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Long-Term Results of Giant Hiatal Hernia Mesh Repair and Antireflux Laparoscopic Surgery for Gastroesophageal Reflux Disease

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Abstract

Background: The application of mesh-reinforced hiatal closure has resulted in a significant reduction in recurrence rates. The most debated issue is the risk of complications related to the use of the prosthesis, which are thought to be the cause of higher dysphagia.
Patients and Methods: From January 2004 to December 2007, 198 consecutive patients underwent laparoscopic fundoplication for gastroesophageal reflux disease (GERD) with or without hiatal hernia. Fifty patients (25.3%) presented a giant hiatal hernia, defined as a hiatal defect over 5 cm. These 50 patients underwent primary simple suture of the crura and additional reinforcement with a Crurasoft® mesh (Bard). Hiatal hernia or GERD symptoms recurrence, dysphagia, and mesh-related complications were investigated.
Results: Of the 50 patients undergoing mesh repair, there were 32 women and 18 men with a mean age of 63.2 years. Conversion rate was 2%. Intraoperative complications rate was 6%, all of them laparoscopically managed. Postoperative complications occurred in 1 patient (2%). Mortality rate was 2%. Median postoperative stay was 3 days. Median follow-up was 62 months. Two percent of the patients presented wrap migration, and 4% presented dysphagia. Six percent of cases presented recurrence of GERD manifestations. There have been no complications related to the use of the mesh.
Conclusions: Laparoscopic antireflux surgery with a prosthetic mesh in cases of giant hiatal hernia is an effective and safe procedure, reducing the rate of postoperative hernia recurrence during long-term follow-up. The incidence of mesh-related complications is very low.

Introduction

Laparoscopic antireflux surgery (LARS) is considered the gold standard in the treatment of gastroesophageal reflux disease (GERD) with or without hiatal hernia.[1] The initial satisfactory outcomes were counterbalanced by a high recurrence rate complicating laparoscopic suture-only hiatoplasty in cases of giant hiatal hernias, reaching an incidence of up to 43% of the cases with hiatal defects over 4 cm.[2,2,3] The application of mesh-reinforced hiatal closure has resulted in a significant reduction in recurrence rates. The most debated issue is the risk of complications related to the use of the prosthesis, such as erosion or migration of the mesh into the esophagus or stomach as well as the development of fibrotic strictures, which are thought to be the cause of higher dysphagia rates and are the main drawbacks discouraging wide application of mesh hiatoplasty.[4,5]

This study aimed to evaluate retrospectively the long-term results of LARS for a series of patients treated from 2004 to 2007. In particular, the surgical outcome and functional results for patients who underwent laparoscopic prosthetic closure were analyzed.

Patients and Methods

Patients

From January 2004 to December 2007, 198 consecutive patients underwent laparoscopic fundoplication for GERD with or without hiatal hernia. Fifty patients (25.3%) presented a giant hiatal hernia, defined as a hiatal defect over 5 cm. These 50 patients underwent primary simple suture of the crura and additional reinforcement with a Crurasoft® mesh (Bard).

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Preoperative, postoperative, and long-term clinical assessment

All the patients underwent a standard preoperative workup including physical examination, blood analysis, upper gastrointestinal barium meal X-ray study, esophagogastroduodenoscopy with biopsy, 24-hour pH monitoring, and esophageal manometry.

Postoperative follow-up was performed at 1, 3, 6, and 12 months and then every year after surgery. An upper gastrointestinal X-ray study was performed at 3 and 12 months, with esophagogastroduodenoscopy, 24-hour pH monitoring, and esophageal manometry in the case of symptoms. Hiatal hernia or GERD symptoms recurrence, dysphagia, and mesh-related complications were investigated.

Surgical technique

The first step was reduction of the herniated stomach and section of the phrenogastric attachment. The short gastric vessels (maximum of three) were cut only when necessary to obtain a "floppy Nissen." The gastrohepatic omentum was then divided, and the esophagus was isolated. In all the patients crural closures were performed with a maximum of three interrupted nonabsorbable sutures between the right and left diaphragmatic pillars. The hiatal defect was measured intraoperatively using a tape measure. In giant hiatal defects (>5 cm), a V-shaped mesh with porous polytetrafluororethylene on one side and expanded polytetrafluororethylene on the other side (Crurasoft Composix mesh, Bard) was placed and fixed on the pillars with interrupted sutures on the edges of the mesh with nonabsorbable sutures in 48 cases and with an Autosuture ProTack (Covidien) endoscopic stapler in 2 cases. A "floppy" Nissen fundoplication was then tailored in all the patients using three nonabsorbable stitches.

Results

Of the 50 patients undergoing mesh repair, there were 32 women and 18 men with a mean age of 63.2 years (range, 22–85 years). Median hiatal defect was 5.5 cm (range, 5–8 cm). Conversion rate was 2% (1 patient). The cause of conversion was transverse colon, omentum, and spleen included in the hernial sac that was impossible to be laparoscopically reduced. Intraoperative complications occurred in 3 patients (6%): 2 cases of pneumothorax during dissection of the sac and 1 case of spleen laceration laparoscopically managed with hemostatic agents (Surgicel®, Ethicon). All these complications were intraoperatively managed without any further sequelae. Postoperative complications occurred in 1 patient (2%), who developed an acute pulmonary embolism on day 4 after surgery. Mortality rate was 2% (the patient suffering the acute pulmonary embolism). Median postoperative stay was 3 days (range, 1–16 days).

One patient (2%) had wrap migration into the chest on day 25 after surgery and required emergency surgery due to incarcerated hiatal hernia with partial ischemia of the stomach.

Complete follow-up assessment was obtained for all the patients after a median follow-up period of 62 months (range, 91–54 months). Upper gastrointestinal X-ray study, performed 3 and 12 months after surgery, did not present hernia recurrence or any other relevant findings in any of the cases. A total of 2 patients (4%) experienced transient dysphagia. The symptoms began 1 month after surgery in the first case and 2 months after the intervention in the second one. In both cases upper gastrointestinal X-ray study, esophagogastroduodenoscopy, 24-hour pH monitoring, and esophageal manometry for dysphagia did not show any abnormalities. Symptoms resolved spontaneously within 3–6 weeks.

A total of 3 patients (6%) presented recurrence of GERD manifestations during the follow-up, requiring daily uptake of omeprazol for control of the symptoms.

There have been no complications related to the use of the mesh.

Discussion

Since its introduction in 1991, LARS has gained great success, and popularity among surgeons and has become the gold standard for the treatment of GERD. The results have been good to excellent in terms of symptom control, functional outcomes, and quality of life improvement.[1,6–8]

Despite a success rate of 85–95% reported in large series with a mid- and long-term follow-up evaluation, important complications are related to hiatoplasty. These complications, including wrap migration and hiatal hernia recurrence, result from inadequate closure of the hiatal crura or disruption of the hiatoplasty, occurring especially in giant hiatal hernias. Anatomic features of the hiatal crus and mean diameter of hiatal defect seem to play a key role in the development of this complication. Crural closure generates a lateral tension proportional to the hiatal defect diameter, which may lead to disruption of hiatal repair during inspiratory movements of the diaphragm.[1,5,9] In our opinion, when a correct repair of the hiatus is not achieved with three stitches, the performance of more sutures will not lead to a tension-free repair, and this hiatoplasty would be more suitable for dehiscence. In giant hiatal hernias (>5 cm in diameter), three sutures are usually not enough to close the crural defect, and therefore we recommend placing a prosthetic mesh in these cases.

Prosthetic reinforcement of the crural closure seems to lower the incidence of postoperative hiatal hernia recurrence and intrathoracic wrap migration.[10–13] In our series undergoing mesh repair, wrap migration appeared in one patient (2%), and, excepting this case, there were no other cases of "clinically" apparent hiatal hernia recurrence. It is well established that recurrent hiatal hernia is not generally apparent clinically. Given that we do not repeat contrast radiography beyond 12 months in asymptomatic patients, we cannot discount the existence of asymptomatic recurrences. Different studies have reported a decrease of postoperative hernia recurrence or wrap migration from 10%, when suture-only hiatoplasty was performed, to 1% when the mesh was superimposed on the pillars' suture.[5,14] Our results support this affirmation. In our series, the incidence of hiatal hernia recurrence in the group of suture-only hiatoplasty was 2.1%. However, both groups are not comparable in that the size of the hiatal defect is significantly larger among the patients undergoing mesh-reinforced hiatoplasty. Nevertheless, it seems that the recurrence rate of hiatal hernias with large hiatal defects can be reduced to a similar incidence rate of smaller hiatal defects, always when a mesh-reinforced hiatoplasty is performed.

The reported incidence of dysphagia after mesh-reinforced hiatoplasty ranged from 0% to 21.7%, with a median value of

3.9%. Mesh-related complications, such as intraluminal erosion, fibrosis, and esophageal stenosis, are thought to be the cause of higher dysphagia rates.[2,15,16] In our series, the incidence of dysphagia was similar in the group of mesh-reinforced hiatoplasty and in the group of suture-only hiatoplasty with Nissen fundoplication (5%).

The most debated issue of hiatal hernia mesh repair is the risk of visceral erosions or adhesions related to the presence of a foreign body. Incidence rates of these entities vary from 0.1% to 20% in the literature. It must be noted that the incidence is significantly lower in recent series with a large number of patients than in older and smaller ones, probably reflecting the learning curve in the mesh placement.[1,5,10] Although prosthetic reinforcement of the crural closure seems to lower the incidence of postoperative hiatal hernia recurrence and intrathoracic wrap migration in patients who undergo prosthetic hiatal closure and long-term incidence of mesh-related complications is very low, as reflected in this study, there is still no consensus concerning the routine or selective use of prosthetic mesh and its shape, size, and type composition. More prospective, randomized studies must be conducted in the future to clarify these debated issues.

Conclusion

LARS with a prosthetic mesh in cases of giant hiatal hernia is an effective and safe procedure, reducing the rate of postoperative hernia recurrence during long-term follow-up. The incidence of mesh-related complications, even during a long follow-up period, is very low.

Disclosure Statement

No competing financial interests exist.

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