Case Presentation

• 34 yo M presented in ER of KCH at 7/06/10
• Painful lump lt groin + vomiting
• Pain started 2 hrs before presentation.
• PMH – known left inguinal hernia
• PSH – negative
• NKDA
Case Presentation

- VS: 146/93, 86, 18, 98%
- PE:
  - suffering from pain
  - Abdomen
    - not distended
    - Soft
    - minimal diffuse tenderness
  - Lt groin - painful, tender, irreducible mass
  - GU - both testicles in place
Case Presentation

• Labs:
  
  – WBC 6.9
  – Lactate 3.6
  – VBG pH 7.53, pCO2 29.8, HCO3 26.3, BE 2.2
Case Presentation

• Dx – Incarcerated inguinal hernia
• OR finding/Procedure:
  – Lt inguinal incision
  – Strangulated, non viable SB in hernial sac
  – Serosanguinous fluid in the sac
  – Resection of SB with stapled anastomosis
  – Repair of hernia with Plug and Patch Bard Mesh
Case Presentation

• Postop course uncomplicated
• Discharged home on POD # 4 when was tolerating regular diet and had BMs.
• Readmission on POD # 7 for SBO
• NGT/NPO/IVF
• ABD XR on HD#2 – contrast in Rt colon, BM+
• HD#3 diet started
• Discharged HD#4
• Patient visited OPC on POD #15
  – doing well
  – postop scar intact
Use of Mesh for Hernia Repair in clean-contaminated field

Dr V. Roudnitsky
Downstate Medical Center
Hernia repair

- Primary repair (tissue repair)
- Synthetic mesh repair
- Biological mesh repair
Long-term follow-up of a randomized clinical trial of non-mesh versus mesh repair of primary inguinal hernia

*British Journal of Surgery* 2007; 94: 506–510

- Randomized prospective study
- 1993-1996 randomization of 300 patients
- No specialized hernia center
- Non mesh repair:
  - Bassini 51%
  - Shouldice 20%
  - McVay 4%
Long-term follow-up of a randomized clinical trial of non-mesh versus mesh repair of primary inguinal hernia

*British Journal of Surgery* 2007; *94*: 506–510

- 10 years follow up:
  - 80 patients non-mesh group – 17% recurrence
  - 73 patients mesh group – 1% recurrence

- Half of recurrence occurred more then 3 years after the operation – adequate follow-up is important
• Multicenter randomized, prospective study
• Suture repair vs mesh repair (100/100 patients)
• The three-year cumulative rates of recurrence:
  – suture repair 43 percent
  – mesh repair 24 percent
• P=0.02
• Risk factor for recurrence:
  – Suture repair
  – Infection
  – Prostatism (men)
  – Previous surgery for AAA
**Figure 1.** Kaplan–Meier Curves for Recurrence of Hernia after Repair of a Primary or First Recurrent Incisional Hernia, According to Whether the Patient Was Assigned to Mesh Repair (N=84) or Suture Repair (N=97).

There were significantly fewer recurrences in patients who were assigned to mesh repair (P=0.005).
Abdominal hernia repair with bridging acellular dermal matrix—an expensive hernia sac

• Retrospective review of 11 complex abdominal hernia repair with Acellular Dermal Matrix
• All cases - bridging of fascial defect
• Mean follow up 24 months
• Recurrence rate 80%
Table 2  Current literature on hernia recurrence using bridged repair

<table>
<thead>
<tr>
<th>Year</th>
<th>Investigator</th>
<th>Patient no.</th>
<th>Mean follow-up (mo)</th>
<th>Hernia recurrence rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Hirsch⁹</td>
<td>1</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>2005</td>
<td>Holton et al¹⁰</td>
<td>46</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2006</td>
<td>Diaz et al⁴</td>
<td>23</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>2006</td>
<td>Schuster et al⁵</td>
<td>18</td>
<td>9.1</td>
<td>50</td>
</tr>
</tbody>
</table>
Special REPORT

New Evidence-based Recommendations for

The Grading and Technique of Repair of Incisional Ventral Hernias

This supplement represents a condensed version of the following publication: The Ventral Hernia Working Group. Incisional ventral hernias: review of the literature and recommendations regarding the grading and technique of repair (published online ahead of print March 22, 2010). Surgery. doi: 10.1016/j.surg.2010.01.008.

The Ventral Hernia Working Group was recently established to evaluate new technologies and techniques for ventral hernia repair. In September 2008, the group met for a 2-day summit with the goal of creating a grading system to guide surgeons in the assessment of patients with incisional ventral hernias with regard to risk for surgical site occurrences such as infection. The group also proposed evidence-based recommendations regarding the approach to advanced surgical techniques for the repair of incisional ventral hernia. This report reviews the grading system and recommendations proposed by the Ventral Hernia Working Group.
<table>
<thead>
<tr>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>Comorbid</td>
<td>Potentially Contaminated</td>
<td>Infected</td>
</tr>
</tbody>
</table>

- Low Risk for complications
- No history of wound infection
- Infected mesh
- Septic dehiscence

**Grade 3**

*Potentially Contaminated*

- Previous wound infection
- Stoma present
- Violation of the gastrointestinal tract

*Figure 1. Hernia grading system*

Table 2. Recommendations of the Ventral Hernia Working Group (VHWG) for Choice of Repair Material For Incisional Ventral Hernias, by Grade

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Strength of Recommendation</th>
<th>Level of Evidence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>Choice of repair material by surgeon preference and patient factors</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Increased risk for surgical site occurrence suggests additive risk for permanent synthetic repair material, and potential advantage for appropriate biologic reinforcement</td>
<td>1</td>
<td>B</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Permanent synthetic repair material generally not recommended; potential advantage to biologic repair material</td>
<td>1</td>
<td>B</td>
</tr>
<tr>
<td>Grade 4</td>
<td>Permanent synthetic repair material not recommended; biologic repair material should be considered</td>
<td>1</td>
<td>A</td>
</tr>
</tbody>
</table>

Based on references 13-25.

• Use of prophylactic mesh for prevention of parastomal hernia during creation of end colostomy

• A prophylactic mesh was used in:
  – 19 of 29 (65%) dirty wounds
  – 56 of 64 (87%) contaminated wounds
<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>No prophylactic mesh</th>
<th>Prophylactic mesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical site infection, n (95% CI)</td>
<td>4 of 15 (27% 1–52)</td>
<td>6 of 73 (8% 2–15)</td>
</tr>
<tr>
<td>Minor infection, n</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Major infection, n</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wound contaminated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical site infection, n</td>
<td>1 of 7</td>
<td>3 of 55</td>
</tr>
<tr>
<td>Wound dirty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical site infection, n</td>
<td>3 of 8</td>
<td>3 of 18</td>
</tr>
<tr>
<td>Condition</td>
<td>No prophylactic mesh</td>
<td>Prophylactic mesh</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Parastomal hernia, ( n ) (95% CI)</td>
<td>8 of 12 (67% 35–98)</td>
<td>8 of 61 (13% 4–22)</td>
</tr>
<tr>
<td>Colostomy</td>
<td>7 of 8</td>
<td>7 of 52</td>
</tr>
<tr>
<td>Ileostomy</td>
<td>1 of 4</td>
<td>1 of 9</td>
</tr>
<tr>
<td>Fistula, ( n )</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stenosis, ( n )</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mesh removed, ( n )</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
• Conclusion:
  
  – A mesh does not increase the rate of complications and can be used in severely contaminated wounds.
Obturator hernia: clinical analysis of 16 cases

- Retrospective review of 16 patients with obturator hernia in 20 years period
- 75% strangulated hernias with 56.3% perforation
- Intestinal resection 12 cases
- Repair with polypropylene 11 cases
- Mesh was used in 6 cases of SB perforation
- Mesh was used in 3 cases of SB strangulation/resection
- Wound infection 4 cases
- No need for mesh removal
Tension-free repair versus modified Bassini technique for strangulated inguinal hernia: a comparative study
Hernia (2005) 9: 156–159

<table>
<thead>
<tr>
<th>Type</th>
<th>Group A (n = 33) (mesh repair)</th>
<th>Group B (n = 42) (tension repair)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect hernia</td>
<td>28 (84.8%)</td>
<td>35 (83.3%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Direct hernia</td>
<td>5 (15.2%)</td>
<td>7 (16.6%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Recurrent hernia</td>
<td>3 (11.1%)</td>
<td>4 (9.5%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Bowel resection</td>
<td>4 (12.1%)</td>
<td>10 (23.8%)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>
• No significant difference of wound infection between the two groups (2/33, 6.1% vs 4/42, 9.5%, p=n.s.)

• No mesh had to be removed.
• 25 patient with strangulated inguinal hernia vs 25 elective hernia repair
• In group of strangulation bowel resection performed in 4 patients (16%)
• No wound infection noted in both group
• 35 Patients with strangulated inguinal hernia
• 9 bowel resection for ischemia but no perforation
• Midline preperitoneal approach
• 2 postop wound infection neither in Pt with intestinal resection
• No mesh had to be removed
Elective Colonic Operation and Prosthetic Repair of Incisional Hernia: Does Contamination Contraindicate Abdominal Wall Prosthesis Use?

Table 2. Colonic Operations Associated with Incisional Hernia Repair

<table>
<thead>
<tr>
<th>Colonic operation</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reestablishment of continuity</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>Colorectal anastomosis</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Colocolic anastomosis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ileocolic anastomosis</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Colectomy and primary anastomosis</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Colorectal anastomosis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Colocolic anastomosis</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Closure of loop colostomy</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 3. Postoperative Surgical Results for 20 Patients

<table>
<thead>
<tr>
<th>Surgical results</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anastomotic leak and wound infection</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Abdominal wall sinus</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Subcutaneous seroma</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Wound infection</strong></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massive mesenteric embolization</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Wound infection is highlighted.
Use of Synthetic Mesh in Incarcerated and Strangulated Groin Hernias: Does It Increase Surgical Site Infection
Rao, Madhuri V., M.D.; Averinos, Dimitrios V., M.D.; Sekos, David H., M.D., F.A.C.S.
Beth Israel Medical Center, New York

Background
- The general trend in the management of acutely incarcerated groin hernias has been to avoid the use of synthetic mesh.
- However the relevant literature to support or dismiss the use of a synthetic mesh in these cases is scant.
- The aim of this study was to review our experience with management of incarcerated groin hernias and to correlate the risk of wound infection with the use of synthetic mesh.

Methods
- Retrospective chart review
- Inclusion Criteria
  - 2000 to 2009
  - Patients > 18 yrs
- Repair of an acutely incarcerated/strangulated inguinal or femoral hernia
- Excluded from study
  - Chronic incarceration/irreducibility
  - Incomplete charts/op reports

Results
- 340 patients on initial search
- 94 patients with acute incarcerated/strangulated hernias
- 7 incomplete charts/questionable operative findings
- 87 patients were included in the study

4 groups based on the intra-op findings
- Viable bowel with/without serous fluid
- Markedly congested bowel and/or presence of hemorrhagic fluid
- Ischemic/necrotic bowel requiring resection
- Necrotic bowel with frank perforation

CT image of incarcerated/strangulated left inguinal hernia

Markedly congested bowel and/or presence of hemorrhagic fluid
- 13 patients
  - Mesh - 10
  - Perfix 4, Marlex 3, Gore-Tex 1, Kugel 1, Prolene 1
  - Wound Infection - 0

Viable bowel with/without serous fluid
- 52 patients
  - Mesh - 52
  - Marlex 35, Prolene 3, Kugel 2
  - Wound Infection - 1

Ischemic/necrotic bowel requiring resection
- 17 patients
  - Mesh - 11
  - Perfix 1, Marlex 2, Alloderm 3
  - Wound infection - 1

Necrotic remnant and appendix in strangulated inguinal hernia

Necrotic bowel with frank perforation
- 4 patients
  - Mesh - 1 (synthetic)
  - Mesh infection - 1

Conclusions
- The use of synthetic mesh in incarcerated or strangulated groin hernias does not increase the rate of SSIs
- True even if bowel resection needed
- Synthetic mesh should not be used in cases of bowel necrosis with perforation

References
- SESAP 14