robotic surgery: is it a tool or specialized practice?
Coker A
The Johns Hopkins University School of Medicine

IP-1502
How to reach the different parts of the world in hernia education?
Śmietaniński M
Poland

IP-1503
Introducing a new technique into practice: training your team
Baghai M
Torrance, CA

IP-1504
European hernia school
Reinpold W
Germany

IP-1505
Remote telementoring
Chen D
UCLA

Springer
Incisional hernia rates in patients undergoing colectomy for benign vs. malignant disease

Shao J, Devulapalli C, Fabrizio A, Alexander H, Bayasi M, Bhanot P
Medstar Georgetown University Hospital

Background: Incisional hernias following abdominal surgery for colectomy can be as high as 20% and is associated with significant morbidity. Complications can include incarceration, pain, bowel obstructions, decreased quality of life and need for repeat operations. Identifying risk factors for hernia development and understanding predisposition to hernia occurrence can help decrease hernia rates. This will the largest multi-institutional study looking at incidence of hernia rates for colectomy based on disease process.

Methods: In this study, an IRB approved, retrospective study was conducted in which the Medstar Hospital database was queried for all abdominal colectomies performed across 11 Medstar hospitals from 2002 to 2016. Patients were identified by ICD-9 & 10 codes and separated based on benign or malignant ICD codes. Exclusion criteria included patients who had concomitant procedures, HIPEC treatment, and transplant surgery. Data set validation was performed to ensure accuracy of data acquired. Incisional hernia rates (IHRs) were determined for each cohort based on subsequent hernia procedural codes performed at the same hospitals. Descriptive statistics and Chi squared test were used to report IHRs in each group.

Results: During this 14-year span, a total of 4970 colectomies were performed at all 11 institutions, 2792 (56%) for benign etiology, and 2178 (44%) for malignancy. Both groups were well matched in demographics and characteristics, only significant difference being age between the two groups: 61.7 years for benign vs 68.1 years for malignancy (p < 0.001). Incidence of incisional hernia undergoing repair was 164 (5.9%) benign disease and 95 (4.4%) for malignancy (p = 0.021) with mean incidence to hernia development seen at 25.3 vs 27.5 months (p = 0.518).

Conclusion: There was an increased risk of incisional hernia formation in patients who had colectomy for benign disease. There is however no significant difference in the interval to hernia development between the two groups.

Mesh sutured repairs of contaminated incisional hernias

Northwestern University Feinberg School of Medicine

Background: Closure of contaminated incisional hernias remains controversial. We sought to evaluate the results of a new mesh sutured repair technique for treatment.

Methods: 48 patients with contaminated hernia defects 5 cm wide or greater by CT scan were treated with mesh sutured repairs. Surgical site occurrence, infections, and early hernia recurrence were recorded and compared to similar patient series reported in the literature.

Results: Of the 48 patients, 20 had clean-contaminated wounds, 16 had contaminated wounds, and 12 were infected per Centers for Disease Control (CDC) Wound classification. 69% of the patients underwent an anterior perforator sparing components release for hernias that averaged 10.5 cm transversely (range 5–25 cm) by CT scan. SSO occurred in 27% of patients with an SSI rate of 19%. Seven patients had superficial infections, 3 had deep SSI, and one of these patients was common to both groups. All infections were treated without the need for mesh strip removal. There were no fistulas or delayed suture sinuses. Midline hernia recurrence with a mean follow-up of 358 days occurred in 3 patients (6%). Three additional parastomal hernia repairs recurred in 4 attempted cases for a total failure rate of 13%. Longest follow up is over 2.4 years in a patient who has not developed a recurrence. Overall hernia recurrence rates as well as markers for 30 day complications are quite similar to existing series of prosthetic and biologic repairs, despite the mesh sutured technique requiring less dissection and implantation of decreased foreign material in comparison to the other surgical strategies.

Conclusion: Mesh sutured closure represents a simplified and effective surgical strategy for contaminated midline incisional hernia repair.
FP-1339
Capacity building in global hernia surgery: a systematic review
Schroeder A, Tubre D, Filipi C
Creighton University Medical Center

Introduction: In low income countries morbidity and mortality due to inguinal hernias is unacceptably higher than in high income countries. In 2015, the World Bank identified outreach initiatives addressing this burden of disease, but concluded that capacity building strategies have to be developed. The following will provide an overview of strategies deployed and include the authors’ experience through the not-for-profit organization hernia repair for the underserved.

Methods: We carried out a systematic review of the literature searching PubMed using twenty-five terms related to global inguinal hernia surgery. Relevant publications were reviewed in full and the following data points were extracted: author, year, non-government organization (NGO), country, number of patients, type of hernia repair, morbidity and mortality, capacity building method, number of trainees, type of trainees, and concept description. Capacity building concepts and outcomes were analyzed.

Results: Our literature search yielded 1108 results, after removal of duplicates 737 publications remained and were screened for eligibility. After review of eligible full-texts, 15 publications reporting capacity building efforts were included. These health initiatives included 25,301 patients across 11 countries spanning 11 years. Capacity building measures included: lectures, tutorials, infrastructure development, surgical teaching, competency-based training programs, and center of excellence development. A total of 281 trainees included local surgeons, residents, general practitioners, mid-level providers, and nurses. Skills improvement and maintenance of proficiency were measured by post-procedure debriefing, standardized assessment tools, video replay, live video streaming, and in person follow ups. High income country outcomes can be achieved.

Conclusions: Inguinal hernia campaigns shift the paradigm from “repairing” to “teaching to repair their own”, with promising results to address a surgically curable disease. Systematic training and center of excellence development are potential high impact capacity building strategies.

FP-1327
Multicenter outcomes of modified retromuscular Sugarbaker parastomal herniorrhaphy
Penn State Milton S. Hershey Medical Center

Parastomal hernias, which are often large, recurrent and associated with a concurrent midline incisional hernia, remain a surgical challenge. Retromuscular repair utilizing principles of Sugarbaker and transversus abdominis muscle release procedures (PPHR) has been described as technically feasible operation for these patients. Here we evaluate the multicenter outcomes of the PPHR technique.

A retrospective review of prospectively collected data from five hernia centers was performed. All patients undergoing PPHR technique were included. Briefly, retromuscular dissection including transversus abdominis muscle release was performed leaving the ostomy in situ. The bowel proximal to the ostomy is lateralized within the retromuscular space and a sublay mesh repair is performed akin to a Sugarbaker herniorrhaphy. Demographics, comorbidities, post-operative complications and recurrences were evaluated.

Forty-four patients who underwent PPHR from August 2014 to July of 2017 were identified (47.7% female, mean age 60 ± 13.1 years, mean body mass index of 30.8 ± 5.7 kg/m², 87% non-smokers, mean ASA of 2.6 ± 07). Average hernia size was 296.3 ± 256.8 cm² and 34.1% were recurrent. Hernias were around ileostomies (47.7%), colostomies (43.2%), and urostomies (9.1%). An open approach was used in 80% (n = 35), robotic in 18% (n = 8) and laparoscopic in 2% (n = 1). Permanent synthetic mesh (average area 820.73 ± 398.3cm²) was most often used (n = 41, 93.2%) with the majority (68.2%) being intermediate weight polypropylene. There were 3 surgical site occurrences requiring procedural intervention and one non-operatively managed small bowel obstruction. Notably, no mesh explantation, erosions or stoma necrosis were observed in these patients. During an average follow up of 9.4 ± 7 months there were two recurrences (4.5%), none requiring reoperation.

This multicenter review demonstrates the durability of the PPHR repair without the associated morbidity of mesh and stomal complication. Although long-term follow-up is needed, the PPHR represents an innovative technique in the management of complex parastomal hernias.
FP-1306
Component separation is safe among all age groups despite a higher incidence of surgical site infection among younger patients
Docimo S, Bates A, Talamini M, Pryor A, Spaniolas K
Stony Brook Medicine

**Background:** The incidence of massive ventral hernias among the elderly will increase as the population ages. Advanced age is often viewed as a contraindication to elective hernia repair. A relationship between age and complications of component separation procedures for ventral hernias is not well established. This study evaluated the effect of age on the perioperative safety of AWR.

**Methods:** The 2005–2013 ACS-NSQIP participant use data was reviewed to compare surgical site infection (SSI), overall morbidity, and serious morbidity in non-emergent component separation procedures among all age groups. All patients were stratified into four age quartiles and evaluated. Baseline characteristics such as age, body mass index (BMI) and ASA 3 or 4 criteria. Statistical analysis was performed using SPSS. Odds ratios (OR) and 95% confidence intervals were reported as appropriate.

**Results:** 4485 patients were identified. The majority of cases were clean (76.8%). Patients were divided into the following quartiles based on age. The older quartile had a mean age of 72.7 ± 4.87 years. There were baseline differences in BMI and chronic comorbidity severity (measured by incidence of ASA score of 3 or 4) between the age groups, with the oldest group having lower BMI but higher rate of ASA 3 or 4 (p < 0.0001 for both). The rate of postoperative SSI was significantly different between age quartile groups (ranging from 16.3% from the youngest group to 9.4% for the oldest group, p < 0.0001). After adjusting for other baseline differences, advanced age was independently associated with lower SSI rate (OR 0.55, 95% CI 0.41–0.73). There was no significant difference in overall morbidity (p = 0.277) and serious morbidity (p = 0.131) between groups.

**Conclusion:** AWR is being performed with safety across all age groups. In selected patients of advanced age, AWR can be performed with similar safety profile and low SSI rate.

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FP-1291
Does transverse abdominis plane (TAP) block increases the risk of developing postoperative urinary retention after an inguinal hernia repair?
Cleveland Clinic Florida

**Introduction:** Postoperative urinary retention (POUR) has an incidence of up to 22%. We evaluated if transverse abdominis plane (TAP) block before surgery increases the incidence of POUR.

**Methods:** We retrospectively reviewed all patients that underwent inguinal hernia repair at our institution from 2016 to 2017. Common demographics and comorbidities were collected as well as short-term outcomes. Patients were divided into two groups: Group 1, patients that had a TAP block and Group 2, patients that did not have a TAP Block before surgery. All tests were two-tailed and performed at a significant level of 0.05. Statistical software R, version 3.3.1(2016-06-21) was used for all analyses.

**Results:** Of the 276 patients reviewed, 28.2% (n = 78) had a TAP block before surgery. Males and Caucasians composed 90.9% (n = 251) and 83.3% (n = 230) of our population respectively. Diabetes was present in 12.7% and Hypertension in 34.8% of our patients. The mean age of our population was 61.15 ± 14.44 years with most of the interventions having a laparoscopic approach (81.2%) and an overall incidence of urinary retention of 7.6% (n = 21). When TAP block group was compared to the Non-TAP block group, we found that all the common demographics and comorbidities were statistically similar in groups 1 and 2 (Table 1), with except for Type 2 Diabetes, more prevalent group 2 (P = 0.049). When the incidence of POUR was statistically higher in group 1 (14.1% (n = 11) than group 2 5.05% (P = 0.01). Intraoperative fluids administration, early readmission rate (< 30 days postoperative) and length of stay were similar in both groups.

**Conclusion:** Patients undergoing transverse abdominis plane (TAP) block before Inguinal Hernia Repair have an increased risk of developing urinary retention in the early postoperative setting. Further prospective and randomized studies may be needed to better assess these findings and determine the benefit/risk ratio of this procedure.
FP-1202
Combined laparoscopic and open approach for flank hernia repair. Technique description and long-term outcomes of 16 cases
Santa Casa de São Paulo

Background: Proximity to bone prominences and retroperitoneal structures makes flank hernia repair challenging. In addition, it limits mesh-tissue overlap predisposing to recurrences. We have hypothesized that, for small to medium sized flank hernias, combining laparoscopically placed intraperitoneal mesh (IPOM) with an open incision, defect closure and onlay mesh reinforcement would confer increased repair durability with acceptable wound morbidity rates. We aim to report our long-term outcomes with the aforementioned technique.

Methods: All patients who underwent flank hernia repair, from March 2013 through June 2017 were identified in a prospectively maintained database, using telephone interviews to compliment follow-up when necessary. Standard technique was used in all cases, combining open and laparoscopic approaches and placing permanent synthetic mesh in both intraperitoneal and onlay positions, in a “sandwich fashion”. Outcomes of interest included 90-day surgical site infections (SSI), 90-day surgical site occurrences requiring procedural intervention (SSOPI) and hernia recurrence rates.

Results: 16 patients met inclusion criteria, consisting of 62% females with a mean age of 59 ± 8 years. Mean body mass index was 29.5 kg/m², and 10 patients were classified as grade II according to the Modified Ventral Hernia Working Group (m-VHWG). 31% were recurrent flank hernias, and mean hernia width was 6.4 cm ± 2.8. Mean operative time was 159 ± 40 min, fascial closure was achieved in all cases, and there were no intraoperative complications. Patients were discharged after a mean 3.3 days length of stay, and there were no unplanned readmissions or reoperations. At a median 36 months follow-up (IQR12-48), there were no SSI or SSOPI and one hernia recurrence was detected at 12 months postoperatively (6.25%).

Conclusion: The proposed technique appears to be safe and feasible, with acceptable wound morbidity and recurrence rates in selected patients. Further study is needed in larger cohorts to include this technique into the surgical armamentarium of flank hernia repairs.

FP-1268
Utilization of hipaa compliant group messaging application to optimize efficiency, productivity, quality, and patient experience in hernia care delivery
Indiana Hernia Center

Introduction: The shift toward value based care has driven a focus on optimizing process efficiency, productivity, quality, and patient experience in US healthcare. 77% of Americans have a smartphone (2016 Pew Study1) providing an opportunity for disruption of the traditional doctor-patient-team communication workflow of hernia care delivery. Here we utilize a mobile HIPAA compliant group messaging application to optimize the full spectrum of hernia care delivery.

Methods: A HIPAA compliant two-way texting application between patient, provider, and team was utilized (http://www.klara.com). We enrolled all patients presenting to the Indiana Hernia Center starting in July 2017 as a quality improvement project. Data was analyzed through the platform analytics and patient surveys.

Results: 112 patients were offered enrollment and 92% (104/112) adopted. Adoption failures: no smartphone 50% (4/8), no data plan 25% (2/8), and no texting 25% (2/8). 870 conversations were initiated between providers and patients.Median response time was 121 min. (past 90 days), 83 min. (past 28 days), 31 min. (Past 7 days). Total messages/texts sent: MD = 2196, MA/NP = 302, office manager = 234. Estimated workforce time saved: 11 h (90 days), 9 h (28 days), 2 h (7 days) Message topics: questionnaires, visit summaries, pre-operative instructions, post-op daily virtual rounds, post-op wound images, appointment scheduling, and patient satisfaction. 100% of patients responded that the application enhanced communication, saved time, and improved subjective quality and satisfaction of care.

Conclusion: Utilization of a two-way messaging app to optimize pre-operative, operative, and post-operative hernia care removes bottlenecks in the patient care delivery process that have the potential to result in downstream increases in medical errors, staff time, cost, and patient dissatisfaction. In this study, we subjectively enhanced the patient experience and improve perceived quality of care hernia care delivery while quantitatively reducing staff time through two-way messaging with patients.
FP-1198

Early Repair of ventral incisional hernia improves quality of life after surgery for abdominal malignancy: a prospective, case-controlled study


Vanderbilt University Medical Center

Background: Recent work has shown that over 40% of patients undergoing surgery for abdominal malignancy develop ventral incisional hernias (VIH) after 2 years. We hypothesized that early repair of a VIH for cancer survivors would improve long-term quality of life (QOL).

Methods: All patients presented to our clinic with a history of surgery for abdominal malignancy and a complaint of VIH were prospectively invited to enroll. QOL was assessed at baseline and 3, 6, 12, 18, and 24-month follow-up using abdominal wall-specific (HerQLes) and cancer-specific (FACT-G) instruments. At the study’s conclusion, patients were divided into 2 groups—those that underwent VIH repair during the study’s course (Repair Group) and those that did not (Control Group). Categorical variables were analyzed using Pearson’s Chi Square and continuous variables with Wilcoxon rank sum test.

Results: Eighty-four patients were enrolled. Overall, 46 patients (55%) underwent VIH repair, with 36 repairs (78%) occurring within 3 months of initial evaluation. Sixty-six (79%) had complete 1-year follow-up data, and 30 (36%) had 2-year data, with a mean follow-up duration of 15.6 months. At baseline, both groups were similar with respect to demographics, cancer stage, and HerQLes/FACT-G scores. The Repair Group showed improvements over baseline HerQLes scores at 3, 6, 12, and 18-month timepoints (median increasing 47–59), while the Control Group showed no improvement (median increasing 47–52), $p = 0.037$. FACT-G scores in the Repair Group similarly showed QOL improvement over baseline at the 3, 6, and 12-month timepoints (median increasing 84–90), whereas the Control Group did not (median increasing 82–86), $p = 0.046$.

Conclusions: Repair of VIH after surgery for abdominal malignancy can improve abdominal wall-specific and cancer-specific QOL, making post-resection abdominal wall reconstruction an important aspect of cancer survivorship and suggesting a role for hernia prophylaxis at the initial operation.
Should paraesophageal hernia patients be following routinely with imaging?
Greenberg J
University of Wisconsin

Laparoscopic repair of paraesophageal hernias are associated with high rates of recurrence due to a variety of factors. Previous studies have found radiographic recurrence rates upwards of 50% following laparoscopic paraesophageal hernia repair with and without mesh. Despite this high rate of radiographic recurrence, far fewer patients had symptomatic recurrences that required additional treatment. As such, it seems reasonable to question whether patients should be followed routinely with imaging after paraesophageal hernia repair. In this presentation, the literature surrounding recurrence and imaging following paraesophageal hernia repair will be reviewed.

Preoperative ultrasound examination of groin hernias: ‘RCTs’ versus reality
Gillion J, Genser L, Beck M
Antony Private Hospital

Specialized studies and one meta-analysis showed that Ultrasound examination (US) is highly efficient in detecting groin hernias. On the other hand, clinical examination (CE) is also highly efficient with a 75–92% Sensitivity and a 93% Specificity.

The International Guidelines for groin Hernia Management (HerniaSurge Group), recently issued, recommend a combination of CE + US in vague groin swelling, possible occult groin hernias (strong recommendation) or in recurrent hernias (weak recommendation).

With the aim of studying how these recommendations are implemented in the real life, we reviewed the results of the 3196 US realized before 13,102 repairs (US in 24% of cases) in 10,915 patients prospectively registered in the 'Club-Hernie' registry from 01/09/2011 to 13/02/2016.

Positive Predictive Value was 92.6, Negative Predictive Value was 92.6, Sensitivity was 96.6, Specificity was 84.8, ranging from 100% in obvious hernias to respectively 73.6, 93.6, 87.3, 84.8 in occult hernias.

Compared with the Non-US group, US was significantly prescribed more often in small hernias, heavy workers, women, BMI > 30 kg/m², suspected bilateral hernias, groin pain, but not more often in recurrent hernias.

Actually, US just confirmed an evident hernia in 2608 (81.6%) cases, showed an occult hernia in 215 cases (6.7%), something interesting in 85 (2.6%) cases, was false-negative in 300 (9.5%) and false-positive in 17 (0.5%) cases. US had been prescribed by the GP in 3089 (96.7%) and the surgeon in 107 (3.3%) of cases.

Our study confirms that US is highly efficient, shows that, according to the recent recommendations, US was, in our series, prescribed in difficult cases, but also in obvious cases (palpable hernias), therefore suggests that almost 80% could be avoided resulting in a cost saving of 8470,000 Euros per year in France. We might address this matter with our colleagues (CME?) who actually prescribe 96.7% of the groin US.
IP-1506
When the radiology report fails us: differences between imaging and operative findings
Towfigh S
Beverly Hills Hernia Center

About 3 of every 4 images performed on patients with hernias is misread by the radiologists. Reasons include (a) lack of uniformity in definition of hernias, (b) poor knowledge of various operations related to hernias, (c) wide variety of mesh products, (d) lack of knowledge of what is normal vs abnormal finding postoperatively, (e) poor attention to the abdominal wall as a notable finding when reading abdomen and pelvis images. Once the surgeon and other treating physicians are aware of this deficiency, then it will be imperative for us to review images with the radiologist and/or learn to read your own images in evaluating patients.

IP-1396
Results of complex abdominal-wall repair with a biologic cross-link mesh: a retrospective multicentric study including 250 patients
Ortega-Deballon P, Derbal S, Fournel I, Khalil H, Kasereka-Kisenge F, Dubuisson V, Barrat C, Romain B, Doussot A
Dijon University Hospital

Background: There is an increased risk of mesh infection and removal when synthetics are used in contaminated and infected surgery. Our policy in such situations was a 2-stage strategy. Despite their cost and the lack of scientific evidence, several biologic meshes are used in complex abdominal-wall repair (CAWR). There is no proper comparison among them and preclinical and clinical data are rarely consistent. The aim of this study was to collect and analyze the experience of 8 tertiary hospitals performing CAWR with the same porcine cross-link mesh.

Patients and methods: Patients undergoing CAWR between 2010 and 2016 in the participating centers were included in a common database. We recorded data about the patient characteristics (age, sex, BMI, comorbidities, number of previous abdominal repair), hernia characteristics (size, location, content, contamination), postoperative and long-term outcomes (morbidity and recurrences).

Results: We analyzed 250 patients (129 women, 121 men), with a mean age of 63 years, a mean BMI of 30 kg/m². Among them 91 (36%) had a previous abdominal-wall repair. The mean hernia size was 13.3 cm and 78% involved the midline; 152 patients (61%) were class 3 or 4 of the VHWG classification and 75 (30%) were class 2. The mesh was intraperitoneal in 172 patients (69%) and sublay in 51 (20%). Severe morbidity (Dindo-Clavien 3 or 4) and mortality were 49% and 7.8%, respectively. 74 patients (30%) needed a reoperation within the postoperative period with 10 explantations of the mesh (4%). The mean length of stay was 12 days. With a mean follow-up of 29 months, the recurrence rate was 7, 23 and 43% at 1, 2 and 3 years, respectively.

Conclusion. CAWR carries a high morbidity. The use of a biologic cross-link mesh permitted a single stage abdominal-wall repair with satisfactory long-term results.

IP-1382
Risk factors influencing longterm outcomes of biologic implants in abdominal wall reconstruction
Gossetti F, D’Amore L, Annesi E, Grimaldi M, Negro P
Policlinico Umberto I - Sapienza University of Rome

Not all biological implants are the same. Once implanted in the host, both final product and results are strongly influenced by the industrial processing performer by manufacturers.

Data from the literature on biological implants are controversial. Papers with evidence base of medicine are very few and, for this reason, the personal experience plays a significant role both in the use of biological prostheses and in the outcome of the patient.

Biological implants must be used like synthetic meshes, with the respect of the already recognized principles of an optimal repair of abdominal wall hernias.

The key factors for successful outcomes of abdominal wall reconstruction with biologics can be resumed as follows: (1) A proper indication, that means the biologic implants should be used only in Grade III patients, according to the VHWG Grading System. They must never be implanted in Grade IV. (2) The operative technique, including the posterior wall closure and the restoration of the linea alba, plays a primary role. If necessary, this large target should be achieved by performing also an anterior or posterior component separation. (3) An accurate choice of the site of the implant; in our experience, the submuscular prefascial space is the most suitable one, both for the vascularization and remodeling of the biologic material. (4) A correct selection of the type of the implant (crosslinked vs non-crosslinked) is also crucial, particularly with regards to recurrence.

In conclusion, long-term outcomes of biologic implants in abdominal wall reconstruction may depend on several factors and these must be known and included by surgeons interested in hernia surgery in their tool box.
Thursday, March 15, 2018

Session 14B: Alternative Approaches to Challenging Hernias

IP-1401
Self-Gripping mesh for incisional hernia: the Philippine experience
Faylona J
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Incisional Hernia is one of the most common problems encountered after a laparotomy. The incidence of incisional hernia ranges from 10 to 15%. Incisional hernias can be managed by different techniques. It could either utilize an open technique or minimally invasive techniques. We present our technique of retromuscular incisional hernia repair using a self-gripping mesh. With the use of this new type of mesh several modifications in the technique were utilized. First, there was a decrease in the amount of subcutaneous flaps needed. Second, the mesh will not need any anchoring stitches. Third, the number of drains needed also decreased from usually two drains to one. Preliminary results showed that there is less seroma formation after this procedure and thus the drains come out earlier. There is also less acute and chronic wound pain due to the absence of the anchoring stitches. In terms of recurrence, results are comparable to published literature. In conclusion, the use of the self-gripping mesh for incisional hernia repair provides better results in terms of acute and chronic wound pain, less seroma formation and comparable results in terms of recurrence rates.

IP-1385
Mesh suture for contaminated incisional hernia repair
Northwestern Plastic Surgery

Background: Suture closures of incisional hernias are recognized as having high recurrence rates, while prosthetic planar meshes and bioprosthetic meshes have their own drawbacks to use, especially in non-sterile fields. In this study, we sought to evaluate the results of a new technique that uses strips of mesh as sutures for closure of contaminated incisional hernias.

Methods: 48 patients with contaminated hernias 5 cm wide or greater by preoperative CT scan were closed with mesh sutures. Surgical site occurrence, infections, and hernia recurrence were compared to similar patient series reported in the literature.

Results: Of the 48 patients, 20 had clean-contaminated wounds, 16 had contaminated wounds, and 12 were infected. 69% of the patients underwent an anterior perforator sparing components release for hernias that averaged 10.5 cm transversely (range 5–25 cm). SSO occurred in 27% of patients while SSI was 19%. There were no fistulas or delayed suture sinuses. With a mean follow-up of almost 12 months, 3 midline hernias recurred (6%). In these same patients, three parastomal hernias repaired with mesh sutures failed out of 4 attempted for a total failure rate of 13%.

Conclusion: Mesh sutured closure represents a simplified and effective surgical strategy for contaminated midline incisional hernia repair.
Hernia repair in cirrhotic patients
Hachisuka T
Yokkaichi Municipal Hospital

Introduction: Cirrhosis is the end stage of severe liver damage caused by hepatitis virus, alcohol and autoimmune hepatitis etc. We sometimes encounter groin hernias and umbilical hernias in those patients. I make a presentation about the general aspects of hernia surgery to cirrhotic patients and our experiences.

Preoperative examinations: Cirrhotic patients often have some typical symptoms which influence surgical procedures, such as ascites, engorgement of the abdominal wall subcutaneous veins and hypocoagulability. To identify ascites and subcutaneous varicose, CT scan should be performed. Preoperative blood examinations for hypocoagulability, such as platelet count, APTT, PT and HPT are also necessary.

Anesthesia: Usually cirrhotic patients have hypocoagulability caused by the decreased platelets and lowering of coagulation factors. General anesthesia is often preferred for hernia surgery to cirrhotic patients. Epidural anesthesia or spinal anesthesia is not indicated.

Operative technique: Minimally invasive technique should be performed to cirrhotic patients because of those symptoms caused by the lowering of liver function. We mostly performed plug and patch technique to minimize the area for dissection. Preperitoneal wide dissection by TAPP, TEP and TIPP is not indicated, because it has a high risk of retroperitoneal bleeding. Particularly, when retroperitoneal bleeding occurs following TAPP and TEP, it is difficult to diagnose the amount of bleeding without CT scan. In all cases, complete peritoneal closure is unavoidable.

Results: Between 2008 and 2017, we experienced 15 inguinal hernias, 2 umbilical hernias. Emergency operation was performed in 3 cases of inguinal hernias and 1 case of umbilical hernia due to incarceration. Plug and patch was performed to elective inguinal and umbilical cases. IP tract repair was performed to one emergency inguinal case and simple closure to one umbilical emergency case with intestinal resection. All cases recovered and discharged with small complications after surgery.

Conclusions: Hernia surgery to cirrhotic patients has more risks than usual. Considering all risk factors caused.
Thursday, March 15, 2018

Session 14C: Video Abstracts

V-1245
Robotic morgagni hernia repair: applying advanced technology in a case of a rare hernia
Cox T, Augustein V
Carolinas Medical Center

Introduction: The surgical approach utilizing robotic skills set is on the rise for the General Surgeon. In the case of hernia repair, this technology is gaining widespread popularity. We present a case of a patient with a Morgagni Hernia, a rare hernia accounting for less than 3% of diaphragmatic hernias.

Case description: Our patient is a 48 year-old female with a 6-year history of alternating constipation and diarrhea with mid epigastric pain. A preoperative computed tomography scan revealed the rare congenital diaphragmatic hernia with colonic contents. Physical exam remarkable for obesity and subxiphoid pain. The patient lost 20 lb prior to surgery.

Operation: An incision at the umbilicus and insertion of a 12 mm balloon trocar was inserted and additional trocars were placed. The colon had reduced from insufflation of her abdomen; omentum remained which was reduced. The hernia sac was then excised. The defect was 5 cm wide by 4 cm in length and not amenable to primary closure. The mesh was marked extraperitoneally with 5 cm of mesh overlap cephalad beyond the defect. One suture was placed at the opposing side of the mesh to aide in appropriate tension and transfascial fixation of the mesh. We then inserted a 15 × 20 cm covered mid weight polypropylene mesh. The marked line on the mesh was sutured to the inferior edge of the defect. Transfascial fixation with the preplaced suture was completed. Tacks were placed after partial desufflation of the abdomen making sure not to put tacks beyond the costal margin and then proceeded circumferentially along the mesh.

Discussion: While the robotic approach for the General Surgeon is gaining popularity, its application in hernia repair is proving to be beneficial. Herein we describe its use for a Morgagni Hernia, applying advancing technology to treat a rare and difficult hernia to repair.

V-1206
Robot-assisted approach with open anterior component separation for multiple recurrent incisional hernia
Oswaldo Cruz German Hospital

This video presents the case of a 71-year male who presented to clinic with a multiple recurrent incisional hernia after an open prostatectomy 2 years ago. Patient had a history of 2 prior failed repairs; first through an open approach with onlay mesh reinforcement and second performed laparoscopically with intraperitoneal mesh (IPOM). A Preoperative CT Scan demonstrated a large infra-umbilical midline incisional hernia with defect extension to the suprapubic region and hernia sac occupying the left lower quadrant and left the inguinal region. Hernia width measured in the CT Scan was 6 cm.

We have proposed a combined, robot-assisted approach with open anterior component separation, fascial closure and dual-mesh reinforcement in intraperitoneal and onlay positions; patient agreed, and elective repair was scheduled.

Patient was laid in lithotomy position, and the robot was docked. Small bowel adhesions to the previous mesh were noted and were fully lysed using sharp dissection. After previous intraperitoneal mesh was removed, defect was shown to be 5 × 9 cm.

Robot was undocked, and an infra-umbilical midline laparotomy was performed. Subcutaneous flap was raised on the left side, and the previous onlay mesh was removed. A unilater, anterior component separation was performed and deemed satisfactory to achieve a tension-free fascial closure without further contralateral myofascial release. Midline was closed with permanent running sutures, and a new polypropylene mesh was placed in onlay position, with wide overlap coverage.

Robot was again docked, and an additional 20 × 25 cm coated polypropylene mesh was placed intraperitoneally and fixed into Cooper’s ligament and pubic bone with permanent sutures, and in the anterior abdominal wall with absorbable tacks.

Recovery was uneventful, and patient was discharged on post-op day 4.

At a 4 month follow-up, there were no wound events and no hernia recurrence, with patient being satisfied with the outcome of the operation.
V-1232
Desmoid tumor, giant, the rectus abdominis muscle. A multipronged approach in the reconstruction of the abdominal wall
Lazzarini Mendes C, Yussef Francis M, Brasil H, Barros P, Pereira C. de Carvalho G, Altenfelder R, Roll S
Santa Casa de São Paulo School of Medical Sciences

Afro-brazilian descendent, female, 32, referring tumor of rapid growth in the abdominal wall. Cesarean 10 months ago. Without comorbidities. Denies family history of malignancy or hernias. Normal pregnancy. Denies allergies and trauma. On physical examination, solid consistency of tumor, quietly moving from the hypogastrum to the epigastric predominantly right. Bilateral lower limb edema at inguinal folds. Imaging demonstrating giant solid formation in the abdominal wall, measuring 19.89 × 12.53 × 13.85 cm compatible with desmoid tumor. Submitted to xifoumbilical laparotomy. The abdominal cavity with free viscerum of tumor invasion. Giant tumor, surrounded by the anterior and posterior sheath of the abdominal rectus muscle. Lateral margin without jeopardizing the external obliques, transversus abdominis and internal. Resection of the tumor mass, weighing 3558 kg and with margin adjacent aponeurosis 2 cm. Carrying transversus abdominal releases (TAR) to the right and Rives-Stoppa to the left. Retromuscular mesh placement, after suture of the aponeurosis of the transversus abdominis muscle, along the back of sheat muscle abdomen straight left. Detachment 4 cm subcutaneous aponeurosis of the external oblique muscle bilaterally. Wall suture previously the screen. Drainage of mioaponeuróticos vacuum spaces.

Anatomopathological examination revealed tumor of 22 × 21 × 14.5 cm, intense proliferation of spindle cells and fibroblasts, dense collagen production without nuclear atypia free margins firming diagnosis of desmoid tumor. Hospital on the second postoperative day. Currently on the 60th day after surgery without complications. The authors concluded that the domain of the tactics and techniques of abdominal wall reconstruction was crucial to the success of treatment.

V-1127
Robotic intraperitoneal onlay mesh for a multiply recurrent inguinal hernia
Holden S, Blatnik J
Washington University in St. Louis

This video depicts a 64 year-old male with a symptomatic, recurrent right inguinal hernia. He had a history of two prior open right inguinal hernia repairs, most recently with a plug. In addition, he had a renal transplant in the right lower retroperitoneal space for tacrolimus-induced end stage renal disease after a cardiac transplant, and a penile implant that was twice revised, with the reservoir located in the extraperitoneal space.

Given the violation of the extraperitoneal space with his renal transplant and penile implant reservoirs, we felt the best surgical option was a robotic-assisted intraperitoneal onlay mesh. This allowed appropriate coverage of the defect while avoiding the preperitoneal space, as well as preventing an open incision through a reoperative surgical site. The benefit of the robotic approach would allow suturing of the mesh along the border, given that tacking was not an option.

Intraoperatively, pneumoperitoneum was established with the Veress needle in the left upper quadrant. Three 8 mm robotic trochars were placed in the upper midline, left and right lateral abdomen. The robot was docked. Initial inspection demonstrated a right inguinal hernia defect 3 × 3 cm in size. The hernia sac was inverted and secured to the anterior abdominal wall with several interrupted 0 silk sutures. We then introduced a 12 × 12 cm piece of Bard Ventralight mesh and secured this in the intraperitoneal onlay fashion, securing it in position to the peritoneum with interrupted Vicryl sutures in the four quadrants, and around the edge with several running 2-0 V-loc sutures. Lastly, we secured the mid portion of the mesh over the initial hernia defect with interrupted silk sutures. The defect was well covered at the conclusion of the procedure with 5 cm overlap in all directions.

He was seen in clinic 1 month post-operatively and recovering well.
Feasability of incisional hernia repair on an outpatient basis
Morfesis F
Owen Drive Surgical Clinic, Fayetteville

Due to changes in hospitals’ policies with respect to availability of hernia meshes and to excess levels of sedation, all incisional hernia repairs under 12 cm in length were performed as outpatient cases, starting in June 2015. Change in practice methods: recruitment of patients who agreed with rationale of outpatient repair, nurse monitoring postop for problems regarding pain medicine, and use of mesh, Fortiva (TM)biologic mesh with which the operator was familiar. A further hypothesis was that biologic materials, which are processed in proprietary ways may have different performance characteristics [Fortiva (TM) is processed with low-dose gamma radiation]. Twenty of the 26 cases were repaired with this mesh; the smaller hernias with primary suture. An average of 13 months follow up is now available for these patients: There were two recurrences, both in immunosuppressed patients which constitute a high-risk group (one with steroid dependent RA and the other on suppression following liver transplant for Hepatitis C). Two patients developed superficial wound infections due to unplanned but controlled enterotomy occurring during repair of incarcerated hernia. Both these patients had survival of their mesh and no recurrence; none of the 26 patients required re-admission to hospital. This data suggests, first, that repair of moderate size incisional hernias on an outpatient basis may be safe and effective and an alternative to conditions that may be imposed by a hospital system in an inpatient setting over which the surgeon has no control. Secondly, biologic meshes may have different and more favorable durability based on how they are processed and further studies should be performed. Thirdly, small case reports such as this one may be useful due to the multiplicity of materials and techniques; a system to encourage publication of such small-group data in a systematic way may help to accumulate clinical information.

Intra operatory measurement of intra-abdominal pressure to large incisional hernia repair as a guide to the extension of relaxation incisions and component separations techniques: initial results
Fernando Xediek Consani H, Rebecchi Y
CHS

Introduction: The surgery for large incisional hernias (LIH) may occasionally lead to abnormal in intra-abdominal pressure (IAP) with clinical significance. Several pre op tacticals have pointed to prevent this increase, the measurement of the IAP has recently become a common practice in monitoring critical patients but the intra op measurement has no or little space in our practice this study shows the initial results and value of intra op measurement of IAP for the repair for LIH.

Patients and methods: A prospective study involving initially 5 patients undergoing elective abdominal wall gap repair (mean length 19.1 cm) with a combined mesh and relaxation or separation technique for incisional hernia was conducted. The purpose of the study was to determine whether or not IAP measurement is a reliable method for the determination of relaxation incision or separation component extension to prevent the dangerous pos op increase of IAP. IAP measurements were performed using a Foley catheter connected to an ABVISER® and dynamic real time monitoring. IAP values were determined pre-operatively, after anesthetic induction, and 24 h after surgery before removing the catheter.

Results: The mean IAP varies from 8.3 to 11.5 mmHg. Incisional hernia repair caused an increase in the mean IAP score of 3.72 mmHg (2.2–6.1) in 4 of 5 patients (80%); the IAP was decreased in two patients and remained equal in the other 3 patients before and 24 h after surgery.

Conclusions: Measurement of urinary bladder pressure has been shown to be easy to perform and free of complications and can also be a useful tool to determine the extension of relaxing incision and component separation techniques.
P-1027
The trans sac is a mesh related technique developed in our department using PHS/UHS for recurrent inguinal hernias
Fernando Xediek Consani H, Rebecchi Y
CHS

Aims: The aim was to review the outcome of the technique in our setting.

Study design: A retrospective study.

Patients and methods: Clinical records of all patients who had recurrent inguinal hernia repair using the Trans Sac approach between January 2008 and December 2013 in our institution were obtained. Details of socio-demographic data, intraoperative findings and postoperative complications were reviewed.

Statistical analysis used: simple frequencies, proportions and cross tabulations.

Results: A total of 532 patients whose ages ranged from 22 to 84 years (mean = 42.4 years) with a male: female ratio of 11:1, were studied. Majority of the hernias were right sided (65.2%), mostly indirect (80.1%). The procedures were for emergencies in 17 (12.9%) cases whereas the rest (87.1%) were done electively. Most procedures, 529 (99.4%) were performed under regional anesthesia. Surgical site infection was the most common complication occurring in six patients (2.5%), while one patient had chronic groin pain. At a mean follow up period of 24 months there was one recurrence. All patients were operated using the proposed approach no need to convert to another technique.

Conclusions: The Trans Sac approach technique for recurrent inguinal hernia repair is an easy, safe and effective method for inguinal hernia repair in our setting.

P-1028
Inguinal hernia repair under local anaesthesia: prospective analysis
Hospital do Servidor Público Municipal HSPM

Objectives: To determine the frequency of postoperative complications and pain in patients undergoing inguinal hernia repair with mesh under local anaesthesia and to assess their safety.

Methods: A prospective observational cross-sectional study conducted at the June 2016 until July 2018. Twenty-seven patients, ranging from 18 to 69 years old, all with a direct or indirect reducible unilateral inguinal hernia were studied. All patients were operated by the Lichtenstein technique with local anesthesia and polypropylene mesh placement. Quantitative and qualitative data such as complications and pain were evaluated in the immediate and postoperative periods, 24 h, 7 days, 30 days, 6 months and annually.

Results: During the study, 27 patients were included. The mean age was 55 ± 9.3 years, 88.9% were men and 11.1% were women, 25.9% were indirect hernias and 74.1% were direct hernias. The BMI was 24.3 ± 1.7 kg/m² (p = 0.78) and the mean surgical time was 64.8 ± 8.8 min (p = 0.39) and there was no statistical difference between the groups. Patients was allocated in 2 groups according to the classification of Nyhus (II and III). Only 2 patients presented seroma and 1 patient have a wound hematoma. No long-term complications or recurrence of hernia were observed in the follow-up period of the study. Intraoperative pain was higher in the group with direct hernias (EVA < 3 and p > 0.05). On the 7th day, pain was higher in the Nyhus III group compared to the Nyhus II group, presenting statistical significance (p < 0.05). After 30 days no patient complained of pain at the surgical site.

Conclusion: Inguinal hernioplasty under local anaesthesia appears to be safe and easy to apply. It can be performed by residents under supervision, with satisfactory patient acceptance and similar complication rates as those observed in conventional inguinal hernioplasty, allowing a surgical time and lower postoperative pain.
**P-1034**

**Peritoneal flap hernioplasty for large transverse incisional hernias. Long term follow-up results**

Nielsen M, de Beaux A, Tulloh B  
Royal Infirmary of Edinburgh

**Background:** Repair of large transverse incisional hernias is a surgical challenge with current methods of abdominal wall reconstruction. The peritoneal flap hernioplasty (PFH) addresses this problem by using flaps of hernial sac to bridge the fascial gap and isolate the mesh from both the intraperitoneal contents and the subcutaneous space, exploiting the retro-rectus space medially and the avascular plane between the internal and external oblique muscles laterally. We report long term results of 80 consecutive cases with transverse incisional hernias undergoing repair with the PFH method.

**Methods:** Patients undergoing elective PFH for transverse incisional hernias from Jan. 1, 2010–Dec. 31, 2014 were indentified from the Lothian Surgical Audit system, a prospectively-maintained computer database of all surgical procedures in the Edinburgh region of southeast Scotland. Patient demographics and clinical data were obtained from the hospital case-notes. Follow-up data was obtained in July 2017 from hospital records and telephone interview.

**Results:** 80 patients, \( n = 53 \) male, 66% were studied. Mean follow up was 59 months (range 31–90 months) and mean postoperative stay was 6.4 days (range 1–23 days). Eleven repairs (14%) were for recurrent hernia. Mean mesh size applied (Optilene Elastic, 48 g/m², BBraun) was 747 cm² (ranged 150–1500 cm²). Redundant skin excision was performed in 54% of cases. Altogether, six patients (7.5%) presented with postoperative complications: five superficial wound infections (6.3%) and one symptomatic seroma (1.3%). One patient (1.3%) developed recurrence within the 5 year follow up period.

**Conclusion:** The Peritoneal Flap Hernioplasty technique is associated with few complications and a very low recurrence rate. We propose this technique as the method of choice for reconstruction of transverse abdominal incisional hernias.

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**P-1037**

**Update on sports hernia repair**

Edelman D  
Baptist Health Doctors Hospital

The diagnosis and treatment of Sports Hernias has been well described by many surgeons. Each has shown good results but not one technique is superior to another. A hybrid mesh was recently released containing a single layer of light weight polypropylene between layers of biologic mesh and was used in all patients. From April 2015 to August 2017, twenty-five men with Sports Hernias were consented for repair. General anesthesia along with local bupivacaine was utilized in a double trochar technique using a 12 mm Hasson at the umbilicus and a 5 mm cannula in the midline lower abdomen. An operative field was created in the pre-peritoneal space. The mesh was fixed to the pubis and posterior rectus muscle with 5 absorbable tacks and fibrin sealant.

Their ages ranged from 17 to 51 years (ave-26.2). Operative time ranged from 25 to 75 min (ave-35.8). All were athletes in a wide variety of sports. There were no operative problems. Three patients developed post-operative seromas requiring percutaneous drainage due to intense bladder pressure from sterile fluid. All patients completed a post-operative therapy program and all have returned to their sport without problems. One patient had LLQ abdominal pain before surgery and that pain persisted afterward, as well.

In conclusion, there is not one type of Sports Hernia repair that has been shown to be more effective than another. Laparoscopic hybrid mesh repair is safe and effective in treating high functioning athletes who experience groin pain diagnosed as a “sports hernia”. Post op seromas appear to be a common post operative finding but have not affected recovery. This presentation will described pre-operative evaluation, intra-operative findings and post-operative care.
P-1040
Arcispedale

In this study, the authors compare two groups of patients with inguinal hernia treated with transabdominal preperitoneal (TAPP) technique using either a self-adhesive mesh (SAM) or a polypropylene and poliglecaprone-25 mesh fixed with titanium staples (TF). Adhésix® (SAM) is a lightweight, monofilament mesh coated with synthetic glue. Methods: between January 2014 and June 2016, 65 patients (mean age 62 years, 90.8% males) underwent a TAPP repair with TF technique and 66 patients (mean age 61 years, 90.9% males) underwent a TAPP repair with SAM technique in two Italian hospitals (Sant’Agostino Estense, Modena and Sant’Anna, Ferrara). Patients were evaluated with a phone-call interview after 1, 3, 6 months postoperatively. The primary endpoints were the severity and frequency of postoperative pain (Numeric Rate Scale, NRS) and time to return to daily activities. Results: the mean length of the procedure was 107.02 min in the TF group and 99.30 min in the SAM group, while the mean hospital stay was 3.02 and 2.32 days, respectively. The mean time to return to daily activities was significantly lower in the SAM group than in the TF group (12.55 vs 17.60 days). In the TF group, mean NRS was 2.58 (1 month), 0.98 (3 months) and 0.67 (6 months) vs 0.95 (1 month), 0.18 (3 months) and 0.18 (6 months) for the SAM group. We reported 11 cases of recurrence in TF group (16.9%) and 3 cases in SAM group (4.5%), with a p < 0.05. Conclusions: the Authors observed a significant reduction of hospital stay, postoperative pain (after 1 month and after 3 months), a quickly returned to daily activities and a lower post operative recurrence rate in SAM group. Furthermore, in our experience the cost of devices used for the SAM technique was lower that the cost for TF technique.

P-1041
The use of processed nerve allografts as interposition grafts following neuroma excision to treat painful abdominal wall neuromas
Park E, Dumanian G
Northwestern University Feinberg School of Medicine

Background: Persistent pain after hernia repair is a common problem, and pain related to abdominal wall neuromas is particularly difficult to treat. The use of processed nerve allografts as interposition grafts following neuroma excision is a novel and effective approach to treat abdominal wall neuroma pain. Methods: Patients with painful abdominal wall neuromas underwent neuroma excision followed by interposition grafting using processed cadaveric nerve allografts to restore continuity between the healthy proximal and distal nerve segments. We performed a retrospective review of seven consecutive cases in six patients who underwent this procedure at Northwestern Memorial Hospital between July 2015 and April 2017. Results: Six cases involved neuromas of an intercostal nerve, and one case involved the ilioinguinal nerve. The initial procedures leading to neuroma formation included open pyeloplasty, kidney transplant, laparoscopic cholecystectomy, laparoscopic gastric bypass, caesarean section, and ventral hernia repair. Of the six intercostal nerve cases, four patients experienced complete resolution of their neuroma pain post-operatively. One patient experienced only moderate improvement of pain prompting a repeat exploratory procedure. A second neuroma was found and treated using the same technique, after which the patient had complete resolution of pain. All six cases were confirmed to be neuromas based on pathology reports. One patient with neuropathic pain involving the ilioinguinal nerve had no discernible improvement in pain following her procedure. Her pathology report revealed that the specimen contained a nerve segment with no pathologic changes. The average age of all patients was 44.3 years (range 31–70), and average follow up was 121.2 days (range 6–366). The average length of graft used was 2.9 cm (range 2–3). No post-operative complications were noted. Conclusions: Neuroma excision and interposition grafting using processed nerve allografts is a safe and effective technique for treating painful abdominal wall neuromas.
P-1042
Incisional hernia prevention with pre-surgery preparation
Tupler J
Diastasis Rehab

Why do patients prepare for shoulder and knee surgery and NOT for abdominal hernia surgery when this type of surgery puts them at the greatest risk for an incisional hernia? Abdominal hernia surgery patients are more at risk because of their abdominal muscles (which they use with every move they make and every breath they take) which will negatively affect their stitches!. Weak and untrained abdominal muscles naturally move in a forwards direction and this forward forceful movement on the stitched connective tissue after surgery is what will undo the stitches. Patients are told not to lift anything over 5 lb after abdominal surgery. However, every time they stand up, they are lifting their whole body weight and that is a tremendous amount of force from their abdominal muscles on their stitches. That’s why preparing for abdominal surgery “before” surgery to strengthen the abdominal muscles and connective tissue and learn how to use the abdominals in a “backward” direction during the recovery process should be part of every patient’s pre-op care. The research and evidenced based Tupler Technique® Ab Rehab Program, which teaches this, is thus the solution for incisional hernia prevention. Having strong connective tissue makes it easier to sew and having strong abdominal muscles that patients know how to use correctly in the recovery process will maintain the integrity of their sutures. This 4 step program will strengthen both the transverse abdominal muscle and the linea alba as well as teach patients transverse muscle awareness with how to use their strengthened abdominal muscles in their recovery process while doing activities of daily living such as sneezing, coughing, getting in and out of bed, standing, and having a bowel movement. This “before surgery” preparation will give them the skills they need for a successful recovery.

P-1044
Botox supported abdominal wall reconstruction in IPOM technique (B.U.B.I.) our solution for difficult cases
Bohnert N, Elieyioglu E, Bär A, Lammers B
Lukaskrankenhaus Neuss

Introduction: One of the biggest problems in hernia surgery is, to get proper results in cases of hernias with big midline defects and/or “loss of domain” hernias. To avoid dissection of healthy parts of the abdominal wall like in the Ramirez operation, which we think is not the best option for multimorbid patients, we developed our own method of Botox supported abdominal wall reconstruction in IPOM technique, B.U.B.I.

Method: In this method we combine the Botox induced relaxation of the abdominal wall with the IPOM technique to achieve a full reconstruction of the midline combined with a mesh. 2 weeks prior to surgery patients were treated with sonography guided Botox injection in both sides of the lateral abdominal wall muscles. To verify the result of the injection a low dose CT scan is done 1 day before surgery. We did an IPOM repair with reconstruction of the midline.

Results: 16 Patients have been operated with Botox injection so far. In 12 of 16 cases we could do a full reconstruction of the midline. Defect sizes have been between 6 x 6 cm to 30 x 35 cm. Intraoperatively no problems occurred and post-operatively one patient had a wound infection. Operative reintervention was not necessary. In a mean follow up of 8 months (2–18) we have no recurrence. We have not seen any Botox related problems.

Discussion: So far the Ramirez operation in all its variations has been one of the most common procedures to create more tissue for closing the midline defect, but especially in multimorbid older patients the high rate of wound complications is a serious problem. Avoiding these problems and preserving the healthy lateral parts of the abdominal wall which are dissected for example in the Ramirez operation, B.U.B.I. is a chemical component separation technique without any risk for the patient.
P-1045
That laparoscopy is the best approach to the treatment of inguinal hernias in the active patient? Study of 300 cases
Soufiane Z, Rachid K
Military Hospital University of Oran

The army needs a young and active population, to the accentuation of the inguinal hernia pathology in the military we have adopted the treatment of inguinal hernias laparoscopic view the postoperative advantages of this surgical approach. We operated 300 patients for inguinal hernias on the age a period of 02 years, the age of our patients varies between 20 and 45 years, all of our patients are professional soldiers, 48% straight hernia, inguinal hernia 35% left, 13% inguinal hernias bilateral, 4% recidivantes hernias. our results were spectacular especially on the plan early resumption of activities in post-surgery all patients resumed their activities after 15 days of convalescence, our exit from hospital patients out 1 day postoperative. The post operative complications was 3 patients had a scrotal edema, a patient had a postoperative Serom no recurrence during the 2 years post operators, 3 patients had chronic post operative pain for a period of 15 and 32 days-limiting.

The approach of laparoscopy in the treatment of groin hernias can become the standard guide in the treatment of inguinal hernias for young soldiers view the many benefits of this surgical approach.

P-1046
Internal supravesical hernia in a 90 years old man: a case report of a rare cause of intestinal obstruction
Cano Cevallos L, Vélez Vera A, Delgado Ollague X, Zambrano Maldonado C
Universidad Católica de Santiago de Guayaquil

Background: Supravesical hernias are considered as a rare cause of intestinal obstruction. Although were described as early as 1804, there have been fewer than 100 cases in the literature. They are located in the supravesical fossa limited by median and medial umbilical ligaments. They are categorized in external and internal (less common) supravesical hernia. There are reports of patients from less than 80 years old but this is the first case of internal supravesical hernia in 90 years old patient.

Case presentation: A 90-year-old man with a medical record of cholecystectomy, prostatectomy and diverticular disease was admitted to the hospital. Two days, previous to the current episode, the patient underwent a laparotomy due to intraabdominal adhesions without postoperative complications. On the third day, develop abdominal distention, vomiting, and pain. On physical examination, the patient was found with signs of peritoneal irritation and palpable suprapubic mass, but hemodynamically stable. The patient’s renal function was normal and leukocytes of 11.750/mm³. In an axial CT-Scan were observed multiple dilated loops of small intestine anterior to the urinary bladder, compressing it. After preoperative workup, a laparotomy was performed. The intraabdominal findings showed an internal supravesical hernia that contained the ileal loop with no signs of ischemia. The herniated ileal loop was 9 cm. The segment was reduced and the defect was closed. It was also found Amyand’s hernia, solved with an appendectomy. Postoperative period was without complications and the patient recovered and discharged 12 days after surgery.

Conclusions: Supravesical hernias are herniation of abdominal content through supravesical fossa. The objective of the study is to report this atypical cause of small bowel obstruction presented in a 90 years old patient with a multiple history of surgeries and additional Amyand’s hernia.
P-1047
Internal supravesical hernia in a 90 years old man: a case report of a rare cause of intestinal obstruction
Cano Cevallos L, Vélez Vera A, Delgado Ollague X, Zambrano Maldonado C
Universidad Católica de Santiago de Guayaquil

Background: Supravesical hernias are considered as a rare cause of intestinal obstruction. Although were described as early as 1804, there have been fewer than 100 cases in the literature. They are located in the supravesical fossa limited by median and medial umbilical ligaments. They are categorized in external and internal (less common) supravesical hernia. There are reports of patients from less than 80 years old but this is the first case of internal supravesical hernia in a 90 years old patient.

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Conclusions: Supravesical hernias are herniation of abdominal content through supravesical fossa. The objective of the study is to report this atypical cause of small bowel obstruction presented in a 90 years old patient with a multiple history of surgeries and additional Amyand’s hernia.

P-1048
Is onlay polypropylene mesh repair an available option for incisional hernia repair?
Hospital Universitario Santa Cristina

Introduction: Lately, incisional hernia repair with onlay polypropylene mesh has been replaced by other surgical procedures such as laparoscopic or sublay mesh repair. The aim of this study was to analyze the complications and recurrence rate after incisional hernia repair, comparing the results of patients who underwent onlay mesh repair and other surgical procedures.

Materials and methods: A retrospective cohort study of patients who underwent incisional hernia repair in a single centre was conducted. Data were obtained from electronic medical records. Patients who had been lost during follow-up were contacted for a visit in the clinic. Univariate and multivariate analysis was performed with Stata 13.0 to analyze the factors associated with postoperative complications and hernia recurrence.

Results: Between June 2004 and December 2015 1078 patients underwent incisional hernia repair. Nearly 10% of the patients had a recurrent incisional hernia. Onlay mesh repair was performed in 125 patients (11.6%). Other surgical procedures included Rives procedure (29.3%), sublay mesh repair (38.6%), intrabdominal mesh repair (17.1%) and primary closure (3.4%). After a mean follow-up of 2.8 years, 73 (7%) patients developed a hernia recurrence. A higher percentage of complications were seen after onlay mesh repair than after other surgical procedures (22.4 vs. 13.1%, p = 0.005). Nevertheless, recurrence was less frequent after onlay mesh repair than after other surgical procedures (22.4 vs. 13.1%, p = 0.005). Recurrence was less frequent after onlay mesh repair (4.2 vs. 7.1%, p = 0.241). Logistic regression discarded an association between onlay mesh repair and hernia recurrence or postoperative complications.

Conclusion: Incisional hernia repair with onlay polypropylene mesh repair was not associated with a higher incidence of postoperative complications or recurrence rate. So, this procedure should not be discarded in selected patients presenting with incisional hernia.
P-1049
Is umbilical hernia repair with composite mesh the gold standard procedure for umbilical hernia repair?
A single centre experience
Hospital Universitario Santa Cristina

Introduction: Surgical procedures to repair umbilical hernia vary from primary closure to retromuscular or intrabdominal mesh repair. In our centre umbilical hernia repair with composite mesh is the gold standard procedure, although other techniques are also performed. The aim of this study was to analyze the medium-term results of a cohort of patients who underwent umbilical hernia repair.

Materials and methods: A retrospective cohort study of patients who underwent umbilical hernia repair in a single centre was conducted. Data were obtained from electronic medical records. Patients who had been lost during follow-up were contacted for a visit in the clinic. Univariate and multivariate analysis was performed with Stata 13.0 to analyze the factors associated with postoperative complications and hernia recurrence.

Results: Between March 2004 and December 2015 2135 patients underwent umbilical hernia repair. Most patients (96.3%) had a primary umbilical hernia. Composite mesh (Ventralex or Ventralex ST) was used in 72% of the patients and primary closure in 23.4%. Onlay polypropylene mesh repair and Rives procedure were also used when appropriate. Nearly 87% of the patients underwent same-day surgery. Only 1.8% of the patients developed complications during the follow-up and 1.6% required a new surgery. After a mean follow-up of 4.3 years, hernia recurrence rate was 3.6%. Recurrence rate was similar after composite mesh repair compared to other procedures (3.5 vs. 4.1%, p = 0.537). Complications were also similar in both groups (2 vs. 1.3%, p = 0.338). Multivariate analysis showed that hernia recurrence was associated with female sex (OR = 2), recurrent hernia (OR = 3.8) and postoperative complications (OR = 9.6); and postoperative complications was only associated with hernia size (OR = 1.5).

Conclusions: Good results can be achieved after umbilical hernia repair using composite mesh repair as the gold standard procedure.

P-1051
What is the solution to prevent contralateral inguinal hernias metachrones by laparoscopy?
Soufiane Z, Rachid K
Military Hospital University of Oran

What to do to prevent the appearance of inguinal hernias against lateral metachrones?
Contralateral exploration in a totally extra-peritoneal inguinal herniography (TEP) laparoscopically allows to repair the hernias discovered incidentally. Nevertheless, some patients with negative contralateral exploration subsequently develop symptomatic hernia on this side. We have considered the incidence of development of the contralateral metacartic hernia especially hernias due to weakness of fascia transversalis and whether prophylactic “repair” would be beneficial.

One of the benefits of total extraperitoneal repair (TEP) is that the contralateral side can be explored and repaired without the need for further incisions.

Some authors speak of an incidence of onset of a contralateral metachronous hernia is 1.2% after 1 year of intervention even after a negative exploration of the counter-lateral orifice. The question remains unanswered especially for the inguinal hernias direct by weakness to prevent the contralateral contralateral inguinal hernias. We have systematically reflected a contralateral prosthesis if we find an inguinal hernia by direct weakness. The purpose of this reinforcement is to prevent a metachronous inguinal hernia by weakness in contralateral especially since all the abdominal pressures will unite on a transversalis fascia Weak counterlateral and hernia due to weakness is inevitable.
Internal supravesical hernia in a 90 years old man: a case report of a rare cause of intestinal obstruction

Cano Cevallos L, Vélez Vera A, Delgado Ollague X, Zambrano Maldonado C
Universidad Católica de Santiago de Guayaquil

**Background:** Supravesical hernias are considered as a rare cause of intestinal obstruction. Although were described as early as 1804, there have been fewer than 100 cases in the literature. They are located in the supravesical fossa limited by median and medial umbilical ligaments. They are categorized in external and internal (less common) supravesical hernia and the last one subdivided by the position related to the urinary bladder. There are reports of patients from less than 80 years old, but this is the first case of internal supravesical hernia in 90 years old patient.

**Case presentation:** A 90-year-old man with a medical record of cholecystectomy, prostatectomy, diverticular disease and a permanent pacemaker was admitted to the hospital. Two days, previous to the current episode, the patient underwent a laparotomy due to intraabdominal adhesions without postoperative complications. On the third day, develop abdominal distention, vomiting, and pain. On physical examination, the patient was found with signs of peritoneal irritation and palpable suprapubic mass, but hemodynamically stable. The patient’s renal function was normal and leukocytes of 11.750/mm³. In an axial CT-Scan were observed multiple dilated loops of small intestine anterior to the urinary bladder, compressing it. After preoperative workup, a laparotomy was performed. The intraabdominal findings showed an internal supravesical hernia that contained the ileal loop with no signs of ischemia. The herniated ileal loop was 9 cm. The segment was reduced and the defect was closed. It was also found Amyand’s hernia, solved with an appendectomy. Postoperative period was without complications and the patient recovered and discharged 12 days after surgery.

**Conclusion:** The objective of the study is to report this atypical cause of small bowel obstruction presented in a 90 years old patient with a multiple history of surgeries and additional Amyand’s hernia.

Preoperative progressive pneumoperitonium and video laparoscopic surgical correction of epigastric hernia followed by loss of domain in obese patient: report of a case

Hospital Geral Ernesto Simões Filho

APM, female, 38 years-old, BMI 41.17. She reports that 15 years ago there began a progressive and painful enlargement of the supraumbilical area. A computerized tomography in 2016 showed a large ventral hernia with a volume of 30% of the abdominal cavity, containing intestinal loops in its interior and with a hernial ring of 6.18 cm. She was submitted to insertion of an intra-abdominal catheter by laparoscopy for daily insufflation of room air. Pneumoperitonium was performed during 14 days and then a second CT of the abdomen was done. This new tomography revealed that all herniated structures had been reduced into the abdominal cavity. The hernia was corrected by laparoscopy with closure of the hernial ring and fixation of a polydioxanone screen, with an operatory time of 136 min. The patient was discharged on the 3rd POD. The technique of progressive pneumoperitonium (PP) aims at diminishing the risks of complications inherent to hernioraphy surgery with loss of domain. The purpose of PP is to increase complacency of the abdominal cavity by means of the insufflated air. That is, to increase intracavitary pressure in a gradual way, thus decreasing the possibilities of the patient developing abdominal compartmental syndrome with renal and respiratory failure postoperatively. Since the treatment of ventral hernia with loss of domain represents a great challenge, especially in obese patients, surgical strategy must be individualized according to each case; however, increasing pre-operative complacency of the abdominal cavity, in order to avoid the aforementioned complications, is deemed mandatory in every case of loss of domain with a volume larger than 25% of the abdominal cavity. Therefore, progressive pneumoperitonium has become an important tool in voluminous ventral hernias, and in cases with hernial ring up to 10 cm this minimally invasive surgery is well indicated as a safe and effective method.
**P-1055**

**Laparoscopic postoperative ventral hernia repair with low-cost nanostructured polymeric mesh. Clinical and economic results**


A. I. Evdokimov Moscow State University of Medicine and Dentistry

The high cost of surgical meshes for intraperitoneal laparoscopic postoperative ventral hernia repair limits their use, especially in developing countries. This is the reason for the search of an adequate low-cost alternative.

**Aim:** to estimate the clinical and economic effect of using the low-cost polymer mesh produced of hydrophobic acrylic in patients undergoing laparoscopic postoperative ventral hernia repair.

**Methods:** we have the first experience of treatment of 36 patients with postoperative ventral hernias, who underwent intraperitoneal laparoscopic ventral hernia repair with new low-cost nanostructured polymer mesh with an antiadhesive cover. All the patients had abdominal adhesions, consequently all the operations have started with adhesiolysis. The technique of mesh implantation and fixation was standard and had no difference from techniques utilized for other meshes implantation.

**Results:** There were no complications in early postoperative period. The average time of hospital stay was 5.5 days (3–8 days). All the patients were receiving an antibacterial therapy with cephalosporin during 5 days. All the patients underwent US and CT investigation in 3–5 months after the procedure. There were no mesh migrations, no adhesions to visceral side of the mesh and no recurrent hernias. According to CT scans the mesh integration with abdominal wall has been observed in all cases. The quality of life was estimated according to SF-36 questionnaire. The control group consisted of 78 patients, who had undergone the same procedure using well-known meshes.

**Conclusion:** The results of the study have shown the same clinical results in both groups with significantly better economic effect in the group with nanostructured polymer low-cost mesh.

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**P-1057**

**Is robotic inguinal hernia repair safe?**

Edelman D

*Baptist Health, Doctors Hospital of Coral Gables*

A series of robotic, laparoscopic inguinal hernia repairs by a single surgeon with an extensive laparoscopic hernia experience at a single institution was analyzed to compare the results of obese patients to the all non-obese patients. Robotic high definition optics using articulating instruments to enhance dexterity results in a refined hernia repair.

Over 2300 patients had laparoscopic inguinal hernia operations performed by the author and 260 of these were Robotic. Body Mass Index was calculated on all patients from 8/2014 to 7/2017. A BMI of > 30 was used as a cut-off for the 2 groups of patients. Hospital records and follow up care was retrospectively reviewed. Follow-up was done at 2, 8 and 16 weeks following surgery. All patients consented for study.

There were 26 patients (one woman) whose BMI was greater than 30 (30–39) and 157 patients (6 women) operated upon during the same time period with an average BMI of 25.45. ASA averaged 2.35 in the obese group compared to 1.82 (p < 0.00024). The ages of the 2 groups were similar at 54.8 (obese) to 57.3 years ranging from 18 to 89 years old. Operating room time was longer in the obese patients at 59.2 min (range 30–80) verses 53.3 min with a range of 30–130, (p < 0.02). There were no major complications but 9 patients in the non-obese group developed urinary retention needing a temporary urinary catheter versus none in the obese group. One hernia recurrence (0.5%) occurred in a non-obese patient and another non-obese patient had temporary slurred speech.

Robotic inguinal hernia repair is safe, effective and requires slightly longer OR times in the obese patient. Recurrence rate and complications are low.
**P-1058**
Differing methods of peritoneal flap closure in laparoscopic trans-abdominal preperitoneal hernia repair affects post operative pain and narcotic usage
McCoy K
Stamford Hospital

**Introduction:** The first laparoscopic inguinal hernia repair was described in 1982 by Ralph Ger. Now more than 600,000 laparoscopic inguinal hernia repairs are performed annually. Two standard techniques exist including Trans-abdominal Pre-peritoneal repair (TAPP) and Total Extra Peritoneal repair (TEP). TAPP repair involves the formation of a peritoneal flap through which the hernia is reduced and a window is created in the preperitoneal space to place the mesh. The closure of the peritoneal flap can be accomplished by various methods such as tacking, suturing or staples. We aimed to compare the immediate post operative pain between two of the above listed techniques: suturing and tacking.

**Hypothesis:** Patient who underwent peritoneal flap closure with suturing method rather than tacks will have decreased immediate post operative pain and require less narcotic usage.

**Methods:** Patients who underwent TAPP hernia repairs done at Stamford hospital and Greenwich Hospital were included included in the study. Patient’s postoperative pain score were reviewed immediately postoperatively and at 3 h using the standardized pain scale. Narcotic usage was recorded in the immediate post operative period.

**Results:** 13 patients underwent TAPP repair. Of the 13 hernia repairs: 3 were bilateral and 8 were unilateral. Patients ranged in age from 43 to 88. 11 of the 13 patients underwent transverse abdominis plane (TAP) blocks for postoperative pain control. Length of stay was found to be similar between the two groups. (P < 0.05). Immediate post operative pain was decreased in the suturing group compared to the tacking group. Narcotic usage was less in the suturing group (P < 0.05)

**Conclusion:** Peritoneal closure using a suturing device during TAPP repair is an acceptable method. This study will serve as a foundation to analyze patient pain against peritoneal flap closure methodology in long-term postoperative record review at Stamford Hospital, and to ultimately confirm optimal closure technique.

**P-1059**
Recommended preoperative pain reducing measures ineffective in outpatient hernia and gallbladder surgeries
Wright R, Wright J, Perry K
Cascade Hernia Institute

**Introduction:** The American Pain Society has strongly recommended the preoperative administration of Acetaminophen, Celecoxib, and Gabapentin individually and multimodally to improve postoperative pain. An ambulatory surgery center administered simultaneous Acetaminophen, Celecoxib, and Gabapentin (denoted as the “ACG protocol” in this study) to patients preoperatively for hernia and gallbladder surgeries. Our hypothesis is that administering preoperative ACG protocol will reduce recovery room time, decrease use of recovery narcotics, and will result in better pain control on the first postoperative day.

**Methods:** A retrospective study compared 87 patients (75% hernias) not utilizing ACG protocol during 2015 and 82 patients (79% hernias) using ACG protocol during 2016. Data collected included the dose and type of narcotic used in the recovery room as well as the amount of time in recovery room. Opioid equivalence to morphine was calculated for each patient using standard conversions to allow comparison. In addition, a survey regarding patient pain control was collected 1 day following surgery.

**Results:** There was no statistical difference in narcotic dosing between the groups in recovery room. There was an average of 10 min more recovery room time in the ACG protocol group than in the non-treated group (P < 0.03). Postoperative day-one pain control survey results were similar between the groups.

**Conclusion:** Adherence to American Pain Society recommendations in accordance with ACG protocol does not decrease time in recovery room, does not decrease the amount of narcotics in recovery room, and does not improve patient pain satisfaction responses. The results of this study call into question the efficacy of the ACG protocol guidelines when these modalities are combined.
**P-1060**

**Tens units augment postoperative pain management in outpatient hernia and gallbladder surgeries**

Wright R, Wright J, Perry K  
Cascade Hernia Institute

**Introduction**: The American Pain Society has recommended postoperative pain control augmentation through use of TENS (Transcutaneous Electrical Nerve Stimulator) units. An ambulatory surgery center administered this TENS unit postoperative guideline for hernia and gallbladder surgeries. Our hypothesis is that utilizing TENS units will be well tolerated by patients and result in better pain control and reduce narcotic refill requests.

**Methods**: A retrospective study compared postoperative charts of 87 patients (75% hernias) not utilizing the TENS units during 2015 and 82 patients (79% hernias) using postoperative TENS treatment during 2016. All patients received hydrocodone or oxycodone by usual criteria as well. A survey regarding patient pain control was collected 1 day following surgery along with TENS unit satisfaction surveys. Narcotics prescribed during the 30-day postoperative period were also recorded.

**Results**: TENS unit satisfaction level was rated “very helpful” by 63%, “helpful” by 36%, and “not helpful” by 1% (P < 0.02). 75% of open inguinal hernia patients rated the TENS unit “Very helpful”, 77% for laparoscopic cholecystectomy, 40% for laparoscopic ventral/umbilical/incisional hernias and only 25% for hiatal hernia repair. There is a trend towards less narcotic refill requests in the TENS use group (P < 0.056). First-day postoperative pain control was not improved with the TENS unit.

**Conclusion**: Adherence to American Pain Society recommendations with postoperative TENS unit treatment is strongly viewed as a positive experience by patients. Use of the tens unit was particularly useful in patients with open inguinal hernia and laparoscopic cholecystectomy and least useful for hiatal hernia repair. In addition, the trend toward fewer narcotic refill requests with postoperative TENS use is encouraging and should be examined in greater detail and larger sample sizes.

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**P-1061**

**Effects of bupivacaine-collagen matrix inl-001 on pain intensity and use of opioid analgesia up to 72 h after open inguinal hernia repair**

Leiman D, Minkowitz H, Jones N, Russell L  
University of Texas Health Science Center, HD Research Corp

**Background**: Studies have demonstrated the safety, tolerability, and efficacy of the bioresorbable bupivacaine-collagen matrix (INL-001) in reducing measures of pain intensity (PI) and opioid analgesia use.

**Methods**: Two identical Phase 3 double-blind studies (MATRIX-1, MATRIX-2) randomized subjects undergoing elective open tension-free mesh inguinal hernia repair under general anesthesia to 3 100-mg INL-001 matrices (300-mg bupivacaine HCl; n = 404) or 3 placebo matrices (pbo; n = 206). In the immediate postoperative period, subjects received parenteral morphine as needed for breakthrough pain. When able, subjects began oral acetaminophen (650 mg tid) and were prescribed immediate-release morphine for breakthrough pain. Subjects assessed PI via numerical rating scale of pain intensity (NRS PI) at predefined time points and prior to receiving parenteral or oral analgesia.

**Results**: The primary efficacy endpoint, time-weighted sum of PI from 0 to 24 h (area under the curve of NRS PI), was significantly reduced in the INL-001-treated group vs pbo (P < .0001). Key secondary endpoints were tested in a fixed hierarchical order, with each endpoint tested only upon statistical significance of the previous one. Subjects treated with INL-001 used less opioid analgesia (in mg IV morphine equivalents) over the first 24 h vs pbo (P < .0001). At 48 h postsurgery, the INL-001 group had experienced less pain vs pbo (P = .0033) and used less opioid analgesia (P < .0001). Similar results were observed for the 0- to 72-h postsurgical period (P = .0441; P = .0004, respectively). A greater percentage of INL-001 subjects had not used rescue opioids vs pbo from 0 to 24 (38.6% INL-001 vs 17% pbo), 0–48 (32.4 vs 17%), and 0–72 h (31.7 vs 17%). Overall rates of adverse events (AEs) were comparable between groups. Rates of opioid-related AEs were lower in the INL-001 group vs pbo (16.6 vs 28.4%, P = .0007).

**Conclusion**: These findings support INL-001’s efficacy in reducing pain intensity and total use of opioid analgesia during the postoperative period.
P-1064
Huge complex incisional hernia after organ transplantation
Yampolski I
Beilinson Hospital Rabin Medical Center

Introduction: Incisional Hernias are a prevalent complication in transplant recipients, mainly in kidney allograft recipients, due to prolonged dialysis, immunosuppressive drugs, especially, corticosteroids, and high prevalence of diabetes. Therefore, the sub group of Complex Incisional Hernias (CIH) present a special surgical challenge with an increased risk of infection and possible impairment of wound healing. Reconstruction of abdominal wall (RAW) in CIH may increase intra abdominal pressure (IAP). Thus, the incidence of cardiorespiratory complications is enhanced with imminent development of “Compartment syndrome” (CS) whenever there is “Loss of Domain”.

Materials and methods: 27 transplanted patients (19-kidney, 5-liver 3-Heart) with CIH, average size 404 sq/cm. After meticulous dissection light-weight mesh was placed in the sublay retromuscular and intermuscular space. Nine patients were morbidly obese, eleven had multiple laparotomies.

Results: After average follow-up of 6.3 years there is one recurrence with no mortality. Four had severe pulmonary complications, one had silent MI. Two patients had AKI, that resolved with conservative resuscitation. Despite elevated IAP of ≥20 mmHg, decompression laparotomy was being withheld. No liver or heart transplanted patient developed rejection or sustained insufficiency.

Conclusion: Repair of CIH in transplanted patients requires special consideration, perioperative adaptation of pharmacological regime and detailed patient preparation. The differential diagnosis between CS and AKI in kidney transplanted setting with borderline elevated levels of IAP may be difficult, although critical. Transient elevation of liver enzymes due to numerous reasons may mimic transplanted liver failure. Heart transplanted patients, may have symptoms that can be attributed either to CS or Heart Failure. Imminent rejection remains always in the background. Careful monitoring and high index of suspicion of AKI, transient liver injury or heart failure, as opposed to CS, enables withholding unnecessary relaparotomies. The open retromuscular and intermuscular approach enables good RAW, low recurrence rate, creating a competent abdominal cavity with appropriate mechanical support.

P-1065
Outcome of the “Manchester” repair (laparoscopic totally extraperitoneal approach with fibrin sealant mesh fixation) in 400 consecutive inguinal hernia repairs
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Central Manchester Foundation Trust

Introduction: This study evaluates outcome of 400 inguinal hernias undergoing the “Manchester” repair over the period 2007–2016. The effect of laterality on chronic groin pain and the reduction of pain scores post-surgery are evaluated.

Methods: The ‘Manchester repair’ is a modification of a laparoscopic totally extra-peritoneal approach with fibrin sealant mesh fixation. Data were collected prospectively. In addition to demographic data including the European Hernia Society classification of grade of hernia, pain scores were assessed prior to surgery and at 4–6 weeks post-operatively using a ten-point visual analogue pain scale. Data were collected on a bespoke database and differences between time-points analysed by non-parametric Wilcoxon signed rank tests with Kruskal–Wallis rank sum test for three-group comparisons. Significance was at the P < 0.05 level and the study was undertaken as an institutional audit.

Results: A total of 274 patients were evaluated (254 m, 20 f); median age 50 (16–85) (IQR 39–65) years. There were 75 right inguinal hernias (27.4%), 39 Left inguinal hernias (14.2%) & 160 bilateral inguinal hernias (58.4%), giving a total of 434 hernia repairs undertaken. There were 6 episodes of recurrence (1.4%). Of the 274 patients evaluated 145 (52.9%) had both pre and post-operative pain scores available. Median pre-operative pain score was 5 [IQR 4–7]. Median post-operative pain score was 1 [IQR 1–2]. This difference was significant (P < 0.001). Pre-operative pain scores were higher for those with a bilateral hernia (median 6 vs 5 and 4, respectively; P = 0.005), but there was no difference in post-operative scores (P = 0.347). One patient (0.3%) presented with chronic groin pain (pain after 3 months).

Conclusion: The data show that the Manchester repair provides an excellent repair with low recurrence and low chronic pain. Longer-term evaluation and larger patient series will add to the understanding of the place of this procedure.
P-1066
Clinical analysis of hernia sac dissection or transection in TAPP
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Objective: To determinate a preferable method for handling hernia sac between dissection and transection, we investigated the safety and effectiveness of these two methods in TAPP.

Methods: The clinical date of 166 operation in 144 male patients who underwent laparoscopic inguinal hernia repair in my hospital between July 2014 and August 2015 was retrospectively analyzed. We compared the operation time, complication, recurrence, and postoperative hospital stay between the two techniques. The time for handling sac was from splitting sac to perietalization of spermatic cord.

Results: The dissection group was divided into two subgroups according to the length of hernia sac (≤ 8 and > 8 cm): operation time for handling sac was (6.2 ± 2.6) min and (24.6 ± 9.8) min, respectively. The difference was significant. The operating time was associated with the size, length of hernia sac and tissue adhesion. The patients with hernia sac > 8 cm in length were separated into dissection group and transection group. A significant difference was shown in operating time, as the former was (9 ± 4) min. There were no differences in postoperative infection, recurrence, hospital stay and intestinal obstruction.

Conclusion: Dissection and transection were both safe and effective techniques. When the length of hernia sac is smaller the 8 cm, dissection has the advantages of minimal injury, less complication, and fewer time expense. If it’s larger than 8 cm transection is preponderant.

P-1067
Patient with urinary retention caused by a large scrotal inguinal hernia. Case report
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Introduction: Inguinal hernias are ones of the most frequent hernias in surgical practice. Inguinal hernias make up approximately 65–75% of all hernias and 90% of them are in males. Their incidence rate increases with age. Urinary retention can be one of the complications after an inguinal hernia operation. The current case history describes a patient with a urinary retention caused by a large scrotal inguinal hernia with a herniation of the urinary bladder into the scrotum.

Case description: The 78-year-old male patient contacted the general surgeon and the urologist in December 2013 when the patient appeared in the emergency department due to urinary retention. Sonography found a bilateral swelling of the kidneys. A permanent catheter was introduced and a large fixed scrotal hernia was discovered. The patient believed that his bladder was in the scrotum, as he ‘needed to massage the scrotum whenever a urinary urgency occurred’. A week later the catheter was removed and Combodart tablets were prescribed. The patient was on an at-home treatment without catheter for a month. The patient came to the attention of doctors in January 2014 due to the heart failure with decompensation and anaemia. Sonography showed a retention in the kidneys. A catheter was inserted. As the urinary bladder could not be punctured, sonography was arranged. The bladder could not be visualised in its typical location and there was a vast amount of fluid in the scrotum. A CT scan with cystography showed a bilateral hydronephrosis with dilated ureters and bladder herniation into the scrotum. Description of the operation: an inguinal herniotomy and an open insertion of a suprapubic epicystotomy were scheduled.

Inguinal hernias with the urinary bladder involvement, which cause urinary retention and UTIs, are usually found in overweight elderly male. If a patient with urinary retention and a large scrotal hernia.
P-1068
Abdominal wall reconstruction with a new ovine polymer-reinforced bioscaffold: early clinical experience
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Introduction: Abdominal wall reconstruction (AWR) techniques are utilized frequently in repair of incisional hernias. This is the first case series detailing use of a new ovine polymer-reinforced bioscaffold (OPRBS) for repair reinforcement in AWR.

Methods: Retrospective chart review was conducted for a consecutive series (n = 11) of patients undergoing AWR with myofascial advancement flap creation and reinforcement with OPRBS. Demographic, preoperative, operative, and follow up data were collected and analyzed.

Results: Mean age was 61.2. There were seven female and four male patients. Mean BMI was 33.1. The most prevalent comorbidities were hypertension (63.6%), morbid obesity (63.6%), and diabetes mellitus (36.4%). Recent smoking history was present in 27.2%. A well documented history of previous wound infection was noted in 18.2%. The mean Ventral Hernia Working Group Grade was 2.5 ± 0.9. There were three Grade 3 patients and two Grade 4 patients. Both Grade 4 patients had enterocutaneous fistulas through indwelling synthetic mesh. Incisional hernias were recurrent in 90.9%. Concomitant operations at the time of AWR included small bowel resection in four patients and resection/repair of enterocutaneous fistula in two patients. Explantation of synthetic mesh was done in 36.4%, and of biologic matrix in 9.1%. Transversus abdominis release was utilized in 90.9% and anterior release in 9.1%. OPRBS was placed in the retrorectus position in 90.9%. Onlay was done in one. Mean follow up has been 8.3 ± 3.4 months with a range of four to 14 months. There has been one hernia recurrence (9.1%). Perioperative complications included superficial wound infection (18.2%), ileus (9.1%), and seroma (9.1%).

Discussion: OPRBS possesses properties of both synthetic and biologic constructs. This represents a new paradigm in hernia repair materials. Herein is the first series describing OPRBS use in AWR. Short term results have been good. Long term data and additional studies are needed.

P-1071
Mesh infection after open incisional hernia repair-our experience
Hospital Universitario San Agustin

Background: Incisional hernia occurs after 3.8–11.5% of all abdominal operations. Due to high recurrence rate following conventional repairs like Mayo, direct suture repair, in 1999 we started to use polypropylene mesh in open repair of incisional hernias. The aim of this study is to show our experiences with mesh infection after incisional hernia repair.

Methods: Since 1999 until present day we have operated 742 patients with incisional hernia, using prosthetic repair (Rives-Stoppa, Traubuco, Chevrel). Patients were hospitalized after previous examination of anesthesiologist. Median age of patients was 64 (28–74 years). There were 245 men (33.22%) and 507 women (67.08%). All were operated in general anesthesia. We have analyzed correlation between size of the hernial defect and infection.

Results: Most of our patient received one-shot prophylaxis. Average hospitalization was 8.6 days (2–38). 65.08% (482 patient) had postoperative drainage with one or two Radon drains. Duration of drainage was 2–6 days. We had 8.09% (59 patients) deep infections, which were caused by: Staphylococcus aureus, Proteus mirabilis, E. coli, Bacterioides fragilis. All infections occurred among patients with hernial defect wither then 10 cm. We treated them with antibiotics according to antibiogram, and local wound treatment. Five cases needed mesh extraction.

Conclusion: Tissue trauma, operating time and mesh size increases the risk for infection. Infections were caused by nosocomial spices. Since these factors are crucial for infection probably laparoscopic approach is more useful and decreases morbidity of these patients. Laparoscopic repair is to become priority for incisional hernia repair.
P-1072
Individualized treatment of the elderly tension-free
Hospital Universitario San Agustin

Background: To analyze tension-free hernia repair surgery carried in the elderly in terms of operation method, anesthesia method and therapeutic effect.

Methods: A total of 1460 cases of elderly patients with tension-free hernia repair performed in our hospital from September 2007 to September 2014 were retrospectively analyzed. We compared different operation schemes for operation time, postoperative pain, postoperative narcotic response, time to leave bed, time to active food intake, length of hospital stay, wound complications, recovery time, recurrence rate, and time to resuming routine daily life, etc.

Results: All the elderly patients with inguinal hernia were cured, and the therapeutic effect was satisfactory. There has been no recurrence, and no wound infection. Compared with general anesthesia surgery, local anesthesia surgery has advantage in shortening the time to resuming daily life, time to leave bed, time to active food intake, and length of hospital stay. (P values ≤ 0.05).

Conclusion: Individualized care plan is satisfactory in the surgical treatment of elderly inguinal hernia. Tension-free hernia repair in the elderly is safe, fast, and effective.

P-1073
Retrospective analysis of various V-patch mesh repairs
Hospital Universitary San Agustin, Department of Surgery

Background: This paper analyzes retrospectively the various V-Patch Mesh repairs for Umbilical Hernia and to decide the ideal mesh with minimal incision and morbidity.

Methods: Surgery for umbilical hernia is always a challenge. Since the day of anatomical Repair by Double Breasting Technique of Mayo and Single sheet mesh open surgery repair and in some cases done by Lap. Hernia repair, the challenge continues. Latest V Patch Mesh Implants from various companies are available since 2010. We analyzed our 80 patients who underwent various V patch mesh repairs and how to choose the ideal.

Results: Fifty-seven patients, predominantly of female gender who had Umbilical hernia and were operated by V Patch mesh. The majority of Patients are Young, the advantage of the V patch is that it can be operated by small incision so it is cosmetic and it has Adhesion Barrier in the Lower part so it can be placed direct into the peritoneum without extensive dissection and is absorbed mostly after a period of time and thus giving a good scar plate with minimal Foreign Body in it. The paper discusses the concept of this surgery and the variations devised in implanting the device and comparison between the available implants and the effects observed in detail.

Conclusion: With properly chosen and well placed V patch mesh repairs gives a promising role to repair umbilical hernias with good surgical outcome.

P-1074
Inguinal hernia repair with patch and plug technique
Hospital University San Agustin, Department of Surgery

Background: While in the past, hernia surgery was carried out mainly under general and spinal anesthesia, in recent years there has been growing emphasis on the role of local anesthesia. Its advantages may be presented in elderly patients especially with major health problems that are unable to receive general or spinal anesthesia. Our aim is to assess the use of Trabucco technique for inguinal hernia repair in elderly patients with ASA score III–IV under local anesthesia.

Methods: From September 2009 till May 2016, one-hundred and seventy-one (n = 171) consecutive operations of inguinal hernia repair have been performed in our department in elderly patients with ASA score III-IV under local anesthesia. The surgical technique used in all of the patients was with patch and plug. Patients’ follow-up ranged between 2 and 50 months. The exclusion criteria where patients presented with incarcerarted hernias with sepsis/necrosis.

Results: Minor swelling of the scrotum was observed in thirty-two patients while twenty-six developed ecchymosis. All of the minor complications were limited and disappeared within a couple of days. None of the cases was presented with bleeding and there was no need for re-operation. None of the patients had recurrence. All patients reported a clear improvement of their quality of life.

Conclusion: The inguinal hernia repair with tension free technique under local anesthesia is a safe, simple and perfect technique even for elderly patients after adequate preoperative assessment and appropriate management. It associated with quick hospital stay, low relapse rates and low morbidity and mortality, if performed at the right time.
P-1075
A comparative study in three techniques of inguinal hernia repair
Hospital Universitary San Agustin, Department of Surgery

**Background:** The best method in inguinal hernia repair has not gained acceptance yet. We compare three techniques: Lichtenstein, Rutkow & Robbins and TEP.

**Methods:** In 72 months, 666 inguinal hernia repairs were performed on 614 patients (596 men, 18 women) from 18 to 93 year-old. 70 patients were operated for bilateral inguinal hernia. Lichtenstein was performed on 60 repairs (Group A), Rutkow and Robbins on 554 (Group B), and TEP on 52 (Group C). In the Lichtenstein method, strengthening of the transverse fascia was applied. In Rutkow and Robbins the cone was sutured and the mesh with clips.

**Results:** Duration of surgery was between 35 and 57 min for the Group A, 24–50 min for Group B, and 30–62 min for the C group. Postoperatively in 4 cases of Group A and in 5 of Group B there was accumulation of fluid collection and 6 cases of Group A and 4 cases of Group B one hematoma was observed. Both were treated successfully conservatively. Administration of analgesics was higher for groups A and B. Hospitalization ranged from 1 to 4 days (Group A); 1–3 days (Group B), while all patients of Group C left the first postoperative day. Return to manual labor was faster in patients of Group C. Operative costs were higher in patients who underwent TEP. No patient had recurrence in a period of 0.5–24 months.

**Conclusion:** The study shows that all 3 techniques are equally effective. TEP provides less postoperative pain, short-term hospitalization and faster return to work. Disadvantage is the higher cost.

P-1076
Long-term results of ventral hernia treatment
Hospital Universitary San Agustin, Department of Surgery

**Background:** In the last decade, the emergence of new implants made it possible to perform hernioplasty of the abdominal wall with preservation of normal anatomy without tension, which led to the reduction of hernia recurrence frequency. Aim of the study: estimation of the treatment results of abdominal wall hernias with Prolene Hernia System ®; PHS ® and Ultrapro Hernia System ®; UHS ®.

**Methods:** From 2002 to 2013, 1015 patients were operated with PHS or UHS. 915 of them had inguinal hernia, 60—umbilical, 40—femoral. Men were 895, women—120. Average age of patients 64.7 ± 2.1 years. PHS was used in 757 cases, UHS—in 258 cases. Surgery was performed under: local anesthesia—108 (54.3%) cases, spinal anesthesia—32 (16.0%), epidural anesthesia—24 (12.1%), general anesthesia—35 (17.6%) cases.

**Results:** There were no intraoperative complications. Seroma (62 cases after UHS and 30—after PHS) and spermatic cord hematoma in patients with recurrent inguinal-scrotal hernia (10 cases—after PHS and UHS) were observed in early postoperative period. No infectious complications and implant rejection of the implant were observed. In the long-term period (11 years), recurrence wasn’t observed and the patients were satisfied with the results.

**Conclusion:** The method of hernioplasty using PHS and UHS prostheses is elegant, easy to perform, adaptable to the individual patient’s needs, provides excellent results. This method does not require restoration of abdominal wall layers by sewing weakened tissues.
P-1077
Bilateral inguinal hernias should be repaired in one session
Hospital Universitary San Agustin, Department of Surgery

Background: Recently there are many article released about inguinal hernia repair but english literature has limited knowledge about bilateral inguinal hernias. 7–29% of inguinal hernias are bilateral. To repair to bilateral inguinal hernias in the same session is a debate for years. This study is conducted to add some knowledge to literature in this subject.

Methods: Of 1604 patients who operated for inguinal hernia, 272 was enrolled in this study. Demographics, whether the hernias are uni or bilateral, lengths of hospital stay of the patients if drain or not of the wound were all assessed. All patients have antibiotic profilaxy.

Results: 123 patients have unilateral hernioraphy 149 have bilateral inguinal hernia repair. Lengths of hospital stay who are undergone bilateral hernioraphy is mean; 2.72 (1–9) days. Mean hospital stay who operated for unilateral hernioraphy is 1.3 (1–7). When the patients who have any additional operation are exclude, the LOS are 2.4 and 1.6 days, respectively.

Conclusion: Feliu et al. in their series mean ages were 54 ± 11, LOS were 1.4 ± 1.3 days, 4.3% of their patients discharged in the same day. No patient of our could not have day case surgery to repair a bilateral inguinal hernia in two session don’t increase LOS more than in 2 times. LOS of bilateral hernia repair reduce in total. LOS of repairing of bilateral inguinal hernia are longer than los of unilateral hernia repair. Any additional operations increase LOS in both groups. The rate of drain the operation field decreased in later years than beginner ones. Peiper et al. a redon drain is not required.

P-1078
Ventralex ST hernia patch in umbilical hernia surgery should be the first option?
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Umbilical hernia, which is rare among abdominal wall hernias, is seen in 4% of all hernias. It can occur in adults for a variety of reasons. Mesh repair techniques recurrence rate and it is reported that the material used is important and that it is an effect on the development of recurrence. In our study, we presented our cases with Ventralex™ ST Hernia Patch (Bard Davol Inc).

Materials and methods: Seventy-one patients who underwent Ventralex™ ST Hernia Patch repair due to umbilical hernia between January 2015 and June 2017 were included in the study. All patients had open procedure for ventral hernia repair and the patches were sutured with 2/0 prolene to the fascial edges as 2 and 3 cm laterally overlapping to all directions.

Results: The mean age was 43.5 (28–65) in males and 52.2 (38–74) in females. 31 male and 40 female patients, having umbilical hernias (65%), paraumbilical hernias (26%) and trochar site hernias (9%) were operated under general anesthesia in an average time of 35 min. 51 cases had small and 10 cases had medium Ventralex patch application. All patients were discharged from the hospital at the first postoperative day with oral analgesic. Only two (2.9%) patients has surgical site infection. No recurrence was encountered.

Conclusion: Umbilical, paraumbilical and trochar site hernias in a range of not more than 3 cm in diameter can be safely repaired by Ventralex ST hernia patch. Its easy to be applied, requires less hospitalization with low complication rate and having no recurrences at least in the earlier follow up period.
P-1079
Robotic repair of a perineal hernia following abdominoperineal resection
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This report describes the robotic repair of a symptomatic perineal hernia following an abdominoperineal resection. The case centers around a 65-year-old female who presented with a painful bulge of her perineum approximately 1-year post-op following robotic abdominoperineal resection (APR) for adenocarcinoma of the rectum. Perineal hernias are a fairly rare occurrence, with limited published data regarding the optimal treatment strategy. Despite robotic perineal hernia repair being a novel idea, it serves as an intersection between two relatively common uses of robotic surgery.

P-1080
Influence of ethnicity-related differences in inguinal canal dimensions on the mesh size for open and laparoscopic groin hernia repair in low-resource countries in Africa
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Introduction: The access to surgery in Africa is significantly limited. Treatment outcomes in Africa differ significantly compared to those achieved in Europe or the US. Therefore, to popularise tension-free repair, it is essential to determine the economically justified mesh size for the African population. The aim of this study was to conduct anthropometric evaluation of inguinal canal in African and European patients to determine their effects on the mesh size.
Methods: The measurements were made in 44 adult males in Africa (Group I) and were compared to measurements in 45 consecutive Caucasian males (Group II). The mean age of patients was, respectively 48.3 and 51.2 years.
Results: There were no statistically significant differences in the internal ring diameter between both (2.2 vs 2.1 cm; p = .58). The distance between the pubic tubercle and the inferomedial border of the internal inguinal ring was significantly shorter in group I (3.8 vs 5.1 cm; p < .001). Similar differences were demonstrated in the length of transverse arch aponeurosis (2.9 vs 4.0 cm; p < .001). The distance between the pubic tubercle and anterior superior iliac spine in group I was approximately 2 cm shorter on each side (10.0 vs 11.8 cm; p < .001).
Conclusions: Anatomical differences in inguinal dimensions between Central African and European populations support the need to adjust the standard size of synthetic mesh used for hernia repair to the needs of local populations. The significantly smaller dimensions of the inguinal canal in African males allow the use of smaller meshes (6 × 11 cm).

P-1081
The influence of different sterilization types on mosquito net mesh characteristics in groin hernia repair
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Background: In low-resource countries, a suture repair is still in common use due to the limited access to commercial mesh implants. The search for less expensive alternatives to the synthetic meshes has led to using mosquito nets. Sterilized mosquito net appears to be a low-cost and commonly available product that closely resembles commercially available meshes. However, the extent to which sterilization alters the structure of mosquito nets is still unknown. The aim of this research was to assess the effects of different sterilization types on physico- mechanical properties of mosquito nets.
Materials and methods: Nine different polymers were analyzed (six mosquito nets from low-resource countries, one European net and two commercial meshes). The analyzed parameters included: polymer type, net surface area, fiber diameter, net thickness, mesh weight, pore size, tensile strength and tear force. The measurements were taken before sterilization, after sterilization at 121 and at 134 °C.
Results: Sterilization altered net surface and pore size, but didn’t significantly alter the single fiber diameter, weave of filaments or net thickness. Steam sterilization didn’t affect the tensile strength or tear force.
Conclusions: Sterilization at 121 °C reduces the mosquito net surface area [40%, resulting in a loss of macroporous structure and turning the mesh into hard, shrunken, non-pliable masses. Sterilization at 134 °C causes some mosquito nets to melt and completely destroys their porous structure. Maximum pressure in the abdominal cavity is higher than the tensile strength and tear force of some locally available mosquito nets; therefore, these nets shouldn’t be used.
**P-1082**

Complex ventral hernia repair in class III morbidly obese patients

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**Introduction:** Patients undergoing complex ventral hernia repair (VHR) often present with significant medical comorbidities, the most prevalent of which is obesity. While recent advancements in abdominal wall reconstruction techniques have provided the general hernia patient population with markedly improved recurrence and post-operative complication rates, many patients have been precluded from these procedures due to excessive BMI. In this study, we intend to demonstrate that complex ventral hernia repair with epigastric artery perforator sparing skin incisions, component separation, and wide spanning retrorectus mesh reinforcement is a viable option for patients with BMI ≥ 40 kg/m² (class III obesity).

**Methods:** A single surgeon retrospective review of our prospectively maintained database was performed. We restricted this data to class III morbidly obese patients undergoing open VHR with component muscle separation and wide spanning mesh reinforcement.

**Results:** Between 2010 and 2017, 131 patients met inclusion criteria for our study. Mean patient BMI was 46.7 kg/m². Operative wounds were categorized according to the National Healthcare Safety Network Wound Class Definitions. There was no statistically significant association between wound class and postoperative complication rates. After our implementation of epigastric artery perforator sparing skin incisions in 2013, significantly less wound breakdown was observed (26.3%) as opposed to before (49.0%) (P < 0.01). Further, significantly less cases required return to the operating room after this technique was implemented (31.3%) as compared to before (60.8%) (P < 0.001). Post-operatively, 28 patients developed an infection requiring antibiotic treatment (21.4%), and the overall hernia recurrence rate was 2.3%. Three patients expired.

**Conclusion:** Complex VHR with abdominal wall reconstruction is a viable option for class III morbidly obese patients. Preliminary data suggests that implementation of epigastric artery perforator sparing skin incisions may reduce the risk of post-operative wound complications, and we have demonstrated hernia recurrence and wound complications comparable to those seen in the general population.

**P-1083**

A hybrid technique for incisional hernia repair

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**Background:** Treatment of incisional hernia of the abdominal wall remains one of the urgent problems of modern surgery. Incisional hernia is one of the most common complications in abdominal surgery, requiring surgical treatment. According to prospective studies, its frequency is 10–31%. The aim of this study was to analyze the results of hernioplasty in patients with incisional hernia using a hybrid technique of hernioplasty.

**Materials and methods:** From 2008 to 2017, 18 patients underwent the combined approach for incisional hernia repair. The mean age of the patients was 62 ± 1.9 years and BMI 34 ± 0.4. There were 8 (44.4%) men, and 10 (55.6%) women. In 3 (16.7%) cases hernias were recurrent. There were 15 (83.3%) patients with midline hernia, 3 (16.7%) with lateral hernia. In 4 (22.2%) cases, hernias were W2 in size, in 14 (77.8%) cases—W3 (EHS classification). The first stage was open method with adhesiolysis, followed by placement of hernial protrusion back into the abdominal cavity and suturing of the hernial gates. In a subsequent laparoscopic way, after intraperitoneal placement of the composite prosthesis (Proceed® in 12 cases or Physiomesh®—in 6 cases), the mesh was fixed to the abdominal wall 4–5 cm away from the hernia gates.

**Results:** At early postoperative period 2 patients developed seromas, which were managed by conservative treatment. Recurrences and infectious complications were not observed with average follow-up of 9 years.

**Conclusion:** Our results confirm that the hybrid technique of hernioplasty is a safe and effective method. With this technique, the open closure of the hernial gates by mesh placement provides restoration of the integrity of the abdominal wall and the improvement of muscle function after injury. The used laparoscopic technique of fixing the prosthesis does not require separation of the abdominal wall layers, which reduces traumatization and wound infection.
P-1085
Tackomesh study. Randomised, blinded, controlled trial comparing mesh fixation techniques in elective laparoscopic repair of incisional hernia with fascial closure: reliatacktm V protacktm—rationale and study design
Sheen A, Stathakis P, Alexander Y, Siriwardena A, Jamdar S

Introduction: This prospective, single-centre, observer and patient blinded (double blinded), fixed design randomised controlled trial is being undertaken to evaluate any difference in pain after 1 month after undertaking a laparoscopic incisional hernia repair with fascial closure and the use of SymbotexTM mesh with fixation using either an absorbable tacker with an articulating arm ReliaTackTM against a non-absorbable tacker ProTackTM.

Study Design: The primary outcome measure is the pain score at rest and activity at day 30 recorded using visual analogue pain score (VAS) (0–10 cm). Power of 80%, an alpha of 0.05, SD 2 and dropout of 5%, a sample size of 136 (68 per group) has been calculated to detect a difference of 1 between the groups. Secondary outcome measures include: Visual analogue pain score (VAS) pain score at days 1, 5–7 days, 3 months and 1-year post-operative. A preoperative VAS score will also be recorded. Seroma formation, length of hospital stay, return to normal daily activity, wound infection, operating and mesh fixation time and Hernia recurrence at 1 year. Health-related quality of life—assessed using the Carolinas Comfort Score TM and Short Form 36 TM, at pre-operatively, 30 days and 1 year. Adverse events will also be recorded. Recruitment has opened in June 2017 and is set to recruit over the next 2 years. The trial has been approved by the UK national ethics committee (REC Reference: 17/NW/0082, IRAS Project ID: 213428) and is also listed on the NHS NIHR National Clinical Research Portfolio.

Discussion: TACKoMESH is the first trial to compare fixation techniques after the fascial closure in Laparoscopic incisional hernia repairs. TACKoMESH will aim to determine if laparoscopic fascial closure and the use of a articulating arm absorbable tacker has any effect on the pain at 30 days, recurrence and overall outcome as well as morbidity and mesh fixation time.

P-1086
10 years inguinal hernia repair with a 3D dynamic responsive implant: indications, procedural steps and long term results
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Introduction: Mesh fixation and biologic response of the implant still represent an issue in inguinal hernia repair. Since 2008, a 3D shaped implant, designed with a dynamic responsive attitude, was employed for inguinal hernia repair. Indications for its usage, surgical technique and long term results are critically analyzed and highlighted in this report.

Methods: A light-weight large-porous multi-lamellar 3D implant made of polypropylene was utilized fixation free to obliterate the hernia defect of patients undergoing inguinal hernia repair. After delivering the prosthesis, stress test demonstrated the implant stayed firm within the defect. Postoperative evaluations were made for length of the procedure, early/late complications, pain assessment and biologic response.

Results: Shortened procedural length and hospital stay, low VAS values and very low degree of postoperative complications were the highpoint of the technique. Postoperative ultrasound excluded implant migration and confirmed the full obliteration of the defect. No significant modifications of the implant core diameter were reported.

Conclusions: The fixation free 3D dynamic prosthesis assured a drastic decrease of postoperative pain and complications related to mesh fixation, resulting simpler, faster and easily reproducible surgical procedure. The dynamic compliance and recoil of the implant within the groin allowed an enhanced biologic response consequent to the cyclical physiologic load exerted upon the prosthesis. These features seem to represent a significant innovation in prosthetic inguinal hernia repair.
**P-1087**

**Long-term results of fixation-free incisional hernia repair with a tentacle-shaped implant**

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**Introduction:** For the treatment of incisional hernias, mesh fixation and implant overlap are still source of debate. Aiming to assure a wider coverage of the abdominal wall with a fixation-free procedure, a special designed tentacle-shaped implant was employed for the surgical repair of incisional hernias. The long-term results of this surgical procedure are analyzed in this report.

**Materials and methods:** Proprietary symmetrically-shaped flat mesh designed with a central body and integrated radiating arms at its boundary was used to repair incisional hernias. The implant was placed in preperitoneal/retromuscular sublay with open approach. To avoid point fixation of the mesh was, the friction of the tentacle straps crossing the abdominal wall structures was used to assure an adequate grip and a wide defect overlap, thus assuring a real fixation-free procedure. All tentacle straps, were delivered through a special needle passer through the abdominal wall laterally from the borders of the hernia defect and then cut short in the subcutaneous layer before wound closure.

**Results:** During a follow-up ranging from 24 to 108 months (mean 64 months), only a small amount of seromas occurred. No infections, hematomas, chronic pain, mesh dislocation or recurrence were reported.

**Conclusions:** The tentacle strap system of the implant ensured reduced skin incisions. The sublay placement of the implant resulted simple and fast, avoiding the need of mesh fixation. During follow-up, to demonstrate the correct placement of tentacle straps and mesh, CT and US scans were regularly carried out. The newly developed surgical technique allowed for a faster recovery and reduced complication rate. No recurrences were reported, even long-term.

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**P-1088**

**Fixation free dynamic femoral hernia repair using a 3D multilamellar implant**

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*University of Cagliari*

**Introduction:** Femoral hernias are relatively uncommon, occurring in approx. 3–4% of all hernias. Female are affected more often than men with a 2:1 ratio. The surgical management of this type of hernia is still debated. This study describes the femoral hernia repair technique by using a dynamic responsive 3D implant.

**Materials and methods:** A multilamellar shaped 3D implant was employed for the repair of femoral protrusions both in female and male patients. The surgical procedure implied blunt dissection of the hernia sac from the surrounding structures of the femoral fossa. Once isolated and reduced the sac into the abdomen the hernia defect is obliterated through the placement of a dynamic 3D implant in a fixation free fashion. Stress test is then performed to demonstrate the grip of the implant within the defect.

**Results:** The surgical approach with the dynamic 3D implant resulted fast and uncomplicated. No intraoperative complications in the described patient’s cohort occurred. Postoperative pain was significantly reduced, resulting in a faster return to normal activities and a better quality of life.

**Discussion:** The described surgical technique for femoral hernia repair with the dynamic 3D implant eliminated all kind of complications related to mesh fixation or suturing the myotendineal structures of the femoral fossa, resulting in simpler, faster and reproducible mini-invasive procedure.
**P-1089**

**Chemical medical glue for mesh fixation in inguinal hernia repair (Lichtenstein, Tapp or Tep)**
Shen Y, Chen J, Yang S
Beijing Chao-Yang Hospital, Capital Medical University

**Objective:** Although the approach of fixing the mesh with non-absorbable synthetic suture has been adopted, it is disadvantaged by the large number of stitches and an increased incidence of complications such as postoperative pain, chronic pain, and hematoma or hydrops formation. With the aim of reducing these complications, some researchers have adapted medical adhesives in tension-free herniorrhaphy and have achieved satisfactory results. We conducted this study using lightweight polypropylene mesh that has been proven to be associated with fewer complications for inguinal herniorrhaphy to imply the effectiveness of n-butyl-2-cyanoacrylate (NBCA) glue for mesh fixation in Lichtenstein tension-free herniorrhaphy and laparoscopic herniorrhaphy for inguinal hernias.

**Methods:** A total of 2136 patients with primary unilateral inguinal hernia were included. In 893 cases, NBCA adhesive (Compont Medical Adhesive, 1.5 ml/tube; Beijing Compont Medical Devices Co., Ltd., Beijing, China) was used during Lichtenstein herniorrhaphy while the left 1243 cases was used in the fixation of the mesh during the laparoscopic herniorrhaphy (TAPP or TEP). Operation time, postoperative length of stay, visual analogue scale (VAS) score, incidence of chronic pain and hematoma formation, and hernia recurrence were evaluated.

**Results:** The operative time was 36.2 ± 10.3 min and the postoperative length of stay was 1.2 ± 0.6 d. The minimum follow-up was 24 months, there were no hernia recurrence or wound infection in either group. The postoperative VAS score was 1.6 ± 0.7, there was no postoperative pain occurred (visual analogue score > 4, lasted 3 months). Thirteen (1.5%) hematomas occurred in the open cases and 17 (1.4%) cases occurred in the laparoscopic group.

**Conclusions:** Application of chemical medical adhesive in tension-free herniorrhaphy for inguinal hernia appears to be a safe and effective approach.

**P-1090**

**Lichtenstein hernioplasty of indirect inguinal hernias with bovine pericardium tissue biological grafts in adolescent and young adult patients (13–45 years old)**
Shen Y, Yang S, Chen J
Beijing Chao-Yang Hospital, Capital Medical University

**Objective:** To evaluate the outcomes of Lichtenstein hernioplasty using bovine pericardium tissue biological grafts in adolescent and young adult patients (13–45 years old).

**Methods:** In this study, 317 patients, 13–45 years old, with primary unilateral indirect inguinal hernias, received Lichtenstein hernioplasty using bovine pericardium tissue biological grafts. The outcome measures were the length of the operation, postoperative visual analogue scale (VAS) pain score, length of hospitalization, postoperative complications and recurrence rate.

**Results:** The operative time was (31.2 ± 5.8) min and the length of hospitalization (1.4 ± 0.7) days. The minimum follow-up was 24 months, there were 2 postoperative wound infections (0.6%) and fully recovered by change of dressing for 1 month; there were no chronic postoperative pain (visual analogue score > 4, lasted 3 months) or local foreign body sensation occurred; 13 patients (4.1%) developed scrotal hydroceles and recovered by the scrotal puncturation. There were no recurrences and other complications.

**Conclusions:** Lichtenstein hernioplasty using bovine pericardium tissue biological graft is a safe and available treatment in adolescents and young adult patients (13–45 years old).
Laparoscopic transabdominal preperitoneal repair of inguinal hernias using acellular tissue matrix grafts

Shen Y, Wang B, Chen J
Beijing Chao-Yang Hospital, Capital Medical University

Objective: To explore the value and the clinical effect of laparoscopic transabdominal preperitoneal (TAPP) hernia repair with acellular tissue matrix grafts. Methods Clinical data of 36 cases of inguinal hernia who underwent laparoscopic TAPP hernia repair with ACTM grafts from January 2014 to January 2016 in Beijing Chao-Yang Hospital, Capital Medical University, were retrospectively analyzed. Postoperative complications and recurrences were recorded. Results Operations were completed successfully in all 36 cases and none was converted to open surgery. The mean operation time was (44.5 ± 7.8) min (range 33–62 min) and the mean hospital stay was (3.5 ± 1.5) days (range 2–7 days). The postoperative VAS pain score were (2.6 ± 0.9) (range 2–4); there were 3 patient suffered fever and 5 patients suffered scrotal seroma. There were no complications such as wound infection and intestinal obstruction after operation. All cases were followed-up for 6–30 months (mean of 19.3 ± 4.3 months) without obvious chronic pain, foreign body sensation and recurrence. Conclusions Laparoscopic TAPP repair of inguinal hernias using acellular tissue matrix grafts is safe and feasible, and has the advantages of minimal invasion, few complications and good postoperative comfortable feeling, without increasing the risk of recurrence. This technique is especially suitable to young patients with inguinal hernia who have the requirement of fertility.

How should the appendectomy and hernia repair be in the surgical treatment of Amyand’s hernia? (Case report)

Ağca B, Iscan A, Sahan C, Ergin A, Altinli E,
Memisoglu K
Fatih Sultan Mehmet Eğitim ve Araştırma Hastanesi

Amyand’s hernia is a rare type of inguinal hernia in which the vermiform appendix located with in the hernial sac. It is seen in nearly %1 and it is difficult to make diagnose pre-operatively. First time it defined by Claidius Amyand in 1735.

An 77 year-old man who had a right inguinal hernia in physical examination operated and appendix vermisormis seen in hernia sac during the operation. Amyand hernia diagnosed during the operation and we did the appendectomy from inside of hernia sac. There is no infected material at the operation area so we applied Lichtenstein hernia repair. As a result: Amyand hernia is a condition that should be kept in mind at all ages, especially in complicated inguinal hernias. We recommend that the selection of the procedure should be done taking into consideration the pathological condition of the appendix, the age of the patient and the additional disease.

Synthetic degradable mesh in TEP procedure

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Halland’s Hospital

Background: Totally extraperitoneal (TEP) operation of inguinal hernia has showed in different studies lower risk of chronic post-operative pain compared with Lichtenstein and a previous study using a synthetic degradable mesh showed good results regarding pain in patients with lateral inguinal hernia (LIH) in open approach, hence the objective of the present study was to evaluate the effect of a synthetic slowly resorbable implant on the incidence of recurrence and chronic postoperative pain in patients with lateral inguinal hernia operated with TEP technique.

Methods: Prospective study including 28 patients with primary inguinal lateral hernias operated with TEP repair using TIGR® Matrix Surgical Mesh. At 3-year follow up recurrence have been determined by ultrasound and clinical examination. Pain has been measured by Visual Analogue Scale (VAS) and Inguinal Pain Questionnaire (IPQ) both pre- and post-operatively.

Results: Preliminary results up until 3-year follow up will be presented at the International Hernia Congress of the Americas Hernia Society.

Rhabdomyolysis following robotic repair of recurrent ventral hernia

Doerhoff C
Capital Region Physicians - SurgiCare

Background: 60% of the population in the US is overweight. 12 million people in the US are morbidly obese (BMI > 40 kg/m2).

Methods: 37 year old male with a BMI: 64.13, and a non-reducible, recurrent incisional hernia. PMHx: Two previous failed open mesh repairs, CT scan: 11 cm × 13 cm recurrent hernia containing bowel.

Operation: Patient’s recurrent incisional hernia was repaired robotically after explanation of two pieces of mesh, primary closure of recurrence, and implantation of 25 cm × 33 cm TSM mesh, using eight permanent transfascial sutures and double crown non-absorbable tacks. Operative time was 5 h. Anesthesia set-up added an additional 1 h of general anesthesia. Six hours post operative patient’s labs: BUN 24, creatinine 2.8, and potassium 7.2. ABG’s: pH 7.11, pCO2 73.0, pO2 74, Base Excess -7.7, decreased urine output with myoglobinuria. Anesthesia admitted patient’s pCO2 was >50 entire operation.

Discussion: Rhabdomyolysis (RML) is defined as CPK of >1000. RML is caused by skeletal muscle ischemic necrosis, typically myonecrosis of the medial glutal muscles. RML risk factors: ASA III–IV, massive obesity, use of succinylcholine, long duration of operation (>4 h), Trendelenburg position, hypertension, and type II diabetes.

Treatment: Intravenous crystalloids and mannitol diuresis. Acute renal failure has a high morbidity and significant mortality.

Intra-operative prevention: Padding of pressure points, changing patient position intra and post-operatively, use of pneumatic mattress, aggressive fluid replacement with adequate urine output, early ambulation and pCO2 < 40 mm.

Conclusion: RML is a serious complication for morbidly obese patients undergoing long anesthetic procedures. The goal is to keep operating times < 4 h, or consider staged operations.
**P-1096**

**Hernia repair in peritoneal dialysis patients**

Doerhoff C  
*Capital Region Physicians - SurgiCare*

**Background:** The definition of stage V end stage renal disease (ESRD) is kidney failure requiring dialysis or transplant, which is a glomerular filtration ratio (GFR) < 15 ml/min per 1.73 m². 661,000 patients have ESRD in the United States and this increases 5% per year. 408,000 patients are on dialysis, with 90% on hemodialysis and 10% on peritoneal dialysis (PD).

**Discussion:** Ventral wall defects (VWD) are common. The literature is controversial whether PD patients are more likely to develop a hernia as a result of increased abdominal pressure from dialysate. Intra-abdominal pressure during PD is 13.5 cm of H₂O pressure (2 L); more likely, dialysate pressure causes an existing hernia to become obvious. Risk factors for developing VWD are polycystic kidney disease, diverticulosis, and anti-inflammatory medications (steroids). VWD for PD patients: 41.4% inguinal, 21% umbilical, 23% ventral, 3.8% femoral and 0.8% intrathoracic.

**Methods:** Most PD catheters are placed by minimally invasive surgery (MIS) laparoscopically or robotically. 17% (12–37%) of patients requiring PD placement will have a preexisting hernia, and those hernias should be repaired at the time of PD catheter insertion. Patients who are on PD and develop an inguinal hernia can be repaired open pre-peritoneal or MIS pre-peritoneal using 5–7 mm non-cutting trocars without a lapse in dialysis. Umbilical defects < 4 cm can be repaired open pre-peritoneal with a device mesh. Umbilical hernia > 4 cm can be repaired by MIS technique without lapse in dialysis. Most incisional defects can be repaired MIS with a resumption of low volume PD for 1–2 weeks. Larger incisional defects requiring open repair require temporary hemodialysis for 4–6 weeks.

**Conclusion:** Ventral wall defects should be repaired in PD patients while minimizing interruption of peritoneal dialysis.

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**P-1097**

**Posterolateral incisional hernia related to extreme lateral interbody fusion of the spine**

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A new type of abdominal wall hernia is described resulting from a lateral approach to the lumbar spine. The minimally invasive lateral transposes approach to the lumbar spine, also known as extreme lateral interbody fusion (XLIF) or direct lateral interbody fusion (DLIF), has become an increasingly popular approach for achieving lumbar interbody fusion over the past decade.

This transpsoas lateral approach to the spine has been demonstrated to show enhanced efficacy and easier recovery compared to traditional anterior approaches to the spine. There are numerous potential complications from this innovative minimally invasive procedure. There have been very few reports of abdominal wall herniation from this procedure. In the largest series of 600 cases reported by Rodgers et al. in 2011, they report only one case of incisional hernia.

The minimally invasive LLIF (includes XLIF) approach is via a lateral skin incision between the iliac crest and costal margin. The external oblique fascia is incised and the external oblique, internal oblique and transversus muscle fibers are separated bluntly until encountering the preperitoneal fat. Further dissection is toward the tip of the transverse process anterior to the quadratus lumborum. The psoas is then split via serial dilators over a guidewire directed at the target disc anatomy.

We describe 10 patients, who had otherwise excellent results from their spinal reconstruction, with a new and distinct form of abdominal wall herniation. Symptoms range from severe pain to a painless bulge in the posterolateral abdominal wall. CT findings reveal herniation through the oblique muscles and in some cases lateral to the oblique muscles.
P-1098
The analysis of Stoppa herniorrhaphy for primary lumbar hernia by using the preperitoneal patch (20 case reports)
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Objective: To explore the security and feasibility of the Stoppa herniorrhaphy in primary lumbar hernia by using the preperitoneal patch. Methods Clinical data of 20 cases of primary lumbar hernia who underwent Stoppa herniorrhaphy from January 2015 to January 2017 in Beijing Chao-Yang Hospital of Capital Medical University were retrospective analysis. Postoperative complications and recurrences were recorded. Results Operations were completed successfully in all 20 cases. The mean lumbar defect was (2.0 ± 0.4) cm (range 1.5–2.5 cm). The mean operation time was (42.9 ± 14.6) min (range 25–75 min) and the mean hospital stay was (3.0 ± 1.1) days (range 1–5 days). The postoperative VAS pain score was (2.5 ± 0.9) scores (range 2–6 scores). There were no complications such as fever and wound infection. All cases were followed up for 4–24 months (mean of 13.4 ± 5.4) without obvious chronic pain, foreign body sensation and recurrence. Conclusion The Stoppa herniorrhaphy in primary lumbar hernia by using the preperitoneal patch is safe and feasible, and has the advantages of minimal invasion, few complications and good postoperative comfortable feeling.

P-1099
Laparoscopic surgical treatment for recurrent spiegel hernia: a case report
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Introduction: Spiegel’s hernias are located on the topography of Spigel’s lunate line at the lateral border of the rectus abdominis muscles. The clinical condition is characterized by bulging and pain in the anatomical topography of the hernia, and can be associated of a complementary examination of image, ultrasonography or computed tomography to make the diagnosis and exclude other causes of abdominal swelling. As a therapeutic possibility, the laparoscopic surgical of the Spiegel hernia with insertion of a synthetic prosthesis—polypropylene mesh with polydioxanone and regenerated oxidized cellulose (Proceed)—is highlighted.

Objective: To describe the clinical case of a patient with a rare ventral hernia, highlighting the experience of treatment by laparoscopy and placement of synthetic prosthesis.

Methods: A qualitative study was carried out with the patient V. L. Q. D., female, 65 years old, selected from the clinical study because she had recurrent hernia, which was corrected by laparoscopic herniorrhaphy with screen insertion. Study carried out in a Brazilian Hospital with medical residency service in General Surgery, under the guidance and follow-up of the local preceptor. The work was organized according to practical experience of the technique and surgical approach used, as well as a review of medical records.

Conclusion: The therapeutic proposal of the Spiegel hernia should be surgical because of the high risk of imprisonment of the hernia product. The present case report describes the successful experience of correction of hernia defect with laparoscopic suture and screen insertion. The surgery obtained an efficient postoperative result, with a short time of hospital stay, without complications, and good aesthetic termination. Therefore, our results open the door to new, safer and innovative approaches to laparoscopy in the context of abdominal wall hernias.

Keywords: Ventral hernia; Laparoscopy
**P-1101**

Exercise after hernia repair surgery

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The most frequent question we’re asked after hernia surgery is: “When can I start exercising again?”

We’ve developed return-to-exercise programs for our hernia patients that are individualized for the type of sport, and to prevent hernia recurrence.

The first week after surgery is progressive walking up to 1 h per day. The second week, daily stretching after a warm-up in the shower or bath. During this second week you’ll start light aerobic exercises at 30 min and progress up to 1 h. Patients must ice after completing exercise. The third week, aerobic exercise effort is moderate. Starting the fourth week, aerobic exercise is unrestricted. After 4 weeks, the patient can begin light weight training. Core workout such as pull-ups, push-ups and sit-ups are started at week six. Patients can exercise without restriction by week eight.

We’ve also established customized training plans for several patient categories:

Professional athletes are our greatest challenge. They’ll inevitably test the limits of hernia surgery. Many of them will ignore pain and potentially endanger the hernia repair.

Recreational athletes are given a plan to maintain their healthy lifestyle. We combine their preferred active sport with a strength building program to combat muscle wasting that occurs with age.

Non-athletic patients generally do not want to exercise. We explain that a light workout decreases the likelihood of hernia recurrence, and at the same time helps flatten their abdomen. They’re usually happy with that and are more likely to follow their specialized program.

Our recommendations also differ for unique patients such as those with underlying medical problems or multiple hernia recurrences.

We have individualized our post-operative training programs for all sports; including hiking, running, golfing, weightlifting, tennis, basketball, soccer, and hiking.

Getting you back to your normal exercise routine, quickly and safely, is always our chief objective!

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**P-1102**

Abnormal per operative cervical ergonomics: a cause of musculoskeletal pain during surgery

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**Introduction:** Previous investigations have highlighted musculoskeletal strain as a cause of surgeon discomfort during surgery;

**Methods:** To demonstrate an ergonomic cause for musculoskeletal symptoms, mobile digital strain gauge assessment (MDSGA) was utilised to prospectively record neck flexion/rotation in 3 surgeons performing open (OS) and laparoscopic surgery (LS). Results are based on mean strain value from 15 min recordings taken randomly during 30 surgeries (15 OS, 15 LS) using a SELS device worn by the operating surgeons who were unaware when recordings were in progress.

**Results:** Overall neck flexion was significantly reduced in LS when compared with OS 21.6 vs 56.2% (p = 0.019). Neck rotation was also significantly reduced during LS 90.9 vs 220 (p = 0.001).

**Conclusion:** MDSGA is a dynamic accurate method for in vivo real time evaluation of cervical ergonomics during surgery. Our results highlight static postural load as a potential cause of abnormal muscle strain/pain in surgeons performing therapeutic laparoscopy when compared with open surgery. The results may suggest the need for appropriate preventive measures to minimise surgeon injury.

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**P-1103**

The key concept for the repair of abdominal incisional hernia is to make a continuous granulation layer along the line of fascia

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**Introduction:** In recent years, a prosthetic repair for incisional hernias by laparoscopy has been widely adopted worldwide. However, when a prosthesis is laparoscopically placed intraperitoneally, there is a risk of intestinal adhesions and a high incidence of mesh bulging as previously described. Therefore, we have continued to adopt anterior approach to make a continuous granulation along the layer of fascia to prevent mesh bulging.

**Methods:** Our indication criteria is as follows; (1) anterior repair by an lightweight monofilament polypropylene mesh on the anterior side with an absorbable hydrogel barrier to a small incisional hernia (< 5 cm) above the laccular line, in which mesh is sutured intermittently to the edge of hernia defect, (2) anterior preperitoneal mesh repair technique (Modified Rives-Stoppa method) to other hernias, in which mesh is placed preperitoneally and sutured to the edge of hernia defect. In most cases, the fascia was not anastomosed to keep fascia tension-free.

**Results:** Between 2005 and 2016, 60 patients underwent Modified Rives-Stoppa technique and 5 anterior technique by hydrogel-coated lightweight mesh. The median operating time was 100 and 74.4 min, respectively. Two cases of recurrence (3.3%) and one wound infection (1.7%) occurred. However, no cases of mesh infection occurred. There were no cases suffering from mesh bulging as a late complication. Some other complications occurred in seven cases, but all recovered conservatively.

**Conclusions:** Our findings suggest that our indication criteria is appropriate for the repair of incisional hernias at the present time. To make a continuous granulation layer along the line of fascia is a key concept for the repair of abdominal incisional hernia.
**P-1104**
Outcomes following ventral hernia repair using biosynthetic absorbable mesh for large and complex abdominal wall defects
Finch D, Hamlett K, Varghese J
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**Introduction:** Early indications suggest that biosynthetic mesh may represent a superior alternative to biologic prostheses in large and complex ventral hernia repair (CVR). Regardless, there is a paucity of data regarding clinical outcomes with such materials. We present a large single surgeon series of CVR with the GORE BIO-A Tissue Reinforcement mesh.

**Methods:** Retrospective casenote review of all adult patients who underwent a planned single-staged large/complex ventral hernia repair as defined by European Hernia Society guidelines with biosynthetic mesh (GORE BIO-A Tissue Reinforcement; Flagstaff, Arizona) between May 2013 and May 2017.

**Results** Overall, 51 patients underwent abdominal wall reconstruction for large/complex ventral hernia. All meshes were placed in the retrorectus position. 33% underwent component separation. 84% of patients were class 2 or 3 according to Ventral Hernia Working Group classification (n = 26, n = 17, respectively). Overall hernia recurrence rate was 4% (n = 2). Post-operative surgical site infection (SSI) occurred in 24%. Mean follow up by clinical examination was 6 months (range 3–17 months). Mean time from operation to casenote review was 23 months (range 3–51 months).

**Conclusion:** This retrospective, single centre, single surgeon study demonstrates low hernia recurrence rates with biosynthetic mesh for large and complex ventral hernia. Although follow up by clinical examination was relatively short, no further representations with hernia repair related complications were detected in a lengthy casenote follow up period. This could indicate that these promising short term results are sustained long term.

**P-1105**
Experimental and clinical study of a new method of reducing intra-abdominal pressure at incisional hernia repair by sublay mesh
Zakurdaev E
Voronezh State Medical University Named After N. N. Burdenko

**Purpose:** The purpose of the study was to develop a method of reducing intra-abdominal pressure at incision hernia repair by sublay mesh.

**Materials and methods:** The anatomical experiment was performed on the 24 cadavers other gender and age with diastasis of the rectus abdominal muscles. In the study measured the tension of the suture at medial edges of the rectus abdominis muscle before and after relaxing incision of the anterior rectus sheath other types. In experiment in vivo at the 5 rabbits chinchilla was study possible intra- and postoperative complications during using a new relaxing incision of the anterior rectus sheath. In the clinical study included 20 patients with incisional hernias witch divided into main and control group. In the main group (n = 10) hernia repair was performing using sublay mesh with new relaxing incision of the anterior rectus sheath and in the control group (n = 10) the operation was performed using the classical sublay mesh method.

**Results:** In anatomical experiment a new relaxing incision of the anterior rectus sheath reduced tension sutures at repair diastasis of the rectus abdominal muscles compared 1.5 times more effectively than classical methods. Outcomes of the experiment in vivo showed that a subcutaneous hematoma (10%) is more probable complication at postoperative period in case using a new relaxing incision of the anterior rectus sheath. In clinical study the level of intra-abdominal pressure in day after operation in main group was 9.8 ± 0.5 mm and in control group its was 14.2 ± 0.5 mm hg.st. (p = 0.05). Postoperative complications in main group of the study were not observed. In the control group patients had 20% postoperative complications at early postoperative course and 40% postoperative complications at late postoperative course (p = 0.05).

**Conclusion:** The relaxing incision of the anterior rectus sheath should use at incisional hernia repair by sublay mesh.
Identification of risk factors for 30-day postoperative complications in patients undergoing primary ventral hernia repair: a prospective cohort study of 2374 patients
Kroese L, Gillion J, Jeekel J, Kleinrensink G
Erasmus MC

**Background:** Primary ventral hernia is a common condition. Surgical repair is associated with complications, but no clear predictive risk factors are identified. The EHS classification offers a structured framework to describe hernias and to analyze postoperative complications. Given this structured nature, the EHS classification might prove useful for preoperative patient or treatment classification. The objective of this study is to investigate the EHS classification as a predictor for complications within 30 days after primary ventral hernia surgery.

**Method:** A registry-based, prospective cohort study was performed, including all patients undergoing primary ventral hernia surgery between September 1st 2011 and February 29th 2016. Univariate analyses and multivariable logistic regression analysis were performed to identify risk factors for postoperative complications.

**Results:** A total of 2374 patients were included, of whom 105 (4.4%) patients had one or more complications, either a wound, surgical, or medical complication. Factors associated with complications in univariate analyses (p < 0.10) and clinically relevant factors were included into the multivariable analyses. In the multivariable analyses, age, BMI, and duration of surgery were independent risk factors. The hernia diameter was no independent risk factor.

**Conclusion:** Primary ventral hernia repair is associated with 4.4% complications. No correlation was found between the EHS classification and postoperative complications. Age, BMI, and duration of surgery are correlated with postoperative complications. Therefore, age and BMI should be used in the preoperative risk assessment.

Case report: surgical treatment of amyand’s hernia
Teresa de Lisieux

**Introduction:** Amyand’s hernia, first described, in 1735, by Claudius Amyand, consists of an inguinal hernia with the appendix in its sac. Amyand’s hernia is an extremely rare surgical event, diagnosed mostly during surgery for the inguinal hernia. The authors report a case of Amyand’s hernia during elective surgery, in an 83-year-old male who had the diagnosis made intraoperatively.

**Objective:** To describe the clinical case of right inguinoscrotal hernia, in which the cecal appendix was inserted in the hernial sac, without sign of inflammation, during elective inguinal herniorrhaphy. In addition, we review the literature in order to alert surgeons to the correct diagnosis and treatment of this rare surgical condition.

**Methods:** This study was carried out with the patient, black man, 83 years old, male, from Salvador—BA, from the outpatient clinic of the General Surgery Department of the Tereza de Lisieux Hospital, Salvador, Bahia, Brazil. The unit with complaint of bulging in the right inguinal region was presented 2 months ago. In the intraoperative, identified cecal appendix in herniary sac (Amyand Hernia) but without inflammatory signs. Performed herniorrhaphy with polypropylene mesh. High on 1st PO, without complications. Literature review through research to Medline.

**Conclusion:** The presence of the cecal appendix within the inguinal hernia sac is a rare occurrence, occurring around 1% of inguinal hernias and an inflamed appendix is found in only 0.13% of the cases. The diagnosis and therapeutic proposal of the Amyand’s Hernia is done mostly during the operative event. The present case presents a successful experience in the correction of the Amyand hernia during open technique, with satisfactory surgical result, without complications.

**Keywords** Amyand; inguinal hernia; appendix; surgery.
**P-1110**

Use of preoperative cardiopulmonary exercise testing derived variables to predict complications after complex abdominal wall reconstruction

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**Background:** Cardiopulmonary exercise testing (CPET) has proven useful in colorectal, vascular and other major abdominal surgery in predicting in-hospital morbidity. The aim of this study was to investigate whether CPET-derived variables can be used to predict complications following complex abdominal wall reconstruction (CAWR).

**Methods:** This was a single institution retrospective cohort study of consecutive patients undergoing CAWR between 2012 and January 2017. Patients were identified from the operative lists of 2 surgeons in our centre. Data were collected from electronic patient documents and operation notes. All patients underwent elective open incisional hernia repair, mainly using a Rives-Stoppa technique with retrorectus mesh placement. Since 2013 our standard practice has been to perform preoperative CPET on all patients prior to consideration of CAWR. Complications were recorded as Clavien-Dindo score at 30 days. A score of 3a or higher was deemed a major complication. We stratified patients into high and low preoperative risk based upon their anaerobic threshold (AT) and maximal oxygen uptake (VO2max). We used a cut-off of 11.1 mls/kg/min for AT and 18.2 mls/kg/min for VO2max based on previous studies of patients undergoing colorectal resection.

**Results:** Forty-two patients had undergone successful CPET and had sufficiently complete data to calculate Clavien-Dindo score. Mean age was 66.9 years with M:F ratio of 2.5:1 and median Ventral Hernia Working Group Classification score was 2. Of the 40 patients with AT recorded, there were 5 major complications (26.3%) in the low risk group of 19 patients and 4 major complications (20%) in the high risk group of 20 patients (p = 1.0). Of the 38 patients with VO2max recorded there were 2 major complications (16.7%) in the low risk group of 12 patients and 7 major complications (26.9%) in the high risk group of 26 patients (p = 0.69).

**Conclusions:** The use of CPET-derived variables at our chosen cut-offs does not predict Clavien-Dindo defined complication outcome.

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**P-1113**

Repair of large incisional hernia using the posterior component separation via transversus abdominis muscle release (TAR) procedure

Hangzhou First People’s Hospital

**Background:** Repair of large incisional hernia remains a big challenge for surgeons. A novel technique of posterior component separation using transversus abdominis muscle release (TAR) was developed to address the shortfalls of the traditional retro-muscular repair. This technique allows for significant posterior rectus fascia advancement, wide lateral dissection, preservation of the neurovascular supply of the rectus abdominis muscle, and provides a large space for mesh sublay repairs.

**Method:** Twenty-four cases of large incisional hernia patients were admitted to hernia and abdominal wall surgical center of Hangzhou from June 2016 to July 2017. All the patients underwent retro-muscular mesh repair, and abdominal wall defect was closed after posterior component separation via TAR. Clinical materials of patients were collected. Superficial wound infection, mesh infection, seroma, fistula, recurrence, and postoperative bulging were recorded.

**Result:** Among the 24 cases of large incisional hernia patients, 15 were male and 9 were female, with a median age of 69.7 (46–79) years. Median defect width were 11.9 ± 2.7 cm. Twenty-one cases were midline incisional hernia and 3 were lateral. Four cases were recurrent incisional hernia. The follow-up time was from 2 to 15 months. There was 1 superficial wound infection, mesh infection, seroma, fistula, recurrence, and postoperative bulging were recorded.

**Conclusion:** Posterior component separation via TAR is a reliable technique for large incisional hernia repair.
P-1114
Risk factors and emergency management of postoperative preperitoneal space hemorrhage after inguinal hernia repair
Hangzhou First People’s Hospital

Purpose: The aim of this study was to provide an assessment of the risk factors inherent to postoperative preperitoneal space hemorrhage after inguinal hernia repair and its emergency management. Methods: 2096 inguinal hernia patients were admitted to our hospital and underwent elective surgery of preperitoneal tension-free repair from January 2012 to December 2016. Abdominal CT scans were used to identify preperitoneal space hemorrhage. Case-control study was performed and each case was matched by age and gender in 1:2 fashion. Patients with hemorrhage were in case group and patients with no hemorrhage were in control group. Clinical data was collected and statistical analysis was performed. Results: Thirty-eight cases were included in the case group. Complication rate of postoperative preperitoneal hemorrhage was 1.81%. 26 cases were under preoperative anticoagulation (68.4%), 22 cases were recurrent hernias (57.9%), 24 cases had extended operating time (63.2%), and 30 cases were during early stage of the learning curve (78.9%). Multivariate analysis identified that preoperative anticoagulation, extended operating time, recurrent hernia, early stage of learning curve, and significant decrease of Hb and Bp were related with hemorrhage development. Conclusion: preoperative anticoagulation, extended operating time, recurrent hernia and early stage of learning curve were risk factors of postoperative preperitoneal space hemorrhage after inguinal hernia repair. Conservative treatment is effective and safe. Progressive descent of hemoglobin and blood pressure is the indication of emergency re-operation.

P-1115
Emergent groin hernia repair: the experience of 69 surgeons
Cleveland Clinic

Purpose: Compared to elective counterparts, emergent groin hernia repair (EGHR) is a rare and challenging clinical scenario. We aimed to characterize patients undergoing EGHR at our institution over the last 10 years. Methods: Adult patients who underwent EGHR at our institution from 2005 to 2015 were identified retrospectively, using telephone interviews to compliment the medical record when necessary. EGHR was defined as an inguinal, femoral, or obturator hernia repair performed due to acute incarceration or strangulation. Outcomes included surgical site infections (SSI), mesh infection, perioperative complications, unplanned readmissions, reoperations, and mortality. Predictors of SSI, perioperative complications, and mortality were investigated using multivariate logistic regression modeling. Results: A total of 257 patients met inclusion criteria, consisting of 62% males with a mean age of 70 ± 17. Indirect inguinal hernia was encountered most frequently (74.7%), and 45 cases (17.5%) demanded a bowel resection. Laparoscopic repair was performed in only 3 instances. Mesh was used in 74% of cases though only 6% of mesh placement was done in the presence of a bowel resection or gross contamination. With a median follow-up of 34 months, the overall SSI rate was 3.6%, and there were no mesh infections. Perioperative complications were seen in 16.3%, and mortality was 3.1%. After logistic regression modeling, mesh use was not associated with increased risk of SSI (OR 1.83, 95% CI 0.32–11.6, p 0.49) nor perioperative complications (OR 1.02, 95% CI 0.41–2.63, p 0.96). Recurrence rates were also not statistically different between mesh and tissue repairs (7.8 vs. 6.8%, p 0.74). Older age (OR 1.05, p < 0.001) and gross contamination (OR 4.3, p 0.04) were independent risk factors for complications. Conclusion: Patients undergoing EGHR are complex, with significant rates of morbidity and mortality most closely associated with old age and the presence of contamination. Mesh use appears to be safe when used sparingly in the presence of gross contamination, while tissue repairs appear to have durable rates of recurrence.
P-1116
Risk stratification for 30-day wound events: the role of a previous history of abdominal wall SSI
Cleveland Clinic

Purpose: It is unclear whether a previous history of wound infection is associated with an increased risk for SSI in future surgeries. We aim to determine the impact of a previous history of abdominal wall SSI (AW-SSI) on 30-day wound events following open VHR with mesh (OVHR).

Methods: Patients undergoing elective OVHR, with a clean wound (CDC1), were identified within the Americas Hernia Society Quality Collaborative (AHSQC). Patients were divided into two groups according to a previous history of AW-SSI. The association between a previous history of AW-SSI with 30-day wound events was investigated using logistic regression modeling. Subgroup analysis was performed to investigate if prior Methicillin-resistant Staphylococcus aureus abdominal wall SSI (MRSA + SSI) confers additional risk when compared to prior non-MRSA infections (MRSA-SSI).

Results: A total of 4073 patients met inclusion criteria, of which 3485 had a negative history for previous AW-SSI, and 588 had a positive history for previous AW-SSI. 30-day SSI and SSOPi rates were significantly higher in the group with a positive history of AW-SSI (SSI 6.46 vs. 2.53%, p < 0.001; SSOPi: 9.18% vs. 4.73%, p < 0.001). After adjusting for confounding factors, multivariate analysis demonstrated that a previous history of AW-SSI confers a 2.5-fold increase in the odds for 30-day SSI (95% CI 1.22, 5.13, p < 0.01), but not for 30-day SSOPi (OR 1.045, 95% CI 0.56, 1.89, p 0.887). No difference was seen in 30-day SSI and SSOPi rates in the MRSA + SSI group when compared to MRSA-SSI group (SSI 5.83 vs. 6.6%, p > 0.99; SSOPi 7.77 vs. 9.48%, p 0.72). Other factors associated with wound events included hernia width, BMI, operative time > 2 h and drain use.

Conclusion: A previous history of abdominal wall SSI is an independent risk factor for 30-day SSI following OVHR. Prior MRSA infection did not confer any greater risk for wound events when compared to other pathogens.

P-1117
A clinical evaluation of miromatrix biological mesh for hiatal hernia repair: preliminary 12-month results
Cleveland Clinic Foundation

Introduction: Paraesophageal hernia repair (PEHR) remains a challenging problem with relatively high surgical failure rates. Attempts at mesh cruralplasty have been unsuccessful due to synthetic mesh erosions, or biologic mesh failures during long term follow up. We report the results of a multicenter trial evaluating a unique, highly-vascular, biological mesh derived from decellularized porcine liver for hiatal cruralplasty during PEHR.

Methods: 41 subjects underwent a laparoscopic PEHR which included complete sac excision, 4 cm intra-abdominal esophageal mobilization, primary crural closure, and MIROMESH onlay reinforcement. Subjects were assessed at 2-week and 6-, and 12-month using the SF-36, GERD-HRQL questionnaire, and VAS GERD related symptoms. UGI was completed at 12 months.

Results: Demographics included mean age 63.3 (± 13.7), 80.5% female, mean BMI of 30.7 (± 4.1) and 93% had Type III hiatal hernia. Mean procedure time was 143.0 (± 45.2) min and median LOS was 3 days. All health and GERD related quality of life scores improved versus preoperative states at 2 weeks, and 6, 12 months follow up: mean GERD-HRQL score 19.3 to 5.4 (p < 0.001), Global GERD-HRQL revealed that 74.4% of subjects reported dissatisfaction with their condition preoperatively and 76.7% of subjects reported satisfaction at 12-month. The SF-36 Physical Composite Score (PCS) showed significant improvement from 41.5 at baseline, to 49.6 at 6-month and 49.1 at 12-month post-surgery (p < 0.01). All the GERD symptoms measured showed significant and sustained improvement at all post-operative time periods. For example, regurgitation went from 4.7 at baseline to 0.8 at 2-weeks (p < 0.0001) and 0.9 at 1-year (p < 0.0001). At 1-year no symptomatic recurrent hernias or reoperations were reported. Imaging at 1-year detected 4 (10%) small recurrent hernias.

Conclusion: The utilization of MIROMESH for crural reinforcement during laparoscopic PEHR resulted in excellent symptomatic.
P-1118
Chronic post-operative pain strongly correlates with patch fixation method used in tension-free inguinal hernias repair under local anesthesia
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Objective: To identify factors associated with post-operative chronic pain in tension-free inguinal hernia repair under local anesthesia.

Methods: The data of 2875 cases of tension-free inguinal hernia repair under local anesthesia, performed from January 2013 to May 2015, were retrospectively analyzed.

Results: A month later, among the 2875 cases, a total of 83 (2.89%) patients reported post-operative pain; 3 months later, only 2 cases still have pains, and the occurrence rate is 0.69%. All the patients with pains have not lasted over 6 months. Age, gender, type of hernia, occurrence of complications and pre-existing underlying diseases showed no correlation with chronic post-operative pain, while the patch suture fixation method showed significant correlation ($P < 0.001$). Four fixation methods were used: 7-stitch, 5-stitch, 3-stitch and 0-stitch patch fixation. Significant differences in post-operative pain incidence were found among the groups. The stitch-free method did not increase postoperative complications.

Conclusion: Multiple factorial analyses demonstrated that patch fixation method is an independent risk factor for chronic pains after tension-free inguinal hernia repair under local anesthesia.

P-1119
Analysis of the occurrence of female pelvic floor hernia patients and the levels of menopause and estrogen
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Abstract: Objective to study the relationship between the occurrence of female pelvic floor hernia patients and the levels of menopause and estrogen.

Methods: The female patients with pelvic floor hernia admitted in out hospital were divided into two groups, according to whether they have the menopause or not. The levels of estrogen were detected, respectively in the two groups, and the difference was compared and analyzed.

Results: The estrogen levels of patients before and after menopause were significantly lower than normal control groups; ($P < 0.05$). The difference is statistically significant.

Conclusion: Significant decrease of estrogen level is a high risk factor for women with pelvic floor hernia, and also is one of the important reason of higher incidence of pelvic floor hernia for women after menopause.

P-1121
Absorbable and permanent mesh for complex abdominal wall: a multicenter prospective study
Hernias University Hospital

Background: Retromuscular mesh reinforcement after posterior component separation techniques are increasingly being used in complex incisional hernias.

Methods: Patients undergoing open retromuscular or posterior component separation technique with a double mesh reinforcement, in 4 European referral centers, and a minimum follow-up of 6 months. Only patients with grade II or grade III complexity according to Slater’s classification were included. The absorbable mesh is made of polyglycolic acid and carbonate trimethylene (BioA®). This mesh was used to reinforce posterior layer and separate the peritoneum from a large piece of medium density polypropylene mesh that was only fixed cranially and caudally. The initial rigidity of absorbable mesh helped to extend and maintained the PP mesh in place.

Results: 170 patients were operated with a mean 61 years (32–86) and BMI 30.5 (21–54), 31% were diabetic and 36% smokers. Mean Cedar scale was 29.9 (7–90). Hernias included: 80 midline (M1-M5), 59 lateral (L1–L4), 31 midline + lateral. Maximum mean hernia defect was 12.8 cm (4–40). The VHWG classification was: 28% type I, 50% type II, 18% type III and 4% type IV Complete closure of anterior layer was achieved in 60%. Surgical technique was: 19 Rives-Stoppa-Wantz, 134 TAR, and 16 retromuscular preperitoneal. 3 cases were operated in emergency situation and another 22 had simultaneous dermolipectomy. Mean hospital stay: 8.7 days. There were 3 postoperative deaths. Wound morbidity was: 20% seromas, 14% hematomas, 12% SSI, 10% partial skin necrosis. 82.9% have been follow-up in outpatient clinic and with a mean follow-up of 18 months (6–54), there were 6 recurrences (3.5%) and 7 buldging (4.5%).

Conclusions: The introduction of an absorbable mesh in combination with a permanent mesh as retromuscular reinforcement achieves excellent results to solve complex cases after a mean 18 months of follow-up.
Mesh fixation during laparoscopic repair of groin hernias with articulating fixation device: short term follow-up

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Background: Different fixation devices have been utilized for mesh fixation when performing LAP repair of groin hernias. The aim of this study was to evaluate the short-term postoperative follow up of patients who underwent laparoscopic repair of groin hernias (TEP or TAPP) with THD articulating fixation device (iMeshTacker™) with absorbable tacks. The reason for using this devise is better control of mesh fixation on the antero-superior aspect of the abdominal wall.

Methods: Fifty three patients were operated during the 7 months period (02/17–07/17) in Herzliya Medical Center with a minimal follow of 30 days. There were two conversions from TEP to TAPP. Three absorbable tacks were applied to standard location: over Cooper ligament and on medial- and latero-anterior border of the mesh. In six patients with large direct hernias, hernia sac was fixed to Cooper’s ligament with a single stitch. All patients were discharged 8–18 h after surgery. All patients were followed 1 week and 1–2 months after surgery. A standard questionnaire was filled with details of postoperative course including pain and physical limitations that could be related to surgery.

Results: Postoperative serous collections occurred in six patients and 1 month later resolved in all but two. Five patients complained on mild testicular pain 1 week after surgery that disappeared in all patients but one a month later. Four patients complained of localized mild pain located to the site of seroma. None of the patients suffered from localized pain or tenderness that could be attributed to tack application sites.

Conclusions: The use of flexible fixation device is feasible and is not associated with any symptoms that could be attributed to tack fixation site.

Hernia basic education in Africa

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Introduction: Hernia operations are one of the most common procedures in General and Visceral Surgery also in Africa. There are a many possibilities to treat Hernias today. Many different operation techniques, a big variety of meshes should be selected as best as possible. In rural Africa the Bassini repair seems to be the gold standard until now. Endoscopic equipment and commercial meshes are frequently not available. But the success in Hernia Surgery is mainly dependent on the skills and experience of the surgeons.

Methods: Since 2015 the Authors developed in German-British collaboration of two humanitarian organizations “Surgeons for Africa” and “OperationHernia” a first standardized training course for younger surgeons in Africa. This education program starts with a 2 days theoretical course including anatomical training, lectures and video demonstrations. The second part includes practical training in small groups in the OR for 3–5 days. The hands on training includes inguinal hernia repair with two standardized open operation techniques (SHOULDICE and LICHTENSTEIN Repair). Furthermore the trainees are trained in local anesthesia. All tutors and presenters of the training course are continuously evaluated by the participants.

Results: The first 2 courses of this Basic Hernia Training with more than 15 participants each took place in Rwanda in 2016 and 2017. A similar training starts by “OperationHernia” organization in Uganda in 2016. We will present the arguments for this training and all results of the continuous evaluation. The evaluation includes also a pre-course assessment of the participants about their personal surgical experience. After the training course the majority of the trainees can provide simple hernia operations alone in a very good standard. Our goal for the sustainability of this project is that today’s trainees could be trainers for the future.
P-1129
International Hernia Collaboration (IHC) guided management of a long term mesh complications post tapp with bladder and pelvic abscesses
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Introduction: 35-year-old male underwent primary laparoscopic repair of right inguinal hernia with release in June, 2008. Post-procedure presented with a pelvic haematoma and subsequent aspiration. Following recovery patient then complained of abdominal bloating, increased urinary frequency and lower abdominal discomfort intermittently for 6 years. In 2017 was referred to a hernia specialist. MRI imaging depicted chronic inflammation, pelvic collections, adherent sigmoid colon and a suspicion of a bladder injury. Patient was then counselled to undergo laparotomy ± bladder wall excision ± colostomy to be performed by a multidisciplinary team (urologist and a General/hernia surgeon) and discussed in the IHC with his permission.

Operative description: Prior to surgery a cystoscopy showed an area of inflammation but urodynamics identified normal bladder function. A midline laparotomy was performed; with a three way urinary catheter in situ. The sigmoid colon was mobilised free. The preperitoneal space was dissected to identify the mesh in a cavity containing dense granulation tissue and pus. Pus sample was taken for culture and sensitivity which isolated a Pseudomonas. Eight protacs were also removed from the cavity. The dissection ensured that there was no damage to the external Iliac vessels, right vas deferens and the bladder. Mesh was cleared off the pubic bone, pectineus fascia, bladder and lateral pelvic wall. A 24 FG drain was left in the in the mesh cavity and removed on day 7 along with his urinary catheter. Total in hospital stay was 9 days and he was discharged with 2 weeks of intravenous piperacillin.

Conclusion: This complicated management of a patient was facilitated by the MDT approach enabled by the IHC. Caveats in his care allude to the on-going pain and suffering as well as urinary symptoms he developed and in cases such as this early investigation and mesh removal is indicated.

P-1131
Open technique in treatment in incisional hernias treated with mesh hernioplasty: our experience
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Introduction: Mesh hernioplasty in the treatment of incisional hernias represents innovation in herniology of abdominal wall defects. It is a hernioplasty, using polypropilene mesh as prosthetic material. The aim of this study is to present our national experience with this technique, based on patients operated in our surgical centers in Serbia in the period from January 1st 2003 up to date.

Method: Prospectively we have analyzed a group of 668 patients (326 men and 242 women) with incisional hernia operated with mesh technique. All patients were classified as ASA I (132 pts), ASA II (174 pts) and ASA III (362 pts). Median age of patients was 54 (43–71). We’ve analyzed operative technique, operating time (total time and time needed for mesh placement), postoperative usage of analgetics, postoperative complications, hospital stay, and time before returning to normal activities.

Results: Trabuco technique was in 31 cases, Rives Stoppa in 546 cases, and 91 patient was treated with Chevrel technique. Average operating time (from incision to lest suture) was 105 min (45–245 min). Average time needed for mesh placement was 42 min (25–68 min). 375 (80.64%) patients needed analgesia on POD1, and 281 (61.29%) on POD2. We have detected following postoperative complications: 31 (6.45%) seromas, 16 (3.22%) hematoma and one urinary infection, all treated conservatively. Average hospital stay was 5.75 days (3–10 days). Return to normal activities was after 3 weeks (5 days–8 weeks). We had 28 recurrences (6%).

Conclusion: Based on our experience, in cases when laparoscopic technique is not possible, open technique with mesh is the best solution in the treatment of incisional hernias.
P-1132

Surgical outcomes of laparoscopic inguinal hernia repair with 3D max mesh implantation

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Introduction: The TEP approach allows for mesh placement within the preperitoneal space, without entering the abdominal cavity. Another benefit of this approach is the avoidance of the incision and closure of the peritoneum typically required in the TAPP approach. We have performed keyhole slit prolene mesh placement nearly for 14 years for the hernia repair, but till 4 years we switched to do 3D mesh inguinal hernia repair for TEP procedure.

Methods: Between 2012 and 2016 we did 159 inguinal hernia repairs by using 3DMax mesh (Bard Davol Inc) implantation for TEP technique.

Results: 69 patients had bilateral inguinal hernia. 32 patients were female and 127 patients were male. Two patients with bilateral hernia were female. Average age of the female patients was 32 years. 29 male patients had prostatic problems, 18 had chronic constipation and 12 had chronic lung disease due to heavy smoking. Average age of the male patients having indirect inguinal hernia (85%) and bilateral type. Patients age > 50 had direct inguinal hernia and nearly 50% bilateral. Average operative time for unilateral hernia was 20 min and for bilateral cases 30 min. We have encountered unilateral epigastric vessel injury in one case having bilateral hernia due to balloon dissection system. Average hospital stay was 36 h. Average follow up of the patients was 51 weeks. One male patient had recurrence following 4 weeks after the procedure and one female patient had femoral hernia following 13 weeks after the indirect hernia repair procedure.

Conclusion: TEP is one of the laparoscopic procedure having the steepest learning curve. The most time consuming part of the operation is to establish prolene mesh with a key-hole slit to the hernia site. 3 DMAX mesh has manufactured as right and left sided and medium and large sizes. It’s very easy to decide the size of the mesh during the operation and the.

P-1133

Randomized clinical trial of transinguinal preperitoneal hernioplasty comparing pre shaped titanium-coated lightweight mesh (Tilene Prep®) and medium-weight mesh

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Introduction: Titanium coating mesh has several excellent features. Compared with polypropylene mesh, it has hydrophilicity, less shrinkage and is easily compatible with tissue. However, there was a disadvantage that mesh development after insertion of the preperitoneal space was hard to compare with mesh of conventional shape addition type. We report on comparing Tilene PREP and Direct Kugel patch for the purpose of evaluating Tilene PREP which is a shaped titanium coated mesh.

Material and method: A total of 40 cases were examined in 20 cases of each case. All cases were treated as men and recurrence, incarcerated cases, femoral hernia cases were excluded. After making of the peritoneal space performed by the transinguinal preperitoneal approach, the mesh was randomizing selected using the envelope method. Mesh insertion time, post operative pain (next day after surgery, 1 week, 3 weeks), postoperative complications and recurrence were examined.

Results: The insertion mean time of all cases was 5 min 38 s, Tilene was 5 min 40 s, Direct Kugel 5 min 33 s, there was no difference. Postoperative pain was evaluated by NRS (numerical rating scale). On the next day, 1 week and 3 weeks later, Direct Kugel was 1.85, 1.45, 0.40 against Tilene 1.85, 1.15, 0.25. There was no recurrence, and two cases of seroma were seen in Tilene.

Discussion: Tilene PREP is equal to or better than Direct Kugel Patch. Tilene PREP has hydrophilicity, has little shrinkage, and has characteristics that are familiar to tissues. In additionally it is not adhered to the intestinal tract even in the peritoneal cavity. Considering the nature of the mesh, it is thought that Tilene PREP can be used with confidence because the complication is less in the long term.
P-1134
Prevention procedure for the development of inguinal hernia after prostatic surgery
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**Background:** It is well known that inguinal hernia after retro-pubic prostatectomy is a common adverse event. We have evaluated our series of inguinal hernia after prostatectomy and assessed the effect of simultaneous prevention procedure carried out at prostatectomy.

**Object and method:** From 2004 to 2016, 77 patients who were carried out retropubic prostatectomy at single cancer center and diagnosed as postoperative inguinal hernia were referred to our institution. At this cancer center dissection of peritoneum from vas deference and transection of processus vaginalis was carried out as prevention procedure for inguinal hernia from 2009. Incidence of inguinal hernia and association of prevention procedure were compared and the effect was evaluated.

**Results:** Break down of the treated hernia was lateral hernia: 97, and medial hernia: 3. Patients were classified into two groups by the prevention procedure (Group-pre without prevention and Group-post with prevention). Incidence of inguinal hernia in the Group-pre was 6.9% (54/781) and that in the Group-post was 3.1% (23/737). By cumulative observation onset of inguinal hernia among Group-pre was (4.1%: 1 year, 5.2%: 2 year, 5.5%: 3 year, 5.6%: 4 year, 6.3%: 5 year). Those among Group-post were (1.9%: 1 year, 2.3%: 2 year, 2.9%: 3 year, 3.4%: 4 year, 2.8%: 5 year) respectively. Incidence of inguinal hernia in the Group-pre was statistically higher than that in the Group-post (p < 0.01, 2 year, 3 year, 4 year, p = 0.09 by Chi square). Mean interval of prostatectomy and onset of hernia was 8 months in the Group-pre and 9 months in the Group-post. The difference was not statistically different. (p = 0.73: Mann–Whitney test).

**Discussion:** Our result demonstrated that simple prevention procedure could satisfactorily reduce the incidence of inguinal hernia by 60%. These results suggested possible role of processus vaginalis in development of inguinal hernia. Dissection of peritoneum and transection of processus vaginalis can be easy but effective prevention for inguinal hernia after prostatectomy.

P-1136
Incarcerated abdominal wall hernia: single-center experience on 180 cases
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**Objectives:** Incarcerated and strangulated abdominal wall hernias are life-threatening conditions requiring prompt surgical intervention, irrespective of location. In addition, emergency hernia repair carries a substantial morbidity and mortality risk. The aim of this study was to share the experiences and outcomes of treatment of incarcerated abdominal wall hernia in a large teaching hospital.

**Methods:** This is a retrospective analysis of electronic patient charts. All patients who underwent surgery for incarcerated abdominal wall hernias from January 2009 until December 2015 were analysed. Pre-, peri- and postoperative parameters were analyzed. The validated Clavien-Dindo classification (CDC) was used for post-operative morbidity and mortality analysis.

**Results:** A total of 180 patients were included for analysis. Male to female ratio was 105:75. Median age was 65 years (range 23–91). Mean BMI was 29.4 kg/m². Fifty-one patients were ASA-score 1; 72 patients ASA 2; 55 patients ASA 3 and two patients were ASA 4. The majority of patients presented with an incarcerated umbilical hernia (n = 68, 37.8%), followed by 40 patients with an inguinal hernia (22.2%) and 36 patients with an incisional hernia (20.0%). In 92 cases (51.1%), hernia contents were strangulated, and bowel resection was performed in 26 patients (14.4%). Overall post-operative morbidity rate was 42.2% (n = 71). Thirty percent were CDC1–2 (n = 55), 11.6% CDC3–4. Thirty-day mortality in our series was 5.0% (9/180). ASA 3–4, age > 75 and bowel resection were associated with significantly higher post-operative complications (p < 0.05). Mesh repair in incarcerated hernias was not associated with higher post-operative morbidity compared to primary repair (p = 0.2).

**Conclusion:** Surgeons must be aware of the increased post-operative risks in older patients, patients with significant comorbidities and after hernia repair with bowel resection.
P-1137
Open transperineal repair of giant perineal repair with synthetic mesh: literature review and case report
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South Pointe

Introduction: Perineal hernia is a rare but known complication following abdominoperineal resection (APR). Surgical repair via open transabdominal, transperineal and laparoscopic approaches has been previously described. We report a recent case of an elective repair of a large reducible hernia via perineal approach with a polypropylene mesh after laparoscopic abdominal perineal resection for rectal cancer. The goal of this paper is to show that a polypropylene mesh can safely be used after an APR.

Presentation of case: A 69-year-old male was diagnosed with T3N1M0 rectal cancer and underwent chemotherapy and radiation. After completion of neoadjuvant therapy he underwent a laparoscopic APR. One year after the operation the patient presented with a large symptomatic bulge. A contrast enhanced computer tomography showed herniation of small bowel through the pelvic floor without obstruction. The patient underwent an elective perineal hernia repair with polypropylene mesh via perineal approach. The mesh was attached to pelvic outlet—presacral fascia, ischiosacral ligament, ischial tuberosities, internal obturator. Anatomical details and technique are graphically described. There were no complications and no recurrence for a 6 month follow-up.

Discussion: Perineal hernia after APR is a rare reported complication. There have been reports of prophylactic mesh placement at time of primary operation, rotational muscle flaps, abdominal and perineal approaches with biological or polypropylene mesh at subsequent surgery. A review of literature is done to decide on the best approach to repairing these hernias.

Conclusion: After initial APR the perineum is a clean area and polypropylene mesh can be safely placed for repair of the hernia with low risk of infection and recurrence.

P-1138
Surgical management of postoperative mesh infection of inguinal hernia
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Background: Mesh infection after herniorrhaphy is only 0.08–0.66% in published studies but a potentially serious adverse event that usually requires removal of the mesh and abdominal wall reconstruction. This study aimed to review and summary 14 years experiences of surgical management of infected mesh after inguinal herniorrhaphy in a single Chinese centre.

Methods: In this study, we reviewed the 55 patients who developed mesh infections after inguinal herniorrhaphy and underwent operative removal of the infected mesh and or abdominal wall reconstruction from 2004 to 2017. Reoperations and readmissions after mesh removal, total healing time, and total cost of hospital stay were calculated.

Results: 55 patients who underwent removal of the infected mesh were separated into 2 groups: partial mesh removal (PMR) (n = 12), and complete mesh removal (CMR) (n = 43). 8 of 12 in the PMR group required reoperation for the removal of residual fragments of infected mesh. When comparing PMR versus CMR as median (interquartile range) values, the total cost of hospital stay (in Renminbi) was 24,308 (14,217–28,167) versus 13,912 (11,006–18,762) (P = 0.009) and the total time (weeks) until successful resolution of the infected mesh problem was 42.3 (1.7–91.7) versus 1.6 (1.3–2.3) (P = 0.002). In 6 of our 53 patients, the biologic prosthesis was employed to a reconstructed abdominal wall while other 47 performed traditional tissue repairs.

Conclusion: Compared with partial removal of infected mesh, complete removal has a greater rate of cure with less cost and a much shorter time to wound healing. In partial of these patients, the biologic prosthesis may be required to perform abdominal reconstruction for strengthen abdominal wall and prevention of a recurrent hernia.
P-1139
Safe adoption of robotic transversus abdominis release (rTAR) technique in an integrated healthcare delivery organization
First Surgical Consultants

Purpose: The robotic transversus abdominis release (rTAR) technique is considered a procedure with a steep learning curve. We examined our early outcomes.

Method: This is a retrospective analysis of prospectively collected data. All consecutive patients undergoing attempted rTAR at Kaiser Permanente Northern California were included. These cases included the first rTAR operation for all authors.

Results: Between November 2015 and July 2017, 16 patients underwent rTAR incisional hernia repair by 5 surgeons without conversions. Patients were on average 64 ± 10.2 years old and had an average of 2.8 ± 1.3 abdominal operations. All patients had BMI < 35 kg/m² (avg 28.9 ± 3.4 kg/m²). Average defect size was 9 ± 1.9 cm (range 6–12) wide and 18 ± 5.6 cm (range 11–28) long. Uncoated MWPP meshes were used in all cases. The average mesh size used was 29 ± 3.7 (range 22–38) cm wide and 34 ± 4.7 (range 26–43) cm long. Average EBL was 30 ± 14 ml. Average cut-to-close time was 413 ± 84 (range 310–526) min. Length of stay was 2.2 ± 1.5 (range 1–6) days. Drains were left within the retrorectus space in all patients and removed on POD 13 ± 5.8 (range 7–30). There were no SSI, SSO or systemic complications within 30 days. Patients have been followed out 168 ± 162 (range 20–515) days. There have been no hernia recurrences to date.

Conclusion: We demonstrated that rTAR can be safely instituted and adopted across an integrated healthcare organization with good results.

P-1140
Reoperative incisional hernia repair in morbidly obese: short-term outcomes from a single institution
Cleveland Clinic Florida

Background: Obesity is a known risk factor both for developing an incisional hernia and for its recurrence. We compare our result of primary and reoperative ventral hernia repairs in obese patients.

Methods: We retrospectively reviewed the AHSQC database for patients who underwent ventral hernia repair at Cleveland Clinic Florida from November 2012 to May 2017. We selected patients with a BMI > 30 and we compared demographics, peri-operative and 30-days outcomes between those undergoing first time hernia repair with those who had previous repairs. Continuous variables were compared using Student T test whereas categorical data were analyzed with Chi square when applicable.

Results: Out of 281 patients who underwent incisional hernia repair, 166 (59%) were obese (BMI > 30). Of those, 66 (39.8%) patients previously underwent an incisional hernia repair (Group 1), whereas 100 (60.2%) had first time incisional hernia repair (Group 2). There was significantly higher prevalence of hypertension in the first group (69.7% (n = 46) vs 49% (n = 49), p = 0.008); no significant differences were reported based on demographics such as age, race, gender, BMI and other comorbidities (Table 1). The comparison showed no significant difference in technique (laparoscopic vs open, operative time, myofascial release, use of mesh, fascial closure, hernia and mesh size, drains used) and only one intra-operative complication in the second group [1.5% (n = 1) vs 0% (n = 0), p = 0.217] (Table 2). Recurrent hernias were more frequently operated in emergency settings compared to primary repairs (16.6% (n = 11) vs 5% (n = 5), p = 0.013), and reported a higher rate of readmissions [10.6% (n = 7) vs 3% (n = 3), p = 0.044]. Post-op outcomes such as length of stay, surgical site infections/occurrences and complications showed no significant differences (Table 3).

Conclusion: Either laparoscopic or open recurrent incisional hernia repair in obese patients seems to be relatively safe and effective. Recurrent incisional hernias tend to require emergency operation and are associated with a higher readmission rate.
P-1141
Outcomes of inguinal hernia repair in octogenarians and older in Belgrade Hernia Service
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Introduction: Surgery in elderly patients can be challenging because of lower physiological reserves and increased comorbidity. With increasing longevity, the incidence of inguinal hernia in the elderly is also increasing. Thus, more patients require surgical treatment. In 2012, Belgrade Hernia Service, a department with a special interest in inguinal hernia, based on short-stay surgery principles, was established within University Hospital. Our aim was to review the current management and the outcomes of inguinal hernioplasty in octogenarians and older performed in Belgrade Hernia Service.

Methods: The records of patients aged 80 and more undergoing elective Lichtenstein inguinal hernioplasty between 2012 and 2017 were reviewed. Data were analyzed regarding demographics, American Society of Anesthesiologists (ASA) classification, type of anaesthesia, complications, recurrence, hospital stay, unplanned admissions and return to normal daily activities. Patients were evaluated before hospital discharge, at 7th and 28th day and annually after the operation.

Results: 68 males and 4 females of mean age 83.93 (80–92) were operated under local anaesthesia, with 24-h hospitalisation. ASA-type 2 and 3 were the most common. No perioperative complications were reported, Postoperative haematoma developed in 3 (4.14%) patients, wound seroma in 5 (7%) and superficial surgical site infection in 2 (2.76%). Readmission in the first 48 h was recorded in 1 patient due to urinary retention. No patient developed deep surgical site infection. Patients have returned to normal daily activities in 5 days. At follow-up, recurrence rate was 1.38%.

Conclusion: Our data suggest that elective Lichtenstein inguinal hernioplasty under local anaesthesia in octogenarians and older has a good outcome and can be safely performed after good preoperative assessment and selection. Elective hernia surgery in elderly with symptomatic hernias should be considered in order to avoid the increased risks of emergency hernia repairs.

P-1142
Prospective multinational trial of a composite mesh for open primary ventral hernia repair: two year results of the panacea study
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Background: The Parietex™ Composite Ventral Patch (PCO-VP) is a monofilament polyester mesh with four fixation points and absorbable expanders to support mesh placement covered by a bioabsorbable hydrophilic collagen film to minimize visceral attachment. The PANACEA study assessed clinical outcomes following open intraperitoneal implantation of PCO-VP for primary ventral hernia repair.

Methods: Primary ventral hernias were repaired by open repair with PCO-VP, and patients were assessed at 1, 6, 12, and 24 months for adverse events, pain, and quality of life (QOL). The primary endpoint was recurrence rate evaluated by ultrasound at 24 months per protocol.

Results: 126 patients (110 with umbilical hernia and 16 with epigastric hernia) with a median hernia diameter of 1.7 cm (0.4–4.0) were treated with PCO-VP, of which 100 completed the 2 year study. Cumulative hernia recurrence was 3.0% (3/101; 95% CI 0.0–6.3%) within 24 months. Numeric Rating Scale pain scores improved from a median of 2.0 (0.0–10.0) at baseline to 0.0 (0.0–6.0) at 24 months (P < 0.001). Median global Carolina’s™ Comfort Scale score was 1.0 (0.0–36.0) at 1 month, compared to 0.0 (0.0–29.0) (P < 0.001) at 12 months and 0.0 (0.0–39.0) (P < 0.001) at 24 months post-surgery. A low superficial wound infection rate was seen (4%, 5 patients) and no mesh infection was observed. On average, subjects were able to drive a car, perform housework, and return to shopping within a week of the procedure, and return to work and play sports within 2 weeks of the procedure. Finally, at 24 months, 99% (102/103) of patients were satisfied with their repair.

Conclusion: At 24 months postoperative, PCO-VP demonstrated positive quality of life, patient comfort and satisfaction ratings. Additionally this intraperitoneal mesh device revealed a low rate of recurrence, with minimal postoperative pain, suggesting long-term efficacy in primary open ventral hernia repair.
The feasibility of single incision laparoscopic tapp with common laparoscopic instruments

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Background: In recent years, single incision laparoscopic (SIL) hernia repair have been reported in some clinical centers by using the triports and the curved laparoscopic instruments. However, this technology is very expensive for some people. How can we benefit more people to meet their needs for reduce the port-related morbidities and improve cosmetic outcomes? This study aimed to assess the safety, efficacy and cost effectiveness between SIL TAPP approaches with common laparoscopic instruments and conventional laparoscopic (CL) TAPP.

Methods: We analyzed the results of patients who underwent either CL or SIL TAPP with common laparoscopic instruments for inguinal hernia between June 2015 and June 2017 in Affiliated Hospital of Nantong University. Patients’ demographic details, type of hernia, operative time, mesh used, post-operative complications and the costs were compared.

Results: There were 26 patients in SIL compared to 23 in CL group. SIL vs. CL showed: age—46 ± 3.26 vs. 55 ± 2.93, p < 0.05; post-operative pain—day one 1.0 vs. 3.0, p < 0.05; operative times—unilateral 48.0 vs. 39.0 min, p < 0.05 and bilateral 81.0 vs. 60.0 min, p < 0.05; cosmetic scar scores 12.0 vs. 24.0, p < 0.01; costs of ports/trocars for SIL and CL were RMB 400 and RMB 400.

Conclusion: Our results have shown that in experienced hands, SIL TAPP with common laparoscopic instruments is safe and as feasible as CL. In addition, this technology improves the cosmetic outcomes significantly, but because it is much cheaper than the use of triports, it is likely to be widely used.

Incarcerated inguinal hernia with ipsilateral obturator hernia: laparoscopic repair

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Introduction: Acute inguinal hernias are common surgical emergencies and can be repaired with open or laparoscopic surgery. One of the advantages of laparoscopic surgery is that it allows the surgeon to explore the complete area, making the diagnosis of multiple hernia defects possible.

Presentation of case: An 87-year-old woman presented with abdominal pain, nausea and intermittent bowel obstruction symptoms. On exploration, pain was located in lower right abdomen, as well as right inguinal bulging. Plain radiograph of abdomen showed intestinal dilatation. Laparoscopic repair was decided, with intra-operative findings of incarcerated right direct inguinal hernia and ipsilateral obturator hernia. A TAPP repair was chosen to repair both defects. Postoperative period was uneventful.

Discussion: Incarceration and strangulation are one of the most severe complications of the inguinal hernia. It is very important to release incarcerated hernia as soon as possible to avoid obstruction or strangulation of the bowel. Several advantages are shown with the TAPP technique, allowing a better exploration of the inguinal area, as well as assessing the viability of the intestine after the reduction of the hernia contents. In few cases, the TAPP procedure also allows the discovery of additional intra-abdominal pathologies and their possible simultaneous treatment. Obturator hernia is a very rare condition that appears more frequently in elder women. Diagnosis is difficult and is often found incidentally. Surgical treatment is required at the time of diagnosis. The advantages of laparoscopic surgery include less post-operative pain, shorter hospital stay and lower complications. In conclusion, the laparoscopic approach is a feasible option for incarcerated inguinal hernia. As described above, the TAPP repair allows a complete inguinal area visualization and correction of multiple hernia defects with the use of a polypropylene mesh.
P-1146
Pitfalls and clinical recommendations of the primary lumbar hernia; a systematic review of the literature
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**Purpose:** The lumbar abdominal wall hernia is a rare hernia in which abdominal contents protrude through a defect in the dorsal abdominal wall, which can be of iatrogenic, congenital or traumatic origin. Two anatomical locations are known: the superior lumbar triangle and the inferior lumbar triangle. The aim of this systematic review is to provide a clear overview of the existing literature and make practical clinical recommendations.

**Methods:** The systematic review was conducted according to the PRISMA-guidelines. A systematic search in Pubmed, MEDLINE and EMBASE was performed and all studies reporting on primary lumbar hernias were included. No exclusion based on study design was performed, making this the largest dataset up-to-date. Data regarding incarceration, recurrence, complications and surgical management were extracted.

**Results:** Out of 670 eligible articles, 13 were included and additional single case reports were analysed separately. The quality of the included articles was 5.7 on average according to the MINORS index (0–16). The occurrence of lumbar hernia is the highest in the superior lumbar triangle (55%). Risk factors are related to increased intra-abdominal pressure, like in other hernias. CT-scanning should be performed during pre-operative workup. The treatment is challenging due to weakness of the abdominal wall and bordering bony structures. Available evidence favours laparoscopic mesh reinforcement, saving open repair for larger defects. Incarceration was observed in 21.1% of the cases, 1.8% had a recurrence after surgical repair. Hematomas and seromas are common complications, but surgical site infections are relatively rare.

**Conclusion:** Pre-operative CT-scan and laparoscopic mesh repair are the suggested standards for diagnosis and treatment of dorsal lumbar abdominal wall hernias. Due to the high risk of incarceration in lumbar hernias a timely elective repair is indicated. The low incidence of lumbar hernias reduces research possibilities and inclusion of different study designs is a limitation of this review.

P-1147
Adhesion awareness 2016: a National Survey of Dutch Surgeons
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**Introduction:** Abdominal surgery leads to adhesion formation in 93% of all patients and is associated with chronic abdominal pain, small-bowel obstruction, female infertility and adverse events during future surgery because of adhesiolysis. Ten-years postoperatively, a third of the patients is readmitted with a mean rate of 2.2 times per patient. The impact of adhesions is mismatched with the involvement in the informed consent process according to the 2010 Adhesion Awareness survey. The survey was repeated to assess the progress of adhesion awareness in the Netherlands.

**Methods:** The 2010 Adhesion Awareness survey was repeated after a literature update. The knowledge on the impact of adhesions; the use of anti-adhesive agents and involvement in the informed consent process were addressed. The questionnaire was distributed to all Dutch surgeons and surgical trainees by e-mail. The data was analysed by Chi square test and independent student t-test; and corrected for multiple testing.

**Results:** The response rate was comparable with 2010 (32.6 and 34.4% respectively). The majority (88.1%) agreed that adhesions are clinically relevant, similarly to the 2010 survey (89.8%). The score on the knowledge test was 38.8% on average, not significantly different from 2010 (37.2%). Only 11.8% replied a correct 10-year readmission rate and 93.4% underestimated the necessity of infertility treatment in females after abdominal surgery. The percentage of patients informed regarding adhesions after a laparotomy increased, but not significantly. Still, 32.5% almost never mention adhesions during the informed consent procedure.

**Conclusion:** Adhesion awareness among surgeons in the Netherlands did not increase over the last 6 years, despite all the efforts that were made during symposia, congresses, published meta-analysis and even newspaper articles. Improvement of knowledge and behavior is essential to narrowing the gap between the impact of adhesions as a major complication of abdominal surgery and the apparent limited adhesion awareness among Dutch surgeons.
P-1148
Postoperative pain after lichtenstein repair using a self-adhering mesh: a systematic review and meta-analysis
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Introduction: Chronic postoperative pain after open inguinal hernia repair is present in 10–12% of the patients. Research has focussed on less/non-traumatic mesh fixation using glue’s or self-gripping meshes. The aim of this meta-analysis is to evaluate all randomized controlled trials comparing any self-adhering fixation technique with sutured mesh fixation regarding the effect on acute and chronic postoperative pain after a Lichtenstein repair.

Methods: This meta-analysis was performed according to the PRISMA-guidelines and registered at PROSPERO (nr: CRD42017056373). Pubmed, Embase and Cochrane CENTRAL databases were systematically searched. The primary outcome, chronic pain, was defined as a VAS-score ≥ 3 at 12 months postoperatively. Subgroup analysis included different fixation methods.

Results: 23 studies were included with a total population of 5387 patients. A self-adhering mesh reduces VAS-scores 1 week (MD - 0.49, 95% CI - 0.81 to - 0.17, p = 0.003) and 1 month postoperatively (MD - 0.31, 95% CI - 0.58 to - 0.04, p = 0.02), compared to suture fixation. Though after 12 months, no difference in the prevalence of chronic pain is found (OR 0.70, 95% CI 0.30–1.66, p = 0.43). Subgroup-analysis showed a significant lower VAS-score for cyanoacrylate-glue fixation 1 week and 1 month postoperatively (p = < 0.0001). Fibrin-glue fixation showed a lower prevalence of chronic pain after 12 months (p = 0.003). The self-gripping mesh showed no significant pain reduction at all time-points. There was no difference in recurrence rate or complications between groups (p > 0.05).

Conclusion: This meta-analysis compares clinical options for self-adhering fixation of a mesh with suture fixation in a Lichtenstein repair and currently includes the largest population. Self-adhering fixation methods show a significant reduction in postoperative VAS-score in the short-term after Lichtenstein repair, but the clinical relevance is questionable due to the limited reduction in VAS-score. The recurrence rate or the occurrence of other complications was not higher compared to the suture group after 1-year follow-up.

P-1150
A retrospective analysis: a single-center experience in the management of open primary incisional hernia mesh repair
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Abstract
Objective: To analyze and assess the clinical efficacy of open primary incisional hernia mesh repair.

Methods: Clinical data of 601 cases of open primary incisional hernia mesh repair from Dec. 2002 to Dec. 2013 in Huadong Hospital were analyzed. The cases were categorized according to surgical mesh types. The data of recurrence, wound infection, chronic pain, patch infection, intestinal fistula and seroma and other complications were analyzed.

Results: There were 5 deaths (0.8%) after the operation. After a mean follow-up of 3 years, there were 23 cases (3.8%) of recurrence, 40 cases (6.7%) of wound infection or fat liquefaction, 5 cases (0.8%) of chronic pain, mesh infection in 10 patients (1.7%), intestinal fistula in 12 patients (2.0%), seroma in 6 cases (1.0%). Compared with the use of Proceed mesh, using GORE-TEX DualMesh or Composix Kugel Patch patch had a higher incidence of wound infection (P < 0.01), while Composix E/X Mesh patch had no significant difference in the incidence of wound infection (P > 0.05). The incidence of mesh infection of GORE-TEX DualMesh was significantly higher than PROCEED (P < 0.01).

Conclusion: Open primary incisional hernia mesh repair for incisional hernia treatment is safe and effective. We recommend using different meshes for different patients for best efficacy.
P-1151
current practice of abdominal wall closure and incisional hernia treatment: a Dutch survey
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Purpose: Incisional hernia after laparotomy is associated with morbidity for patients and incurs costs for surgeons and general society. Although much research is performed on improvement of surgical technique to prevent incisional hernia development, little is known on its application and current practice. Therefore, a survey was performed among Dutch surgeons.

Methods: All members of the Dutch Surgical Society were invited to participate in a 28-question online survey on technique and materials used for abdominal wall closure after midline laparotomy and on opinions and treatment of incisional hernia. We performed a subgroup analysis of surgical subspecialties.

Results: 402 surgeons completed the survey, representing 97% of all Dutch surgical departments. Overall response rate was 26%. Most respondents close the abdominal fascia in a single mass layer, using a monofilament slow absorbable running suture. Preferred choice of suture size, size of bites and steps and wound-length to suture-length ratio is variable. Surgical trainees, gastrointestinal and oncologic surgeons prefer smaller sutures and higher wound-length to suture-length ratios when compared to trauma, vascular, pediatric and general surgeons. General knowledge on incidence and risk factors of incisional hernia was good. Laparoscopic and open repair of incisional hernia are equally popular among respondents. A mesh repair in sublay position, fixated with sutures is the most popular treatment for incisional hernias larger than one centimeter.

Conclusion: This is the largest survey to date investigating current practice of abdominal wall closure and incisional hernia repair. While all respondents prefer mass closure with slow absorbable sutures, the ‘small steps and bites’-technique is more prevalent among surgical trainees, gastrointestinal and oncologic surgeons. This offers an opportunity for these subspecialties to disseminate evidence-based techniques to their colleagues.

P-1152
Laparoscopy for female inguinal hernia repair
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Laparoscopy today seems an attractive approach for all inguinal hernias, particularly in females due to the greater prevalence of femoral hernia or obturator hernia. In open repair these synchronous hernias are often missed.

Between January 2006 and July 2016, 66 consecutive female patients underwent laparoscopic repair for groin hernia. The patient demographics, operating time, type of hernia, conversion rate, intraoperative and postoperative complications and recurrence were measured. 52 patients had inguinal hernia, 6 femoral hernia, 2 inguinal with obturator and 6 both inguinal and femoral hernia. 57 patients underwent a totally extra-peritoneal (TEP) repair and 9 patients underwent a trans-abdominal pre-peritoneal (TAPP) repair. 1 patient in TAPP and 6 patients in TEP group underwent SILS.

62 patients had primary and 4 recurrent hernia. Of these 4 patients who presented with recurrence, one patient had a femoral recurrence immediately after a previous open repair of an inguinal hernia suggestive of a possible missed femoral hernia. One patient with was found to have a synchronous femoral hernia and 2 with obturator hernia along with an inguinal were not detected preoperatively. An inguinal with a synchronous occult hernia was only diagnosed during the laparoscopy. The overall mean operative duration was 62 min (range 34–112 min). One patient required conversion to open due to adhesions from previous surgery. Three patients developed seroma, one bruising around 10 mm port site and one hematoma postoperatively. No recurrences were recorded.

Laparoscopic repair offers accurate diagnosis and simultaneous treatment of both inguinal and femoral hernia with minimum morbidity and good clinical outcomes. Laparoscopic repair has become the procedure of choice for the treatment of the majority of groin hernia in women at our institution.
Occult hernias during laparoscopic inguinal hernia repair: a single centre experience

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Laparoscopy by offering magnification and better vision provides us the opportunity for clear visualization of the myopectineal orifice. This gives the advantage to visualize presence of occult hernia. The aim of our study was to assess the potential of the laparoscopic approach for inguinal hernia repair in detecting occult hernias in an Asian population.

From January 2013 to April 2016 all patients who underwent an elective laparoscopic inguinal hernia repair were prospectively studied. Retrospective analysis of prospectively collected data was done. Parameters evaluated included patient demographic, operative technique used, operative time, type of groin hernia detected and postoperative complications.

A total of 443 patients underwent laparoscopic inguinal hernia repair. This included 202 unilateral and 231 bilateral cases, with total of 664 groins hernias. Indirect hernias were the most common, followed by direct and then femoral hernias. There were 420 male and 23 female patients. In all 80 occult hernias were found: 1 spigelian hernia, 20 obturator hernias and 59 femoral hernias. 53 patients developed seroma, most were managed conservatively except 3 cases who needed aspiration and 1 patient excision. Peri-port bruising was noticed in 21 patients and 14 patients had hematoma all managed conservatively. Seven off these patients were on aspirin, clopidogrel or warfarin pre-operatively. Superficial wound infection documented in nine patients. Three patients had postoperative urinary retention. Only one patient developed chronic groin pain and is on medical management. No recurrence was documented till date.

The laparoscopic inguinal hernia repair by providing better vision and magnification gives us an opportunity to detect unexpected or occult hernias which can be repaired during the same setting and thereby reducing the chance of recurrence and possible need for second surgery.

Tailored laparoscopic approach in large inguino-scrotal hernias: a single centre experience

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Endolaparoscopic repair of inguinal hernias is becoming the widely accepted approach. In this study, we reviewed our series of patients undergoing Endo-laparoscopic repair of large inguino-scrotal hernias in a limited period of time.

Between March 2013 and July 2015, 50 patients with inguino-scrotal hernias underwent laparoscopic inguinal hernia repair. Patient demographics, hernia characteristics, operating time, surgical technique, conversion rate, intraoperative and postoperative complications and recurrence were recorded, measured and analyzed using MS Excel software.

50 patients who underwent laparoscopic inguinal hernia repair were recorded, 47 patients underwent total extraperitoneal (TEP) inguinal hernia repair and 3 patients underwent transabdominal pre-peritoneal (TAPP) inguinal hernia repair. 26 patients had unilateral hernia and 24 patients had bilateral hernias. The mean age was 45 years old. The mean operation time was 74 min for unilateral hernia and 116.5 min for bilateral hernia. Three patients (6%) required a combined open surgery to transect the incarcerated omentum. There was no mortality. Morbidity was limited to seroma formation in 13 (26%) patients and 2 patient of the combined laparoscopic-open approach had wound infection treated with dressing and antibiotics. Mean Follow up was 27 weeks. There were no recurrences. All patients were discharged within 23 h.

We conclude that the laparoscopic approach can be safely employed for the treatment of complicated inguinal hernias as inguino-scrotal; surgical experience in endolaparoscopic hernia repair is mandatory with tailored technique in order to reduce to minimum morbidity and to achieve good clinical outcomes with acceptable recurrence rates.
P-1155
Two year results of incisional and primary ventral hernia repair with a novel three-dimensional textile composite mesh: the Symchro registry study
Clinique Saint Charles

Background: The SymCHro study assessed patient outcomes and surgeon satisfaction following ventral hernia repair with Symbotex™ composite mesh, a three-dimensional monofilament polyester mesh that contains an absorbable collagen barrier on one side to minimize tissue attachment.

Methods: SymCHro is a multicentric observational registry study of 100 consecutive patients in the Club Hernie database who underwent ventral hernia repair with Symbotex™ composite mesh. The primary objective is to assess recurrence and complications within 2 years of surgery.

Results: One hundred consecutive patients from the Club Hernie database were treated for a total of 105 hernias (39 primary, 66 incisional; 77 repaired laparoscopically, 20 open, 3 open to laparoscopically) with a mean defect area of 5.2 ± 5.6 cm² (0.8–28.3) for primary hernias and 31.9 ± 38.7 cm² (1.6–188.5) for incisional hernias. Patient follow-up after 2 years was 93% (93/100). Six (6.0%) low-grade seromas (unrelated to the mesh) and 3 (3.0%) cases of low-grade transitory ileus (mesh or procedure relationship unknown) occurred perioperatively or within 1 month follow-up. One (1.0%) recurrence occurred within 1 year. No additional adverse events occurred within the 24 month follow-up and no serious adverse events were reported. Patient pain, assessed by Visual Analog Scale dropped significantly from 4.7 ± 2.5 (0–10) at baseline to 0.2 ± 0.7 (0–3) at 3 months postoperative. At 24 months, 86 patients (95%) rated their hernia repair satisfaction as good or excellent. Overall, 96% (94) of surgeons reported satisfactory mesh-memory shape, and all surgeons reported good mesh flexibility and ease of insertion.

Conclusion: These 2 year registry study results show minimal pain, low complication and recurrence rates and good ease of use, suggesting long term efficacy of Symbotex™ composite mesh in ventral hernia repair.

P-1157
The faces of Phasix. P4 Hb and the promising first longtime results. should we change our paradigm for permanent mesh?
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Introduction: For ventral and groin hernias, the use of mesh became state of the art. In case of infected or contaminated places the ridge of decision becomes narrow. Biological meshes were thought to solve the problem of infected hernia situations and complex hernia in high risk patients. However, recent results were disappointing for the benefit of the use of these cost intensive and infection triggering materials. In vitro and animal studies have demonstrated an enhanced bacterial growth and late hydrolysis, after 15–18 months, for P4HB, and a remaining scar tissue of high strength.

Methods and procedures: Between September 2015 and September 2017, 31 Patients were operated for complex and infected hernia, 6 for smaller incisional and groin hernias. The meshes were placed mainly in onlay position, in some cases in sublay or as a supplement enforcement onlay when a permanent mesh was placed as sublay (sandwich), or in TAPP position.

Results: All cases showed a primary healing tendency, no mesh has been explanted, the observation period is 4–24 months (mean 12). The main complication was observed with 2 cases of seromas, one of them infected. 3 patients were re-operated due to skin necrosis. The onlay meshes in these cases were kept in site and were observed with excellent granulation activity (foto documented). No hernia recurrence was seen in the first 12 months, 1 recurrence in the first 24 months.

Conclusions: The use of P4 HB meshes showed to be an excellent plan B for very complicated and infected hernia cases that need repair. Onlay position of these meshes is not an additive risk factor even in complicated skin situation. P4HB mesh can be considered as an alternative to permanent mesh or suture alone for small incisional and groin hernias.
P-1158
Comparative study to analyse quality of life by carolina comfort scale in obese and non obese patients undergoing various type of laparoscopic ventral hernia repair
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Deboshi Sharma

Introduction: Advent of laparoscopic hernia surgery has reduced many complications associated with obesity. We compared QOL in obese and non obese patients using Carolina Comfort Scale (CCS) after various laparoscopic ventral hernia repairs.

Aim: Compare the QOL by CCS in obese and non obese patients undergoing various type of laparoscopic ventral hernia surgery.

Method: Prospective observational study done from October 2014 to March 2017 on patients undergoing laparoscopic ventral hernia surgery (n = 94). Twenty-nine were obese (BMI > 30) (Group I) and 65 were nonobese (BMI < 30) (Group II). Groups were further subdivided into four subgroups based on surgery performed. (A) IPOM (B) IPOM plus (C) ECS + IPOM plus (D) ECS + hybrid Repair. VAS score was assessed post surgery after 24 and 48 h. Quality of life post surgery was assessed by CCS on POD7, POD30, and POD90. We compared VAS and CCS scores in obese and non obese patients in the subgroups. Unpaired t test was used for statistically analysis.

Results: After 24 h and 48 h VAS score was highest in obese ECS (Group I—C) (mean—9.0) as compared to nonobese ECS (Group II—C) (mean—8.6) but it was statistically insignificant (p value—0.28). CCS on POD7 was highest in obese ECS + hybrid (Group I—D) (mean—50.86) as compared to nonobese ECS + hybrid (Group II—D) (mean—43.33) which was statistically significant (p value—0.01). CCS on POD 30 and 90 was statistically insignificant in other groups and their subgroups.

Conclusion: Quality of life was significantly affected in early post operative days in obese patients as compared to nonobese. But as time progressed in both groups QOL was comparable without any statistical significance. Hence complex hernia surgery can be done in obese patients without significantly affecting QOL.

P-1160
Diagnosis and treatment for mesh infection with bowel erosion after open inguinal hernia repair
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Background: Inguinal hernia repairs are the most common elective abdominal wall procedures performed by general surgeons. The use of mesh has become the standard for hernia repair. However, mesh-related complications have become increasingly more frequent. Few reports from the medical literature have presented severe mesh-related complications following open inguinal hernia repair. One of these complications is mesh erosion into bowel. This study was to discuss the diagnosis and treatment for mesh infection with bowel erosion after open inguinal hernia repair.

Methods: From January 2013 to December 2015, 89 cases with mesh infection following open inguinal hernia repair were included, including 7 cases with mesh erosion into bowel. The medical records of these patients were retrospectively reviewed.

Results: Only one patient had diagnosed mesh infection with bowel erosion before operation, and six patients made a definite diagnosis via laparoscopic exploration. Surgical treatment involved separated bowel from mesh via laparoscopic method, bowel resection or repair (laparoscopic or open methods), primary suture, without replacement of a new mesh. All patients were followed up for a mean period of 21 months (range 14–35 months), no wound infection, intestinal fistula, postoperative pain and recurrence were observed.

Conclusions: The rate of mesh infection due to mesh erosion into bowel is 7.9% (7/89). The diagnosis and treatment of mesh infection with bowel erosion after inguinal hernia repair are complicated. Laparoscopic technology plays a significant role in diagnosis and treatment. Using comprehensive surgical treatment can obtain a satisfactory result.
**P-1161**

Laparoscopic mesh removal for otherwise intractable inguinal pain following endoscopic hernia repair is feasible, safe and may be effective in selected patients


Maxima Medical Center

**Background:** Laparoscopic inguinal hernia repair is preferred over an open technique because of reduced recovery time, favorable cost-effectiveness and less chronic postoperative inguinal pain. Nevertheless, some patients develop a nociceptive inguinal pain syndrome possibly related to presence of the mesh. This is the first study describing feasibility, safety and effectiveness of laparoscopic mesh removal in patients with chronic pain after endoscopic hernia repair.

**Methods:** Pre- and intraoperative data of chronic pain patients scheduled for endoscopic mesh removal were prospectively collected by a standard evaluation form. Long term efficacy was determined using pain scores, patient satisfaction and quality of life questionnaire. A Wilcoxon signed ranks test was used to determine significant differences between pre- and postoperative pain scores.

**Results:** Fourteen patients were studied (11 males, median 52 year). Median operating time was 103 min. Conversion to open surgery was not required. One intraoperatively recognized bladder laceration was laparoscopically closed. Otherwise, no intraoperative or postoperative complications occurred. Eight months postoperatively (median), pain scores had dropped from 8 to 4 (p < 0.01). Satisfaction was good or excellent in 10 patients. A recurrent hernia developed in two patients requiring an open mesh repair in one.

**Conclusions:** Laparoscopic mesh removal is a feasible, safe and effective option in selected patients with chronic groin pain after endoscopic hernia repair in hands of an experienced surgeon.

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**P-1162**

Surgical strategies for gastrointestinal cancer metastasis in abdominal wall

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**Objective:** The abdominal wall metastases (AWM) of Gastrointestinal (GI) cancer have relatively less incidence and poor prognosis, we retrospectively reviewed the treatment of such patients in our department and summarized our experience.

**Methods:** We reviewed data from 35 cases who sought care for the AWM of GI in our department. Inclusion criteria: (1) AWM with a diameter ≥ 5 cm whatever abdominal invasion of GI or postoperative AWM; (2) abdominal wall defects with an area ≥ 100 cm² after resection of tumors; (3) immediate functional repair of giant complex abdominal wall defects. R0 resection aimed to eradicate the tumor (n = 13) and palliative surgery aimed to relieve the metastasis-related complication (R2 resection, n = 12) were performed. The giant complex abdominal wall defect created after tumor excision was categorized into three types: type I, defects involving only the loss of skin; type II, myofascial defects with intact skin coverage (20 cases); and type III, myofascial defects without skin coverage (5 cases).

**Results:** The immediate abdominal wall reconstruction was successful in all cases, which were carried out by the reinforcement repair technique and the double patch bridging repair technique. One patient died of operation-related abdominal infection and myelosuppression. Other complications included seroma in two cases and flap necrosis combined with infection in one case. Only two cases with colon cancer developed abdominal wall hernia caused by tumor recurrences. Survival statistics revealed that the postoperative survival time of patients with AWM of colorectal cancer who underwent R0 resection was significantly longer than patients who underwent R2 resection (P = 0.028).

**Conclusion:** The appropriate surgical strategy performed could prolong survival time, alleviate the suffering of incisional complication, and improve the quality of life for patients with AWM of GI cancers.
P-1163
Is there an optimal incision and closure technique for the right upper quadrant to reduce incisional hernia? A systematic review
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Abstract
Background: There is increasing consensus that midline incisions should be closed with the small-bite technique. No such recommendations exist for right upper quadrant (RUQ) incisions. Numerous incisions are employed in this area reflecting differing operations undertaken and surgeon preference. The aim of this review is to determine whether the risk of incisional hernia formation can be minimised for any particular RUQ incision and method of closure.

Method: A literature search was performed using PubMed and Embase to identify studies which analysed rates of incisional hernia in the RUQ of the abdomen. The primary outcome measure was incisional hernia rates for different types of incision and closure technique. Secondary outcome measures, if reported, were overall survival, wound dehiscence and wound infection rates.

Results: Of 106 papers identified, 9 met the criteria for inclusion. Incisional hernia rates varied from 0% (right subcostal incision repaired in two layers) to 30.7% (“Mercedes” incision closed in two layers). Secondary outcome reporting was variable. Long term data on incisional hernia rates are not available for the type of incision or type of closure.

Conclusion: There is insufficient evidence to support any particular type of incision or specific closure technique in RUQ incisions with regard to the risk of incisional hernia formation.

P-1165
Pre-operative progressive pneumoperitonium, herniorraphy and abdominoplasty in the correction of voluminous ventral hernia: report of a case
Hospital Geral Ernesto Simões Filho

RMR, male patient, 37-years-old, Body Mass Index 26.1 kg/m², presented with incisional ventral hernia of large volume and loss of domain, in the mesogastric and infraumbilical areas. Computerized tomography of the abdomen (CTA) showed a hernia in the umbilical area with a hernia sac of 1800 mL of volume, containing bowel loops and a hernial ring of 4.9 cm in width. The relation of hernia sac volume (HSV)/abdominal cavity volume (ACV) was 38%. The patient was submitted to insertion of peritoneal catheter and daily insufflation of 1500 mL of room air into the abdominal cavity was done during 14 days. After 14 days of pneumoperitonium a new CTA revealed an increase of 15% of the abdominal cavity with reduction of the intestinal content of the hernia sac. A herniorraphy was then performed with onlay placement of a propylene mesh and abdominoplasty. The patient evolved without signs of abdominal hypertension such as renal and respiratory failure, and was discharged from the hospital on the 3rd post-operative day (POD) with a drain, which was withdrawn on the 7th POD. Correction of incisional hernias is one of the commonest surgical procedures, since this complication occurs in about 11% of laparotomies. Preoperative progressive pneumoperitonium (PPP) allows increase of abdominal cavity volume, reinsertion of herniated hollow viscera, improved diaphragmatic function, lysis of intra-abdominal adhesions and closure of the abdominal wall without tension. In the present case, as in other reports, an indication of PPP with a HSV/ACV relation of 25% and daily insufflation of 1500 mL for 14 days was adopted, with clinical acceptance of the patient. In spite of the patient not being obese, abdominoplasty was indicated due to the abdominal wall deformity.
A prospective, randomized control study between titanium coating mesh and polypropylene mesh in laparoscopic inguinal hernia repair

Beijing Chao-Yang Hospital, Capital Medical University

Objective: To compare the effect between Titanium Coating mesh and polypropylene mesh in laparoscopic inguinal hernia repair.

Methods: A total of 48 patients performed laparoscopic inguinal hernia repair from January 2016 to June 2016 were included into this study. All patients were divided into two groups randomly, including Titanium coating mesh group (observation group, n = 24) and polypropylene mesh group (control group, n = 24). The operation time, intraoperative bleeding, hospital stay, hospital cost, time return to work and complications were analyzed.

Results: All of the operations were performed successfully. No statistical difference was observed of operation time, intraoperative bleeding, hospital stay, time return to work between two groups (P > 0.05). The difference of hospital cost, incidence of seroma and foreign body sensation were statistically. No recurrence, infection or chronic pain was observed at 1 year follow-up. In observation group, 1 seroma case and 5 foreign body sensation cases were observed. And in control group, 5 seroma cases and 8 foreign body sensation cases were observed with higher hospital cost (P < 0.05).

Conclusion: Using Titanium Coating mesh may decrease the incidence of seroma and foreign body sensation with same risk of recurrence and complications. It is worthy to be used for clinical practice although hospital cost may be higher than polypropylene mesh.

Management of acute mesh infection in a patient with intestinal fistula after correction of incisional hernia: report of a case

Hospital Geral Ernesto Simões Filho

MJS, male, 63-years-old, with a midline incisional hernia, submitted to treatment with placement onlay of polypropylene mesh, evolved with mesh infection and partial dehiscence of the abdominal wall. Debridement and wound dressing were performed with a good evolution. The patient returned after 60 days with an enteroatmospheric fistula confirmed by tomography and severe malnutrition (BMI 18.4; serum albumin 1.8). Antibiotic therapy was started with nutritional support for 14 days. He was submitted to resection of the fistulized blockage to the abdominal wall (descending colon and small bowel loops) and ostomies were done without mesh removal. He was discharged after 14 days with complete resolution of the condition. The usage of a mesh is the gold standard in the treatment of incisional hernias, besides reducing the risk of relapse in at least 30% of cases. Among the complications, wound infection occurs up to 8% and there may be infection of the mesh in 1–2% of cases, even with the usage of prophylactic antibiotics, drains and irrigation of the wound. This situation is an important complication and removal is customary, but the removal may increase greatly the relapse rate, in up to 80%. The main factors associated with mesh infection are the type of mesh and the technique used, besides incisional hernia, old age, obesity, smoking habit, presence of a fistula, malnutrition, and immunosuppression. The treatment recommended currently for early mesh infection is based on wound care, usage of negative pressure therapy or adequate wound care, clinical and nutritional support, antibiotic therapy and culture of secretions. Several reports show that such measures make possible maintenance of the mesh and successful treatment of wall infection in at least 70% of cases, reaching almost 100% when dealing with macropore polypropylene mesh associated with experience of the team.
P-1169
Usage of preoperative progressive pneumoperitonium and component separation for the treatment of giant incisional hernia with loss of domain: report of a case
Hospital Geral Ernesto Simo˜es Filho

RNS, female, 40-years-old, BMI 31.25. The patient had had an incisional hernia for 2 years. Computerized tomography of the abdomen (CTA) showed a hernial ring of 13.85 cm, width of the hernia sac of 19.76 cm, and relation of hernia sac volume (HSV)/abdominal cavity volume (ACV) of 30%. An intra-abdominal catheter was inserted by laparoscopy with daily insufflation of 2000 mL of room air programmed for 14 days, but on the seventh day after the procedure insufflation was interrupted for 2 days because of abdominal discomfort and tachycardia. After the period of PPP, a new CTA revealed an increase of 83.1% of ACV. Subsequently, hernial ring repair was performed with separation of anterior and posterior components and onlay fixation of polypropylene mesh. The patient was discharged from the hospital with a drain on the third postoperative day. Hernias considered giant with width of the hernia sac greater than 15 cm and HSV/ACV relation of more than 25% are candidates for PPP. Determination of the air volume in PPP and the total of applications still remain dependent on the surgeon. The goals to be accomplished with PPP are: gradual increase of intra-abdominal pressure, stabilization of diaphragmatic and ventilatory function, distention of abdominal cavity and muscles, lysis of adhesions, improvement of portal, mesenteric and intestinal circulation to receive again viscera in the abdominal cavity, with vasodilation and increase of macrophage arrival which improve healing. The method of separation of components by dissection of abdominal musculature preserves physiology and is an important resource for repair of hernial ring when aponeuroses do not get close to the linea alba.

P-1170
Open tension-free hernia repair for unilateral primary inguinal hernia: 20 years experience of a single Chinese center
Huadong Hospital Affiliated to Fudan University

Abstract
Objective: Open tension-free hernia repair for the adult inguinal hernia was universally accepted by worldwide surgeons in the last decades. The aim of this study was to summarize the clinical experience of 7626 cases of open tension-free unilateral primary inguinal herniorrhaphy performed from a Chinese teaching hospital setting. Methods: A total of 7626 patients underwent open tension-free inguinal herniorrhaphy between November 1997 to January 2017 at Huadong Hospital Affiliated to Fudan University. All the cases were treated with the different operation of different mesh. The operation procedure, postoperative complications, reoperation rate was evaluated and discussed. Results: In our study, the mean age of patients was 70.6 years. Modified Kugel was most used repair procedure. There were 156 cases of fat liquefaction (2.05%), 61 cases of seroma (0.80%), 24 cases of postoperative hematoma (0.31%), 23 cases of surgical site infection (0.30%), 5 cases of testicular pain (0.07%) and other rare cases like ischemic orchitis, priapism were recorded in early postoperative complications. In 32.2 months mean follow-up, only 31 cases of recurrences (0.41%), 15 cases of chronic pains (0.20%) and 1 case of mesh infection were observed. The total reoperation rate was only 0.87% and there were no deaths in our series. Conclusion: Open tension-free repair is safe and effective for an inguinal hernia. Different procedures have similar clinical outcomes. No matter early or late postoperative complications or even reoperation should be prevented as best as we can. The appropriate operative procedure should be chosen by the surgeon according to individualized principle in different cases.
P-1171
The application of self-made needle in laparoscopic pediatric inguinal hernia repair
Wang X
The Fifth People’s Hospital of Chengdu

Objective: To explore the clinical value on Self-made double-hole needle which use for laparoscopic pediatric inguinal hernia repair.

Methods: To analyzed the data of postoperative that 1532 cases were reviewed, who were divided into the single-hole needle group (652 cases)and the double-hole needle group (880 cases), all of they were treat by Laparoscopic from April, 2006 to April, 2016.

Results: The average operation time of the group of single-hole needle was 17.7 min which 4.4 ml blood loss; 23 cases suffered small hematoma under the abdominal wall; and 3 patients recurred. The average operation time of the double-hole needle group was 7.4 min which 1.2 ml blood loss; 2 cases suffered small hematoma under the abdominal wall; and 1 patients recurred. Two groups of children stayed in hospital with average of 2 days. The operation time, volume of bleeding, rate of complication in double-hole needle group were significantly less than those in the single-hole needle group (P < 0.05). The hospital stay, recurrence rate was not statistically significant (P > 0.05).

Conclusion: Self-made double-hole needle in laparoscopic pediatric inguinal hernia repair with short operation time, less trauma, simple operation, in the clinically more efficiently, and that was worth generalizing and applying.

P-1172
Impact of surgihoney reactive oxygen species on surgical site infections in high-risk abdominal wall reconstruction
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University College London Hospital

Background: A surgical site infection (SSI) can double length of hospital stay, reduce quality of life and markedly increase healthcare costs. A novel antimicrobial gel has been engineered by microbiologists called Surgihoney Reactive Oxygen (SHRO). SHRO gel is being applied to a group of Abdominal Wall Reconstruction (AWR) patients at our institution. We aim to show a reduction in local wound complications after SHRO application compared with our retrospective wound complication rates. We also aim to assess to safety and feasibility of SHRO post AWR.

Methods: Patients with ventral hernias of grade 3 and 4 (VHWG grade) are being included. Intervention; SHRO is applied after abdominal fascial closure and before skin closure. Our abdominal closure and skin closure technique is standardized for all participants. Data is being collected from the 1st March 2017 to 1st December 2017. We are aiming for a prospective cohort of 30 patients. Outcomes will be compared to a retrospective cohort of 30 patients.

Results: Primary outcome: SSI within 30 days of surgery, assessed by clinicians at 5, 15 and 30 days and by patient’s self-report for the intervening period. Secondary outcomes include other surgical site occurrences (SSOs) (haematoma, seroma, wound dehiscence, skin necrosis), duration of stay in hospital, reported side effects from local treatment and other systemic postoperative complications.

Discussion: Our trial results will be presented and the safety and feasibility of SHRO will be discussed. So far in the trial we have recruited 15 patients and have noticed favorable outcomes in the reduction of SSIs in grade 3 and 4 AWR patients. During this presentation, the scientific bactericidal mechanisms of how SHRO gel works will also be discussed.
P-1174
Comparative efficacy of laparoscopic repair and open repair in inguinal occult hernia
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Objective: To investigate the curative effect and prognosis of open inguinal hernia repair and laparoscopic hernia repair in the treatment of occult hernia.

Methods: 70 cases of male patients with occult hernia were chosen and randomly divided into observation group and control group. Patients in observation group operated with transabdominal preperitoneal repair (TAPP), patients in control group were treated with open tension-free hernia repair between preperitoneal gap hernia repair. Compare the operation time, amount of bleeding, hospitalization time, VAS index, complications and prognosis.

Results: For the observation group, the operation time was longer than the control group with no significant difference (P > 0.05); the VAS score lower than the control group with significant difference (P 0.05); bleeding was less than the control group with significant difference (P < 0.05); hospitalization time is shorter than the control group with significant difference (P < 0.05); bed time shorter than the control group with significant difference (P < 0.05); patients with chronic pain in control group were more than observation group with significant difference (P < 0.05); the observation group had no wound infection, the control group had 3 cases of wound infection, have significantly the difference compared with the observation group (P < 0.05); adverse reaction rates of the control group higher than that of the observation group with significant difference (P < 0.05). There was no significant difference on total cost of treatment between the two groups (P > 0.05). A half year later, the physical health score, mental health score, cognitive function, social function of the observation group were higher than the control group with significant difference (P < 0.05).

Conclusion: TAPP repair for occult hernia had better treatment effect and prognosis.

P-1175
Preoperative progressive pneumoperitonium, component separation and abdominoplasty for treatment of giant incisional hernia: report of a case
Hospital Geral Ernesto Simões Filho

FA, male, 78-years-old, had an incisional hernia for 1 year. Abdominal computerized tomography (ACT) revealed a hernial ring of 12.85 cm in the hypogastrium, width of the hernia sac of 25 cm and relation hernia sac volume (HSV)/abdominal cavity volume (ACV) of 37%. An intra-abdominal catheter was inserted by laparoscopy for daily insufflation of 1500 mL of room air. Pneumoperitonium was performed for 7 days. The ACT done 7 days after pneumoperitonium showed that 7 days after the procedure the abdominal cavity volume had increased 13.3% and the relation HSV/ACV was 43%. Then, synthesis of hernia sac with separation of anterior and posterior components, onlay fixation of macropore propylene mesh and abdominoplasty were performed by the plastic surgery team. The patient evolved uneventfully and was discharged with a drain on the 4th post-operative day. Hernias with a width greater than 15 cm are considered giant. Indication for pre-operative progressive pneumoperitonium (PPP) is according to the value of the HSV/ACV relation, varying from 25 to 50% among referral centers. In the aforementioned Service it was stipulated that every patient with abdominal wall deformity should be handled conjointly with the plastic surgery team. In large abdominal wall defects separation of components (SC) has arisen as a therapy which uses knowledge of anatomy, considering vascular supply, innervation and musculoskeletal configuration, for containment of abdominal cavity structures, allowing efficient functionality of the trunk. Therefore, in the event of difficulty in approaching the aponeuroses of the hernia ring, SC is feasible and becomes an important tool for preservation of abdominal wall physiology, contributive to micturition, defecation, vomiting, parturition and forced expiration.
P-1176
A systematic methodological review of reported perioperative variables, postoperative outcomes and hernia recurrence from randomised controlled trials of elective ventral hernia repair: clear definitions and standardised datasets are needed
University College London Hospital

Background: This systematic review assesses the perioperative variables and post-operative outcomes reported by randomised controlled trials (RCTs) of ventral hernia repair. This review focuses particularly on definitions of hernia recurrence and techniques used for detection.

Objective: Our aim is to identify and quantify the inconsistencies in perioperative variable and postoperative outcome reporting, so as to justify the future development of clear definitions of hernia recurrence and a standardised dataset of such variables for ventral hernia repair trials.

Methods: The PubMed database was searched for elective ventral hernia repair RCTs reported January 1995 to March 2016 inclusive. Three independent reviewers performed article screening, and two reviewers independently extracted data. Hernia recurrence, recurrence rate, timing and definitions of recurrence, and techniques used to detect recurrence were extracted. We also assessed reported post-operative complications, standardised operative outcomes, patient reported outcomes, pre-operative CT scan hernia dimensions, intra-operative variables, patient co-morbidity, and hernia morphology.

Results: 31 RCTs (3367 patients) were identified. Only 6 (19.3%) defined hernia recurrence and methods to detect recurrence were inconsistent. Sixty-four different clinical outcomes were reported across the RCTs, with wound infection (30 trials, 96.7%), hernia recurrence (30, 96.7%), seroma (29, 93.5%), length of hospital stay (22, 71%) and haematoma (21, 67.7%) reported most frequently. Fourteen (45%), 11 (35%) and 0 trials reported CT measurements of hernia defect area, width and loss of domain respectively. No trial graded hernias pre-operatively using generally accepted scales.

Conclusion: Ventral hernia RCTs report peri- and post-operative variables inconsistently, and with poor definitions. A standardised minimum dataset, including clear definitions for hernia recurrence and recurrence detection, is required.

P-1177
Use of negative pressure therapy in the treatment of mesh infection after incisional hernioplasty: report of a case
Hospital Geral Ernesto Simões Filho

BNO, 72-years-old, female, BMI 31, presented with intraumbilical incisional hernia after gynecologic surgery 40 years before. Tomography of the abdomen revealed hernial ring of 3.2 cm and relation of volume of hernia sac to abdominal cavity less than 10%. She was submitted to incisional hernioplasty with onlay placement of macropore polypropylene mesh and plication of abdominal recti. She was discharged on the 2nd POD without immediate complications. She returned on the 11th POD with fever and signs of deep wound infection, and was submitted to opening and debridement of the wound. Parenteral antibiotic therapy was used for 7 days. The patient presented a deep cavity, 4 × 8 × 4 cm, and therefore therapy by negative pressure (for 14 days) was chosen, and then third intention closure of the wound with outpatient follow-up of the abdominal wall. Wound infection is a complication which occurs in up to 10% of cases, usually happens on the 5th–10th day after the procedure, may be classified as superficial or deep (where it involves mesh and aponeurose and has an incidence of 1–2%). The main associated factors are old age, obesity, comorbidities, smoking habit, size and complexity of the surgery, emergency procedure, contaminated area, or presence of fistulae. In spite of its small frequency, it may lead to loss and removal of the mesh, which increases greatly the risk of disease relapse. Currently, several studies have demonstrated high rates of success (70–100%) in the management of this condition with the use of therapy by negative pressure (chiefly for deep or extensive cavities) and maintenance of the mesh, especially if it is macroporous and made of polypropylene. This treatment, in spite of its high cost, leads to less time of hospital stay and quickest closure of lesions.
**P-1178**  
Intramural hematoma of ileum causing intestinal obstruction after incarcerated inguinal hernia reduction  
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**Introduction:** Intramural hematoma of small intestine is a rare condition. There are some reports about this condition in a patient with trauma 1, a patient who takes blood thinner 2 or a patient who has blood disorder 3. However, there are few report about this condition follow incarcerated hernia reduction. We described a case of incarcerated hernia complicated by small intestinal obstruction from small intestinal intramural hematoma.

**Case report:** A 22-year-old man was admitted to the surgical department with a 3 day history of abdominal distension, nausea and vomiting symptom. Five days before he had undergone left groin hernia repair for an incarcerated hernia. On admission the physical examination revealed a temperature 36.7 C, pulse rate of 74 per minute and blood pressure 142/82 mmHg. Laboratory tests reported hemoglobin 13.8 g/dl, white blood cell count 8900 cells/mm\(^3\), platelets count 270,000 cells/mm\(^3\), prothrombin time 13.6 s and INR 1.13. Segmental dilatation of the small bowel was seen on the plain abdominal film. The patient was taken to the operating theater for an exploratory laparotomy with a presumptive diagnosis of a complete small bowel obstruction. Intraoperative findings were notable for an intramural hematoma of proximal ileum. There was an obstruction at the segment of hematoma. There was no strangulation or intra-peritoneal food content contamination. Segmental ileal resection with primary end-to-end anastomosis was performed. He was discharged 7 days after the operation.

**Conclusion:** Intramural hematoma of small bowel post hernia reduction is a rare condition. A gentle and meticulous technique during reduction of incarcerated hernia is required to avoid this condition. Treatment is urgent surgical. Early diagnosis and surgical intervention are essential for the patients who has complete intestinal obstruction.

**P-1179**  
New narrow mesh for the repair of inguinal hernia  
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We retrospectively analyzed over 5 years period 354 consecutive male patients with primary inguinal hernia treated with a hybrid operation utilizing the pure tissue in combination with a Narrow Mesh (NM).

- The NM is a strip of 3 × 6 cm mesh.
- The long lateral aspect is sutured to the native inguinal ligament from the public spine to 4 cm. upward from the exit of the spermatic cord.
- The long medial aspect, that can be considered as a neo-inguinal-ligament, is sutured to the conjoin muscles, with the reconstruction of the internal inguinal ring with the last stitch.
- The NM, placed between the inguinal ligament and the conjoin tendon, achieves two main objectives:
  - It reduces the tension on the suture line and at the same time it reapproximates the conjoin tendon to its almost normal position so to reestablish the physiological shutter mechanism.
  - Furthermore there is no encircling by the mesh of the spermatic cord.

- From 2007 to 2012 354 adult male patients underwent primary inguinal hernia repair.
- Median age was 49 (range 18–86).
- According to Nyhus classification, there were 17 (5%) Nyhus type I hernias, 143 (40%) Nyhus type II hernias, 121 (34%) Nyhus type IIIa hernias, 73 (21%) Nyhus type IIIb.
- Epidural anesthesia was used in 61 (17%) procedures, while local anesthesia was used in 293 (83%).
- The ileo-inguinal nerve was exised in 37 (10%) of the patients.
- Median operation time was 38 (26–86) min.
- Median hospital stay was 6 (range 6–36) h.
- After a median follow up of 72 months (range 60–118), there were 2 (0.5%) recurrences.
- Chronic inguinodynia at 1 year occurred in two patients (0.5%).
- The use of NM for inguinal hernia repair is safe and effective carrying a low incidence of recurrences as well as a low incidence of post-operative complications, expecially chronic inguinodynia.
Technique of seven-step maneuver for tapp

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**Background:** The laparoscopic transabdominal preperitoneal (TAPP) technique was a leading mode of inguinal hernia repair, on the basis of lower incidence of postoperative pain and faster recovery compared with open technique. However, TAPP is still considered a more difficult surgical procedure. The aim of this study was to provide a step-by-step teaching module for hernia surgeons learning TAPP.

**Methods:** One hundred and three patients who underwent laparoscopic inguinal hernia repair with Chen’s seven-step maneuver between May 2015 and April 2016 at our hospital were enrolled. The critical steps were presented in a standardized way. The difficult procedures’ key points (e.g. Anatomic landmarks recognition, preperitoneal space dissection, hernia sac dissection, mesh placement and peritoneal closure) are described and took photographs.

**Results:** Laparoscopic repairs were successful in all patients, with a mean surgical time of 28 ± 16.7 min. Mean postoperative hospitalization duration was 3.2 ± 0.8 days. Four patients suffered from postoperative local hematomas. Six patients had short-term local pain. There were no cases of chronic pain. All patients were followed up at least 8 months, and no recurrence was observed.

**Conclusion:** With this adequate program, the technique of Chen’s seven-step maneuver can be learn quickly, skillfully, and safely and easily perform by young trainees under the supervision of experienced laparoscopic surgeons.

Progressive preoperative pneumoperitoneum preparation for surgery of complicated hernias with loss of domain

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**Background:** Repairing complicated hernias with loss of domain is a challenge for the general surgeon. A progressive preoperative pneumoperitoneum (PPP) was used to increase the volume of the abdominal cavity and abdominal wall compliance. The aim of the study is to evaluate the efficacy of progressive preoperative pneumoperitoneum in management of complicated hernias with loss of domain.

**Methods:** all patients were placed catheters under ultrasound guidance for progressive preoperative pneumoperitoneum. All patients had pre- and postoperative progressive pneumoperitoneum computed tomography of the abdomen, and the volumes of the incisional hernia (VIH), the total peritoneal content (VP) and the VIH/VP ratio were measured, respectively. All patients were received laparoscopic hernia repair by complete closure of the defect and reinforcement with anti-adhesion mesh. The rate of overall postoperative morbidity and recurrence was evaluated.

**Results:** after PPP, the mean VIH and VP were both increase. The VIH/VP ratio was decreased. The overall postoperative morbidity rate was similar to that reported in the literature. At a mean follow-up of 1 year, no recurrence was found.

**Conclusion:** progressive preoperative pneumoperitoneum increased the volume of the abdominal cavity in patients with complicated hernia with loss of domain, allowing reduction of the rate of abdominal compartment syndrome. The preoperative preparation method of PPP is safe and effective choice for surgery of complicated hernias with loss of domain.
Giant midline abdominal wall hernias require complex reconstruction of the anterior abdominal wall in order to restore its structural and functional continuity. We would like to present our experience with these challenging cases with the utility of the combined retro-rectus mesh placement with anterior component separation technique and their overall functional outcome.

Materials and methods: A retrospective analysis of prospectively collected data on 35 patients with giant (≥ 10 cm) midline incisional hernia who underwent reconstruction in 1st Department of General Surgery between 2015 and 2016 with a follow-up period of 6 months.

Results: Demographic data of our series include age of 64 years (median, 30–75) with a male to female ratio of 15:25, length of symptomatic hernia 14 months, more than two previous laparotomies (25), bowel obstructive symptoms (15) and recurrent herniation (28). BMI recorded was 35 (median, 28–46) and ASA of II (median, I–III). Co-morbidities included cardiac disease (24), diabetes (7), respiratory disease (10) and systemic immunocompromise (5). Operative and technical details showed surgery duration up to 160 min, cranio-caudal rectus sheath defect (21), transverse rectus sheath defect (11), cross-sectional area of fascial defect (9) developed (short-term post-operative complications: 5% seromas all resolving spontaneously; superficial wound infections 4%). 10% of patients were completely asymptomatic at (median) 6 month follow-up; 10% reported mild pain, but not limiting any daily activity; 5% described pain occasionally limiting activity. There were two clinical recurrences with one patient developing global bulging.

Conclusions: Our series is comparable to the literature in patient cohort demographics, co-morbidity and risk factor profile; however, we demonstrate an excellent intermediate term outcome with only few clinical recurrences and an improvement in quality of life, through ability to perform activities of daily living.
P-1186
Laparoscopic surgery for the treatment of pediatric incarcerated inguinal hernia: 10 years experience in a single institution
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Background: Many children with inguinal hernia would experience the scenarios of incarceration. Fatal consequences will arise if it was not handled properly and timely. In the last decade. We utilized laparoscopic surgery to reduced and repaired incarcerated inguinal hernia (IIH) for children. We report the experience of a large series in our institution.

Methods: In the last decade more than 4000 children with inguinal hernia were treated by laparoscopic surgery in our institution. Over 30% had experienced the episodes of hernia incarceration before they visited us. There were 521 children needed emergent admittance due to hernia incarceration. Manual reduction was performed on 314 patients and they were rendered to selective operation subsequently, while 207 cases needed urgent laparoscopic operation. In the surgical group, 60 cases who suffered the hernia incarceration more than 12 h, we operated on them urgently even a successful manual reduction was performed. On the other hand, we gave emergent operation on 147 children due to irreducible hernia. In this study we focus on the 207 emergency surgical cases.

Results: All surgery was successful without serious complications. Two cases needed open conversion because hernia was irreducible under laparoscopy. The mean operative time was (27 ± 11) min. The mean of postoperative hospital stay was (49 ± 20) h. During the operations, contralateral patent processus vaginalis was found and subsequently repaired in 63 cases (30.4%). Mild complications occurred in 5 cases, no major impact on final outcome. There were 6 recurrent cases (2.90%) in these patients who had been followed-up for 3–143 months.

Conclusions: Laparoscopic surgery is a safe and reliable alternative for the treatment of pediatric IIH. It has the advantages of minimally invasive and highly efficient that enable attain a satisfactory outcome. Vitality of the incarcerated organ can be inspected while strangulation was rare in pediatric IIH.

P-1188
Comparative analysis between laparoscopic vs open inguinal hernia in a University Hospital. Results at 7 years
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Hospital Universitario Austral

Introduction: Inguinal hernias are the most frequent, occupying between 50 and 60% of all hernias in the abdominal wall. The laparoscopic approach to inguinal hernia repair has been shown to be beneficial in reducing postoperative pain and facilitating an earlier return to normal activity.

Aims: To compare and analyze the results at 7 years of laparoscopic vs open inguinal hernia repair. To classify the patients studied according to the different variables: age, sex, type of surgery performed. Compare recovery time to perform daily activities and return to work activity.

Materials and methods: Retrospective descriptive observational study. We included all patients (291) operated on inguinal hernioplasty between January 1, 2009 and December 31, 2010. Data were collected by telephone survey, effective in 178 patients (60.3%) and Clinical History analysis.

Conclusion: In our Hospital, both types of surgeries are indicated for the repair of herniated defects of the groin. We did not find significant differences in the recurrences and other complications, although in the postoperative satisfaction of the patients, the shortening of time to resume daily and work activity.

P-1189
The phases of Phasix
Waha J, Auer T, Mathew E, Bradatsch A, Kniepeiss D
Department of General Surgery, Medical University Graz

The phases of Phasix—in vivo observation of P4 HB mesh in onlay-position during revision OP.
Animal studies have shown a significantly higher bacterial resistance compared to other synthetic and biological material.

Between September 2015 and September 2017 37 patient were operated with infected and/or complex incisional hernias and four patients with high grade risk factors.
Five of these patients needed re-operation due to skin necrosis, chronic seroma, infected seroma or entero-cutaneous fistula within a time frame ranging between 7 and 350 days after mesh implantation.
Results: None of the meshes had to be explanted, all meshes presented with excellent granulation and ingrow activity (foto documents), even in significantly infected surgical sites due to bacteria and/or fungi.
Conclusion: Resistance to surgical site infection like we observed in these cases was never seen before using synthetic material. P4 HB could be a good option for patients following open abdominal surgery and other infected and contaminated cases with need for abdominal wall enforcement or even bridging.
P-1191
Postoperative follow-up after inguinal hernia surgery via a smartphone application; the future?!
van Hout L, Bökkerink W, Ibelings M, Vriens P
ETZ Tilburg

There is a high heterogeneity in measuring pain and functioning after inguinal hernia correction through paper or web-based pain diaries and questionnaires. Also, these measuring instruments have different forms of bias. Patient monitoring via an innovative smartphone application may provide a more accurate insight into a (un)complicated postoperative course after inguinal hernia surgery.

The Q1.6 Inguinal hernia app uses ‘twitch crowdsourcing’ for prospective data collection; a short question that can be answered within seconds during unlocking the screen. Questions are derived from widely used and validated questionnaires. Questions are set dynamically based on operation date and previously given answers. Patients can be monitored in real-time via a dashboard. The system also provides a notification system for potential complications. Patients planned for elective inguinal hernia surgery were asked to install and use the application. An exploratory study was performed to investigate the feasibility and applicability of the application and data obtained.

In the last quarter of 2016, 83 patients in three different hospitals installed the application preoperatively. Of these patients, 96.4% used the application for more than 2 weeks postoperatively and 79.5% used the application for more than 3 months. Over 14,000 data points were generated during the first 3 months of follow-up. The first user experiences are positive and the data obtained gave clear insight into postoperative recovery after inguinal hernia surgery. Patients were satisfied and did not experience the manner of data collection as annoying or intrusive.

This way of real-time generating “big data” may improve the integrity of pre- and postoperatively obtained data and can promote research on (chronic) pain and recovery after inguinal hernia surgery with possibilities for machine learning. After a validation study, the application can be used as a measuring instrument. This technique is promising and can also be used in other patient categories.

P-1192
Trends in emergency hernia surgery in a district general hospital; a retrospective review
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Queen Elizabeth Hospital, Gateshead

Aims: Abdominal wall hernias are amongst the most common surgical pathologies requiring emergency surgery. We aim to investigate whether the types of hernias, presenting as emergencies, has changed over time.

Methods: A retrospective review of all emergency hernia cases in a single district general hospital was performed. Data from the hospital’s electronic theatre record system between August 2011 to August 2016 which included patient demographics and hernia type were reviewed. Hernia type was determined by the Healthcare Resource Groups coding system. Parastomal hernias were excluded as defined by the European Hernia Society.

Results: Over the 5-year period, 298 emergency hernia repairs were performed on patients with a mean age of 62.3 (SD = 18.2). 31% were inguinal hernias, 30% umbilical hernias, 10% femoral, 28% ventral (including port site and incisional hernias) and < 1% obturator hernias.

A Chi square goodness of fit test which compared the occurrence of hernias by type with the previously published occurrence rate in 2011 showed \( \chi^2 (4) = 57.025, p < 0.01 \). Chi square test of hernias by types for each year was \( \chi^2 (4) = 14.629, p = 0.26 \).

Conclusions: Significant deviated was observed from the previously published occurrence rate which described inguinal, umbilical and femoral hernias, in descending order, as the most frequent emergency presentations. Our findings suggest that ventral hernias are prevalent within our population. A better understanding of this trend variation is necessary as complex incisional type hernias can be resource intensive to investigate and their management consideration different based on Ventral Hernia Working Group recommendation.

Recommendations: Using Hospital Episode Statistics and Surgical Workload Outcomes Audit Database (SWORD) database would allow us to better identify changes in trends across emergency services and to effectively manage resources.
P-1193
Abdominal hernia workup: use of imaging in the emergency setting
Ng C, Brown L, Mudawi A
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Aims: Emergency repair of hernias is associated with significantly higher morbidity and higher recurrence rate. However, due to the heterogeneity of its presentation, the role of diagnostics imaging is unclear. We aim to investigate the different modalities used and whether USS or CT is useful in helping surgeons anticipate the possibility of bowel resection.

Methods: A retrospective review of all emergency hernia cases in a single district general hospital was performed. Data were collected from the hospital’s electronic theatre record system between August 2011 to August 2016 included patient demographics and hernia type. Hernia types were determined by the Healthcare Resource Groups coding system. Parastomal hernias were excluded as defined by the European Hernia Society.

Results: 298 emergency hernia repairs were performed within 5 years. 78.9% were primary hernias which consist of inguinal, femoral, umbilical, ventral and other. 48.7% had no imaging, 30.5% have only plain film, 10.7% CT and 10.1% USS. 48.5% of those with primary hernias had imaging, while 61.3% had imaging in the secondary group. Chi Square test to compare the use of imaging between primary and secondary hernias was \( \chi^2 (2) = 6.18, p = 0.045 \). When comparing the use of imaging between different hernia types \( \chi^2 (3) = 6.77, p = 0.343 \). Analysis of the reports for USS and CT showed none of the USS gave any description of the viability of the bowel and only 12.5% of the CTs correctly identified bowel compromise leading to bowel resection.

Conclusion: Majority of patients in the emergency setting with hernias have diagnostic imaging to look for sequelae of a hernia rather than to define the anatomy. This would explain why USS and CT are not frequently used, except in secondary cases where there is clinical uncertainty. Although these modalities are able to assess for bowel ischaemia we have not found them to be reliable.

P-1196
New classifications for sports hernias
Hutchinson W, Gerhardt M, Hanelin J, Mandelbaum B
William B. Hutchinson Jr. M.D. A.P.C

There has been a lot of controversy over what “sports hernia’s” should be called. The reason for this is that it incorporates multiple injuries and tries to make one simple definition. I feel that defining the region of the injury not only makes it easier, but more focused.

The treatment can then be organized more thoroughly. Some of these regions are better treated more conservatively, while others regions will never resolve without some sort of intervention. We have divided the definition to include injuries from the umbilicus to the mid thigh region. The first region incorporates everything from the midline to the lateral portion of the anterior rectus muscle; including the symphysis pubis. The second involves everything lateral to this and as low as the inguinal ligament. The third region involves everything below the inguinal ligament to the mid thigh. The fourth incorporates injuries from the mid thigh laterally and includes all pelvis and hip problems. This outline includes the workup, which consists of the following components; Labwork, X-ray, CT, MRI, and Ultrasound. Treatment includes surgical and non-surgical procedures.

P-1197
Overuse of pre-visit ultrasound in patients referred for treatment of inguinal hernias
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Introduction: Physical exam by a surgeon and inguinal ultrasound have a high sensitivity and specificity for the diagnosis of inguinal hernias. However, ultrasound is often performed prior to referral to a surgeon’s office, and adds additional cost and time to the treatment of inguinal hernias. The aim of our study is to assess the rate and necessity of ultrasound prior to clinical exam by a hernia surgeon to minimize cost and improve utilization of healthcare resources.

Methods: We reviewed the medical records of patients referred for an inguinal hernia to surgeons who operate at an urban tertiary care center from April through July, 2017. These cases were analyzed for patient demographics, findings on referring provider and surgeon physical exam, pre-visit imaging, healthcare system of surgeon, and case outcome.

Results: Twenty-eight percent of patients had an inguinal ultrasound prior to visiting a surgeon. Forty-five percent of patients who underwent ultrasound, had a hernia on physical exam by the referring provider, and 86% had a positive physical exam by the surgeon. Patients with no hernia detected on referring provider’s physical exam underwent ultrasound 70% of the time. Of the 30% with a negative physical exam that did not undergo ultrasound, 90% had a positive physical exam by the surgeon and were offered surgery.

Conclusion: Inguinal ultrasounds are being ordered unnecessarily by referring providers in patients with palpable hernias on physical exam, increasing cost and time of treatment. Surgeons increased ability to detect and rule out hernias, allows them to make clinical decisions in cases where the referring provider was unable to detect a hernia and no pre-visit imaging was performed. Limiting the use of ultrasound to the occult hernia can help minimize cost and improve utilization of healthcare resources.
P-1201
Early experience with incisional fascial reinforcement to prevent hernias: patient selection, techniques and outcomes
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University of Pennsylvania

Introduction: Incisional hernias (IH) continue to increase morbidity, cost and disability for patients. There may be an opportunity to decrease rates of IH with incisional fascial reinforcement (IFR) at the time of laparotomy. There have not been many studies detailing how IFR fits into the hernia ecosystem—specifically, deciding what patients may benefit from IFR and what techniques should be considered. Herein, we will provide a dual-institution review of patient selection, description of technique, and early outcomes after IFR.

Methods: A dual-institution retrospective chart review was performed of prospectively collected data. Patient characteristics and identifiable hernia risk factors were determined. Additionally, operative technique and early post-operative outcomes were observed. Standard statistical tests were applied.

Results: 23 cases of IFR were analyzed, 13 of which were males. The average age and BMI of patients was 58 and 29.5 respectively. The most common procedures during IFR were colorectal (9), abdominal aortic aneurysm (AAA) repair (6) and gynecologic (4). All patients were counseled on mesh characteristics, surgical complications and hernia morbidity. All cases used a biosynthetic mesh, with 22 placed as an onlay. Average time for mesh inset, 27 min, was recorded for 11 patients. 6 of the cases had mesh fixed with fibrin glue. One patient had a dehiscence, two had seromas, zero had SSI, and zero had IH with 6-month average follow-up.

Discussion: Appropriate patient selection and risk counseling are essential in ensuring that IFR is successful. The most feasible and efficient techniques need to be implemented in order to decrease the burden of IH. Early results using onlay placement of a biosynthetic mesh in high-risk patients undergoing colorectal, AAA, and gynecologic procedures seem promising. Further studies need to be conducted in order to assess long-term efficacy in each of these populations with this technique and type of mesh.

P-1204
Abdominal wall reconstruction: effect of BMI on surgical outcomes
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Background: Incisional Hernias are the most common long term complication following a laparotomy. There is a high recurrence rate after primary herniorrhaphy without mesh, therefore mesh repair of any hernia defect > 2 cm is the standard of care due to a lower rate of recurrence. Obesity is a risk factor in the development of incisional hernia and a major risk factor for hernia complication. The aim of the study was to evaluate the effect of obesity on surgical outcomes after abdominal wall reconstruction.

Method: This was a single institution, retrospective study that examined data between 2011 and 2016 of all patients that had abdominal wall reconstruction (rectopectus repair and component separation repair). Patients were stratified into BMI ≥ 40 and BMI < 40. Records with missing relevant data and patients undergoing panniculectomy during the same inpatient stay were excluded. Univariate analysis and multivariate logistic regression were used to compare outcomes between the two groups.

Results: A total of 402 patients were identified after inclusion and exclusion criteria were met. The BMI ≥ 40 group had 303 patients, with a mean BMI of 31.6, and the BMI < 40 group had 99 patients, with a mean BMI of 45.8. Median length of follow-up was similar between the two groups, 4.6 months for BMI ≥ 40 vs 4.2 months for BMI < 40. The BMI < 40 group had a relatively higher rate of recurrence at 6 vs 1% for the BMI > 40 group (p = 1). A multivariate analysis demonstrated BMI wasn’t a predictor of hernia recurrence rate after surgical repair.

Conclusion: Results of the study show obesity did not significantly contribute to recurrence of incisional hernia and post-operative complications in patient who had undergone abdominal wall reconstruction repair.
P-1205
Should the use of ultrasound impact the management of groin hernias in women?
University of Michigan

Background: Broad recommendations discouraging use of ultrasound for the evaluation of primary inguinal hernia have not been explored in women where clinical diagnosis may be obscure. To address this, we investigated the use of ultrasound and its impact on operative decision-making in a cohort of women referred for inguinal hernia.

Methods: A single-center retrospective chart review of patients who were evaluated by the division of minimally invasive surgery for primary groin hernia from 1/2014 to 4/2017 was performed. Ultrasound use, imaging results, physical exam findings, and operative management decisions were compared by Fischer’s exact test with a significance level of 0.05.

Results: Of the 358 patients evaluated, 15% (n = 54) were women. Women were more likely than men to have an ultrasound performed (56 vs. 33%, p = 0.002) and less likely to have a positive physical exam for hernia (43 vs. 84%, p < 0.001). Amongst patients with a positive ultrasound for hernia (n = 122), women were less likely than men to have a positive physical exam (28 vs. 70%, p < 0.001) and less likely to proceed to surgery (32 vs. 57%, p = 0.028). No difference in gender between rate of surgical recommendation for patients with positive ultrasound and positive physical exam or positive ultrasound and negative physical exam was demonstrated. Similarly, amongst patients with a positive physical exam (n = 278), there was no difference in recommendation for operative intervention by gender.

Conclusions: Ultrasound is more commonly utilized in women, however, there is low correlation between positive ultrasound and clinical exam. Regardless of gender, patient management was primarily based on physical exam, rather than ultrasound findings. This results in significantly fewer women undergoing hernia repair. Whether this reflects appropriate management or a disparity in care in which women are undertreated for hernia needs further exploration.

P-1207
Correlation between CT scan measurements and incisional hernias in obese patients
Cleveland Clinic Florida

Background: Obesity is a risk factor both for developing incisional hernias and for recurrences. CT scan may have a role in predicting hernia evolution.

Methods: We retrospectively reviewed the AHSQC database for obese patients (BMI > 30) who underwent incisional hernia repair at Cleveland Clinic Florida from November 2012 to May 2017. Group 1 included patients who had a first hernia repair, and Group 2 already had two or more previous repairs. Pearson correlation test and multiple linear regression were calculated measuring hernia width on CT scan as a dependent factor and recti muscle thickness, width and thickness/width ratio, abdominal wall muscles and pannus thickness as independent variables.

Results: Out of 166 patients who underwent incisional hernia repair, we identified 9 (5.4%) patients within Group 2 and we matched them with other 9 patients within Group 1. Comparison of mean CT values did not show any significant difference between the groups. A positive correlation was found between hernia width and right and left recti thickness both in Group 1 and Group 2 (r = 0.434, p = 0.121 and r = 0.709, p = 0.016 vs r = 0.811, p = 0.004 and r = 0.384, p = 0.154, right and left respectively). Negative correlation was found between hernia width and right and left recti width and ratio in Group 1 (r = -0.334, p = 0.190 and r = -0.499, p = 0.086; r = -0.396, p = 0.145 and r = -0.532, p = 0.070, right and left respectively), but not in Group 2. Abdominal wall muscles and pannus thickness positively correlate with hernia width in Group 2 only (r = 0.492, p = 0.089 and r = 0.710, p = 0.016, respectively). Multiple regression showed that hernia width increased 5.872 mm for each mm of left rectus thickness in Group 1 (R^2 = 0.503, p = 0.032), whereas in Group 2 hernia width increased 7.047 mm for each mm of right rectus thickness (R^2 = 0.657, p = 0.008).

Conclusion: Recti muscles thickness and width seems to correlate either with primary or recurrent incisional hernia size.
P-1211
Prevention of parastomal hernias using purse-string suture: a single center experience
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Introduction: Parastomal hernia (PH) is the most common local stoma complication. Its occurrence is associated with bothersome physical symptoms and mental discomfort, with an overall negative effect on quality of life. It is estimated that about 50% of patients with stomas are at risk for the development of symptomatic parastomal hernia, especially those who underwent colostomy procedure. The aim of the study was to verify whether the use of synthetic monofilament non-absorbable purse string suture (USP size: 1.0) on the fascia around the edges of the stoma orifice is adequate for primary prevention for the formation of PH.

Materials and methods: The study enrolled 60 patients who were assigned to two groups depending on the procedure chosen for PH prevention. Group I consisted of 30 patients who underwent stoma formation with primary prevention using purse string sutures around stoma orifice, group II consisted of 30 patients who did not undergo any parastomal hernia prevention at the time of stoma placement. All operations were performed via open approach. Patients were followed-up in different time points including 1 week, 1 month, and 1 year after surgery.

Results: There was a significant difference in the incidence of parastomal hernia between the two patient groups. In group I we observed a 10% incidence of PH, in group II the incidence was higher and reached up to 30%.

Conclusions: Abdominal surgery, despite its clearly visible progress, still faces challenges regarding parastomal hernia treatment. Our primary method of parastomal hernia prevention has a significant impact on the effects of its treatment and the occurrence of complications related to the stoma. This method seems to be simple and safe and is recommended because of the significant decline in the occurrence of parastomal hernias and the subsequent reduction in costs of their treatment.

P-1212
The Albin technique: a personalized method of hernia repair
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At the Hernia Center of Southern California we have performed 12,000+ hernia surgeries over a period of 30 years. The Albin Technique is a modification of the classic Lichtenstein technique.

The Albin Technique unlike most hernia operations differs in that we do not perform a cookie-cutter type of hernia surgery or a one-size-fits-all hernia repair.

Rather we have a customized hernia repair.

Our typical repair uses a tension-free polypropylene mesh. The mesh is attached inferiorly with permanent suture and superiorly with absorbable suture.

Aerobic individuals receive a lightweight flexible repair. Individuals who perform very strenuous work get a medium weight mesh plus a superior suture line that is reinforced with additional permanent sutures. Big or tall patients will require a larger mesh and or additional more sutures compared to a tiny individual. We determine whether we want strength or flexibility based on patient needs.

We map the distribution of the pain preoperatively for patients complaining of severe pain and accordingly divide the offending nerve or nerves at the time of the hernia repair.

We take great care with the spermatic cord and tighten the internal inguinal ring only when required, as it would be for an indirect inguinal hernia, a large cord lipoma, or a laterally located inguinal hernia. For all other hernias, we leave a patulous internal inguinal ring with less infringement on the spermatic cord thereby reducing post-operative testicular pain.

It is not uncommon at our hernia center to perform a full day of right inguinal hernia repairs and none of the operations are identical. We have developed and perfected a system whereby, following our assessment of the individual’s needs, we determine the suture material to utilize, the type and size of mesh, treatment of the spermatic cord and the treatment of the nerves.
P-1213
Trepp compared to lichtenstein’s technique for inguinal hernia: what’s best?
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Background: Chronic pain is the main postoperative complication after surgical inguinal hernia repair, especially after Lichtenstein’s technique. Preliminary experiences with a soft mesh positioned in the preperitoneal space by, in most cases, the total extraperitoneal (TEP) approach, showed promising results considering the reduction of chronic postoperative inguinal pain (CPIP). TEP and Lichtenstein are currently preferred techniques in guidelines worldwide. However, the ongoing evolution of surgical innovations, aiming less patients with chronic postoperative pain, for inguinal hernia repair led to an open direct approach with preperitoneal mesh position: the transrectus sheath preperitoneal (TREPP) mesh repair. It is hypothesized that the TREPP technique may reduce the amount of patients with CPIP compared to the Lichtenstein procedure.

Methods: TREPPoLi is an ethical approved multicenter randomised parallel clinical trial comparing TREPP versus Lichtenstein from the patients’ perspective next to societal- and hospital perspectives. The trial protocol will be published and was registered (ISRCTN14511362) All consecutive patients with a primary unilateral inguinal hernia will be invited to participate in the trial. After written informed consent, patients will be randomly allocated to either the TREPP mesh repair or to Lichtenstein’s procedure. The primary outcome will be differences in CPIP and development will also be measured with quantitative sensory testing devices. Secondary outcome measures will be serious adverse events, health status, learning curve and costs. The hypothesis is that inguinal hernia repair according to the TREPP technique compared with Lichtenstein reduces the amount of patients with CPIP from 12% to less than 6% (> 50% reduction). A population size of 960 patients is required.

Conclusion: The TREPPoLi trial aims to evaluate the TREPP and Lichtenstein from patients’ perspective. All outcomes will be evaluated in line with verified patient reported outcomes critical for decision making and will focus on the amount of patients with CPIP at 1 year postoperatively.

P-1214
What is wrong with the good old preperitoneal mesh repair for small primary ventral hernias?
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Introduction: Mesh devices have shown their pro and cons with relatively short follow-up after primary ventral hernia repair. Instead, a preperitoneal mesh repair is slightly more difficult, but safe, preventing adhesions to the mesh surface and a solid and more physiological type of repair. We aimed to evaluate the 3 years outcome using a flat mesh in the preperitoneal space and compare it to the mesh device literature for this type of hernias.

Methods: Over a 5-year period (2009–2014) all patients with a primary ventral hernia that received treatment by open surgical preperitoneal repair with the Rebound HRD-V™ mesh were evaluated. The objectives included basic patient characteristics, hernia characteristics using the EHS classification, operating time, length of hospital stay, post-operative complications and hernia recurrence after both early and longterm follow-up.

Results: In total 166 patients were included. The median operating time was 46 min. Intra-hospital complications were reported in six patients (4.8%). First post-operative evaluation was performed after a median period of 3.3 weeks. A clinical seroma was seen in 4 patients (2.4%), all conservatively managed. Three patients (1.8%) reported a superficial wound infection. All patients had a follow-up after both 1 and 3 years. One recurrence (0.6%) was clinically seen after a follow-up of 3 years in 154 patients (92.7%). The overall mean follow-up after a final telephone questionnaire was 72 months with no meshes removed and 1 confirmed recurrence by ultrasonography, probably related to a missed second hernia orifice at the time of first repair.

Conclusion: Preperitoneal mesh repair seems to be at least as efficient as an open intraperitoneal mesh repair using mesh devices, both in terms of complications and recurrence rate in comparison with current data from the literature. A memory containing flat mesh facilitates correct and flat positioning of the mesh in the preperitoneal pocket.
P-1215

Preoperative pain evaluation before decision on inguinal hernia surgery helps to avoid chronic inguinal pain

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Introduction: Postoperative pain is important for quality of life after groin hernia repair. Preoperative pain evaluation before decision for inguinal hernia surgery may help to reduce chronic postoperative pain. There is little information on preoperative pain evaluation available (Magnusson et al. 2014).

Methods: We evaluated preoperative pain and postoperative pain in five groups of operations (2007–2017): Group 1 (n = 419) painful primary inguinal hernia; group 2 (n = 23) painful secondary inguinal hernia with laparoscopic index operation; group 3 (n = 36) painful secondary inguinal hernia with open index operation; group 4 (n = 5) painful secondary hernia—index operation laparoscopic + further lap/op operations; group 5 (n = 8) painful secondary hernia—index operation open + further lap/op operations. Clinical examination + colour-coded duplexsonography + diagnostic infiltration + differential diagnosis MRT CT. Perioperative antibiotic prophylaxis and preemptive pain prophylaxis + infiltration. Intraoperative documentation of nerve entrapment + tailored neurectomy + histological examination of nerve tissue. Specific hernia repair suture/mesh posterior and anterior wall. Follow-up complications hematoma, seroma, pain, bleeding, other, chronic pain.

Results: Gr N Op Age Pain Index OpTi Hist Chronic Change TSP 1 TSP 2 Follow-up TSP 3 ReH CNP. (1) 419 49.5 97.6% 85.51 92.1% 100% 4.77% 6.9% 13.48 26% 1.2% 0. (2) 23 46.95 70% 92.91 100% 100% 13% 21.7% 21 26% 0 1. (3) 36 46.88 44.4% 110.13 88.9% 100% 2.8% 2.8% 22.88 16.7% 5.5% 0. (4) 5 55.4 100% 95 100% 100% 20% 40% 10.4 40% 0 0. (5) 8 56.37 12.5% 110.62 100% 100% 0 12.5% 6.75 0 12.5 0.

Pain Index (Pain before index operation); OpTi (operation time); Hist (Histology); chronic change (chronic pathological nerve change); TSP (temporary somatic pain); ReH (recurrent hernia); CNP (chronic neuropathic pain).

Conclusion: Preoperative pain evaluation is instrumental to avoid chronic postoperative pain by aiding to choose the adequate hernia technique.

P-1218

Elective Lichtenstein vs Stoppa inguinal hernioplasty in the patients with recurrent inguinal hernia

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Background: During the past decades surgical care of recurrent inguinal hernias has been paid growing attention. In addition, herniorrhaphy in the patients with recurrent inguinal hernia has been associated with higher morbidity and mortality rates which increases significantly with emergency operations. The aim of this study was to compare the outcomes of the elective Lichtenstein vs Stoppa hernioplasty performed patients in a district general hospital for a 5-year period.

Methods: Prospective-retrospective study of patients with recurrent inguinal hernia undergoing elective Lichtenstein and Stoppa inguinal hernioplasty at a district teaching hospital.

Results: From January 1st 2013–December 31st 2017, all patients with recurrent inguinal hernia who underwent elective Lichtenstein and Stoppa inguinal hernioplasty were recorded. All patients who underwent repair of inguinal hernia with the Lichtenstein and Stoppa technique were operated by using polypropylene macroporus flat mesh different size. Data regarding demographics, co-morbidity, type of hernia, complications, hospitalization postoperative pain and use of analgetics and return to normal daily activities were recorded in 1-year follow up. Patient satisfaction following the operation was also assessed (short-follow up—1 year).

Conclusion: Lichtenstein and Stoppa inguinal hernioplasty under spinal anesthesia is a simple, comfortable and effective method, with prompt recovery and low complications and can be done safely in patients with recurrent inguinal hernia. It is possible to achieve excellent results with this techniques in general surgical unit.
Applying open abdomen closure techniques to abdominal wall repair after burst abdomen or giant hernias: does it work?
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Introduction: Mesh mediated fascial traction (MMFT) is considered an adequate therapeutic strategy for abdominal emergencies and open abdomen (OA). Giant ventral hernias with loss of domain and burst abdomen might also require specific strategies to approximate the fascia. We report our experience in the surgical treatment of both burst abdomen and advanced abdominal wall reconstruction.

Methods: Since 2011, we recorded all patients treated with MMFT prospectively. Patients with burst abdomen and with giant hernias and loss of domain were eligible for this analysis. Loss of domain patients were treated with botoxulin infiltrations and prepared for open IPOM repair with augmentation. In case primary fascial closure was not possible MMFT was applied.

Results: Between 2011 and 2017 six patients with burst abdomen and 3 patients with a giant ventral hernia with loss of domain needed this technique. Mean age was 57.8 years (36–77 years). Mean BMI was 28.3 kg/m² (18–41 kg/m²). Burst abdomen was diagnosed at 6 days (5–18 days). The mean duration of the MMFT was 13.8 days (7–21 days), with a mean dressing change of 3.6 changes. In four out of six patients (66.6%) fascial closure was obtained. The median follow-up is 12 months.

Of the three patients with loss of domain, one patient had MMFT with negative pressure therapy planned preoperatively because of an infected mesh. In two other patients, this strategy was adopted intraoperatively, as the planned approach to obtain closure was not achieved. All patients had final fascial closure: the infected patient using biological mesh, the others using large pore synthetic mesh.

Conclusion: Mesh mediated fascia traction in combination with negative pressure therapy is a useful tool to achieve anterior fascial closure both after burst abdomen and giant hernia repair with loss of domain or as a bridge to final closure in case of contamination.

41 Cases of round ligament varicosities that are easily misdiagnosed as inguinal hernias
Hangzhou First People’s Hospital

Abstract
Purpose: To demonstrate the benefit and safety of conservative therapy for round ligament varicosities (RLVs) that are easily misdiagnosed as inguinal hernias.

Methods: We retrospectively analyzed clinical materials of 41 consecutive cases of RLVs diagnosed by ultrasound in a single hospital from January 2011 to December 2015. Misdiagnosis rate, clinical and sonographic features, management after diagnosis and prognosis were recorded.

Results: All forty-one cases were pregnant females in their second or third trimester. Twenty-eight cases were first misdiagnosed as inguinal hernias (68.3%). Thirty cases presented as reducible swelling in the inguinal area (73.2%), and 25 of which were painful (61.0%). Four cases only felt pain in the inguinal area without swelling (9.7%). Seven cases had no obvious discomfort (17.1%). All cases were diagnosed as RLVs by gray-scale and color Doppler ultrasonography and justified a wait-and-see strategy. Thirty-seven cases were followed until total recovery after delivery (follow-up rate 90.2%). Swelling with or without pain disappeared spontaneously postpartum.

Conclusions: RLVs are easily misdiagnosed as inguinal hernias and color Doppler of the inguinal area is the best examination for making the correct diagnosis. Conservative therapy for RLV is beneficial and safe when assured by color Doppler.

Keywords: Round ligament; Varicosities; Inguinal hernia; Ultrasonography; Conservative therapy

Application of fluorescence tracer navigation technique with indocyanine green in complex abdominal wall defect repair by parallel shifting of obliquus externus abdominis flap
Hangzhou First People’s Hospital

Autologous tissue repair is one of the most important techniques used in abdominal wall defect repair. And Obliquus externus abdominis flap parallel shifting shows the advantage of good blood supply, helpful in large defects, and suitable for functional reconstruction, as a result, could bring about good clinical outcomes. What counts is the reservation of blood supply of Obliquus externus abdominis flap, then we need a proper method to assess the blood supply. Fluorescence tracer navigation technique with indocyanine green could be an easy, safe, and effective method.
P-1222
Does the statistical analysis of quality of life change our view on the tailored approach for treatment in inguinal hernia repair?: Lichtenstein vs. Tapp vs. Desarda
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Background: Inguinal hernia repair is the most common general surgical procedure in industrialized countries. The European Hernia Society guidelines recommend a mesh-based repair with the Lichtenstein technique or an endoscopic approach for primary inguinal hernia. Recently pure tissue surgery is struggling to keep its legitimacy. The aim of this study was to investigate whether a non-mesh technique is still a good alternative compared to mesh-based techniques in individual cases regarding the Quality of Life (QoL).

Methods: Patients undergoing LICHENSTEIN (L), TAPP (T) or DESARDA (D) repair for inguinal hernia from 2013 to 2016 at the Rostock University Medical Center were included. DESARDA’s technique, first published in 2001, is a method reinforcing the floor of the inguinal canal with a strip of external oblique aponeurosis. Technical details and outcomes were determined by physician chart review. Return to work and health-related quality of life (EQ-5D) were evaluated with a mailed survey at a median of 20 months after repair.

Results: 351 patients that underwent inguinal hernia repair (43 pure tissue) were identified. The Follow up rate was 63% (93% pure tissue). All perioperative variables were the same except the age [median 73.5 (L) vs. 58 (T) vs. 33 (D) years; p < .01] thus corresponding to the comorbidities. In spite of this postoperative recurrence and the duration back to work differ not significantly between the groups the health related QoL improves to the reference level of the German population.

Conclusion: From a socio-economic perspective, a pure tissue technique is probably the most cost-effective approach for young patients who participate in the labour market. The QoL analysis including chronic pain, demonstrate similar results for the different techniques. The endoscopic techniques may be preferable since they cause less numbness and postoperative pain.

P-1225
Clinical and epidemiological profile of incisional hernia patients at a Brazilian University Hospital
Santa Casa de São Paulo School of Medical Sciences

Introduction: Incisional hernia is one of the most common postoperative complications of abdominal surgery. Although incisional hernia pathogenesis remains unclear, depending on the risk factors, incisional hernia can occur in 3–60% of patients undergoing the ventral wall procedure. The aim of the present study was to report the epidemiology and risk factors associated with incisional hernia in the Brazilian population.

Methods: A prospective, observational study was conducted at the Hernia Department of the Santa Casa de São Paulo School of Medical Sciences, Brazil, between January 2016 and February 2017. We evaluated 85 patients with incisional hernia. Demographic profile and data on surgery type, postoperative complications, defect size, and time between hernia diagnosis and treatment, were studied.

Results: The study results showed that cases had a mean age of 52.6 years and, of the 85 patients analyzed, 50 were female and 35 male. Mean BMI was 31.3. The most frequent conditions included obesity and hypertension, present in 9 and 36 patients, respectively. Tobacco use was found in 43.5% of cases. Regarding problems at the surgical site, 29 patients had complications (wound infection in 30% and seroma/hematoma in 18%). Half of the cases were diagnosed within the first year after laparotomy. Emergency procedures had been performed at the initial surgery in 54% of cases. One-third of the procedures were for gastro-intestinal tract conditions and 12% for ventral hernia recurrence.

Conclusion: In our group, incisional hernia predominantly affected female patients aged 50–60 years. These hernias were frequently associated with primary emergency procedures and with at least one co-morbidity, such as tobacco use, obesity, diabetes mellitus and hypertension.
P-1229
Hernia mesh repair for inguinal hernias in a 3rd world country (Cameroon): personal experiences
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Aim: The aim of this study is to evaluate the efficacy of hernia mesh repair for inguinal hernias in 3rd world countries, based on personal observations and experiences.

Materials and methods: Group of 92 patients, 83 men and 9 women, aged 14–88, underwent planned operative treatment of inguinal hernia in local hospitals in Cameroon in 2008 and 2011. We performed 118 procedures, 107 in men and 11 in women. 36.44% of all cases in men involved scrotal hernias, half of which involved a significant defect of the posterior wall of the inguinal canal. We observed 12.7% of bilateral hernias (n = 15). 18.7% of all patients were treated for recurrent hernias. The hernia repair method included: the Lichtenstein method (n = 110), Robbins-Rutkow method (n = 4) and PHS (n = 4). In one case we performed large bowel resection. Half of all the procedures were performed without electrical coagulation. Half of all operations were performed by surgeons highly experienced in hernial repairs. In the prospective analysis we evaluated early and late complications.

Results: There was one case of recurrence (0.84%) in a patient after Robbins-Rutkow hernia repair of scrotal hernia with a large posterior wall defect. Other complications involved: seroma—1.69% (n = 2), abscess—4.2% (n = 5), hematoma—5.08% (n = 6). Two patients required surgical revision due to a large hematoma of the scrotum (n = 1) and recurrence (n = 1). We did not observe operation related deaths.

Conclusions: Hernia mesh repair for inguinal hernias can be safely performed in 3rd world countries regardless of the type of the mesh used. Perioperative antibiotic therapy is indicated.

P-1230
Incisional hernia in the elderly
Univeristy of Chile, Clinic Hospital

Introduction: Life expectative has been increased to over 80 years old. With an increasing frequency of patients who require surgery in the last 20 years. Incisional hernia in this population has been increased too. These patients have more previous morbidity and increased risk of mortality. Comprehensive preoperative evaluation and Frailty concepts, are relevant to this group of patients.

Aim: The purpose of the present study is to present our experience in the repair of incisional hernias in the elderly.

Methods: Between 2012 and 2016, 672 patients with incisional hernia were attended at the Clinic Hospital of the University of Chile. Demographic data, comorbidities, primary surgery, type of repair and mesh used, were recorded in computer database using the statistic software STATA. Patients were divided in two groups. Over and under 65 years. Statistics analysis of data were submitted to chi2 test.

Results: 288 patients (43.5%) were over 65 years old. Patients over and under 65 years, presented: hypertension (63.5–35.8%, p = 0.001) diabetes (18.8–14.6%, p = 0.162) COPD (2.03 vs 1.96% p = 0.41) hypothyroidism (3.14 vs 9.37%; p = 0.51). Emergency surgery (7.54 vs 2.6%; p = 0.001) Open surgery (97.1 vs 88.5%) laparoscopic surgery (2.9 vs 11.5%; p = 0.001), patients without post operative morbidity (94.9–96.4% NS), respectively. Minor complications as: hematoma, surgical site infection, urinary retention, were observed. In the present study, no mortality was reported. Onlay repair with polypropylene mesh, was performed in 73.6%.

Conclusions: In the elderly, elective surgery for repairing incisional hernia, can be performed with low morbidity and mortality.
**P-1234**

**Short-term results of a multicenter study on prevention of incisional hernia with an onlay PDVF mesh visible on MRI (visible trial)**


*Hospital Universitario del Henares*

**Background:** Incisional hernia (IH) can be safely reduced with the addition of a mesh to the conventional closure of the abdominal wall. The aim of the VISIBLE trial is to evaluate the safety and effectiveness of mesh reinforcement. This study focused on the short-term results to evaluate surgical site occurrences and the magnetic resonance (MRI) images at 6 weeks.

**Methods:** Observational prospective multicenter study registered in clinicaltrials.gov (NCT: 03105895). 200 patients are planned to be recruited using an onlay polyvinylidenfluorid (PDVF) mesh that can be tracked by MRI. Patients with at least a risk factor for IH will be recruited. This PDVF mesh is a permanent macroporous mesh with CEE approval for hernia prevention. Patients are followed clinically and radiologically (MRI).

**Results:** Outcomes represent results after 1-month: 48 patients have already been included: 52% elective, 48% emergency. Mean age was 65 years (55–74). Men, 60.4%. Mean BMI was 28 kg/m² (25–32). Wound classification: clean-contaminated (54.2%), contaminated (18.8%) and dirty (25%). Surgical morbidity: 6.3% SSI, 6.3% seromas, 10% hematomas and 2% of organ/space infection, solved by medical treatment. 3 patients (6.3%) have been reoperated due to septic shock. Mortality was 4.2%. Mean EVA pain score was 2 (1–3) on discharge and 0 at 1 and 3 months after surgery. It has been described 1 case of SSI after 3 months, but at 6 months follow-up it doesn’t exist any complication related to the mesh. In the evaluation by MRI at 6 weeks, one case of IH has been observed to date.

**Conclusions:** On the basis of this preliminary results, VISIBLE trial demonstrates the safety of the PDVF mesh, which can be assessed by MRI. It will be paramount to analyze the development of IH through the MRIs to understand better the causes of herniation and search for better methods of prevention.

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**P-1237**

**New concept in anatomy and abdominal wall surgery**

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In 1990, Ramirez described the original component separation technique as a means to facilitate complex abdominal wall reconstruction with the use of autologous abdominal wall tissue. Since its original description, the anterior component separation, several modifications have been proposed to this technique: periumbilical perforator-sparing anterior component separation, laparoscopic/endoscopic component separation, posterior component separation and trasversus abdominis release (TAR).

Because each technique has advantages and disadvantages, it is important for surgeons treating patients with large abdominal wall hernias to consider each repair on a case-by-case basis. Here, we propose an original concept in anatomy of abdominal wall, a new version of anterior component separation (by posterior approach) and some trick and tips to identify the proper repair.

Abdominal wall can be considered comprised of two compartments: (a) posterior compartment: transversalis fascia and the peritoneum (caudad to the arcuate line of Douglas) plus posterior rectus sheath (chehalad to the arcuate line of Douglas), (b) Anterior compartment: rectus muscle plus anterior rectus sheath.

If a real loss of substance of posterior compartment is present (it means that it is not possible a tensionfree closure of the peritoneum and the posterior rectus sheath) a posterior component separation and eventually a TAR are necessary. Even if posterior components separation and TAR do not permit a tensionfree closure, a bridged biological or absorbable synthetic mesh can fill the real loss of substance. Then, a bigger further synthetic mesh will be placed in the retromuscular space.

If a loss of substance of the anterior compartment is present (it means that the rectus diastasis does not allow a tensionfree closure of the anterior compartment) an anterior component separation is necessary, that can be accomplished both by anterior and posterior approach.

Sometime, in selected patients both component separation techniques (posterior and anterior) are necessary.
P-1239
Estimating recurrence rates in the international hernia mesh registry (IHMRR): calculation method matters
Yoo A, Corso K, Chung G, Romanowski C, Schleckser P, Schmitz N
Johnson & Johnson

Hernia recurrence is an important and common complication after incisional hernia mesh repair. Various methods of calculating recurrence rates have been reported. This study evaluates three methods for estimating recurrence rates after incisional hernia mesh repair.

Patients enrolled in the IHMRR who had incisional/ventral hernia repair with mesh between 2007 and 2016 were included. Umbilical, epigastric, and other abdominal wall hernias were excluded. Hernia recurrence was either physician confirmed or patient reported hernia recurrence ≥ 31 days after index repair. At 1 and 2 year follow-up three recurrence rate methods were used to estimate recurrence rates: Intent to treat (ITT, all recurrences occurring within each time interval divided by all patients enrolled), cumulative events proportion (CE, all recurrences divided by all patients with a recurrence or follow up at each time interval) and Kaplan–Meier (KM). Patients were censored at end of study (2 years follow up). Rates were calculated for all patients and stratified by open and laparoscopic approach.

A total of 892 patients was analyzed: The mean (SD) age was 56.8 (12.9) years and 50.7% were females. Mean BMI was 31.7 kg/m² (7.0) and mean defect area was 63.5 (86.6) cm². Laparoscopic approach was performed in 51.2% of patients. Mean (SD) follow-up was 527.4 (274.3) days for open and 521.8 (275.3) days for laparoscopic. ITT underestimated and CE overestimated recurrence rates compared to KM. At 1 and 2 years, ITT (95% CI): 3.8% (2.7, 5.3%) and 6.4% (4.9, 8.3%); CE: 5.3% (3.7, 7.3%) and 15.7% (12.2, 20.0%); KM: 4.7% (3.1, 6.2%) and 8.7% (6.5, 10.8%). Recurrence rates were not significantly different between open and laparoscopic for all methods.

Hernia recurrence estimation varies by calculation method and this difference increases with longer follow up. Standardized recurrence rate reporting is important to help contextualize different studies.

P-1240
Individualized treatment of complex ventral hernia repair: 2000 cases experience
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Introduction: There are about 5000 hernia cases every year in our hospital, Ventral hernia 600 cases among, and complex cases about 80%, 20% patients from Beijing and 80% Patients non-Beijing, about 500 complex ventral hernia (Do by my team) last year. Complex ventral hernia means that ventral hernia which is huge and/or combined with a lot of complications, the treatment for complex ventral hernia is difficult in clinic. (1) Giant ventral hernia with adiposity (BMI > 28): hernia defect size (diameter) > 12 cm and/or second peritoneal cavity > 20% abdominal cavity (HSV/ACV). (2) Irreducible or incarcerated giant ventral hernia. (3) Recurrent ventral hernia (with mesh). (4) Ventral hernia combined skin and/or mesh infection. (5) Ventral hernia combined intestinal fistula. (6) Ventral hernia combined ascites (cirrhosis). (7) Ventral hernia combined organ expose (ACS). (8) Ventral hernia combined serious adhesion in abdomen. (9) Ventral hernia at special position (easy recurrence). (10) Ventral hernia combined primary or secondary tumor.

Regular surgery is only one reliable method to cure the abdominal hernia and Irregular surgery result complication even death of patients. Precise diagnosis, precise selection (operational time, operational technique, operational method, mesh), pay attention preoperative preparation are very important.

Individualized procedures to treat complex ventral hernia can get ideal result.
P-1243
Combining laparoscopic external oblique release with robotic ventral hernia repair: a novel approach to ventral hernia repair
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Introduction: With improvements in surgical critical care, antibiotics, temporary abdominal wound closure, and biologic mesh, many people are surviving invasive abdominal surgeries and forming large ventral hernias. Open hernia repairs are painful and often morbid procedures. In the era of minimally invasive surgery, the option for robotic surgery exists, however the surgeries can be technically difficult with long operative times. Upon literature review, we identified a knowledge gap. There are currently no data or case reports of combined laparoscopic transversus abdominis release with a robotic ventral hernia repair. The purpose of this study was to introduce a combined laparoscopic component separation and robotic ventral hernia repair as an option for repairing large ventral hernias.

Methods: A retrospective review of prospectively collected data was done at a single center combined community and academic teaching hospital. Patients who presented to the office electively with the complaint of large ventral incisional hernia were offered combined laparoscopic and robotic ventral hernia repair. The primary outcomes were length of stay and hernia recurrence. The intervention consisted of a laparoscopic transversus abdominis release, a robotic primary fascia repair, and robotic placement of mesh.

Results: Two patients were included in this study over a 1-month period. Both patients were male and their mean age was 44 years. The mean length of stay was 2 days. There were no complications. At 8 month follow-up, both patients were free of hernia recurrence.

Conclusions: Through this pilot study, we conclude that a combined laparoscopic transversus abdominis release and robotic ventral hernia repair is not only feasible, but also beneficial to patients with large ventral hernias.

P-1248
Reconstruction of giant mid line incisional hernia with chevrel technique
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Abstract
Introduction: Giant incisional hernia (GIH) is a serious pathologic entity which is characterized with massive loss of muscle and fascial tissue and complete impairment of the anatomical and physiological function of the anterior abdominal wall. Reconstruction is accompanied with a high rate of relapses, complications and even mortality.

Materials and methods: During 17 year period (2000–2016), total of 319 patients have been operated for midline GIH. By using Chevrel’s classification it is M4-W4R type of incisional hernia. Standard reconstruction by Chevrel’s technique was used with the creation of new linea alba. The defect on the anterior rectus sheet was covered with polypropylene mesh. Female to male ratio was 209/110 with median age of 48 years (31–72). Median BMI was 32.1. Concomitant cholecystectomies were done in 11 patients and dermolypectomies on 31 were performed at the same time.

Results: There were no cases of intraoperative complications and mortality. Postoperative mortality, as a result of perforated peptic ulcer was seen in one patient. Operative time after the improvement of the technique varied between 60 and 70 min. Average time of hospitalization was 8.8 days (range 7–21). SSI were noted in 56 (17%) patients. Seroma was a leading complication in our series. Partial necrosis of the skin was seen in 12 patients (4%). Hernia recurrence was evidenced in 7 patients (2.1%) during the follow up period (6–48 months) in controlled 284 patients.

Conclusion: The original Chevrel technique sublimed from the tissue reconstruction on the linea alba and approximation of rectus muscle, strengthened with onlay application of mesh. It represents an acceptable method with very good results. The low recurrence and complication rate, as well as the functional results, influence on the acceptance of this method by highly specialized institutions that deal with the treatment of GIH.
P-1249
Tep release & reinforce technique (RRT) for sportsman hernia
Dudai M
Ramat Aviv

At 1986 we upgraded our technique for sportsman hernia (SH) to TEP with releasing of the inguinal ligament (IL). At 1998 independently, David Lloyd add the IL release to his TAPP technique. We will describe our release and reinforce technique (RRT).

Background: The pathologies of SH are in the posterior wall (PW), conjoint tendon and inguinal ligament. Consequence of that, a high pressure be created in the inguinal canal (IC) and on the genito and femoral nerves (entrapment) during sport activities (SA). The aim of the surgical repair is to avoid those consequences and reinforcing the PW.

Methods In our RRT we combining pressure releasing with PW reinforcing: doing a vast release, one should reinforce the Groin. Reinforcing the Groin without releasing the pressure creators, the patient can remain with the pain. The strained and inflamed IL creates pressure in the IC and on the nerves behind it (entrapment); genital and femoral. Pressure can be created as well by herniation of Lipomas into injured opened anatomical orifices. The PW deficiency leading to bulging during SA and increasing pressure in the IC.

We use TEP, SH is always bilateral. after adhesiolysis and extraction of any herniated lipoma, we dividing the IL at the lateral aspect of the IR. For completing the procedure, we reinforcing the PW with wide light PPP mesh. The PPT is supplemented by Athlete Rehabilitation Program.

Discussion: The injured IL is a major factor of pressure creating in the IC and entrapping the Genital and Femoral Nerves behind it. Dividing the IL in addition to PW reinforcing, add a great advantage for relieving pain during SA. RRT procedure leads to very good results of less than 0.5% persistent pain after returning to SA.

P-1251
Comparison of fixation methods in laparoscopic ventral hernia using the Americas Hernia Society Quality Collaborative (Ahqsc)
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Mesh fixation in ventral incisional hernia is currently a topic of considerable debate. The purpose of this study was to compare outcomes in laparoscopic incisional hernia repairs utilizing tack fixation alone versus tack and suture fixation.

A retrospective review of all patients undergoing laparoscopic ventral hernia using tack fixation (absorbable/non-absorbable) alone compared to tack (absorbable/non-absorbable) and suture fixation were queried from the AHSQC database. Outcome measures included hernia recurrence rate, pain, quality of life, wound related issues, and length of stay. Propensity match scoring was performed to compare patients undergoing tack only fixation versus tack and suture fixation with a p-value of < 0.05 considered significant.

A total of 852 patients were identified after propensity match scoring with 426 who underwent repair with tacks alone and 426 who underwent repair with sutures and tacks. Following matching there were no differences in BMI, age, hernia width/length, or baseline pain/quality of life. There were no significant differences found in outcomes measures including recurrence rates, pain and quality of life outcomes at 30 days, 6 months, and 1 year, surgical site infection (SSI), surgical site occurrences (SSO), and postoperative length of stay (p > 0.05).

Based on this large data set, there is no statistically significant difference in hernia recurrence or postoperative surgical complications when comparing mesh fixation in laparoscopic incisional hernia repair with absorbable or non-absorbable tack fixation alone versus absorbable or non-absorbable tack and suture fixation. Further study is needed to evaluate but at present there is no convincing evidence that one type of fixation is superior to another in laparoscopic ventral hernia repair.
A post-market, prospective, multi-center, single-arm clinical investigation of Phasix™ mesh for VHWG grade 3 midline incisional hernia repair
Erasmus University Medical Center

**Background:** Incisional hernia is a frequent complication of midline laparotomy. The use of mesh has been reported to lead to fewer recurrences compared to primary repair. However, in Ventral Hernia Working Group (VHWG) Grade 3 patients, whose hernia is potentially contaminated, synthetic mesh may be prone to infection. There is a strong preference for biological mesh in contaminated fields, which may better resist infection with little chance of foreign body reaction compared to permanent synthetic mesh. However, non-crosslinked biological mesh products often degrade too quickly to facilitate native cellular ingrowth. Phasix™ Mesh is a biosynthetic mesh with both the biocompatibility and resorbability of a biological mesh and the mechanical strength of a synthetic mesh. This multicenter, single-arm study aims to assess the use of Phasix™ Mesh in VHWG Grade 3 European hernia patients.

**Methods:** A total of n = 85 VHWG Grade 3 hernia patients were treated with Phasix™ Mesh at 15 sites across Europe. The primary outcome is Surgical Site Occurrence (SSO) requiring intervention, including hematoma, seroma, surgical site infection, wound dehiscence, skin necrosis, and fistula formation through 3 months. Secondary outcomes include hernia recurrence, infection, pain, and quality of life through 24 months. Follow-up visits are scheduled at drain removal, discharge, or staple removal and at 1, 3, 6, 12, 18, and 24 months postoperatively.

**Results:** Fifteen sites have treated n = 85 subjects to date, and we report on the first n = 50 subjects completing the 3-month follow-up visit. Data from this early follow-up period reflect promising results, including: 10% (n = 7) SSO, 0% (n = 0) hernia recurrence, 0% (n = 0) fistula, 1% (n = 1) skin necrosis, 1% (n = 1) hematoma, 4% (n = 3) seroma, and 11% (n = 8) wound dehiscence.

**Conclusion:** Phasix™ Mesh demonstrated favorable outcomes in VHWG Grade 3 European patients, exhibiting low incidence of SSO and hernia recurrence at 3 months. Longer-term 24-month follow-up is ongoing.

Prevention of incisional hernia in complex abdominal wounds after damage control laparotomy due to abdominal sepsis. Texas Endosurgery Institute experience
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Texas Endosurgery Institute

**Background:** Damage control laparotomy, intensive care unit resuscitation, and planned re-laparotomy are the method frequently used to manage catastrophic intra-abdominal contamination among critically ill patients. The main difficulties in managing an open abdomen are the control of intraabdominal fluid secretion, facilitation of abdominal exploration, and preservation of the fascia for abdominal wall closure. The objective of this study was to determine how negative pressure therapy system reduces the extent of inflammatory response, and incisional hernia rate after damage control laparotomy for intra-abdominal sepsis at Texas Endosurgery Institute.

**Materials and methods:** We have prospectively collected the data of all those patients that were treated with open abdomen for complex abdominal problems and in who the use of negative pressure therapy until the fascia was considered ready to close was needed.

**Results:** Since August 2009 thru September 2017, Texas Endosurgery Institute database identified 154 patients (84 women and 70 men), all of them with generalized peritonitis. Mean age was 63 years (range 28–92). In 140 (91%) of the patients the fascia closure was successful at PO day 6 (3–24). The intensive unit care median stay was 27 days (3–90), and the median length of hospital stay was 33 days (12–110). 3 (2%) of the patients developed incisional hernia treated laparoscopically with mesh placement. 57 (37%) patients were reinforced with mesh at the time of fascial closure.

**Conclusions:** Our findings demonstrated effective use of negative pressure therapy for managing the open abdomen in critically ill patients, decreasing the overall hospital stay and incisional hernia rate after open abdomen with complex abdominal wounds. The application of negative pressure therapy is a safe option for the control of sustained intra-abdominal hypertension and management of severe sepsis due to purulent peritonitis.
P-1262
Mesh sutured abdominal wall repairs: a novel technique for management of acute fascial dehiscence and open abdomens
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Background: Management of acute fascial dehiscence and open abdomens following complications of gastrointestinal surgery remains a difficult and unsolved problem.

Methods: Five patients with an acute fascial dehiscence and five patients with open abdomens due to complication of intra-abdominal procedures were closed with mesh sutured repairs. Surgical site occurrence (SSO) and hernia occurrence rates are reported.

Results: Of the ten patients, two had clean-contaminated wounds (CDC 2), six had contaminated wounds (CDC 3), and two were infected (CDC 4) per Centers for Disease Control (CDC) Wound classification. Eight patients were VHWG grade 3 and 2 patients were VHWG grade 4. There were six males and four females with an average age of 53.1 years and average BMI of 30.6. Only one patient required components release. Mean operative time was 103 min (range 47–229 min). Three of ten patients were on immunosuppressant anti-rejection regimens for solid organ transplant. Overall, four patients experienced an SSO (40%). One patient had a surgical site infection requiring IV antibiotics (10%) and ultimate return to the operating room for debridement of superficial fat necrosis. Two patients had hematomas requiring operative drainage (20%), and two patients had seromas treated non-operatively (20%). Overall three patients required return to the OR. Only one of ten patients required readmission within 30 days, which was for a psychiatric condition and not related to his abdominal closure. One patient had a postoperative hernia develop re-repaired with mesh strips, for a 10% recurrence rate at a mean follow up of 1.5 years.

Conclusion: Mesh sutured closure represents a simplified and effective surgical strategy for treatment of acute fascial dehiscence and open abdomens, with an acceptable profile of minor complications and low rate of hernia development.

P-1264
Rectus diastasis laparoscopic reconstruction (Rdlr): personal technique, 10 years experience
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Objective: restore anatomy and physiologic functionality of diastasic abdominal wall, eventually complicated by single or multiple hernias, by re-approximating the rectus abdominis muscles through cranio-caudal laparoscopic running sutures and mesh repair. 302 cases from January 2007 to September 2016, minimum follow-up 12 months.

Method: elected patients under 65 years old, BMI < 30, ASA1–ASA2, with maximum inter-rectal distance of 10 cm. According to the innovative RDLR technique, rectus muscles are re-approximated from xiphoid to pubis using laparoscopic running self-locking, PDS sutures to restore anatomy and physiologic function of the abdominal wall. The repair is consolidated placing an intra-peritoneal semi-absorbable mesh in order to buttress the repair and reduce tension on suture line, minimizing tearing pain at suture line and the risk of recurrence. The entire procedure is performed in gas-less laparoscopy, with laryngeal mask and intra-peritoneal liquid anaesthesia. The use of semi-absorbable and absorbable sutures, mesh and fixation devices, enhances the mini-invasivity of the technique reducing foreign material left behind.

Results: in all cases abdominal functioning was successfully restored; no higher pain related to the continuous laparoscopic suturing was reported compared to bridge IPOM repair, while allowing for a more physiologic outcome and a stronger repair. The RDLR technique allowed for a sound and anatomic reconstruction and more satisfactory aesthetic results. The reconstruction of linea alba and defect closure did not determine short and long term higher pain, while minimizing seroma formation. No intra operative bleeding, no mesh infection have been recorded. 100% follow up at 12 months, 98% at 24, 86% at 36, no recurrences observed.

Conclusions: Rectus diastasis laparoscopic reconstruction (RDLR) proved to be a feasible technique for the “restitutio ad integrum” of the abdominal wall anatomy and functionality, allowing better aesthetic results with no increase of pain and less seroma formation, compared to classic tension-free IPOM laparoscopic repair.
Postoperative abdominal hernia with open ventral hernia repair with mesh: Ovhr

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Background: The incidence of incisional hernias following abdominal incisions is high and difficult to estimate.

Methods: From 2006 to 2016, 286 patients were operated with postoperative abdominal hernia. 37% were previously operated at our clinic and 63% at various hospitals with standard absorbable suture closure. Open ventral hernia repair with mesh was used on all of the patients that were operated. Pre-surgical prophylactic dose of antibiotic was given to all patients, no antibiotics were used postoperatively except for patients with wound inflammation, analgesia were commonly used. Generally used materials were prolene mesh or dual mesh. Commonly used mesh size was: 20×30 cm with 154 patients (54%), 15×15 cm with 103 (36%), other sizes with 29 (10%). Chevrel technique of the premuscular placement of prolene mesh was used with patients 117 (41%), retromuscular preperitoneal mesh was placed in 84 patients (29%), onlay placement of mesh in 60 (21%), and in 25 patients (9%) intraperitoneal dual mesh was placed. In 183 patients (64%) that were operated vacuum drainage was inserted.

Results: In 24% operated patients seroma occurred and lasted for more than 10 days. In 4% patients inflammation of the incision site occurred and were treated with antibiotics for more than 7 days. Only 0.7% retromuscular mesh patients needed removal of the mesh. In intraperitoneal mesh patients longer usage of analgesia was recorded. Average time for hospitalization was 7.6 days. Recidivism occurred in 4% patients.

Conclusion: Chevrel’s technique in midline incisional hernia repair and Retromuscular mesh repair technique with all the remaining incisional hernias demonstrate best results respectively.

Comparing different modalities for the diagnosis of incisional hernia: a systematic review

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Introduction: Incisional hernia (IH) is the most frequent complication after abdominal surgery. The diagnostic modality, observer, definition, and diagnostic protocol used for the diagnosis of IH potentially influence the reported prevalence. The objective of this systematic review is to evaluate the diagnostic accuracy of different modalities used to identify IH.

Methods: Embase, MEDLINE OvidSP, Web of Science, Google Scholar, and Cochrane databases were searched to identify studies diagnosing IH. Studies comparing the hernia detection rate of two different diagnostic modalities or inter observer variability of one modality were included. Quality assessment of studies was done by Cochrane Collaboration’s tool. Article selection and data collection was performed independently by two researchers. PROSPERO registration: CRD42017062307.

Results: Fifteen studies representing a total of 2986 patients were included. Interobserver variation for CT-scan ranged from 11.2 to 69% (n = 678). Disagreement between ultrasound and CT-scan ranged between 6.6 and 17% (n = 221). Ten studies compared physical examination to CT-scan or ultrasound. Disagreement between physical examination and imaging ranged between 7.6 and 39% (n = 1602). Between 15 and 58% of IHs were solely detected by imaging (n = 380). Relative increase in IH prevalence for imaging compared to physical examination ranged from 0.92 to 2.4 (n = 1922).

Discussion: Ultrasound or CT-scan will result in substantial additional IH diagnosis. Lack of consensus regarding the definition of IH contributes to the disagreement rates. Both the observer and diagnostic modality used, are considered additional factors explaining variability in IH prevalence and should be reported in incisional hernia research.
P-1281
Swedish hernia register: 25 years of prospective groin hernia registry
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Background: The Swedish Hernia register was founded in 1992 with the aim to “describe and analyze hernia surgery and stimulate improvements at the participating units”. 25 years later almost all groin hernia repair, performed on patients 15 years or older, are registered in the SHR, creating a database of more than 300 000 prospectively registered operations.

Aim: the aim of this study is to describe trends and analyze improvements within groin hernia surgery in Sweden using register data from 1992 to 2016.

Method: The study is an observational register study including prospectively registered operations. Primary end point is risk of reoperation for recurrence, for three time intervals, 1992–2000, 2001–2008 and 2009–2015. Cumulative risk of reoperation is analyzed using the cox proportional regression analyses.

Results: Suture techniques has been replaced by open anterior mesh repair in men (70%) and by laparoscopic repair in women (65%). Proportion recurrent vs primary repair has decreased from 16% in 1995 to 9% in 2016. In men, the 5 year cumulative risk of reoperation for recurrence was 3.8% in 1992–2000 compared to 2.8% in 2009–2016. In women the risk decreased from 5.3 to 2.8%. In men, recurrence, emergency repair, and all methods of operation but open anterior mesh repair were associated with an increased risk of reoperation. In women, recurrence and all methods of repair but laparoscopic repair were associated with an increased risk.

Conclusion: A distinct improvement of groin hernia surgery has taken place during the last 25 years. Open anterior repair in men and laparoscopic repair in women are associated with the smallest risk of reoperation for recurrence. In the future, the register will continue to evaluate groin hernia surgery in Sweden with an enlarged palette of endpoints such as postoperative pain and patient satisfaction.

P-1282
Abdominal trunk function protocol: an examination tool designed to evaluate the dysfunctional panorama related to abdominal rectus muscle diastasis (ARD)
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Introduction: Abdominal rectus muscle diastasis (ARD), or diastasis recti (DR), is an expected condition following pregnancy. Functional symptoms from this condition is still an undefined topic. Symptoms as lower back pain, core instability, abdominal wall weakness and discomfort in the abdominal trunk are all symptoms that are respectively associated to ARD. There is today no consensus of how to define the dysfunctional panorama, how to score the symptoms and when and to whom you should recommend training or surgery.

Method: In cooperation with the Physiotherapy department a structured examination protocol was designed, consisting of six separate physical examinations and one questionnaire. The questionnaire and the examinations used in the protocol are all validated methods. The questionnaire used in the protocol is the Disability Rating Index (DRI), an instrument designed to evaluate physical disability, mainly intended for clinical settings, which give a self-rated score with range 0–120. The physical examinations are: evaluation of back muscle strength, examined as a static movement with the patient in a horizontal position and measured in seconds; abdominal muscle strength, examined as a static abdominal crunch and measured in seconds; lateral core stability, examined as the abdominal plank in left and right position, ventral core stability, examined with the Core Muscle Strength and Stability Test (CMSS) with increasing difficulty, measured in seconds; pelvic stability, examined as the abdominal plank in left and right position, ventral core stability, examined with the Core Muscle Strength and Stability Test (CMSS) with increasing difficulty, measured in seconds; pelvic stability, examined with the Active straight leg raising test (ASLR), measured in a difficulty scale with range 1–5 for left and right side, and the Pelvic Joint Provocation Test (4P test), stated as positive or negative for left and right side.

Discussion: The Abdominal Trunk Function Protocol has been used at 50 patients pre- and post-training to evaluate the abdominal function after training. The protocol seems to give an overall picture of the dysfunctional panorama related to ARD.
P-1284
Thirty day outcomes after laparoscopic primary inguinal hernia repairs: comparison of a high volume center vs. Nsqip database
Cleveland Clinic Florida

Background: Laparoscopic Inguinal hernia repair is becoming increasing popular. We compare our outcomes to the National Surgical Quality Improvement program (NSQIP) (NSQIP) database.

Methods: All laparoscopic primary inguinal hernia repairs at our institution between 2010 and 2016 were retrospectively reviewed and compared to the (NSQIP) database. We compared 30 day readmissions, reoperations and post-operative complications. We also compared the same outcomes after propensity case match. All test were two-tailed and performed at a significance level of 0.05.

Results: A total of 1769 cases from our institution were compared to 29,887 of the NISQIP database. Base line characteristics and co morbidities were significantly different between the groups prior to the match. Our cohort had older patients (61.48 ± 15.05 vs 57.66 ± 16.55 < 0.001) with higher incidence of congestive heart failure (3.45 vs 0.1, p < 0.001), renal Failure (19.95 vs 7.96, < 0.001), myocardial Infarction. Following the propensity case match, 30 day reoperation and readmission rates were similar. However, wound infection (0.4 vs 0.05, p = < 0.001), urinary retention (4.75 vs 0.01, p < 0.001) were higher in our cohort. All wound infection were superficial except for one case which needed mesh explantation for sepsis in the immediate postoperative period. The operation time was higher in our population (93.47 ± 136.77 vs 64.88 ± 35.54 p < 0.001).

Conclusion: We report a higher wound infection and urinary retention rates than National averages likely due to the older age, higher incidence of Diabetes, COPD, and Smoking in our cohort.

P-1285
Prostheses used for abdominal wall hernia repair: why do they shrink?
CHU de QUEBEC-Universite Laval

Eleven hernia repair meshes implanted for up to 4 years were harvested at recurrence, infection and infection associated with a fistulae. They were made of polypropylene and/or expanded polytetrafluoroethylene. The devices shrank considerably from 12 to 53% with heavy fibrotic reactions. That shrinkage occurred due to the contraction of the scar tissue that penetrated through the materials and encroached all the polypropylene structures. The level of inflammation was aggravated in case of polymer oxidation associated with the external surface of the fibers. Multiple cracks led to detachment of particles. The collagen bundles in the scar tissue did not show any waviness, and thus could be considered as responsible for the lack of elasticity of the scar tissues. In addition, to the oxidation of the most outer layers of the polypropylene fibers, the nodes of the expanded polytetrafluoroethylene structures were occasionally dispersed into the surrounding tissues. The thinner prostheses, i.e. monolayer of polypropylene mesh led to thinner encapsulation and less important fibrous shrinkage. The devices with several layers of polypropylene with or without ePTFE membrane led to more exacerbated reactions. Despite the plethora of devices commercially available, there is still no consensus to identify the most efficient prostheses. Biointegration of the devices by wavy collagen fibers might be the best way to preserve the elasticity of the abdominal wall: this healing procedure is urgently needed to guarantee the long-term durability of the hernia. Meanwhile, the prostheses must keep their tensile strength intact during their life-time because of the absence of the capacity for patients to regenerate a healthy abdominal wall. The search for appropriate fabrics capable to fulfill all the patient’s requirements should demonstrate an adequate biocompatibility together with a long-term biostability. Alternative polymers such as PVDF might more appropriate.
P-1289
Sell gripping mesh in hernia surgery. Experience at University Of Chile Clinical Hospital
Clinical Hospital Of University of Chile

Introduction: The use of meshes in abdominal wall hernia repair has dramatically diminished recurrence rates. However there is some concern about post-operative and chronic pain due to the mesh itself and sutures used. Long term recurrences are still under evaluation. From 2011 is available at local market a self gripping mesh (Progrip) with advanced micro grip technology for hernia repair. Mesh characteristics made it a very good election on this field because sutures are not needed is easy to install and the cost is reasonable.

Objective: To present the experience with this mesh at the department of surgery of the university of Chile clinical hospital from 2011 to 2015. This period of time allows for at least 2 years of follow-up.

Results: During the period mentioned above 578 patients were operated upon with this mesh. Of these 420 were males (72.6%) and 158 female (27.4%). Mean age was years old. The distribution of hernias was as follows: 198 right inguinal hernias, 152 left inguinal hernias, 33 upper middline, 64 bilateral growing hernias, 37 incisional hernias, 18 more than one hernia, 64 umbilical hernias and 22 not stated. Mean surgical time was 50 min and post operative pain measured an 1 week was 3–4 VAS. The were 6 recurrences in this series.

Conclusions: Self gripping mesh is easy to apply, no suture is needed, post-operative pain is less than others mesh used, less operative time is needed and recurrence at 2 years was similar to other meshes uses.

P-1292
A short case series of rare presentations of appendicitis within midline incisional hernias: spontaneous evisceration and chronic incarceration of the appendix
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Anterior abdominal wall hernias containing the appendix are rare and usually due to sliding variants into the inguinal region or the femoral canal. These are known eponymously as Amyand’s or De Garengoet’s hernias respectively. They are usually encountered incidentally, but may present with appendicitis. For this phenomenon to occur in midline incisional hernias is even scarcer. Presented are two cases of appendicitis in midline incisional hernias with discussion of their successful management.

Case 1: A 70-year-old male presented with spontaneous rupture of his incisional at rest having previously undergone open abdominal aortic aneurysm repair. On assessment his hernia had eroded through the skin with causing an eviscerated greater omentum and appendix. Computed tomography (CT) demonstrated a defect measuring 18 × 15 cm. He underwent open appendectomy and incisional hernia repair with a collagen bridging mesh (Permacol). He made an uneventful recovery and was discharged on the seventh day. Histology showed acute appendicitis with peritonitis.

Case 2: A 37-year-old female presented with a 3 day history of central abdominal pain and vomiting with deranged liver function tests, she was managed for presumed mild pancreatitis when magnetic resonance cholangiopancreatography showed some oedema in the peri-pancreatic fat. She was discharged at day 4, but returned 12 days later with an erythematous incarcerated port-site incisional hernia from previous laparoscopic sterilisation. CT showed a 3 cm defect at the umbilicus containing presumed small bowel with surrounding fat stranding. She underwent incisional hernia repair where an ischaemic appendix was found necessitating appendectomy. The defect was repaired with an onlay prolene mesh and a suction drain left in situ. She developed a wound infection that was managed with antibiotics only, the drain was removed and she was discharged on day three. Histology showed acute inflammation on a background of changes consistent with chronic appendiceal incarceration.
Use of absorbable biosynthetic polyglycolic acid + trimethylene carbonate scaffold in the management of complex abdominal wall defects. Experience in a reference Hospital Unit


University Hospital La Fe

Introduction: The repair of the abdominal wall requires the handling of multiple elements. The surgeon must know and master several techniques and materials to adapt to each clinical case and provide a suitable alternative solution to each patient. We present our experience with the use of absorbable biosynthetic polyglycolic acid + trimethylene carbonate prosthesis (Bio-A, Gore®) associated with wall repair using modified Anterior Component Separation (m-ACS, Carbonell technique) and Posterior Separation of Components-Transversus Abdominis Release (PSC-TAR) in the treatment of large and complex abdominal wall defects.

Material and method: Up to July 2017, we performed a total of 45 PCS-TAR; in 32 cases (those in which the defect or the quality of musculoskeletal component in the abdominal wall was worse) resorbable prosthesis (Bio A®) have been implanted associated with a permanent PPL mesh. Also, in 3 cases in which m-ACS didn’t allow the midline closure, the prosthesis has been used as a bridge located in the preperitoneal plane and between the two rectus abdominis muscles, completing surgery with a large PPL mesh according to our standard technique. We present the results of our experience: demographic data, origin and type of hernia (dynamic study with Valsalva-CT, location and size of the hernia ring, volumetry, analysis of the contents of the visceral sac and its annexes), preoperative management of complex cases (10 pre-conditioned cases with botulinum toxin-A infiltration followed by progressive pneumoperitoneum), technical details of the surgery and analysis of immediate postoperative and immediate and medium-term evolution (up to 30 months follow up). Interesting CT and MRI images provide pre and postoperative protocol control, especially when meshes and new materials have been used with the ability to be visible and controllable by imaging techniques (multidetector CT in the case of reabsorbable prostheses BioA, Gore™, and MRI in the case of meshes treated with iron nanoparticles such as IPOM-visible, FEG Dyna-mesh™). With these we were able to control the positioning, retraction, folding and complications associated with prostheses.

Results: Our experience in the use of reabsorbable biosynthetic prosthesis (Bio-A®), although still initial and reduced to 32 cases, has been very positive. It has been especially useful in the treatment of large lateral hernias (lumbotomy, pararectal for kidney transplantation) and peristomal, with the advantage of allowing a firm preperitoneal plane.

Posterior separation of components-tar (Pcs-Tar) in the management of complex abdominal wall defects.

Our experience with 45 cases


University Hospital La Fe

Introduction: Abdominal wall surgery requires the management of several reconstructive techniques. Surgeon must know and master different options to adapt to each clinical case and offer the right solution for each patient. In recent years, various surgical techniques have been developed on the basis of the concept of component separation. We present our experience with the Posterior Separation of Components with Transversus Abdominis Release (PSC-TAR) in the management of complex abdominal wall defects.

Material and method: Since its description by the group of Rosen-Novitsky, we have progressively implemented this surgical technique in our working group. Until July 2017, we operated a total of 45 patients with PSC-TAR. We present data from our series: demographic data; analysis, origin and type of hernia (by dynamic abdominal wall CT scan with Valsalva maneuver, which allows accurate localization and size of the hernia ring, volumetry, analysis of the contents of the visceral sac and its annexes), preoperative management of complex cases (12 cases pre-conditioned with Botulinum Toxin-A infiltration followed by progressive pneumoperitoneum), technical details of the surgery and analysis of immediate postoperative and immediate and medium-term evolution (up to 30 months follow up). Interesting CT and MRI images provide pre and postoperative protocol control, especially when meshes and new materials have been used with the ability to be visible and controllable by imaging techniques (multidetector CT in the case of reabsorbable prostheses BioA, Gore™, and MRI in the case of meshes treated with iron nanoparticles such as IPOM-visible, FEG Dyna-mesh™). With these we were able to control the positioning, retraction, folding and complications associated with prostheses.

Results: Our experience with the PSC-TAR technique, although still initial, has been very positive. It has been especially useful in the treatment of lateral incisional hernias (lumbotomy, pararectal incisions in kidney transplantation) and in peristomal hernias (sometimes associated.)
P-1299
Incisional hernia after tram flap for breast reconstruction. Management with posterior component separation-tar (Pcs-Tar). Preliminary results
University Hospital La Fe

Introduction: In breast reconstruction, the use of pedicled rectus muscle flaps (TRAM) is associated with the development of abdominal bulging and incisional hernias in up to 63 and 18% of patients, respectively. The addition of a mesh during wall closing reduces these figures to 3–6 and 1–2%, respectively, thus justifying the added cost.

In the setting of the abdominal wall reconstruction for complex incisional hernias treatment, the technique of posterior separation of components by the release of the transverse abdominis muscle (SPC-TAR) has been gaining popularity among the global surgical community because it allows fascial reconstruction and facilitates lateral dissection in a well vascularized retromuscular plane where a preperitoneal mesh with a considerable overlap will be placed to reinforce the visceral sac and provide a competent and safe repair of the defect. Since its description by the group of Rosen-Novitsky, we have implemented in our work group the PCS-TAR technique in different scenarios.

Material and method: In this study, we evaluated the safety and efficacy of reconstruction of the abdominal wall with SPC-TAR in a cohort of patients submitted to breast reconstruction using TRAM and who, despite having an onlay mesh, developed an incisional hernia in the donor area.

Until July 2017, we operated a total of 45 patients with SPC-TAR, of which 4 are patients undergoing TRAM flap who have developed an incisional hernia in the donor area.

Results: These are 4 patients (mean age 56 years, BMI 26).

P-1300
Causation of primary inguinal hernia: a European preliminary analysis of socioeconomic factors
Central Manchester NHS Foundation Trust

Introduction: The aim of this preliminary European study was to explore possible socioeconomic causative factors for a primary inguinal hernia including the clinical history of a preceding sudden strenuous event.

Methods: Prospective data from 500 patients with a primary inguinal hernia from the Netherlands and United Kingdom was examined for any trends in causation with respect to Occupation, physical activity and occurrence of a sudden strenuous event. All data were analysed using R version 3.0.2.

Results: There were 462:38 (m:f) median age of 60 years (IQR 47–70). 247 (49.4%) had a bulge or swelling (B/S), 238 (47.6%) complained of discomfort/pain (D/P) with median VAS (0–10) pain score of 6 (IQR 4–7). 79.8% complaining of a lump within 2 weeks of D/P. 203 (40.6%) indicated a preceding unusual strenuous event (moving/lifting a heavy object) with 63.2% noticing the hernia within 2 weeks of the event. Similar proportions in a desk-based role vs manual role reported a B/S as their primary symptom (46.0 vs 45.3%), while half reported D/P (49.4 vs 47.2%) compared with less strenuous jobs. Strenuous employment activity (> 4 h/week) 44.5% presented with B/S and 51.1% with D/P compared with 49.4 vs 47.2% respectively for those with less strenuous jobs. Physical activity (> 3 h/week) 48% presented with a B/S and 49.5% with D/P, compared with the less active (> 3 h/week) (56 and 48% respectively) and the inactive (no physical exercise) (48.4%, 89 and 47.3%, 87).

Conclusion: Equal number of patients present with either a B/S or D/P. Half the patients presented after a single strenuous event mainly involving lifting/moving a heavy object. Considering physical exercise, less than 3 h in a week may present with a B/S more often than D/P. This suggests that infrequent exercise may be more of a causative factor than either regular or none.
Desmoids tumor of the lateral abdominal musculature. Excision and reconstruction by posterior component separation (Pcs-Tram)


University Hospital La Fe

Desmoids tumour or aggressive fibromatosis is treated by extensive surgical excision to avoid local recurrence, and subsequent reconstruction of the abdominal wall that may be difficult and require the use of meshes. We present our experience with the Posterior Component Separation-Transversus Abdominis Release (PCS-TAR) in the management of complex abdominal wall defect following desmoids tumour excision.

Patient male 32 year, presenting a painless, firm, moving bump in de right flank. Diagnostic evaluation included imaging tests (ultrasound, CT scan and MRI) and thick needle biopsy; results showed a 10 × 7 cm well delimited tumour, affecting the oblique internal and transverse muscles, leaving the oblique external free. Patient was operated on, with extensive tumour resection and PCS-TAR technique using an absorbable biosynthetic polyglycolic acid + trimethylene carbonatescaffold and a large PPL mesh to achieve complete abdominal wall reconstruction.

Surgery was performed without complications, with hospital discharge on the third postoperative day without associated early morbidity. In subsequent reviews, patient has evolved well. The pathology exam reports complete excision with disease-free borders. A CT scan control (7th postoperative month) shows not only that there’s no local recurrence but also the efficacy of abdominal wall reconstruction.

Abdominal wall surgeon must know and master different options to offer the right solution for each patient. In this particular case, the lateral location of the tumor makes repair difficult; so, our experience with PCS-TAR facilitated the success with the patient we present.

what effect does esrd have on elective laparoscopic ventral hernia repair?


SUNY Downstate Medical Center

Introduction: The prevalence of end stage renal disease (ESRD) is increasing rapidly worldwide, as is the number of those patients requiring general surgical procedures. It has been predicted that the number of ESRD patients will increase approximately 1.5-fold by the year 2020. Studies have shown ESRD as independent risk factor for worse outcome after general surgical procedures. Our aim is to explore the effects that ESRD has on patients undergoing laparoscopic repair for ventral hernias.

Methods: Using ACS NSQIP (2010–2015) we identified patients with reducible ventral hernia who underwent elective laparoscopic repair. We excluded patients with wound class 3 or 4, and missing sex, race, BMI, functional status, ASA classification data. Risk variables included age, sex, race, morbid obesity, and presence of ESRD. Outcomes of interest included length of stay (LOS), 30-day postoperative wound infection, dehiscence, pneumonia, reintubation, failure to wean from ventilator, pulmonary embolism, deep vein thrombosis, urinary tract infection, myocardial infarct, bleeding, sepsis, septic shock, return to operating room, and mortality. We performed multivariable analysis using logistic regression, adjusting for these risk variables.

Results: 8791 patients were identified, majority of which were female (n = 4944, 56.2%), White (n = 6799, 77.3%), with median age of 54 years, and 64 (0.78%) had ESRD. Multivariable logistic regression adjusting for all risk variables showed that ESRD was an independent risk factor for postoperative pneumonia (OR 6.91, 95% CI [1.64, 22.88], p = 0.00363) and sepsis [OR 18.58, 95% CI (2.74, 75.81), p = 0.000286].

Conclusion: In this large observational study, we find that even in the setting of elective laparoscopic ventral hernia repair, patients with chronic renal failure requiring dialysis are at increased risk of postoperative pneumonia and sepsis. Clinicians should be cognizant of these risks when operating on these high-risk patients.
Incisional hernia after kidney transplantation. Management with posterior component separation-tar (Pcs-Tar). Preliminary results
University Hospital La Fe

Introduction: Incisional hernia in kidney transplant recipients is a challenge for surgeons, not so much because of its incidence (1.2–3.8%) but because of certain technical issues. On the one hand, the proximity of the hernia to the allograft and transplanted ureter within the retroperitoneal iliac fossa means that the repair could compromise the function of the graft. In addition, the extension of the hernia defect to nearby bony prominences complicates adequate dissection and may limit the overlap of the mesh. Long-term immunosuppression is associated with impaired wound healing, increasing the risk of wound complications and hernia recurrences. In this context, the use of reinforcing meshes is controversial because of the risk of prosthetic infection and the need for its removal. Since its description by the group of Rosen-Novitsky, we have implemented in our work group the technique of Posterior Separation of Components through the release of the transversus abdominis muscle (PSC-TAR). This approach allows fascial reconstruction and facilitates extensive lateral dissection of the preperitoneal retromuscular plane contiguous to the retroperitoneal iliac fossa—where the transplanted organ has been placed—to the psoas muscle, allowing a considerable overlap of the mesh located in this retromuscular plane to strengthen the visceral sac, and offers a safe and lasting repair.

Material-method: In this paper, we evaluated the safety and efficacy of reconstruction of the abdominal wall with PSC-TAR in a cohort of kidney transplant recipients with complex incisional hernias in flanks. Until July 2017, we operated a total of 45 patients with PSC-TAR, of whom 21 are renal allograft recipients with lateral-flanks incisional hernia. We present data from our series: demographic data, hernia analysis (dynamic abdominal wall CT scan using Valsalva maneuver, which allows the exact location and size of the hernia ring, volumetry, analysis of the contents of the visceral sac.

Outcomes between males and females undergoing repair of spigelian hernias
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Introduction: Female sex is associated with differing abdominal wall pathophysiology compared to males, therefore we sought to explore the effect of female sex on outcomes of patients undergoing repair of Spigelian hernias.

Methods: We identified adult patients using the Nationwide Inpatient Sample (2005–2012) diagnosed with Spigelian hernia undergoing surgical repair. Risk variables included age, sex, race, income, insurance, comorbidity status using the validated van Walraven score, morbid obesity, and procedure type (laparoscopic vs open). Outcomes of interest included length of stay (LOS), postoperative mechanical, respiratory, digestive tract, cardiovascular complications, postoperative infection, pulmonary embolism, DVT, intraoperative complications, and mortality. We then performed univariate analysis followed by multivariable logistic regression adjusting for all risk variables.

Results: 8156 patients were identified. Univariate analysis showed that males had longer LOS (mean 5.67 vs 4.82 days, p < 0.0001), increased mechanical (4.03 vs 2.95%, p = 0.0104), respiratory (5.27 vs 3.82%, p = 0.00228), digestive tract (6.02 vs 4.88%, p = 0.0304), cardiovascular (1.89 vs 1.18%, p = 0.0128) complications, pneumonias (1.59 vs 0.57%, p < 0.0001), intraoperative complications (5.46 vs 3.27%, p < 0.0001), and death (1.50 vs 0.55%, p < 0.0001), while females had increased postoperative infections (5.96 vs 4.49%, p = 0.0053). Multivariable logistic regression showed that females had decreased risk of mechanical [OR 0.708, 95% CI (0.554, 0.906), p = 0.00579], respiratory [OR 0.714, 95% CI (0.575, 0.896), p = 0.0172] complications, DVTs [OR 0.515, 95% CI (0.265, 0.989), p = 0.0465], intraoperative complications [OR 0.580, 95% CI (0.464, 1.274), p < 0.0001], and death [OR 0.353, 95% CI (0.215, 0.566), p < 0.0001], but was an independent risk factor for postoperative infection [OR 1.343, 95% CI (1.092, 1.660), p = 0.00573].

Conclusion: We find that after adjusting for demographic, socioeconomic, comorbidity status, and procedure type, females are at decreased risk for postoperative morbidity and mortality following Spigelian hernia repair, but are at increased risk for postoperative infection. Prospective studies exploring causes of these biological differences are warranted.
P-1309
Race and sex play different roles in surgical site infections following abdominal wall reconstruction
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Stony Brook Medicine

Introduction: Previous studies have demonstrated patient socioeconomic factors as a major determinant of post-herniorrhaphy complications and mortalities in elective ventral hernia repair. Abdominal wall reconstruction for ventral hernia is a complex procedure with many variables playing a role in outcome. The purpose of this study is to identify if race and sex play a role in outcomes among patients undergoing abdominal wall reconstruction (AWR) specifically.

Method: The 2005–2013 ACS-NSQIP participant use data was reviewed to compare surgical site infection (SSI) among male and female patients as well as race (Caucasian vs. non-Caucasian) patients. Baseline characteristics were collected. Multivariable logistic regression was used to control for patient demographics and comorbidities. Odds ratios (OR) and 95% confidence intervals were reported as appropriate using SPSS.

Results: A total of 4488 patients were identified. The majority of cases were clean (75.9%) and performed in female patients (52.5%). Surgical site infection was noted in 12.9% of cases. After adjusting for other baseline differences, male sex was independently associated with lower SSI rate (OR 0.83, 95% CI 0.68–0.99). After adjusting for other baseline differences, race (Caucasian vs. non-Caucasian) was not shown to be associated with SSI. Overall morbidity and serious morbidity were not statistically significant.

Conclusion: For patients undergoing abdominal wall reconstruction, race does not play a significant role in surgical site infections. However, male sex did demonstrate a slightly protective benefit to SSI compared to female patients.

P-1310
Nebulized cyanoacrylate for prostheses fixation in Rives-type eventroplasty. Usefulness of MRI-visible meshes for safety control
University Hospital La Fe

Introduction: In our team, Rives technique is of choice for midline small-moderate. We amended the standard technique by using cyanoacrylate-glue for mesh fixation; we shortened surgery time and reduced local complications without impairing safety, because relapse rate didn’t increase. We started this modification 4 years ago, with good clinical results but, with the appearance of meshes visible by imaging techniques, we proposed its use in this non-stitches technique and later verification of the mesh fixation.

Material-method: Ten patients with incisional hernia (transverse diameter range 5–9 cm) were operated on with this modified technique: retromuscular PPL-PVDF prosthesis marked with iron-nanoparticles, visible by MRI images (IPOMvisible, Dynamesh®), fixed without stitches but using nebulized cyanoacrylate glue (Glu-Bran, GEM®). MRI is performed 6 weeks postoperatively as follow-up protocol, it allows visualizing positioning, retraction, folding and complications associated with prosthesis.

Results: The technique was applied as usually, except for the use of visible mesh. There was no complications related to the surgical procedure and the immediate postoperative period was uneventful. The MRI allowed, 6 weeks later, to control the mesh fixation system. A case of folding at the distal end of the mesh and the casual (not clinically suspected) finding of a seroma were the only discordant notes. In all other patients, the mesh was properly fixed, without displacements, wrinkles, folds or complications associated with their use or the fixation system used.

The use of visible mesh allowed us to confirm that fixation of retromuscular prosthesis exclusively with cyanoacrylate-glue is safe and effective in the short term.
P-1312
Safety of light-weight, large pore synthetic mesh in open complex ventral hernia repair
Zabel D, Oleck N, Liu F, Belgrade J, Conway M, Kalish E, Santoro P
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Introduction: The indications for biologic or synthetic mesh used in open complex ventral hernia repair (cVHR) remains controversial. No specific type of mesh has been uniformly adopted for repairs performed in clean/contaminated or contaminated fields. A previous study of synthetic mesh use in cVHR showed a 4% mesh removal rate and a 7% recurrence rate in early follow-up. Recent evidence shows improved infection resistance of light-weight large pore synthetic mesh.

Methods: We retrospectively reviewed our prospectively maintained database at a single institution between 2010 and 2017. Open cVHR with light-weight large pore synthetic mesh anchored at xiphoid and pubic symphysis in the sublay position (pre-peritoneal or retro-recess). Patients demographics were collected and outcome of surgical site infection, mesh removal and hernia recurrence was followed.

Results: A total of 527 consecutive patients were evaluated based on wound classification, clean (n = 380), clean/contaminated (n = 112), contaminated (n = 28) and dirty/infected (n = 7). Surgical site infection in the post-operative period are as follows: clean (14.8%), clean/contaminate (16.9%), contaminated (17.9%) and dirty/infected (42.9%). The dirty/infected group was the only statistically significant difference identified compared to the clean group (p < 0.05). Only two patients had mesh removal, they were both from the clean/contaminated group. There were 15 recurrences, 12 in the clean group (3.9%) and 3 in the clean/contaminated group (2.7%), not statistically significant.

Conclusions: Utilizing synthetic mesh in cVHR other than clean fields remains controversial. We have demonstrated favorable outcomes in patients with clean/contaminated and contaminated fields compared to our clean cohort. We feel that the vascularized sublay position compared to the intra-peritoneal position of mesh offers infection resistance in light-weight large pore mesh and offers a safe alternative in cVHR. We feel that more prospective studies with biologic mesh comparisons are necessary to completely evaluate safety and efficacy in this complex patient population.

P-1313
A comparison of outcomes of morbidly obese vs non-obese patients undergoing laparoscopic repair for spigelian hernias
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Introduction: Spigelian hernias are rare hernias in which laparoscopic repair is associated with decreased postoperative morbidity and mortality compared to open repair. We sought to determine whether morbid obesity (MO) adversely affects outcomes in patients undergoing laparoscopic repair.

Methods: We identified adult patients using the Nationwide Inpatient Sample (2005–2012) with a diagnosis of Spigelian hernia undergoing laparoscopic repair using intention to treat analysis (laparoscopic converted to open were treated as laparoscopic cases). Risk variables included age, sex, race, income, insurance, comorbidity status using the validated van Walraven score, and MO. Outcomes of interest included length of stay (LOS), postoperative mechanical, respiratory, digestive tract, cardiovascular complications, postoperative infection, pulmonary embolism, DVT, intraoperative complications, and mortality. We then performed univariate analysis followed by multivariable logistic regression adjusting for all risk variables.

Results: A total of 957 patients were identified, majority of which were women (n = 579, 60.5%), White (n = 610, 63.7%), with median age of 57 years. Univariate analysis showed no statistically significant association between MO and postoperative morbidity and mortality. MO vs non-MO patients did not have increased LOS (mean 3.35 vs 3.76 days, p = 0.833), and multivariable logistic regression did not demonstrate MO as an independent risk factor for postoperative morbidity or mortality when adjusting for other risk variables.

Conclusion: In this large observational study using a national database, we find that morbidly obese patients that undergo laparoscopic repair for Spigelian hernias have similar postoperative length of stay, morbidity, and mortality as non-morbidly obese patients. Therefore body habitus should not deter surgeons from performing laparoscopic repair if they encounter patients that present with this uncommon surgical disease.
P-1316  
Evaluating the real world use of a new hybrid hernia mesh  
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Background: There are a variety of mesh and technique options for patients who present with a ventral/incisional hernia. A new hybrid hernia mesh (macroporous, monofilament PTFE and a microporous resorbable synthetic polymer) is now available for use in the treatment of ventral/incisional hernias.  

Methods: A clinical quality improvement (CQI) effort was implemented in an attempt to better measure and improve outcomes for patients who undergo ventral/incisional hernia repair. Over a 10 month period, 212 ventral/incisional hernia repairs were performed at nine different institutions using this new hybrid mesh. Patients received a laparoscopic, robotic or open repair. Short-term outcomes were assessed to gain feedback on the new mesh, including its use with different techniques and in nine different local environments.  

Results: Fifty-six patients had a robotic repair. Forty-seven patients received an open repair. One-hundred four patients received a laparoscopic repair. Five patients were excluded that received a combination of laparoscopic/open repair. The average BMIs of patients were similar between the groups (robotic: 33.7, open: 32.3, laparoscopic: 32.1). The robotic group had a 21% rate of previous hernia repair. The open group had a 36% rate of previous hernia repair. The laparoscopic group had a previous hernia repair rate of 19%. Average time in the post anesthesia care unit was similar (robotic: 139.5 min, open: 135.5 min, laparoscopic: 126.5 min). Average hospital length of stay was noted to be shortest for the laparoscopic group at 3.9 days. The robotic group average hospital length of stay was noted to be 4.5 days. The open group average hospital length of stay was 6.1 days.  

Discussion: These results suggest the patients who received laparoscopic or robotic repair had shorter hospital length of stay. There were no short-term mesh related complications.

P-1317  
The repair of a complex para-iliac, paraspinal hernia after recurrent iliac chondrosarcoma resection  
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Carolinas Medical Center  

Repair of complex flank hernia repair can be markedly complicated when the iliac crest is surgically absent. We present the case of a 39-year-old woman who presented with symptomatic incisional para-iliac hernia and recurrent bone tumor.  
The patient had history of recurrent low-grade left iliac wing chondrosarcoma following previous resection with vascularized fibula autograft and large posterior flank hernia. After workup by Orthopedic Oncology and General Surgery, she underwent repair in the left lateral position after ureteral stent placement. A transverse, flank incision over her previous scar was made. Incarcerated left colon and bowel were reduced, and a wide retroperitoneal dissection was performed to expose the spine and recurrent tumor. Meticulous oncologic resection of the 5.5 cm chondrosarcoma was conducted from adjacent psoas and paraspinal muscles, while sparing L4–5 nerve roots and lumbar nerve plexus. The tumor was removed with grossly negative margins. Bone anchors were fastened in the lumbar spine and reconstructed acetabulum, and anchor sutures were passed through the paraspinous muscles to be continuous within the preperitoneal space. A preperitoneal plane was developed from the midline to over the spine, and from diaphragm to the space of Retzius, with full mobilization of the left kidney. A preperitoneal 25 × 23 cm coated, polypropylene mesh was fixated to the bone anchors, with additional fixation to previous fibular strut graft plate, rectus fascia, and oblique muscles, with careful attention to iliac vessels, gonadal vessels, and lumbar plexus. This provided massive overlap of the hernia defect from the pelvis and lumbar spine to the midline. The patient was admitted to the floor postoperatively without complication.  
Even when faced with distorted, reoperative anatomy, the principles of secure mesh fixation, preperitoneal fascial reinforcement, bone anchors, and wide mesh overlap can be used to achieve satisfactory results in even the most complex flank and para-iliac hernia repairs.
P-1318
Endometriosis masked by umbilical hernia
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Background: Endometriosis is a common gynecological condition affecting more than 22% of women in which endometrial glands and stroma present outside of the uterus. Umbilical endometriosis with underlying hernia is extremely rare and challenging to diagnose; patients usually have a long time-to-presentation, ranging from 2 months to 5 years, which suggests that symptoms are difficult to interpret and may be masked by herniation. We report two cases of umbilical endometriosis secondary to umbilical hernia repair and reviewed methods of earlier diagnosis and management.

Methods: We reviewed our patient charts to retrospectively review the workup obtained prior to the diagnosis of umbilical endometriosis, the timeline to treatment and pathology. We then reviewed the literature to evaluate ways to diagnose umbilical endometriosis in a timelier fashion and to review the various treatments.

Results: A 45-year-old woman presented with umbilicus pain and cyclic bleeding 2 years after an umbilical hernia repair and was subsequently diagnosed with umbilical endometriosis. The mass and mesh were surgically removed. The second case was a 45-year-old woman presenting with periumbilical pain and induration, diagnosed with recurrent umbilical hernia. Past surgical history includes umbilical hernia repair as an infant. Dense scar tissue found during her second umbilical hernia repair was sent to pathology and demonstrated to be endometriosis. She opted for symptom treatment through medical therapy.

Conclusion: We found that surgical therapy limits recurrence and malignant conversion of endometriosis. Laparoscopy may be used for excision of suspected umbilical endometriosis and diagnostic for intraabdominal gross disease.

P-1321
Inguinal Pain Questionnaire: short form (Ipqsf)—an instrument designed to evaluate inguinal pain after groin hernia repair
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Introduction: Chronic pain is common after inguinal hernia repair. The patient-reported outcome regarding post-operative pain (short-term and long-term) is an important quality measure for groin hernia repair. The Inguinal Pain Questionnaire (IPQ) is a validated questionnaire regarding pain in the groin following hernia repair. It consists of 18 questions and may be found to be too extensive for use in daily clinical practice. This study compares results from a condensed form (IPQ-sf) of the IPQ to those from the original IPQ to determine if they are to be considered as interchangeable.

Material and method: 400 patients operated with inguinal hernia repair during March 2013, were recruited from the Swedish Hernia Register (SHR). The patients received: the IPQ; the IPQ-sf (which consist of two questions); and the McGill pain questionnaire. The score in IPQ and IPQ-sf, respectively, range from 0 to 12. The questionnaires were sorted in two equal groups, one patient group received the questionnaires in order: IPQ, IPQ-sf and McGill, the second group: IPQ-sf, IPQ and McGill.

IPQ and IPQ-sf results were compared using Kappa coefficient test to evaluate compliance. A population pyramid diagram was used to visualize the distribution and correlation between the results from IPQ-sf and McGill.

Results: After two reminders, the reply frequency was 73.5% (n = 294). After exclusion of 15 incomplete questionnaires the frequency was 69.8%. The result from Kappa coefficient analyzes was an agreement of 78.49%.

Discussion: The condensed questionnaire (IPQ-sf), is considered to be a safe and convenient instrument to evaluate post operative inguinal pain, compared to IPQ and McGill pain questionnaire.
Critical view of the myopectineal orifice, a 1-year retrospective review
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Introduction: Inguinal hernia is a common pathology in our country, the surgical resolution mean a hight number of procedures. In the last years many recommendations are propose to reduce the risk or eliminate the secondary complications of the laparoscopic procedures, we adopt the critical view of the myopectineal orifice to improve the percent of secondary complications in TAPP technique.

Objective: Based on the fact that the critical view of the myopectineal orifice should be simple and educative in order to be adopted by the general surgical community, this group wants to demonstrate that with this technique the complications secondary to TAPP technique will be reduced in our population.

Method: A retrospective study was conducted from January 2016 to April 2017, the patients selected were from both gender with surgical indications for TAPP technique and perform the Critical View of the Myopectineal Orifice.

Results: The study included 93 patients with groin hernia, all of theme perform with TAPP technique and perform the Critical View of the Myopectineal Orifice. The mean age was 61.3 years, 100% was primary hernias, the diagnostic methods was TAC in 61% and US in 39%. Comorbidities was present in 38% of the patients, DM 14%, hypertension 20%, Hypertension plus diabetes 2% and tobacco habit 28%. All the procedures was perform with polypropylene/poliglecaprone meshes, the size of the meshes was 15 × 10 cm. In all the procedure we used tackers of 5 mm to fix the mesh and peritoneum. The the prevalence of the hernia types was: left 27%, right 37%, bilateral 37%, according with the European hernia society groin hernia classification (medial 10.4%, lateral 88.1%, femoral 1.5%). The percentage of associated complications to the procedure was 7.5% (infections 0%, recurrence 5.3% and chronic groin pain 1%).

Conclusions: Implementing the critical view concept will help standardize a growing variability in laparoscopic hernia repair, facilitate training, reduce complications.

Role of bariatric surgery in ventral hernia repair: 6 years results in a consecutive series of patients
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Bariatric patients are often affected by complex ventral hernia. Open ventral hernia repair synchronous to bariatric surgery is associated with high risk of wound complications.

In a retrospective review of 10 patients with a mean of BMI 51 who underwent Roux-en-Y gastric bypass (RYGBP) and concurrent open ventral hernia repair between 2005 and 2009 in our unit we found 57% of SSO (26% SSI).

Starting from 2011, when we observe a bariatric patient with a complex ventral hernia, first we try to treat obesity with a laparoscopic RYGBP or a sleeve gastrectomy. Otherwise an open RYGBP and simultaneous ventral hernia repair using a reabsorbable polyglycolic acid-trimethylene carbonate mesh in IPOM position is performed.

Definitive repair of ventral hernia is deferred after the weight loss.

Between January 2011 and June 2017, 6 patients (mean BMI 47.5–85.7% with loss of domain, median hernia defect 271,08 cm²), were submitted to open RYGBP and simultaneous IPOM repair with a reabsorbable mesh and 32 (mean BMI 46.6,—loss domain 37.5%—median hernia defect 174,08 cm²) to laparoscopic bariatric surgery.

After the weight loss (mean BMI 31.5—loss of domain 21%) 12 patients (mean BMI 30.3, median hernia defect 199 cm²), underwent anterior component separation (ACS) and 26 patients (mean BMI 31.8, median hernia defect 160.7 cm²) underwent transversus abdominis release (TAR) repair. The posterior sheath, both in ACS and TAR, was reinforced by reabsorbable and polypropylene mesh.

In RYGBP + IPOM reabsorbable mesh, ACS and TAR group SSO rate was 16.6%, 41.66%, 7.6% (p 0.014), SSI rate was 0%, 8.3%, 3.84% (p 0.73) respectively.

Weight loss induced by bariatric surgery before elective complex ventral hernia repair seems decrease dramatically complications.
P-1331
Long-term outcomes of phase I trial for robotic iliopubic tract (R-Ipt) repair
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Introduction: The iliopubic tract repair was first introduced by Lloyd Nyhus as an open non-mesh retroperitoneal repair for inguinal hernia. We have adopted this repair using a robotic approach and studied this robotic iliopubic tract (r-IPT) repair in a phase I trial. In this study we report the long-term outcomes from our preliminary population.

Methods: Starting in 2015, patients were enrolled in a phase I trial of r-IPT repair. Inclusion criteria included patients at low risk for recurrence who presented with small non-recurrent inguinal hernias. Patients with concurrent femoral or obturator hernias were excluded. Demographics, symptoms, physical exam findings, operative findings, and postoperative outcomes measures were collected prospectively.

Results: Eleven hernias were repaired in 6 patients. The majority (5/6, 83%) were female. Average age was 42 years (range 31–52); average BMI was 24 kg/m² (range 19–35). Patients were followed for a mean of 11.5 months. All cases were performed outpatient. All patients (100%) had resolution of their preoperative symptoms. Two (18%) had postoperative complications: 1 instance of genital branch neuralgia, with spontaneous resolution; 1 instance of lateral femoral cutaneous neuralgia. Follow-up averaged 12 months (range 1–27 months, median 12 months). There have been 0% recurrences.

Conclusion: The Nyhus-inspired robotic iliopubic tract (r-IPT) repair is a novel application of a minimally invasive approach to provide a non-mesh tissue repair in inguinal hernia. In our Phase I patient population we have shown the repair to be durable in low risk patients, with no recurrences noted to date. Complications are technical in nature and can be serious. Enrollment in Phase II trial is ongoing to evaluate the efficacy of this minimally invasive alternative to mesh repair when applied to a more general population.

P-1333
Laparoscopic hernia repairs without mesh fixation
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Background: The treatment of the inguinal hernia at present is based in surgical procedure with low morbidity and high postoperative satisfaction of the patient. In this scene the laparoscopic approach is constituted as the best intervention united and the constant need of the part of the surgeon to offer interventions of high quality and lowest cost, therefore the laparoscopic hernia repair without fixation mesh emerges as an excellent alternative.

Method: A prospective study was carried out with 122 patients to laparoscopic hernia repair TAPP and TEP without fixation mesh and primary close of inguinal defect. with a follow-up time of 6 months and 1 year.

Results: The participation was 100% with 72% unilateral hernia and 28% bilateral hernia. the average time of surgery was 20 min one-sided repair, and 50 min in the bilateral ones, the recurrence of the hernias was 0% during the time of follow-up, the principal complication were seromas in 0.02% with spontaneous resolution and a case with inguinal pain managed with analgesics, non re-interventions were registered neither mortalities

Conclusion: The laparoscopic hernia repair without fixation of the mesh it a safe technique with result of recurrence and complications are similar to the report in literature for technique with fixation of the mesh.
P-1343
Short term outcomes in patients undergoing paraesophageal hiatus hernia repair
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Background: Paraesophageal Hiatal Hernias (HH) may be a large contributor to the pathophysiology of gastroesophageal reflux disease (GERD). Many patients are asymptomatic; however, symptomatic presentations include heartburn, regurgitation, dysphagia, nausea, or vague epigastric pain depending on the hernia type and severity. The optimal technique and timing of repair remains controversial. Most reports have focused on outcomes of recurrence rates and long-term quality of life assessments. However, short-term outcomes and readmissions have become important in all forms of surgery. We present our experience.

Methods: Between January 2012 and April 2017, all patients undergoing isolated HH repair on our foregut surgery service were reviewed and those undergoing concomitant bariatric surgery were excluded.

Results: 240 patients were identified and 132 were included. 41 were male (31%) and 91 were female (69%) with a mean age of 59 years (range 20–91 years) and a mean BMI of 29.4 (17–42). Worsening GERD was the most common presenting symptom, occurring in 75 (56.8%) patients. 87 laparoscopic cases were performed (65.9%) and 45 robot-assisted (39.1%). Mesh was used in 64 (48.5%) operations (3 polytetrafluoroethylene; 61 biologic). Techniques included: Toupet fundoplication in 68 cases (51.5%), Nissen fundoplication in 35 (26.5%), Dor fundoplication in 5 (3.8%), combined Collis gastroplasty in 4 (3%), and primary suture repair in 20 (15.2%). The mean length of stay was 2.7 days for laparoscopic and 2.2 days for robot-assisted cases. 30-day readmission occurred in 9 patients (6.8%)—6 laparoscopic and 3 robot-assisted. Three major complications and 15 minor complications were reported, with 2 re-operations within 30 days. Neither mesh use nor robotic vs. laparoscopic technique were associated with 30-day readmission (p = ns, Fisher’s Exact Test).

Conclusions: Hiatus hernia repair can be performed safely with a low incidence of complications.

P-1348
Utilization of fibrin glue with retromuscular mesh placement for hernia repair: is something better than nothing?
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Introduction: Mesh fixation remains an integral step in satisfactory repair of abdominal and inguinal herniae. In recent years fibrin glue has been proposed as a safe and effective substitute to staples, tacks and other forms of penetrating fixation, with fewer reports of postoperative chronic pain, and equivocal recurrence rates. There is a paucity of literature exploring the role of mesh implantation without the aid of fixation. We analyzed our outcomes utilizing fibrin glue for mesh fixation versus no fixation at the time of open, laparoscopic and robotic abdominal wall reconstruction.

Methods: Review of a prospectively maintained hernia patient database was conducted identifying individuals who received either fibrin glue or no fixation during retromuscular mesh placement from August 2015 to May 2017 at our high volume hernia center. Patients who underwent laparoscopic, robotic, and open repair were included in this study. Perioperative data and postoperative outcomes are presented with statistical analysis for comparison.

Results: We identified 143 patients, 96 of who received fibrin glue (FG) and 47 who underwent mesh placement with no fixation (NF). Mean mesh area was 791.2 cm$^2$ for FG recipients compared to 558.2 cm$^2$ for NF (p < .05), mean operative time of 223.4 min compared to 161.8 min (p < .05), and estimated blood loss of 63.1 mL compared to 6.8 mL (p < .05). Postoperative complications at 30 day follow up for FG included chronic pain (2.1%), PE (2.1%), DVT (1.0%), wound dehiscence (1.0%), seroma (2.1%), and hematoma (1.0%). One individual in the NF group experienced postoperative hematoma which was surgically evacuated.

Conclusion: Our series review suggests that the use of fibrin glue may not afford significant benefits compared to the use of no mesh fixation in retromuscular space. Additional expense associated with fibrin sealant may be unnecessary.
Effect of surgical approach on subsequent incisional hernia size: a nationwide cohort study

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Background: Incisional hernias are more common after open than laparoscopic surgery. The objective of the current study was to compare the size of incisional hernias after open and laparoscopic colonic resection. Secondly, we aimed to analyze if surgical approach was associated with subsequent surgical repair of a large incisional hernia.

Methods: Data on all patients undergoing colonic cancer resection in Denmark from January 2007 to March 2016 were merged with registrations in the Danish Ventral Hernia Database during the same period. All patients registered with a first-time incisional or port-site hernia were included. Large hernias were defined as a fascial defect area $\geq 100 \text{ cm}^2$. A 100% follow-up was achieved through the Danish Civil Patient Registry.

Results: A total of 499 patients were identified as undergoing both colonic cancer resection and subsequent hernia repair. Of these, 241 (48.3%) underwent laparoscopic colonic cancer resection. The fascial defect was greater after open (mean 94.0 cm$^2$, IQR 15.0–144.0) compared to laparoscopic (mean 61.3 cm$^2$, IQR 9.0–70.0) colonic resection, $P < 0.001$. The incidence of large hernia repair was higher after primary open compared to laparoscopic surgery (32.2 vs. 19.1%, $P = 0.001$). After multivariable analysis, open compared to laparoscopic surgery was significantly associated with an increased incidence of large hernia repair (OR 2.03, CI 1.23–3.35, $P = 0.006$). Other significant factors were BMI $\geq 30 \text{ kg/m}^2$ (OR 2.52, CI 1.36–4.78, $P = 0.004$) and postoperative fascial dehiscence (OR 3.69, CI 1.69–8.15, $P < 0.001$). Age $> 75$ years was associated with a decreased risk of large hernia repair (OR 0.22, CI 0.08–0.54, $P = 0.002$).

Conclusions: Incisional hernias leading to surgical repair were smaller in patients previously undergoing laparoscopic compared to open colonic cancer resection. Open surgery, obesity and postoperative fascial dehiscence increased the incidence of subsequent large hernia repair.

Robotic inguinal hernia repair eliminates the need for post-operative narcotics and demonstrates lower post-operative pain scores

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Abstract

Background: More than 700,000 hernias are repaired annually in the United States. The major division in management of these patients in the past included open versus laparoscopic hernia repair. Robotic inguinal hernia repair has seen exponential growth in popularity with recent studies showing potential advantages with this modality. This Cohort study examined a single surgical practice experience with robotic TAPP repair with mesh (Bard 3D max preshaped mesh) with respect to immediate post-operative pain, 30 day readmission rates and cost of procedure itself.

Methods: We performed a retrospective analysis of 262 consecutive patients (n = 128 robotic TAPP and n = 134 open plug and patch); who underwent inguinal hernia repair between January 2015 and June 2017. Differences in demographics, co-morbidities and pain scores were compared in both groups using Student’s paired t-test. Our study also evaluated the complications and re-admission rates between the two groups.

Results: Both groups were similar with regard to age (50.3 ± 9.9 vs 61.8 ± 14.6, $p > 0.05$), Gender (95% male vs 95% male $p = 0.99$), BMI, mean ASA, and co-morbidities (hypertension, diabetes, hyperlipidemia). On initial evaluation, the robotic group had significantly lower immediate pain scores between 0 and 1 compared to the open group with the pain scores 4–5.

Conclusion: We conclude that robotic inguinal hernia repair with mesh eliminates the need for post-operative narcotics secondary to less parietal trauma, less dissection, non-fixation of the mesh, and shorter operating times. Future directions of our study include comparing 30-day post-operative complications including bleeding, urinary retention, surgical site infections, surgical site occurrences and 30 day readmission rates cost analysis between the two groups.
**P-1352**

**Incidence of paramedian incisional hernia (PIH) after anterior spine exposure**

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**Introduction:** The paramedian incision is a valuable technique for retroperitoneal exposure of the thoracolumbar anterior spine. Despite good spinal outcomes, PIH represents a significant morbidity in these patients. Here, we review a large cohort of anterior spine procedures in order to establish the incidence of PIH and its potential risk factors.

**Methods:** We retrospectively reviewed patients who underwent an anterior spine procedure from 2012 to 2017. Patients undergoing only posterior spine procedures were excluded. Demographics, clinico-pathologic data, perioperative data, and hernia-related data were collected from medical records. Unpaired t-tests, Chi squared tests, Fisher’s exact tests, and multiple regression analysis were used to compare outcomes. The institutional review board approved the study.

**Results:** Of the 755 patients included in the study, 445 (59%) were women, and the mean (SD) age of all patients was 60 years (12.4). 732 (97%) paramedian approaches were performed with a vascular surgeon present. 19 (2.5%) patients developed a postoperative PIH. The median follow-up time was 10 months (IQR 3.5–19.9), and the median time to hernia diagnosis was 90 days (IQR 10–122). The mean (SD) size of PIH was 13.5 cm (5.5), 9/14 (64%) were repaired with synthetic mesh, and 3/14 (21%) required bowel resection. On univariate analysis, a history of abdominal surgery (*p* \(< 0.01\)), a history of posterior spine surgery (*p* \(< 0.01\)), post-operative ICU stay (*p* \(< 0.01\)), and longer length of stay (median 8.7 vs 6.8 days, *p* \(< 0.01\)) were associated with PIH. Multiple regression showed a history of abdominal surgery (*p* = 0.013), posterior spine surgery (*p* = 0.02), and post-operative ICU stay (*p* = 0.02) remained statistically significant.

**Conclusions:** At a single institution, paramedian incision for anterior spine exposure resulted in a low rate of PIH. Surgeons involved in these collaborative procedures should consider the patients’ surgical history in the careful performance of fascial closure to potentially reduce PIH in these at-risk patients.

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**P-1353**

**Laparoscopic TEP hernia repair with single incision in the lower abdomen**

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**Introduction:** An umbilical port is widely used in many types of laparoscopic surgeries. For totally extraperitoneal (TEP) hernia repair, preperitoneal dissection around umbilicus is not always necessary. We developed a novel minimally invasive technique of single-port in the lower abdomen laparoscopic TEP inguinal hernioplasty under local anesthesia which is suitable for overnight hospital admission.

**Materials and Methods:** From January 2012 to December 2015, a consecutive group of 134 patients with bilateral inguinal hernia was included. Obese patients, patients with giant hernia or irreducible hernia were excluded. We used 0.5% lidocaine with epinephrine as local anesthesia. An incision of 30 mm in the lower abdomen was made and a wound protector with sealing silicon cap was placed. We used three 5-mm trocars and a 5-mm flexible laparoscope. A flat self-fixating mesh with resorbable microgrip was installed and spread over the myopectineal orifice. No tacking devices were used.

**Results:** The mean ± SD age was 67 ± 10 and male sex was 84%. The mean operating time was 176 ± 65 min. Surgical complications were not observed except for 5 cases of minor seromas (3.7%). Pneumoperitoneum due to peritoneal injury was occurred in 16 cases (11.9%) and managed by suturing the defect. During median follow-up of 32 months, we observed 1 hernia recurrence.

**Conclusion:** The mid-term outcomes were similar to those of conventional TEP or open hernia repair. Surgical invasiveness of this technique was minimal because the area of dissection in the preperitoneal space is smaller than that of umbilical TEP. Postoperative recovery was rapid and patients can walk soon after surgery. This novel procedure may be feasible in ambulatory setting.
P-1354
Non-cross-linked biological mesh in complex abdominal wall hernia: a German cohort study
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Background: Complex abdominal wall hernia repair (CAWHR) is a surgically challenging procedure. The use of biologic meshes in these cases is controversial. The aim of our study was to evaluate long-term results of CAWHR with biologic mesh.

Methods: In this cohort study, we included all patients operated for CAWHR with Strattice™ mesh in six German hospitals. Patients underwent abdominal examination and ultrasound to assess hernia recurrence, and completed Quality of Life questionnaires.

Results: Thirty patients met the inclusion criteria, and 21 have so far been seen for long-term follow-up (8 females, 13 males, mean age 65 years, median follow-up 24 months). Their hernia defects were median 20 cm (range 10–30 cm). Regarding the surgical intervention, the most frequent postoperative complication was surgical site infection (48%), no Strattice™ had to be removed. By the time of outpatient clinic visit, 3/21 patients (14%) had a recurrence, none had undergone reoperation. Four patients (19%) had bulging of the abdominal wall. Quality of Life questionnaires revealed that 9 patients experienced no restrictions during daily activities and that 10 patients were pain free during activities.

Conclusion: These preliminary results show that despite a high rate of postoperative wound infection no biologic mesh had to be removed. The recurrence rate after long-term follow-up is acceptable and the quality of life is good in these complex hernias. Strattice™ seems therefore to be an appropriate option for CAWHR. Data are still acquired; results and analysis will be completed in November 2017.

Keywords: Complex abdominal wall hernia, Non-cross-linked biological mesh, Long-term results

P-1355
Extended endoscopic linea alba reconstruction glue (Eelarg): new technique for ventral hernias in combination with diastasis recti-abdominal muscles separation
Dudai M
Ramat Aviv

During the last 2 years there are advantages leaded by the minimal invasive techniques for repairing Ventral Hernias (VH). Two main understanding are in the base of the new developments: A. The defect in the muscles must be repair by a new Linea Alba (LA) construction, otherwise the functioning of the abdominal wall is negatively affected. B. The Mesh must be attached to the muscle below or above for reducing the recurrent rate. Doing it by minimal invasive technique the surgical trauma and results will be improved. 2015 WOLFGANG RIENPOLD from Hamburg present his MILOS an Endoscopic Assisted preperitoneal technique, followed by FERDINAND KOECKERLING from Berlin with ELAR an Endoscopic Assisted technique for LA reconstruction. GUY VOLLER from Memphis demonstrated that Glue reinforcing Onlay mesh, lead to favorite results.

Lastly Diastasis Rectaii (DR) become recognized as pathology leading to pack pain and progressing abdominal wall dysfunction. DR require surgical repair, repairing Umbilical Hernia without the DR will lead to recurrent.

Our eELARG technique started 2017. We use total endoscopic technique, penetrating with Optiview trocar and CO2 pressure to the anterior Rectus Sheet (RS) level, exposing it from Xiphoid to Pubis and Costal margin laterally. Any Hernia sac is dissected and repair, relaxing incision done when needed on the lateral aspect of the RS. The LA is duplicated by running non-absorbable suture from Xiphoid to Pubis. Second running suture approximate the medial aspect of the RS. A Mesh is applying over the repair and the muscles, fused immediately to place by Fibrine Glue.

After 20 year of Lap IPOM repair and massive open Component Separation, new Endoscopic technique are emerging for the VH. Our eELARG enable reconstruction of the LA, with extra-strength receiving from the immediate mesh fusing by the glue, all of that with the advantages of minimally invasive Endoscopic technique.
P-1356  
Comparative study of desarada: tissue based technique versus lichtenstein technique for primary inguinal hernia repair  
Jain M, Jain R, Pal T, Meena S  
All India Institute Of Medical Sciences, New Delhi  
The presentation is a comparative and prospective study between Desarda—tissue based technique versus Lichtenstein technique for primary inguinal hernia repair. The study done was designed to establish the clinical outcomes of hernia repair using the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis, a non mesh tissue only repair, which is acclaimed to be able to restore the normal physiology of the inguinal canal as compared to the mesh based repairs. In this study there was statistically significant difference between the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis and Lichtenstein method in regard to post operative pain scores, mean hospital stay and return to daily activities. As far as peri operative complications are concerned there was statistically significant difference in frequency of seroma formation only.  
The most evident indications for the use of the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis technique include: (1) use in young patients, (2) in contaminated surgical fields, (3) in the presence of financial constraints or, (4) if a patient disagrees with the use of mesh.  
The tissue only repair was shown to take a significantly shorter operative time.  
To conclude the tissue based herniorrhaphy showed better outcomes in terms of (1) VAS (pain), (2) ADLs. (3) Shorter operative time. (4) Reduced post operative complications of seroma formation.  
Though the recurrence rate of physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis technique for hernia repair after a follow-up of 1.5 years is comparable to that of Lichtenstein method which is considered a standard procedure of management of inguinal hernia.

P-1357  
Hernias across ghana: the impact on quality of life  
Allen J, Oppong C, Adebibe M, Bonomaully M  
Diana Princess of Wales, Grimbsy  
Background: Hernias are a common preventable cause of morbidity and mortality. A 2016 systematic review estimated that sub Saharan Africa has the highest mortality of groin hernia repairs in the world. In the Western world it has also been shown that hernias adversely affect quality of life, however there is little evidence of this in the African subcontinent. This study aimed to investigate this relationship in a less economically developed country.  
Methods: A group of UK doctors and scrub nurses travelled to 3 areas of Ghana for a 2-week period performing elective hernia repairs. 54 patients agreed to complete a questionnaire at their pre-operative assessment. This described how their hernia affected their quality of life and included questions on pain, activity levels and sexual intercourse. Individual’s responses were kept confidential, with no patient-identifiable data recorded on the answer sheets.  
Results: 4 key risk factors for hernia were identified: previous hernia (13%), cough for > 1 month (31%), constipation (40%) and heavy lifting (92%). 43/54 (80%) were farmers. 46/54 (85%) participants had pain on at least a weekly basis with only 4/54 (7%) being pain-free. 40/55 (73%) participants stated their pain was either moderate or severe. 41/55 (75%) participants stated that their hernia affected their daily activities such as washing, cooking or working on at least a weekly basis. 12 patients declined to answer the last question however 26/42 (62%) stated that their hernia affected their sex life.  
Conclusion: This study shows that hernias in patients across 3 areas in Ghana cause a significant impact in quality of life. It also suggests that heavy lifting and farming are strong risk factors for hernias. Symptomatic hernias resulting in unemployment will presumably have a profound socioeconomic impact amongst the Ghanaian population.
P-1358
Outcomes of medium weight macroporous polypropylene mesh in retromuscular abdominal wall repair
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Introduction: The utility of medium weight macroporous polypropylene mesh (MPM) in open, laparoscopic, and robotic repair of ventral and incisional abdominal wall hernias is subject to continued investigation. We present a review of perioperative outcomes and quality of life using this prosthetic material in the retromuscular position.

Methods: Patients who underwent abdominal wall reconstruction utilizing posterior component separation technique with MPM in the retromuscular space were identified from a large prospectively maintained hernia database between August 2015 and May 2017. Perioperative data and postoperative outcomes are presented as descriptive statistics. Quality of life was assessed utilizing the Carolina’s Comfort Scale with score ≥ 2 deemed significant.

Results: Of 192 cases 92 were performed laparoscopically, 71 through robotic-assisted approach, and 29 by open surgical repair. 44.2% of patients had recurrent ventral or incisional hernias. 43.2% of patients had ASA scores ≥ 3 and average BMI of 32.0. 68% of cases were classified as clean with 33% as clean-contaminated. Mean defect area, mesh area, operative time, estimated blood loss, and length of stay were 167.0 cm², 603.8 cm², 177 min, 32 mL, and 1.6 days. Wound complications included seroma (3.1%), hematoma (2.1%), trocar site dehiscence (1.0%). One patient developed hernia recurrence at previous colostomy site by 1 year requiring laparoscopic IPOM repair. Carolina comfort scores demonstrated significant preoperative pain in 43.8% (n = 84) and limitations of daily activities in 36.0% (n = 69) compared to 17.7% (n = 34) and 13.0% (n = 25) by mean follow up 21 months. 5.2% (n = 10) of patients reported some mesh sensation during daily activities at 21 months.

Conclusion: MPM use in retromuscular space was found to be affordable and effective while associated with no mesh related complications in this cohort. Appropriate improvement in QOL outcomes were observed with minimal reports of mesh sensation.

P-1359
Repair of large incarcerated incisional hernia on super obese patient
Tan B, Anil Dinkar R
Khoo Teck Puat Hospital

We report a case of large incarcerated incisional hernia repair on a super obese lady. 53-year-old lady, morbidly obese at BMI of 48 kg/m², presented with incarcerated large 40 × 35 cm incisional hernia at lower abdomen. She had long standing lower abdomen incisional hernia for more than 10 years from previous Caesarean section and midline laparotomy for perforated appendicitis. On examination, there was large incisional hernia at lower abdomen that extending to mid-thigh region and chronic skin ulceration seen. CT scan was done showed dilated proximal small bowel with transition point seen within hernia sac and stranding seen around small bowel mesentery. Ascending and transverse colon were seen in hernia sac. Exploratory laparotomy was done, bowel were oedematous and dilated proximal to transition point, small and large bowel were released from incisional hernia sac. Upon returning bowel content back to abdominal cavity, she had high airway pressure, we were unable to close the abdominal cavity or bridge rectus sheath with mesh. Temporary abdominal closure was done and she was admitted to intensive care unit. She was brought back to operating room for relook laparotomy 3 days later, bowel was less oedematous and healthy. Anterior and posterior component separation were done to bring the rectus sheath closer, sublay composite mesh was inserted and secured with tacker. Panniculectomy was done with excision of chronic hernia sac. Patient was extubated the next day and tolerating diet. She was discharge home on post-op day 7. (Pre-/intra-/post-operation photos available).

P-1360
Incisional hernia rate after stoma reversal surgery: can be reduced!
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Klinikum Mittelbaden Baden-Baden Balg

Presentation of the early-postoperative course of two patient groups after prophylactic mesh augmentation of the abdominal wall using two different meshes: resorbable synthetic mesh vs. non-resorbable synthetic mesh—a matched-pair analysis.
**P-1363**
The inguinal revisited: the surgical point of view
an anatomic—surgical mapping with regard
to postoperative chronic groin pain following open hernia repair
Konschake M, Rene F, Marit Z, Bernhard M, Reinhard F, Franz M, Thomas S
Medical University of Innsbruck

**Background:** Inguinodynia or chronic post-herniorrhaphy pain, defined as pain lasting longer than 3 months after inguinal hernia repair, has become the most important complication after open inguinal hernia repair and therefore comprises the patient’s quality of life. The lack of exact knowledge and understanding of the neuroanatomy of the inguinal region, might be the major reason for long term postoperative pain. Besides, the treatment of the nerves during operation remains unclear.

**Methods:** A clear and understandable anatomic mapping of the inguinal region and the spermatic cord sheaths by means of anatomic dissection, ultrasound guided representation all three inguinal nerves [iliohypogastric nerve (IHN), ilioinguinal nerve (IIN), genital branch of the genitofemoral nerve (GBGFN)] including a practical (preoperative) algorithm and surgical cases are presented. Step-by-step documentation of the surgical layers, their relationship to the most important surgical landmarks for the three inguinal nerves (IHN, IIN, GBGFN) are provided.

**Results:** The anterior—superior iliac spine, pubic tubercle, Camper’s fascia, external oblique aponeurosis, superficial inguinal ring, external spermatic fascia, cremasteric fascia with cremaster muscle fibers, internal spermatic fascia, cremasteric vein (= external spermatic vein = “blue line”), ductus deferens, pampiniform plexus and the inferior epigastric artery are the main surgical landmarks for an open inguinal hernia repair, likewise for ultrasound guided representation.

**Conclusion:** An exact and well-understood knowledge of the inguinal anatomy is an indispensable basic requirement for all surgeons to perform inguinal ultrasonography and open inguinal hernia repair without complications especially as postoperative inguinodynia.

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**P-1364**
Laparoscopic primary ventral and incisional hernia repair: comparison of operative variables and outcomes
Begum S
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**Introduction:** The superiority of laparoscopic ventral and incisional hernia repair over open repair has been validated by many studies in literature but there is paucity of literature comparing the outcomes of laparoscopic repair of primary ventral hernias versus incisional hernias. The aim of this study is to review our experience of laparoscopic repair of primary ventral and incisional hernia and compare the operative variables and short-term outcomes.

**Materials and methods:** We reviewed the clinical data of 121 patients who underwent laparoscopic ventral and incisional hernia repair from January 2014 to December 2015. Demographics, operative variables and short term outcomes were compared between the two groups. Comparison of outcome variables was done using independent sample t test for continuous variables and Chi square test for categorical variables.

**Results:** Out of 121 patients, 46 (38%) underwent incisional hernia repair and 75 (62%) had primary ventral and recurrent hernia repair. Female gender was predominant in both groups. Both groups did not differ in terms of age and BMI. Operating time, length of hospital stay and extent of adhesiolysis was significantly higher in patients with incisional hernia (\(p < .011\), \(p < .011\) and \(p < .001\) respectively). Intraoperative complications were more in patients with primary ventral hernias (\(p > .264\)) but postoperative complications were observed more in patients with incisional hernias (\(p < .061\)). Recurrence or trocar site hernia was not observed in any patient in the follow up period.

**Conclusion:** Laparoscopic incisional hernia repair is associated with extensive adhesiolysis, longer operating time and hospital stay as compared to primary ventral hernias however, and there is no significant difference in early and late postoperative complications in both groups.
Reinforcement of complex abdominal wall reconstructions by the use of absorbable synthetic meshes

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Wilhelminenspital

Abdominal wall hernia is a recurrent issue world-wide and requires the implantation of over 1 million meshes per year. Because permanent meshes such as polypropylene and polyester are not free of complications after implantation, many mesh modifications and new functionalities have been investigated over the last decade. Indeed, mesh optimization is the focus of intense development and the biomaterials utilized are now envisioned as being bioactive substrates that trigger various physiological processes in order to prevent complications and to promote tissue integration. In this context, it is of paramount interest to review the most relevant bio-functionalities being brought to new meshes and to open new avenues for the innovative development of the next generation of meshes with enhanced properties for functional abdominal wall hernia repair.
Laparoscopic management of recurrent parastomal hernia by modified Sugarbaker technique
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AIIMS, Bhubaneswar

Background: Parastomal hernia (PSH), broadly defined as an incisional hernia located at or immediately adjacent to a stoma, is one of the most common complications following intestinal stoma creation. It often leads to a decrease in the quality of life for patients due to discomfort, pain, frequent ostomy appliance leakage, or peristomal skin irritation. About 40–60% of stomas done are permanent and will never undergo a reversal procedure. With regard to stoma type, colostomies traditionally have been thought to confer a higher risk of PSH than ileostomies. While most patients can be managed conservatively, surgical management is required when there is obstruction, incarceration, or strangulation of the hernia. The different types of surgical repair did electively include stoma tranlocation, fascial repair, mesh repair and laparoscopic repair by technically demanding sugarbaker technique but all with high recurrence rate. The below described case is about a modified sugarbaker technique of repair.

Case report: This is a HD video presentation of recurrent parastomal hernia undergone laparoscopic repair in a 64 years male, who had open Transhiatal distal esophagectomy for suspicious esophageal nodule and open abdominoperineal operation for lower rectal malignancy with permanent colostomy in the past. The patient had undergone the previous surgeries 2–3 years back by midline incision from xiphoid till symphysis pubis. The stoma had developed parastomal herniation and had undergone open mesh repair 10 months back with early recurrence in 2 months. There was an extensive intraabdominal adhesion with loops of small bowel densely stuck to the hernia sac and mesh. After meticulous adhesiolysis the 7–8 cm hernia defect was narrowed by non absorbable suture in a tensionless manner, after doing laparoscopic release of posterior rectus sheath and composite mesh was placed by Sugarbaker technique. The patient is doing well since the last 18 months without any recurrence.

Down to up tar to solve a multirecurrent incisional hernia in a young patient with intestinal fistula
Henares University Hospital

Introduction: Multirecurrent incisional hernias (IH) with previous mesh repairs are a real challenge. The down to up TAR gives a great opportunity to solve very complex cases.

Methods: We present a 64 obese man with hypertension and bronchitis. He was operated of umbilical hernia 3 times before undergoing a laparotomy for rectal cancer in 2009, closure of ileostomy in 2010 with repairs with mesh in all the procedures. In 2012, the patient underwent a new repair of IH with primary closure and biologic mesh. Since 2013, the patient presents a big symptomatic recurrence with a hernia size of 315 cm², and intermittent intestinal discharge through previous wound. With CEDAR of 57%, the patient was offered an elective repair through an open retromuscular approach.

The intestinal fistula was isolated and excised after more than 3 h of adhesiolysis, including removal of previous meshes, stitches and tackers. Then the retromuscular preperitoneal plane was accessed. A down to up TAR was performed and the preperitoneal place was dissected from central tendon to both Cooper ligaments. The lateral dissection reached the posterior axillary line. An absorbable mesh was used as reinforcement of posterior layer and support a big 50 × 45 cm polypropylene mesh fixed inferiorly to both Cooper ligaments. No lateral transparietal fixation was made. A little bridge in the midline was partially left but covered with the previous scar tissues.

Results: The patient was discharged on the 8th day after an uneventful recovery. After 1 year, there is no recurrence and the patient remains asymptomatic and can do his daily life and practice sports.

Conclusions: The combination of absorbable and permanent meshes in a retromuscular preperitoneal position is a good alternative in these cases. In complex multirecurrent incisional hernias, posterior components separation technique offers a complete reconstruction of the abdominal wall.
V-1128

Robotic-assisted repair of an incarcerated incisional hernia after evisceration using myofascial advancement flaps
Tan W, McAllister J, Blatnik J
Washington University in St. Louis School of Medicine

A 40-year-old female with BMI of 51.6 was referred for evaluation of an incisional hernia. She had undergone an open total abdominal hysterectomy and bilateral salpingo-oophorectomy, complicated by a surgical site infection and dehiscence several months ago. On exam, she had a large open wound in the lower portion of her midline incision with visibly peristalsing bowel beneath granulation tissue.

After obtaining abdominal access, three robotic trocars were placed in the upper abdomen. Initial inspection revealed small bowel that was densely adherent to the overlying granulation tissue and hernia sac. This was freed using sharp dissection and the bowel was reduced back into the abdomen, leaving an 8 × 8 cm defect.

To allow for adequate midline mobilization and to establish an extraperitoneal plane for mesh, myofascial advancement flaps of the right posterior rectus sheath and transversus abdominis muscle and left transversalis fascia were performed. The peritoneum on the posterior rectus sheath in the right upper abdomen was incised. Dissection was continued across the midline towards the left side of the abdomen to establish an extraperitoneal, retrorectus plane.

The left transversus abdominis muscle in the posterior rectus sheath was incised, medial to the neurovascular perforators. The posterior rectus sheath and the hernia defect were closed using barbed suture. A 25 × 20 cm poly-4-hydroxybutyrate monofilament mesh was secured to the anterior abdominal wall. The peritoneal flap was closed using barbed suture, preventing exposure of the mesh to the visceral cavity. The old hernia sac and granulation tissue from her open wound in her lower midline incision was excised. This wound was closed loosely with several interrupted sutures and packed.

The patient’s postoperative course was uncomplicated and she was discharged on day three. She was seen in the office 2 months after her surgery where she was noted to be doing well.

V-1185

Totally endoscopic sublay repair (Tes)——a novel approach to repair midline ventral hernia
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Objective: Investigating a novel approach to treat a midline ventral hernia——totally endoscopic sublay repair (TES). The procedure will be described in detail and the safety and efficacy evaluated.

Method: During July and December 2017, eleven consecutive cases of primary and secondary epigastric midline ventral hernias were repaired using the TES procedure. A large mesh should be placed in the retrorectus position using this minimally invasive procedure. The indications for this procedure include umbilical, epigastric and incisional hernia equal in length to the rectus diastasis.

Result: All operations were successful without open conversion. The mean operation time was 120 min (80–205 min), postoperative pain was mild and the mean VAS was 2.5 on first postoperative day. The average postoperative stay in hospital was 3.3 days (3–5 days). 2 cases experienced postoperative seroma but without adverse effect on the final outcome and no recurrences during the follow-up period of 1–6 months.

Conclusions: TES procedure is safe, practical and minimally invasive requiring no specific device and highly reproducible. Besides there is no need for expensive anti-adhesion mesh and fixation tacker which make it more cost effective. TES is a good technique for the surgical treatment of midline ventral hernia.

V-1187

Single large 30 × 15 polipropilene mesh in tapp laparoscopic bilateral inguinal repair. An option for medial bilateral recurrence
Barragan F, Cingolani P, Iudica F, Diaz Pietrini M
Hospital Universitario Austral

Male, 39 years, BMI29 ASAI. Prior History of Bilateral inguinal Hernioplasty (TAPP) that recurred on the right side and was repaired by open Lichtenstein. Fiscal exam Bilateral Recurrent Inguinal Hernia M2 (EHS). Laparoscopic re do TAPP approach. Single large 30 × 15 polypropylene midwith mesh with mechanical absorbable fixation. Day surgery. Return to sports 4 weeks. 24 moth follow up no recurrence, no chronic pain.
V-1200  
Experimental laparoscopic ventral hernia model  
Pontifical Catolic University of Paraná  

Purpose: To develop swine model of laparoscopic induced incisional hernia, reproducing what surgeons face in this kind of procedure.  
Methods: Six swine models, under general anesthesia and video laparoscopy, were submitted to a 5 cm incision, on supraumbilical median line, cutting peritoneum and aponeurosis, preserving the integrity of skin and subcutaneous tissue. Postoperatively, the models were evaluated weekly during 30 days and reproached by videolaparoscopy to verify the defect created and repair with a polypropylene mesh.  
Results: One swine died. The other five models survived and developed a large incisional hernia, with integrated local skin, along omental adherences to abdominal wall.  
Conclusion: The swine model is able to reproduce the defect and can be used for video laparoscopic surgical training at teaching centers.  
Keywords: Laparoscopic, Incisional hernia, Swine

V-1210  
Combining laparoscopic external oblique release with robotic ventral hernia repair: a novel approach to ventral hernia repair  
Bryczkowski S, Pereira S, Patel P  
Hackensack University Medical Center/Stephen G. Pereira, MD & Associates  

Introduction: With the improvements in surgical critical care, antibiotics, temporary abdominal wound closure, and biologic mesh, many people are surviving invasive abdominal surgeries and forming large ventral hernias. Open hernia repairs are painful and often morbid procedures. In the era of minimally invasive surgery, the option for robotic surgery exists, however the surgeries can be technically difficult with long operative times. Upon literature review, we identified a knowledge gap. There are currently no data or case reports of combined laparoscopic transversus abdominis release with a robotic ventral hernia repair. The purpose of this study was to introduce a combined laparoscopic component separation and robotic ventral hernia repair as an option for repairing large ventral hernias.  
Methods: A retrospective review of prospectively collected data was done at a single center combined community and academic teaching hospital. Patients who presented to the office electively with the complaint of large ventral incisional hernia were offered combined laparoscopic and robotic ventral hernia repair. The primary outcomes were length of stay and hernia recurrence. The intervention consisted of a laparoscopic transversus abdominis release, a robotic primary fascia repair, and robotic placement of mesh.  
Results: Two patients were included in this study over a 1-month period. Both patients were male and their mean age was 44 years. The mean length of stay was 2 days. There were no complications. At 8 month follow-up, both patients were free of hernia recurrence.  
Conclusions: Through this pilot study, we conclude that a combined laparoscopic transversus abdominis release and robotic ventral hernia repair is not only feasible, but also beneficial to patients with large ventral hernias.

V-1235  
Down to up tar with transversus mesh reinsertion for complex abdominal wall treatment in a young patient  
Hospital Universitario del Henares  

Background: Treatment of complex incisional hernias with loss of domain is a surgical challenge. The release of the transversus abdominis muscle (TAR) technique has been an important contribution in the repair of these cases. We present a modification with a down to up access and the possibility of reinsertion of the transversus abdominis muscle to the mesh.  
Methods: We present a 54 years man with morbid obesity and smoking. He has been operated for umbilical hernia two times before. Since many years, he has a symptomatic bulge (hernia size: 90.25 cm²), with most of the small bowel in the sac. With 76% CEDAR, the patient was offered an elective repair through an open posterior component separation technique.  
We completed a preoperative preparation with a weight loss for 6 months and respiratory physiotherapy. We also added preoperative pneumoperitoneum and botulin toxin blockade 3 weeks before surgery.  
A bilateral down to up TAR was performed, dissecting the preperitoneal plane from the central tendon of diaphragm to the Cooper ligaments, and laterally as far as the posterior axillary line.  
We used a double mesh technique, with an absorbable mesh to reinforce the posterior layer and a big 60 × 40 PDVF mesh. We reinserted the transversus abdominis muscle as a variation of our technique, to contribute mesh fixation. A panniculectomy was also made.  
Results: The patient was discharged on the 10th day. A seroma was aspirated once at 4 week and after 2 months the patient returned to his job of carpenter. After 6 months there is no signs of recurrences.  
Conclusions: A thorough preoperative strategy and TAR permits to obtain a complete reconstruction of the abdominal wall, preserving the function of the muscles, and facilitating quality of life. Reinsertion of transversus abdominis is a modification that may be beneficial in young patients.
V-1236
Posterior components separation technique for complex abdominal wall reconstruction after necrotizing fasciitis in a bariatric patient
Puerta de Hierro University Hospital

40 years-old male. Bariatric surgery in the year 2012 (BMI 57): laparoscopic vertical gastroplasty converted to open approach due to technical problems. Several complications during the postoperative period, including abdominal evisceration and partial resection of the upper anterior abdominal wall due to a severe necrotizing fasciitis. The patient was referred to our complex abdominal wall unit. His actual BMI is 40. He presents a loose of domain incisional hernia in the subcostal bilateral incision, with no possibility of reduction of the hernia sac content. Preoperative CT scan showed an abdominal wall defect of 20 × 20 cm in the upper abdomen, with absence of the upper part of both rectus abdominis muscles and left lateral abdominal musculature. Progressive pneumoperitoneum with the placement of a temporary intraperitoneal catheter was preoperatively performed. Abdominal wall reconstruction with a modified posterior component separation technique with overextended preperitoneal 50 × 50 cm polypropylene mesh was performed. The patient was discharged in the fifth postoperative day without any complications.

V-1246
Laparoscopic repair of recurrent ventral hernia with a pre-peritoneal approach
Yolsuriyanwong K, Marcotte E, Chand B
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Case presentation: This 46-year-old female presented with worsening abdominal pain and obstructive symptoms. She has T2DM and morbid obesity (BMI 55 kg/m²). She underwent a gastric bypass in 2008 with abdominal pain and obstructive symptoms. She has T2DM and morbid obesity and diabetes.

Laparoscopic repair of recurrent ventral hernia with a pre-peritoneal approach: We used two 5-mm ports and one 12-mm port. The herniated contents were reduced. We confirmed our suspicion that the inferior portion of the mesh had ripped away from the abdominal wall and rolled up and lateral, leaving a large hernia defect below. We cut through the hernia sac into the preperitoneal plane and raised a large peritoneal flap all the way down to the pubis. The hernia defect measured 10-cm wide by 7-cm long. We placed a 15 × 15 cm self-fixating mesh all the way down to the pubis and fixed it in place to Cooper’s ligament with a permanent tacker. We placed another 15 × 15 cm mesh to cover the rest of the defect with at least 5 cm overlap in each direction. The meshes were fixated to the abdominal wall with multiple permanent tacks and ten transfascial sutures of 0 Prolene. The patient had a favorable post-operative course. She developed an asymptomatic seroma around 2 weeks postoperatively that slowly self-resolved. She has no recurrence with a current follow up of 2 months.

Conclusion: We present a minimally invasive pre-peritoneal approach to fix a low midline recurrence of an incisional hernia. This was an alternative to a complex open repair with bilateral component separation in this patient with a higher risk of recurrence due to morbid obesity and diabetes.

V-1247
Balloon-less totally extraperitoneal (Tep) repair of inguinal hernia with split screen showing preperitoneal entry and operative planning
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Washington University in St. Louis School of Medicine

A 61-year-old man with history of two prior open right inguinal hernia repairs presented with 2 months of increasing left sided inguinal discomfort and bulge, worse with activity and lifting. On exam he was noted to have a reducible left inguinal hernia with no signs of recurrent right inguinal hernia. He was felt to be a good candidate for minimally invasive repair and scheduled for laparoscopic TEP repair.

The TEP repair is generally facilitated by balloon inflation in the preperitoneal space to create an adequate working space for repair. Given concerns about increasing costs in surgery, the cost of the balloon may be a barrier to utilize this technique. Here, we show how to gain access to the preperitoneal space and create an open working plane without the use of a dissecting balloon.

In the operating room, a 2 cm infraumbilical incision was made and the anterior rectus fascia was exposed just to the left of the linea alba. The fascia was incised and the rectus muscles were retracted laterally. A 10 mm balloon trocar was placed and CO2 gas was attached at 12 mmHg. The tip of a 5 mm, zero-degree scope was then used to bluntly dissect the preperitoneal space from the umbilicus to the pubic symphysis and bilateral Cooper’s ligaments. Two 3 mm trocars were then placed in the suprapubic region, and blunt dissection proceeded laterally. A large indirect hernia sac was encountered and mobilized off the testicular vessels and vas deferens. Dissection proceeded until wide mesh overlap was possible and a 10 × 15 cm piece of self-gripping mesh was placed over the defect. The space was then desufflated, and the fascia and skin were closed.

The patient was discharged home the same day. He was seen in clinic 2 weeks postoperatively and was found to be doing well with no pain or recurrence.
**V-1250**

**Stage recurrent hernia repair with concomitant bariatric surgery**

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**Background:** Management of ventral hernias in obese patients is a challenging problem. They are at risk of failure due to mechanical factors (tension, poor tissue approximation, mesh rejection) and general medical conditions (diabetes, nutritional deficiencies, infections). Bariatric surgery is a well-established method of improving these risks through substantial weight loss and improvement of metabolic comorbidities. We present a video case of a morbidly obese female with a history of multiple incisional hernia recurrences due to prior abdominal surgeries, that were complicated by wound and mesh infections. She then successfully underwent weight loss surgery with concomitant two-stage hernia repair.

**Case report:** A 31-year-old, female; 303 lbs, BMI: 52 with recurrent incisional hernia and infected mesh, history of multiple drainages, IV antibiotics and unsuccessful dietary management of obesity. The patient underwent a hybrid laparoscopic Roux-en-Y gastric bypass, with open primary repair, component separation and removal of the infected mesh. After substantial weight loss (89 lbs, BMI 36, %EWL 29), 8 months after gastric bypass, the patient presented with a small recurrence and underwent definitive hernia repair with a reinforcing primary repair and using biological mesh. No further recurrences or complications noted in 5 months follow up.

**Conclusion:** Stage hernia repair with concomitant bariatric surgery is a safe and effective management of recurrent incisional hernias with infected mesh in morbidly obese patients.

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**V-1283**

**Hiatoplasty with bioabsorbable synthetic mesh as an alternative to gastric by-pass for hiatal hernia after sleeve gastrectomy**


*Hospital Platón Barcelona*

**Introduction:** A symptomatic hiatal hernia with GERD is a late frequent complication after sleeve gastrectomy for morbid obesity. Laparoscopic repair using an absorbable reinforcement mesh could be a safer alternative in selected patients, avoiding the risks of the non-absorbable meshes (dysphagia, erosion, inclusion, etc.) as well as the risks of the gastric bypass.

**Objective:** To describe the technical details of laparoscopic repair of a hiatal hernia post-sleeve gastrectomy using an absorbable reinforcement mesh (hiatoplasty).

**Methods:** A 67-year-old woman underwent tubular gastrectomy for morbid obesity (initial BMI 43 kg/m²) in 2008. After 3 years of follow-up, she complained of daily regurgitation and occasional vomiting but without heartburn. FGS and barium swallow: mid-size hiatal hernia without signs of esophagitis. Manometry/pHmetry: gastroesophageal reflux without impairment of esophageal function. At that time (2011), the BMI was 26.1 kg/m². After reviewing therapeutic options with the patient, she underwent laparoscopic surgery to reduce hernia content, resection of the sac, closure of the crura and reinforcement with bioabsorbable synthetic mesh (Gore Bio-A®). The main technical aspects of the procedure are described, with special emphasis on the characteristics of the mesh, its placement and fixation.

**Results:** Surgical time: 75 min. There were no intra-operative or postoperative complications. The patient was discharged on the third day without dysphagia and with correct tolerance to the oral diet. After 3 years of follow-up, patient remains asymptomatic and no recurrence has been observed in barium swallow. The patient’s BMI remains stable (25.8 kg/m²). Patient satisfaction with the procedure is high (9 out of 10).

**Conclusions:** Laparoscopic surgical repair of hiatal hernia after a sleeve gastrectomy may be a valid therapeutic option for selected patients. The use of an absorbable reinforcement mesh seems to be a good option to reduce the recurrence rate, avoiding potential complications of non-absorbable meshes.
V-1287
Morbidity and readmissions after laparoscopic recurrent inguinal hernia repairs: comparison to NSQIP database
Cleveland Clinic Florida

Background: The outcomes of laparoscopic repair of recurrent inguinal hernia after previous open repair are not frequently reported. We report short term outcomes over the last 5 years and compared them to the National Surgical Quality Improvement program (NSQIP) database.

Methods: We retrospectively reviewed our laparoscopic recurrent inguinal hernia repairs performed between 2010 and 2016. The 30 day readmissions, reoperations and post-operative complications were compared to same outcomes from NSQIP. To reduce the effect of confounding factors we used propensity case match. All tests were two-tailed and performed at a significance level of 0.05.

Results: A total of 176 cases from our institution were compared to 3431 of the NISQIP database. Base line characteristics and co morbidities were significantly different between the groups prior to the match. Our cohort had older patients (64.8 ± 13.8 vs 61.83 ± 15.38 p < 0.001) with higher incidence of renal Failure (18.75 vs 0.15, p < 0.001) and CVA (7.95 vs 0.06, < 0.001). Following the Propensity case match, the reoperation rates, post op wound infection, post op PE, post op renal failure and post op bleeding rates were similar. However 30 day readmission (14.77 vs 3.64, p < 0.001), pneumonia (1.7 vs 0.11, p = 0.01), urinary retention (5.11 vs 0, p < 0.001) were higher in our cohort. The operation time was higher in our population (98.3 ± 39.89 vs 73.06 ± 44.76 p < 0.001).

Conclusion: We conclude that the higher 30 day readmission, pneumonia and urinary retention are attributed to the increased age and comorbidities in our cohort.

V-1322
Laparoscopic approach for inguinoscrotal hernia with retroperitoneal herniation
Cleveland Clinic Florida

Objective: To describe a rare case of laparoscopic repair of bilateral inguinoscrotal hernia with ureteral herniation.

Case report: A 56-year-old male with history of bilateral inguinoscrotal hernias and hematuria was diagnosed with right hydroureteronephrosis secondary to herniation of the distal ureter.

Technique: The preperitoneal space was accessed via infraumbilical incision and the space was dissected with a balloon. Two 5-mm trocars were inserted in the midline under direct vision and an additional 5-mm trocar was inserted in the right lower quadrant for additional retraction. A massive right indirect inguinoscrotal hernia was reduced. The large defect was repaired with a mesh split around the cord and an additional piece over the slit. The Left sided hernia was repaired in a standard fashion with single mesh. Permanent tacks were used for the repair.

Results: No intraoperative or postoperative complications occurred. At short interval follow up he has an expected seroma, but no clinical evidence of recurrence.

Conclusion: Laparoscopic preperitoneal repair can be adopted for large inguinoscrotal hernia. Retroperitoneal herniation with hydronephrosis can be a complicating symptom of such hernias.

V-1324
Laparoscopic repair of left paraduodenal hernia
Cleveland Clinic Florida

Introduction: Internal hernia is a pathological condition resulting from abnormal protrusion of abdominal viscera through an opening in the intraperitoneal recesses of the abdominal cavity. The most common group is that of paraduodenal hernias (53%). Here we present a case of Left paraduodenal hernia in a 52-year-old woman who underwent successful Laparoscopic repair.

Methods: A 52-year-old woman with a 1-year history of intermittent abdominal pain, underwent a CT scan that showed internal hernia with bowel in the lesser sac. The patient had previous laparoscopic cholecystectomy and appendectomy. A 10 mm supra umbilical port was inserted using the Hasson technique. Three 5 mm ports were used additionally in the right and left upper quadrants. There was a loop of bowel that was just to the left of the ligament of Treitz, in the left paraduodenal fossa (of Landzert). There was no evidence of obstruction. The left paraduodenal fossa was closed by placing running sutures using 2-0 silk.

The patient tolerated the procedure well and was discharged the same day on regular diet.

Conclusion: Left paraduodenal hernia should be taken into account in a patient with a history of recurrent abdominal pain. Surgery is treatment of choice, because it reduces the risk of emergency and complications associated to hernia. Laparoscopic approach is feasible and effective in repairing paraduodenal hernias.
V-1336
Use of Firefly® technology to assist in robotic inguinal mesh removal in males
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Introduction: Mesh entrapment of the spermatic cord after inguinal hernia repair in males is a serious complication which can lead to debilitating pain. When attempting to remove mesh in these patients it is critical that the viability of the spermatic cord structures and testicle are assessed. In this video we demonstrate the use of Firefly® fluorescence to assess testicular perfusion intraoperatively.

Patient history: The patient is a 27-year-old male with a history of laparoscopic inguinal hernia repair who presents with severe pain in his left groin and testicle. The patient was found on CT to have a meshoma with spermatic cord entrapment.

Methods: A robotic transabdominal pre-peritoneal approach was employed to remove this mesh. In the setting of spermatic cord entrapment the patient was additionally consented for possible vasectomy and possible orchiectomy. To determine the need for orchiectomy the blood supply to the testicle was assessed with Firefly® fluoroscopy. Indocyanine green was used as the fluorescence agent with 1–2 cc of indocyanine green being given intravenously. Using Firefly® the surgeon was able to note adequate testicular perfusion and orchiectomy was avoided.

Conclusion: When attempting to remove inguinal hernia mesh causing spermatic cord entrapment in males testicular perfusion should always be assessed. For this assessment we recommend Firefly® fluorescence to assess the need/risk for orchiectomy when performed robotically.

V-1337
Laparoscopic repair of a large subxiphoid incisional hernia after Cabg
Cleveland Clinic Florida

Background: Subxiphoid incisional hernias after coronary artery bypass grafting (CABG) have a reported incidence ranging from 1 to 4.2%. We present a case involving the laparoscopic repair of the subxiphoid incisional hernia using barbed sutures and to achieve superior fixation of the mesh.

Methods: The patient is a 75-year-old male that presented with an epigastric/subxiphoid hernia after a CABG and aortic valve replacement in 2015. He was symptomatic with the chief complaint of pain and mild shortness of breath associated with this hernia. He had a past medical history significant for an abdominal aortic aneurysm, bladder cancer and non-insulin dependent diabetes mellitus. He had an 84 pack year smoking history. A standard 4 trocar approach was taken to the hernia and the defect (10 x 10 cm) was closed primarily using a running 2-0 barbed suture but the top of the defect consisted of separated bone and was not able to be closed. A 25 x 20 cm polypropylene mesh was fixated to the abdominal wall using trans fascial sutures, but the superior edge of the mesh was fixated using barbed sutures as well as fibrin glue to fixate the mesh to the posterior aspect of the rib cage and diaphragm.

Results: The patient did well postoperatively and was discharged home on postoperative day 3 in stable condition with his pain well controlled and tolerating a general diet. He has done well postoperatively and has no evidence of hernia recurrence at 5 month follow up.

Conclusions: Laparoscopic approach to these hernias provided ideal exposure of this hernia and allowed for rapid recovery as opposed to traditional open repairs. It also allowed us to adequately fixate the mesh on the superior border which is much more difficult in an open approach.
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