TITLE: PARIETEX MESH REPAIR OF THE ESOPHAGEAL HIATUS : 10 YEAR EXPERIENCE

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ABSTRACT

BACKGROUND: Despite continued controversy there is an increase use of mesh in the laparoscopic repair of the esophageal hiatus during antireflux surgery and paraesophageal hernia repairs in attempt to reduce the rate of hernia recurrence. Fear of mesh-associated major complications of visceral erosion, mesh infection, and dysphagia from inflammatory changes drives this controversy. Over the past twenty years we have performed over 1,700 laparoscopic repairs of the esophageal hiatus for gastroesophageal reflux disease or symptomatic paraesophageal hernia. In this report we present our experience in 549 patients over 10 years where Parietex horseshoe shaped mesh was used in the laparoscopic repair of the esophageal hiatus.

MATERIAL and METHODS: In this study, we performed a retrospective study of all patients undergoing a laparoscopic Parietex mesh repair of the esophageal hiatus between March 2002 and February 2012 at Wellstar Kennestone Hospital and Marietta Surgical Center. Our guidelines for and technique of mesh placement is described in detail.

RESULTS: 549 patients underwent a laparoscopic Parietex mesh repair of the esophageal hiatus. There were no major complications of mesh erosion, mesh infection, or stricture formation.

CONCLUSIONS: Parietex mesh can be safely used for the repair of the esophageal hiatus during laparoscopic antireflux surgery or paraesophageal hernia repair following our guidelines and technique.

INTRODUCTION

The laparoscopic approach to antireflux surgery and paraesophageal hernia repair is now standard.(1,2) Initial experience revealed a high rate of recurrence or breakdown of the esophageal hiatus repair.(3,4)

In an attempt to decrease this failure rate surgeons began utilizing mesh in the repair of the esophageal hiatus. (5,6,7). Of great concern is the risk of the major complications of mesh-associated visceral erosion, mesh infection, or stricture formation. (8,9)

Our initial experience with Parietex Composite mesh, a macroporous polyester material with an absorbable collagen barrier, in the repair of ventral hernias encouraged us to use this mesh in the repair of the esophageal hiatus. The Parietex mesh was simple to place laparoscopically and easy to secure with hernia staples. The biologic cellulose hydrophylic coating added the benefit of decreased adhesion formation. (10,11) Initially we cut out the horseshoe shape from the standard rectangular shaped mesh. (pict 1)

This study analyzes our experience with all patients that had Parietex mesh used in the laparoscopic repair of the esophageal hiatus with emphasis on our guidelines for and technique of mesh placement and associated major complications.

MATERIAL & METHODS

A retrospective study of all patients undergoing a laparoscopic repair with Parietex mesh of the esophageal hiatus during antireflux surgery or paraesophageal hernia repair between March 2002 and February 2012 at Wellstar Kennestone Hospital and Marietta Surgical Center. Clinical charts were reviewed for the following data: pre-op diagnosis, age, sex, weight, time of surgery, intra-op and post-op complications, hospital stay, and follow-up. Follow-up was one and three weeks post discharge and as needed afterwards. Phone contact was made to assess the incidence of mesh related complications.

RESULTS

There are 549 cases of laparoscopic repair of the esophageal hiatus with Parietex mesh. Pre-op diagnoses: medically refractory GERD in 379 patients (69%), paraesophageal hernia in 104 patients (19%), and failed anti-reflux surgery in 66 patients (12%).

Age average 49.8 years (9- 86, median 49)

Sex: female 291 (53%), male *258* (47%)

Weight: average 185.1 lbs (85 – 338, median 183)

Time of surgery average 118 minutes (56 – 241, median 122)

Hospital stay: average 1.4 days (0 – 25, median 1.0)

Complications: No intraoperative or perioperative mortality. No conversions to open surgery. No esophageal, gastric, or splenic injuries. No mesh erosion, infection, or stricture formation.

Follow-up: 3 months to 10 years. Routine postoperative at one and three weeks, then as needed. 549 (100%) of patients were seen early postoperative. 175 (32%) were seen at a later date for various concerns ie. Abdominal pain, gas bloat , or dysphagia. Phone interview to assess mesh related complications obtained in 82% (451) patients.

Major complications: None. No cases of mesh infection, visceral erosions, or stricture formation.

Minor complications: (45 pts,8.2%) pneumonia (6pts, 1%), UTI (3pts,0.5%), dehydration requiring admission (11pts, 2%), dysphagia requiring dilation (difficulty swallowing greater than 8 weeks postoperative(22pts,4%), superficial wound infection (3pts,0.5%)

19 (3.5%) patients required an operation in the postoperative period for unrelated conditions. 12 laparoscopic cholecystectomies, 3 laparoscopic inguinal hernia repair, 2 laparoscopic port site hernias, 1 laparoscopic appendectomy, and 1 laparoscopic repair of a perforated ulcer.

TECHNIQUE

Our technique of laparoscopic surgery at the esophageal hiatus has been previously described. (12,13,14) The major points are:

- Preoperative prophylactic IV antibiotics
- low lithotomy position
- SCD's are placed prior to the induction of general anesthesia
- an orogastric tube is routinely placed

- proper dissection of the esophageal hiatus is performed attaining adequate abdominal esophageal length.
- when necessary an intraoperative EGD is performed when the dissection is difficult to clarify the anatomy
- the esophageal hiatus is repaired primarily posterior to the esophagus with permanent sutures approximating the right and left crus. (pict 2)
- the primary crural repair is buttressed with an onlay of Parietex horshoe shaped mesh
- the mesh is secured to the crura posterior to the esophagus with hernia staples. (pict 3) Care is taken to make sure the mesh does not touch the esophagus. A two millimeter margin between the perimeter of the mesh and the esophagus is maintained. (pict 4) The legs of the mesh are secured on the right and left crus respectively. Extra or redundant mesh is excised.
- The stomach (fundus) is placed between the esophagus and mesh. (pict 5)
- . Routine division of the uppermost short gastrics prevents tension.

DISCUSSION

The use of mesh in the repair of the esophageal hiatus during laparoscopic antireflux or paraesophageal repair surgery is of concern to surgeons. The avoidance of mesh utilization is driven by the fear of catastrophic complications.(9) The complex anatomy and the dynamic physiology of the esophageal hiatus has made the permanent repair of

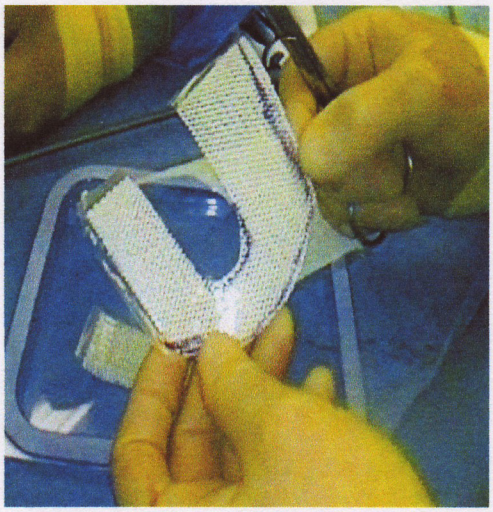
the esophageal hiatus difficult to attain. The movement at the esophageal hiatus associated with respiration and the constant pulsation of the nearby aorta are potential factors in erosion of mesh into the esophagus or stomach. We believe strongly that in order to avoid a catastrophic complication when mesh is used to repair the esophageal hiatus adherence to the following guidelines is critically important. (table 1) First, do not encircle the esophagus with the mesh. The horseshoe shaped mesh opened anteriorly prevents constriction of the esophagus. (pict 6) Second, do not allow the mesh to touch the esophagus. A two millimeter margin between the edge of the mesh and the esophagus is preferable. Special attention is paid at the crux of the primary repair posteriorly. We place the horsehoe mesh posterior to the esophagus such that the cephalad repair stitch is immediately above the mesh. (pict 3) Third, place the fundus between the mesh and the esophagus separating the esophagus from the mesh.

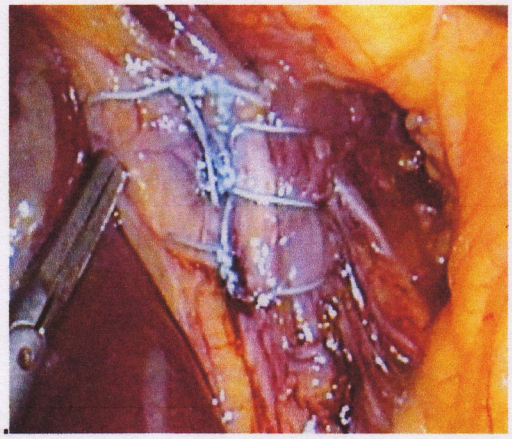
Our follow-up was limited. Nonetheless our follow-up of the 175 symptomatic post-op patients revealed minor complications in 45 patients (8%). The absence of major mesh-associated complications of visceral erosions, mesh infection, or stricture is important. We strongly believe that the nature of major complications of mesh erosion, infection, or stricture formation are such that we would be made aware either by patient complaint, colleague notification, or legal action. Typically the presentation of mesh erosion is early in the post-op course although one case in the literature presented at nine years. (9) Our follow up of up to 10 years without mesh-associated erosion, infection, or stricture formation is encouraging.

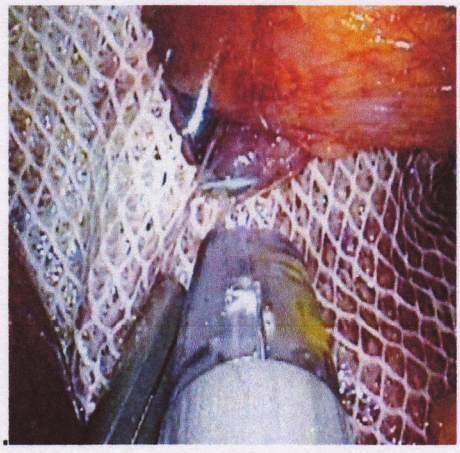
CONCLUSION

Parietex horseshoe shaped mesh can be safely utilized in the laparoscopic repair of the esophageal hiatus.

PICTURES

1. 

2. 

3. 

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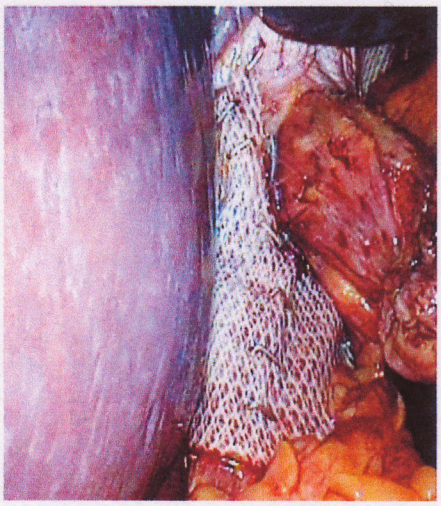

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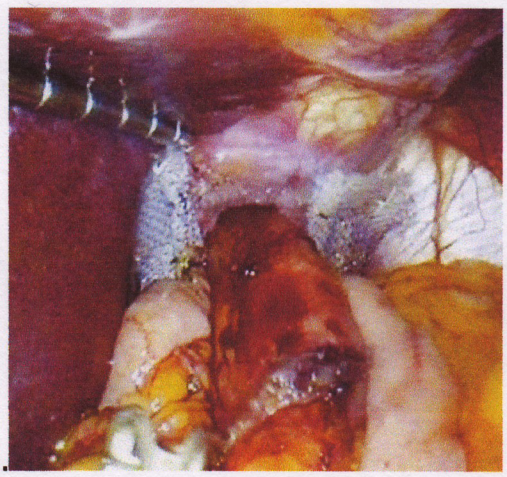

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Table 1 Guidelines for Mesh Placement

- Do not encircle the esophagus with mesh
- Do not allow the mesh to touch the esophagus
- The horseshoe mesh is placed over the primary posterior repair
- The horseshoe mesh is secured with hernia staples (pict 3)
- 2 mm margin between mesh and esophagus is maintained (pict4)
- Fundus placed between esophagus and horseshoe mesh (pict5)
- Do not use mesh if there is contamination

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