The Use of Mesh Prosthesis for Hiatal Hernia Repair

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Introduction

• Large Hiatal Hernia - High Recurrence Rate

  Complications and Results of Laparoscopic Reflux Procedures: A Review of 10,489 Cases
  --Frantzides CT, J Am Coll Surg. 2001

• Technique of Hiatal Hernia Repair

  Management of Intrathoracic Stomach with Polypropylene Mesh Prosthesis Reinforced Transabdominal Hiatus Hernia Repair

  Prosthetic Reinforcement of Posterior Cruroplasty During Laparoscopic Hiatal Herniorrhaphy
  --Frantzides CT, Surg Endosc. 1997
Hypothesis

The use of prosthetic mesh reinforcement may decrease the recurrence rate of large hiatal hernias.

Frantzides CT, Madan AK,
Study Design

- Prospective 1991-2000
- Randomized
- Patients with ≥ 8 cm hiatal defect
- Two Groups:
  - Simple Cruroplasty
  - PTFE onlay mesh with cruroplasty
Frantzides CT, Madan AD, Carlson MA, Archives of Surgery 2002
Study Population

- 628 Patients
- 351 (56%)
- 72 (11%) (20%)
Study Population

72 total patients (Type I - IV)

• Simple cruroplasty: 36 patients
• PTFE group: 36 patients
Follow-up

- **Office visits:**
  - one week
  - one month
  - three months
  - six months
  - yearly

- **Esophagogram**
  - 3 months
  - 6 months
Follow-up

• Range: 6 months to 6 years
• Mean: $3.3 \pm 1.7$ years
• Median: 2.5 years
# Results

<table>
<thead>
<tr>
<th></th>
<th>Simple Cruuroplasty</th>
<th>PTFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>63 (42-81)</td>
<td>58 (36 – 92)</td>
</tr>
<tr>
<td>Duration of Surgery (hrs)</td>
<td>2.1 ± 0.3</td>
<td>2.6 ± 0.5*</td>
</tr>
<tr>
<td>Hospital Stay (days)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Complications (minor)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Conversions</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Recurrences</td>
<td>8 (22%)</td>
<td>0 (0%)*</td>
</tr>
</tbody>
</table>

Frantzides CT, Madan AD, Carlson MA, Archives of Surgery 2002
Complications

Simple Cruroplasty Group

- Pneumothorax (conservative treatment)

PTFE group

- Pneumonia
- Urinary retention (delayed discharge)

No long term sequela from any complications
Recurrences

• 3/8 patients chose medical management

• 5/8 patients underwent reoperation
  – 1 patient had an open repair with PTFE
  – 4 patients had a laparoscopic repair with PTFE
Cost

- PTFE group > $960 ± $70

- Cost due to increased operative time as well as the cost of the prosthesis
Jan. 2001-DEC. 2012

- Hiatal Hernia > 5 cm
- Poor tissue
- Cases

  Total HHR: 1094
  without mesh: 916 (83.7%)
  with mesh: 178 (16.3%)

  Recurrence:
  without mesh: 16 (1.7%)
  with mesh: 2 (1.1%)
## Comparative Studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Publication</th>
<th>Mesh</th>
<th>Non-Mesh</th>
<th>Type</th>
<th>Mesh Recurrence</th>
<th>Non-Mesh Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schulz</td>
<td>JGGW 1998</td>
<td>161</td>
<td>157</td>
<td>Prolene</td>
<td>2 (1.2%)</td>
<td>12 (7.1%)</td>
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<tr>
<td>Basso</td>
<td>Surg Endos 2000</td>
<td>67</td>
<td>65</td>
<td>Prolene</td>
<td>0</td>
<td>9 (13.8%)</td>
</tr>
<tr>
<td>Frantzides</td>
<td>Arch Surg 2002</td>
<td>36</td>
<td>36</td>
<td>PTFE</td>
<td>0</td>
<td>8 (22%)</td>
</tr>
<tr>
<td>Kamolz</td>
<td>Surg Endos 2002</td>
<td>100</td>
<td>100</td>
<td>Prolene</td>
<td>1 (1%)</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>Ganderath</td>
<td>J Gast Surg 2002</td>
<td>170</td>
<td>361</td>
<td>Prolene</td>
<td>1 (0.6%)</td>
<td>22 (6.1%)</td>
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<tr>
<td>Ganderath</td>
<td>Arch Surg 2005</td>
<td>50</td>
<td>50</td>
<td>Prolene</td>
<td>4 (8%)</td>
<td>13 (26%)</td>
</tr>
<tr>
<td>Oelschlager</td>
<td>Ann Surg 2006</td>
<td>51</td>
<td>57</td>
<td>Biologic Mesh</td>
<td>4 (9%)</td>
<td>12 (24%)</td>
</tr>
<tr>
<td>Oelschlager</td>
<td>JACS 2010</td>
<td>51</td>
<td>57</td>
<td>Biologic Mesh</td>
<td>*(54%)</td>
<td>*(59%)</td>
</tr>
</tbody>
</table>
A questionnaire was sent to all members of SAGES in 2006 regarding hiatal hernia repair.

275 responses were reviewed and 261 were acceptable for analysis for a total of 4803 cases.

77% laparoscopic and 74% use of mesh in their repairs.

SAGES QUESTIONNAIRE

- On lay technique was used by 64% of the surgeons.
- Only 22% of the surgeons routinely perform 360 degree reinforcement of the hiatus.
- 31% used biomaterial, 24% PTFE, 4% polypropylene, 20% other.
Conclusion

Prosthetic reinforcement of cruroplasty in large hiatal hernias lowers recurrence rate.