Crural Buttressing: Why, When, and with What

Michael Maddaus, MD
Professor of Surgery
Garamella-Lynch-Jensen Chair in Thoracic Surgery
Division of General Thoracic and Foregut Surgery
University of Minnesota
## Recurrence Rates Following Open Repair

<table>
<thead>
<tr>
<th>Author</th>
<th>n</th>
<th>Gastroplasty</th>
<th>Recurrence</th>
<th>Reoperation</th>
<th>F/U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altorki</td>
<td>47</td>
<td>0</td>
<td>1 (2%)</td>
<td>2%</td>
<td>Pt Contact</td>
</tr>
<tr>
<td>Pearson</td>
<td>94</td>
<td>80%</td>
<td>2 (2%)</td>
<td>2%</td>
<td>Interview/UGI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>At 1, 5, 10 yrs</td>
</tr>
<tr>
<td>Allen</td>
<td>124</td>
<td>66%</td>
<td>1 (1%)</td>
<td>1%</td>
<td>Chart, interview, questionnaire</td>
</tr>
<tr>
<td>Ellis</td>
<td>119</td>
<td>0</td>
<td>13 (11%)</td>
<td>8%</td>
<td>Chart, interview, questionnaire</td>
</tr>
</tbody>
</table>
Laparoscopic Early Recurrence Rates

Up to 42%!
Patient Instruction
Crural Closure is Essential

In all cases!
Problems With Giant Hernias

1. Tension
2. Attenuation
3. Movement
Preserve Crural Integrity
Sac Dissection
Reinforced Crural Repair
PTFE Mesh vs Simple Closure

Prospective, randomized trial

Hiatal hernia > 8 cm
36 simple closure
36 with PTFE onlay
Mean follow-up 3.3 ± 1.7 years

Recurrence
Simple closure - 22% (8/36)
Mesh - 0

Frantzides, Arch Surg, 2002
Polypropylene Mesh vs Simple Closure

polypropylene mesh
1 x 3 cm

Granderath, J Gast Intes Surg 2002
Polypropylene Mesh vs Simple Closure

531 patients

1 year f/u

361 no mesh 22 (6.1%)

170 mesh 1 (0.6%)

Granderath, J Gast Intes Surg 2002
Biologic Mesh

Xenogeneic extracellular protein matrix

Provides a bioscaffold

Resorbable

Badylak, Transplant Immun, 2004
The weak muscles of the crura are strengthened by scar from a mesh prosthesis
Biologic Onlay Mesh
Randomized, Prospective Multicenter Trial

Multicenter, prospective, randomized trial

4 centers

University of Washington
Oregon Health Sciences University
Washington University (St. Louis)
Oregon Health Clinic

Oelschlager, Ann Surg, 2006
Biologic Onlay Mesh
Randomized, Prospective Multicenter Trial

5 cm hernia

Have a telephone

Free of cognitive or speech impairment

Oelschlager, Ann Surg, 2006
Biologic Onlay Mesh
Randomized, Prospective Multicenter Trial

SIS - small intestine submucosa

7x10 cm patch

57 simple closure
51 mesh closure

Oelschlager, Ann Surg, 2006
Biologic Onlay Mesh
Randomized, Prospective Multicenter Trial

**Symptoms questionnaire**

2-4 weeks postoperatively

6 months

**UGI 6 months**

Recurrence - hernia >2cm

*Oelschlager, Ann Surg, 2006*
Biologic Onlay Mesh
Randomized, Prospective Multicenter Trial

Recurrence

Mesh 9% (4/51)
No mesh 24% (12/57)

*P<0.04

Oelschlager, Ann Surg, 2006
Redo Nissen – Polypropylene

33 recurrent hernias

Onlay polypropylene mesh with hole for esophagus

3 - 4 cm keyhole

Hernia tacker to place

2 (6%) – recurred 60 month F/U

No mesh complications

Granderath, WJS, 2008
Table 2. Comparison between Group A (no mesh) and Group B (mesh)

<table>
<thead>
<tr>
<th></th>
<th>Group A (No Mesh)</th>
<th></th>
<th>Group B (Mesh)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Recurrence</td>
<td>n</td>
<td>Recurrence</td>
</tr>
<tr>
<td>PEH</td>
<td>153</td>
<td>15.0%</td>
<td>228</td>
<td>2.6%</td>
</tr>
<tr>
<td>LF</td>
<td>576</td>
<td>9.5%</td>
<td>411</td>
<td>1.5%</td>
</tr>
<tr>
<td>Total</td>
<td>729</td>
<td>10.7%</td>
<td>639</td>
<td>1.9%</td>
</tr>
</tbody>
</table>
Synthetic Mesh

Complications

Aortic erosion
Migration
Dysphagia
Gastric erosion
Stricture
Synthetic Mesh Complications


Mesh complications after prosthetic reinforcement of hiatal closure: a 28-case series
Mesh complications after prosthetic reinforcement of hiatal closure: a 28-case series

Mesh complications after prosthetic reinforcement of hiatal closure: a 28-case series

Which To Use?

Biologic

Or

Polypropylene

Properly Placed
Essential Components of Hiatal Hernia Repair

- Hernia-sac excision
- Preservation of crural integrity
- Circumferential fat-pad dissection
- Esophageal length $\geq 2.5$ cm
- Gastroplasty when indicated
- Reinforced crural repair
Essential Components of Hiatal Hernia Repair

- Hernia-sac excision
- Preservation of crural integrity
- Circumferential fat-pad dissection
  - Esophageal length $\geq 2.5$ cm
- Gastroplasty when indicated
- Reinforced crural repair
- Biologic mesh butress
Sir Ronald Belsey

The pleasures to be derived from eating and drinking increase relatively as the satisfaction to be gleaned from other sources of physical gratification decreases with the normal decline in prowess of advancing years.

Ronald Belsey
Honored Guest’s Address
46th Annual AATS, 1966