GIANT HERNIA REPAIR – MY EXPERIENCE

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…”If we could artificially produce tissue of the density and toughness of fascia and tendon, the secret of the radical cure of the hernia repair would be discovered.” Theodore Billroth 1857

Adalbert Franz Seligmann (1890?)
Incisional hernias are one of the most frequently encountered problems following open abdominal surgery, with a reported incidence of 11 to 20% following laparotomy. Currently, there appears to be an evolution in the operative management of this common clinical dilemma.
The most difficult to repair are complex, multiply recurrent hernias with significant loss of domain (> 15–20% of the abdominal contents).
This loss of domain (residence) implies that a proportion of the abdominal contents reside permanently (in a hernia sac = the second abdominal cavity) outside their natural compartment, and returning these contents will require significant physiological adaptation (mainly respiratory!!!) if the volume exceeds > 15–20% of this compartment.
Although laparoscopic repair is a promising approach, it is not applicable to complex hernias with significant (> 15–20% of the abdominal contents) loss of domain. Which technique should be used for open mesh repair (sublay, onlay or inlay technique) has not been defined because there are few comparative trials to indicate under which circumstances the different techniques give best results, comparative studies to indicate which gives the lowest recurrence rate.
Open Mesh Techniques

- **Onlay**: The mesh is placed between the skin and the muscles, with recurrence occurring.

- **Inlay**: The mesh is placed between the muscles, with end-on anchoring.

- **Sublay**: The mesh is placed below the muscle layer, holding it in place by the intraabdominal pressure.
This series consisted of a total of 52 patients (12% from total number of incisionals - 431), operated on between April 2002 and June 2010. They consisted of 22 males and 30 females, mean age was 57.8 years (range, 33–79 years). Length of follow-up was between 6 months and 6 years.
The history is often complex; some patients have been psychologically traumatized by major abdominal sepsis, multiple operations and long periods in intensive care. Hernias were examined and, if a clinical assessment of significant loss of domain was made, a CT scan was requested.
Pre-operative lung function tests were performed in selected patients and patients with cardiorespiratory co-morbidity were managed in HDU/ITU after operation, in order to pre-empt potential respiratory problems associated with splinting of the diaphragm and increase in intra-abdominal pressure after surgery.
WHICH TECHNIQUE?

- Lower midline hernias - onlay mesh
- Upper midline hernias – sublay; onlay; Ramirez with onlay triple mesh layer
- Lateral and transverse hernias received onlay mesh.
- Single intravenous dose of broad-spectrum antibiotics at induction.
- Epidural anaesthesia was routinely used in addition to a general anaesthetic to
  a. improve postoperative pain
  b. control and to optimise breathing,
  c. protecting against basal atelectasis and other respiratory complications.
- Suction drains were placed between fascial layers (removed drainage was less than 50 ml in a 24-h)
Medium (5–10 cm; \( n = 14, 27\%\))

Large (> 10 cm; \( n = 38, 73\%\)).

The largest fascial defect was measured at 40 x 20 cm and the loss of domain was 50%

Mean surgical time -110 min (range, 90–500 min).

Length of in-patient stay in hospital was between 6 and 50 days (mean, 7.9 days).
Suture Repair 20-60%

Prosthetic Repair 0-10%

Postoperative local complications 17-50%

References:
- Williams RF et al., (2008) Hernia
18 patients (34.6%) experienced different complications.

SEROMA -12
INFECTION -2 (BMI 44; 46)
BOWEL FISTULA -2
BOWEL ADHESIONS -2

5 COMPLICATED PATIENTS HAD TO HAVE FURTHER SURGERY.

Recurrence rate 6% (3 patients)

8 patients - HDU and were monitored for 1–5 days.
1 patient - ICU and was ventilated for several days.
1 death - mortality (1.9%).
COMPLICATIONS

✓ Seroma
Wound infection is a potential complication for all hernia repairs and deep seated infection involving the inserted mesh may lead to longstanding sepsis which usually necessitates secondary operation - removal of the mesh.
wound infection
Skin necrosis and erosion

Onlay method
Wound before suturing

12 day after operation
Intestinal adhesions/ bowel fistula

- PP Mesh
- PE Mesh
One patient who had an oblique hernia repaired using the onlay technique, had a recurrence lateral to the mesh, which occurred at 3 years.
Table 1. Results of the Repair of Large Abdominal Wall Defects with the Component Separation Technique

<table>
<thead>
<tr>
<th>First author</th>
<th>Year</th>
<th>Patients</th>
<th>Clean/contaminated</th>
<th>Complications (n)</th>
<th>Rehemiation n (%)</th>
<th>Followup mean (range, mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramirez²⁵</td>
<td>1990</td>
<td>11</td>
<td>8/3</td>
<td>Wound infection (2)</td>
<td>0</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>DiBello⁹</td>
<td>1996</td>
<td>35*</td>
<td>20/15</td>
<td>Hematoma (1)</td>
<td>3 (8.6)</td>
<td>22 (1–43)</td>
</tr>
<tr>
<td>Girotto¹⁰</td>
<td>1999</td>
<td>33</td>
<td>30/3</td>
<td>Wound infection (8)</td>
<td>2 (6.1)</td>
<td>21 (6–57)</td>
</tr>
<tr>
<td>Shestak¹¹</td>
<td>2000</td>
<td>22</td>
<td></td>
<td>Wound infection (2)</td>
<td>1 (5)</td>
<td>52 (8–84)</td>
</tr>
<tr>
<td>Lowe¹²</td>
<td>2000</td>
<td>30⁺</td>
<td></td>
<td>Wound infection (12)</td>
<td>3 (10)</td>
<td>12</td>
</tr>
<tr>
<td>Cohen¹³</td>
<td>2001</td>
<td>24</td>
<td>15/9</td>
<td>Skin dehiscence (2)</td>
<td>1 (4)</td>
<td>? (12–36)</td>
</tr>
<tr>
<td>Authors</td>
<td>2002</td>
<td>43</td>
<td>28/15</td>
<td>Wound infection (6)</td>
<td>12 (30)</td>
<td>15.6 (12–30)</td>
</tr>
</tbody>
</table>

*In 15 patients, an onlay synthetic prosthesis was implanted as well.
*In 10 patients, an onlay polypropylene mesh was implanted as well.
Components separation (Ramirez technique)
NOT ONLY THE COMPLICATIONS BUT ALSO SUCCESSFUL OPERATIONS
INNOVATIONS IN VENTRAL HERNIA REPAIR
Materials and techniques to reduce MRSA and other infections

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The use of mesh in ventral hernia repair substantially reduces recurrence rates; however, the risk of infection varies with the mesh used. New biomaterials and novel technology have reduced infection risks, as has the adoption of minimally invasive approaches to ventral hernia repair. This roundtable session, experts discuss strategies to control infection risk factors, surgical techniques that optimize outcome, and techniques to manage infection when it does occur.

Impact of Approach on Infection Risk
LeBlanc: At the most basic level, in hernia repair, we have to deal with risk of recurrence and risk of infection. In light of these challenges, what factors do you consider in selecting an approach?

Hamilford: Using retusus alone to close a hernia cavity is relatively low risk of infection, but this type of repair is associated with a risk of recurrence that can be 40% to 50%, or even higher. Consequently, the use of mesh substantially reduces hernia recurrence; however, in open hernia repair, the reported rate of infection is between 3% and 18%.22,23

The laparoscopic approach reduces both wound complications and infections (PNEC).24,25 In one recent report of 859 patients, the risk of mesh infection was less than 0.5%.26 The low infection rate is, in fact, the most attractive benefit of a laparoscopic ventral hernia repair.
New antimicrobial meshes and nuanced technique have reduced infection risks, as has the adoption of laparoscopic approaches to ventral hernia repair.
The laparoscopic approach reduces both wound complications and infections. The low infection rate is, in fact, the most attractive benefit of a laparoscopic ventral hernia repair.
## Infection and Recurrence: Studies of Lap Ventral Hernia Repair Using EPTFE

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients (N)</th>
<th>Infection Rate (%)</th>
<th>Recurrence Rate (%)</th>
<th>Average Follow Up (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOY, 1998</td>
<td>144</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>BAGEASU, 2002</td>
<td>159</td>
<td>3</td>
<td>16</td>
<td>49</td>
</tr>
<tr>
<td>BEN-HAIM, 2002</td>
<td>100</td>
<td>1</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>BERGER, 2002</td>
<td>150</td>
<td>0</td>
<td>2.7</td>
<td>----</td>
</tr>
<tr>
<td>CARBAJO, 2003</td>
<td>270</td>
<td>0</td>
<td>4.4</td>
<td>44</td>
</tr>
<tr>
<td>LEBLANK, 2003</td>
<td>200</td>
<td>2</td>
<td>6.5</td>
<td>36</td>
</tr>
<tr>
<td>HENIFORD, 2003</td>
<td>850</td>
<td>0.7</td>
<td>4.7</td>
<td>20.2</td>
</tr>
<tr>
<td>FRANTZIDES, 2004</td>
<td>208</td>
<td>0</td>
<td>1.4</td>
<td>24</td>
</tr>
<tr>
<td>Overall</td>
<td>2081</td>
<td>1</td>
<td>5</td>
<td>27</td>
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Large hernias will continue to be a common and vexing challenge to the general surgeon. While minimally invasive techniques and modern prosthetics have bolstered the surgeon's armamentarium, we have yet to realize the ultimate goal of recurrence free repairs that are free from any morbidity. Furthermore, despite of published data, many of the fundamental questions in “Giant hernioplasty” remain unanswered. However, if the past is any predictor, the scientific and medical community will continue their march forward in search of Bilroth's "secret of the radical hernia repair."
TRANSPLANTATION OF THE ABDOMINAL WALL
THANK YOU FOR YOUR ATTENTION!