The Case

- HPI:
  - 75M presents with 48 hours of abdominal pain, distention and obstipation associated with nausea and bilious vomiting.
  
- A known reducible left inguinal hernia has now become fixed, firm and is significantly painful.
The Case

- PMH: HTN, BPH; Normal C-scope in 2011.
- PSH: None

- Exam:
  - 150s/80s; 90-100s; 97.8
  - A&Ox3, uncomfortable and lethargic
  - Soft, distended, minimally tender abdomen
  - Firm, tender left groin mass with no skin changes
  - Rectal Exam Negative
The Case

Laboratory Results:
- CBC 15>17/53<252
- Electrolytes 140/4.1/95/19/42/3.89<115
- VBG 7.319/45/28/20.4/-2.4
- Lactate 6.1
The Case

Preoperative Course:
- NGT placed: 500cc feculent fluid initially drained
- Appropriate fluid resuscitation

Operative Course
- Induction complicated by vomiting / aspiration.
- Exploratory Laparotomy
  • Revealed significantly dilated loops of edematous, congested, ischemic small bowel secondary to incarcerated loop of distal ileum. Sigmoid colon and bladder appeared also involved. Not reducible. 4L feculent material milked retrograde.
- Groin incision
  • Standard Incision and dissection
  • Revealed large pantaloon hernia. With minimal dissection and traction from within, Contents were reduced.
The Case

• Operative Course Continued
  – Necrotic 15cm portion of incarcerated small bowel was resected. Anastomosis was performed.
  – Bassini Repair
  – Reinforced with mesh patch
  – Patient became unstable
    • Acidotic, Hypoxic, hypotensive, tachycardic
  – Skin of Abdomen Closed Expeditiously
  – Patient Transferred to ICU.
The Case

- Post operative course
  - Increasingly hypoxic, acidotic and hypotensive
  - Left IJ TLC was placed after arrival in ICU
  - Left Breath sounds were decreased
  - Emergent Left Tube Thoracostomy Performed
  - ACLS initiated
  - Patient expired
Inguinal Anatomy 1

- Inferior epigastric artery and vein
- Rectus abdominis muscle
- Hesselbach's triangle
- External inguinal ring
- Inguinal ligament
- Inguinal canal
- Femoral artery
- Femoral vein
- Femoral ring
- Spermatic cord
Inguinal Anatomy 2
Inguinal Anatomy 3
Inguinal Hernia - Special Types

- Dual/Pantaloon/Saddle Hernia: Both direct and indirect sacs +
- Sliding Hernia: (Hernia-en-glissade)
  Retroperitoneal organ is part of hernial sac
- Richter’s Hernia: only part of circumference of the small gut is obstructed
- Maydl’s Hernia: “W” shaped hernia
- Littre’s Hernia: Meckel’s diverticulum
- Amyand’s Hernia: Appendix
Epidemiology

- Incidence not known
- 75% of all hernias occur in the groin
- Inguinal hernia 25X more likely in a male
- Indirect always most common (2:1 in males)
- Femoral hernias far more common in females
- 1 - 3% will become strangulated.
INVAGINATION TEST

- Felt on the pulp: direct hernia
- Felt on the tip: indirect hernia
Diagnosis 1

Key Concept:

- REDUCIBLE
- IRREducible / INCARcerated
- STRANGULATED
Anterior Repairs

- Incision
- Opening of External Oblique Aponeurosis
- Protection of Ilioinguinal Nerve
- Isolation of Cord Structures
- Dissection of Hernia sac
- Reduction vs High Ligation.
- Closure of External Oblique
Bassini Repair

- Incise Floor of Inguinal Canal.

- Internal Oblique / Aponueurosis of Transversalis to Inguinal Ligament
Dr Chester McVay

1911 -1987
McVay Repair

- Cooper’s Ligament Repair

- Medial Transition Stitch
  - Femoral Sheath & Inguinal Ligament

- Relaxing Incision

- Indirect, Direct and Femoral Defects
Edward Earle Shouldice

1890 - 1965
Lichtenstein Repair

[Diagram showing steps of the Lichtenstein Repair procedure, with labels for iliohypogastric nerve, external oblique aponeurosis, internal oblique muscle and aponeurosis, ilioinguinal nerve, genital branch of genitofemoral nerve, external spermatic vessels, internal oblique muscle, rectus sheath, polypropylene mesh, cremaster covering of cord, and other relevant anatomical structures.]
Results of prosthetic mesh repair in the emergency management of the acutely incarcerated and/or strangulated groin hernias: a 10-year study

S. S. Bessa · M. R. Abdel-fattah · I. A. Al-Sayes · I. T. Korayem

- Excluded only those with feculent or purulent contamination

- Lichtenstein Repair

- Perioperative Antibiotics

- All resections repaired in the Groin Field
Table 3: Mortality and morbidity rates in patients with viable and non-viable contents

<table>
<thead>
<tr>
<th></th>
<th>Viable contents (193 patients)</th>
<th>Non-viable contents (41 patients)</th>
<th>$^{\text{FE}} \ p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mortality</td>
<td>4 (2.1 %)</td>
<td>1 (2.4 %)</td>
<td>1.000</td>
</tr>
<tr>
<td>2. Complications</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Wound infection</td>
<td>11 (5.7 %)</td>
<td>3 (7.3 %)</td>
<td>0.717</td>
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<tr>
<td>Scrotal hematoma</td>
<td>8 (4.1 %)</td>
<td>1 (2.4 %)</td>
<td>1.000</td>
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<tr>
<td>Chest infection</td>
<td>6 (3.1 %)</td>
<td>2 (6.2 %)</td>
<td>0.632</td>
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<tr>
<td>DVT</td>
<td>2 (1 %)</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>Transient liver function deterioration</td>
<td>10 (5.2 %)</td>
<td>1 (2.4 %)</td>
<td>0.694</td>
</tr>
<tr>
<td>Mesh infection</td>
<td>1 (0.5 %)</td>
<td>0 (0.0)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

$^{\text{FE}} \ p$ value for Fisher Exact test for comparing between the different studied group
<table>
<thead>
<tr>
<th>Author</th>
<th>Type of hemia</th>
<th>Surgical approach</th>
<th>Number of patients</th>
<th>Resection-anastomosis of non-viable intestine</th>
<th>Wound infection</th>
<th>Seroma</th>
<th>Mesh infection</th>
<th>Recurrence</th>
<th>Mean/med follow-up duration (in months)</th>
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<tbody>
<tr>
<td>3. D’Ambrosio et al. [7]</td>
<td>All</td>
<td>Open</td>
<td>23</td>
<td>23/23</td>
<td>2/23</td>
<td>5/23</td>
<td>0/23</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>4. Pans et al. [8]</td>
<td>Groin</td>
<td>Open</td>
<td>35</td>
<td>9/35</td>
<td>2/35</td>
<td>0/35</td>
<td>1/35</td>
<td>50.4</td>
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<tr>
<td>5. Wysocki et al. [9]</td>
<td>Groin</td>
<td>Open</td>
<td>20</td>
<td>1/20</td>
<td>0/20</td>
<td>1/20</td>
<td>0/20</td>
<td>N/A</td>
<td>15.3</td>
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<tr>
<td>6. Wysocki et al. [10]</td>
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<td>Open</td>
<td>27</td>
<td>1/27</td>
<td>0/27</td>
<td>1/27</td>
<td>0/27</td>
<td>0/27</td>
<td>18</td>
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<tr>
<td>8. Wysocki et al. [12]</td>
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<td>56</td>
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<td>10. Atila et al. [14]</td>
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<td>12. Leibl et al. [16]</td>
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<td>36</td>
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<td>0/36</td>
<td>0/36</td>
<td>1/36</td>
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<tr>
<td>13. Ferzli et al. [17]</td>
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<td>11</td>
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<tr>
<td>14. Rebuffat et al. [18]</td>
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<td>0/28</td>
<td>0/28</td>
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<td>11.3</td>
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<td>15. Legnani et al. [19]</td>
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<td>0/9</td>
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<tr>
<td>16. Nieuwenhuizen et al. [20]</td>
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<td>7/99</td>
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<td>17. Elsebæ et al. [21]</td>
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<td>19. Ueda et al. [23]</td>
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<td>0/10</td>
<td>20</td>
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<tr>
<td>20. Lohsiriwat and Lohsiriwat [24]</td>
<td>Groin</td>
<td>Open</td>
<td>20</td>
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<tr>
<td>21. Sawayama et al. [25]</td>
<td>Groin</td>
<td>Open</td>
<td>74</td>
<td>10/74</td>
<td>2/74</td>
<td>7/74</td>
<td>0/74</td>
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<td>N/A</td>
</tr>
<tr>
<td>Total number percentage</td>
<td></td>
<td></td>
<td>783</td>
<td>122/783</td>
<td>37/783</td>
<td>32/773</td>
<td>2/783</td>
<td>(15.9%)</td>
<td>(4.7%) (4.1%) (0.3%)</td>
</tr>
</tbody>
</table>
Conclusions

• Repair of Strangulated Inguinal Hernias should be performed using an open / anterior technique.

• Laparotomy is indicated when patient has evidence of compromised intra-abdominal viscera.

• The use of mesh in a clean-contaminated field during strangulated inguinal hernia repair is not contra-indicated.
THANK YOU