

Research Article

A Multicentric Regional Experience about Mesh Using During Hiatal Hernia Repair

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Abstract

Laparoscopic antireflux surgery represents the gold standard in the treatment of gastroesophageal reflux disease, especially with hiatal hernia. Meshes have been proposed to help reduce the recurrence rate, but mesh-related complications such as dysphagia, stricture and erosion into the esophagus or stomach could occur, so, available data have not established a clear role for mesh using and it is still debated. Probably, we need more strict and precise indications so that the use of mesh will be considered useful and safe in some conditions only, according to the hiatal surface hernia. Furthermore, the ideal type of mesh (synthetic or biologic) and method of its placement should be also established. We report our own multicentric experience involving seven institutes about the use of mesh in a large group of patients who underwent hiatal hernia repair in our region (Sicily, Italy) with a low recurrence rate (10%), most of which without mesh placement during surgical treatment.

Keywords: Hiatal hernia repair; Mesh; Laparoscopic surgery

Introduction

Laparoscopic surgery is considered the gold standard in the treatment of gastroesophageal reflux disease, especially with hiatal hernia, with lower mortality and morbidity rates than with open antireflux surgery [1]. Its overall failure rate is reported in about 10% at 10 years and possible reasons for failure are recurrent hiatal hernia, too much tension in the closure of the crura, a too tight or a slipped fundoplication and genetic changes in the muscle or suspensory tissue [2-3]. The use of mesh to reinforce the closure of the diaphragmatic hiatus is strongly debated due to mesh-related complications (stricture, dysphagia, erosion into the esophagus or stomach) and recurrence rates [3-5].

Recently, in the USA, a large report involved members of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) regarding their practice related to mesh use for Hiatal Hernia Repair (HHR). During 2010-2012, 2518 members responded to a questionnaire about HHR and, even though the minority of them

only used it routinely, the majority of them have used absorbable mesh with onlay technique, but nevertheless, finally there was no clear accepted use of mesh in HHR [6].

We report a multicentric experience about the use of mesh in a large group of patients who underwent hiatal hernia repair. This series has been collected in our region (Sicily, Italy).

Materials and Methods

A questionnaire consisting of twelve multiple choice questions was designed and partially modified (Table 1) following the SAGES members model [6]. It was sent *via* e-mail to the surgeons who perform hiatal hernia repair in their practice regarding our Region (Sicily) and involving seven Institutes. All responses were collected and analyzed from November 2018 to March 2019. All patients underwent a follow-up at least one year and underwent a barium X-ray every six months and an esophagusgastroduodenoscopy one year after surgery to identify any relapses that did not give clinically detectable symptoms.

Results

All surgeons used laparoscopic approach for hiatal hernia repair and Nissen-Rossetti technique for the fundoplication in all cases. Regarding annual volume of hiatal hernia repair, 71% of surgeons perform 20 to 40 repairs per year and 29% perform less of 20 repairs per year. A total of 1137 strongly symptomatic patients undergoing hiatal hernia repair were examined.

About mesh using, 71% never used mesh during hiatal reconstruction; 14.5% sometimes used absorbable mesh (only in giant hiatal hernia with defect >5 cm), after repairing the hiatus with suture,

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Table 1: Questionnaire

1. How many hiatal hernia repairs/year do you perform?		
<input type="checkbox"/> <20	<input type="checkbox"/> 20-40	<input type="checkbox"/> >40
1b. How many repairs have you overall performed in your experience?		
2. Which kind of surgical technique do you use for the Fundoplication?		
<input type="checkbox"/> Nissen-Rossetti Toupet	<input type="checkbox"/> Nissen	<input type="checkbox"/> Dor
3. Do you perform laparoscopic or open surgery for hiatal hernia repair?		
<input type="checkbox"/> laparoscopic	<input type="checkbox"/> open	
4. Do you use mesh during hiatal hernia repair?		
<input type="checkbox"/> yes, always	<input type="checkbox"/> no	<input type="checkbox"/> sometimes
5. If yes, how do you place the mesh?		
<input type="checkbox"/> anterior hiatal closure	<input type="checkbox"/> posterior hiatal closure	<input type="checkbox"/> contactless with esophagus
6. When using mesh during hiatal hernia repair, which kind of mesh do you use?		
<input type="checkbox"/> absorbable	<input type="checkbox"/> nonabsorbable	
7. Have post-operative complications ever occurred?		
<input type="checkbox"/> yes	<input type="checkbox"/> no	
8. If yes, what kind?		
9. If recurrences have occurred, which is the percentage?		
<input type="checkbox"/> 0-10%	<input type="checkbox"/> 11-30%	<input type="checkbox"/> >30%
10. Have you ever performed revisional surgery on a patient with previous hiatal mesh?		
<input type="checkbox"/> yes	<input type="checkbox"/> no	
11. If yes, which is the annual volume?		
<input type="checkbox"/> < 3/year	<input type="checkbox"/> 3-6 /year	<input type="checkbox"/> > 6/year
12. Have you ever performed hiatal hernia repair during other surgical operations (es. cholecystectomy)?		
<input type="checkbox"/> yes	<input type="checkbox"/> no	
Please, use this space to report any experience or comments about hiatal hernia repair:		

placing the mesh in a U-shaped configuration, with the base of the U overlying the anterior hiatal closure and sutured in place; 14.5% used absorbable mesh in all cases, but with the base of the U overlying the posterior hiatal closure (Figure 1).

Regarding post-operative complications, 14.5% of respondents that always used absorbable mesh and 14.5% of respondents that sometimes used absorbable mesh, did not report any complication. Remaining 71% have reported general complications of antireflux surgery in just 17 cases such as splenic bleeding, incisional hernia, tardive splenic rupture and most of all dysphagia (Figure 2). About rate of recurrence, the only respondent that always used absorbable mesh did not report any recurrence, remaining respondents have reported recurrence in about 10% of cases (Figure 3).

Discussion

Hiatal hernias can be subdivided into sliding (type I) and large (types II-IV) hiatal hernias. Type I typically is associated with gastroesophageal reflux disease and often is managed medically with antisecretory drugs. Type II-IV may be associated with severe

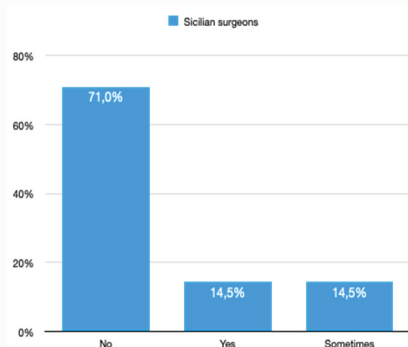


Figure 1: Frequency of mesh use during hiatal hernia repair: 71% of respondents don't use mesh, 14.5% always use mesh, 14.5% sometimes use mesh.

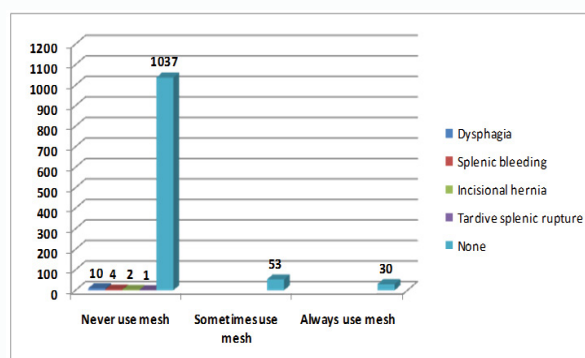


Figure 2: Frequency of post-operative complications: 71% of surgeons never used mesh and have reported general post-operative complications of anti-reflux surgery. On a total of 1137 surgical procedures performed, these complications were: 10 cases of dysphagia (59%), 4 cases of splenic bleeding (24%), 2 incisional hernias (12%), 1 tardive splenic rupture (6%).

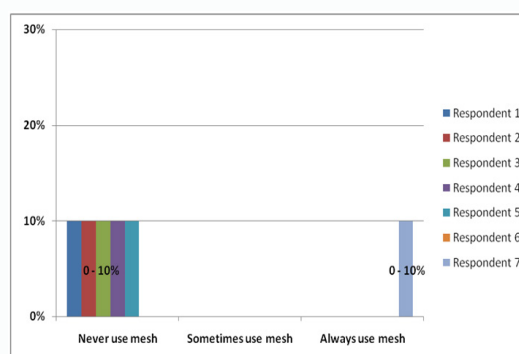


Figure 3: Rates of recurrence. Seven Sicilian institutes participated in our study. In six centers there was a recurrence rate between 0 and 10% and in only one center there were no cases of recurrence.

complications such as organoaxial rotation leading to strangulation of the stomach (Table 2).

Table 2: Classification of hiatal hernia

I	Sliding hernia with the gastroesophageal junction above the diaphragm
II	Paraesophageal hiatus hernia. A part of the stomach herniates through the hiatus and lies beside the esophagus, without movement of the gastroesophageal junction
III	Combined hernia. The combination of the type I and II
IV	A large defect in the hiatus, allowing other organs to enter the hernia sac

Symptomatic patients with a large hiatal hernia should be offered surgical repair [7]. Laparoscopic surgery is considered the gold standard in the treatment of gastroesophageal reflux disease, especially with hiatal hernia. The miniminvasive approach offers an excellent view of the hiatal region and it is related to a lower mortality and morbidity rates and earlier postoperative mobility than with open antireflux surgery [1,5,8]. At first, dissection of the hernia sac from the posterior mediastinum is performed, after, the procedure consists of reduction of the herniated intra-abdominal position of the distal esophagus (so that the esophago-gastric junction remained without tension at least 2 cm under the hiatus), posterior cruroplasty, and the addition of an antireflux procedure (Nissen-Rossetti, Dor, Toupet) [7,9]. Several reports have suggested that a concomitant fundoplication is not necessary, but we strongly support its use because it prevents gastroesophageal reflux disease and also provides an additional reinforcement by securing the stomach below the diaphragm. The overall failure rate is approximately 10% at 10 years and common causes of failure are recurrent hiatal hernia, too much tension in the closure of the crura, a too tight or a slipped fundoplication and structural or genetic changes in the muscle or suspensory tissue [2,3]. The use of mesh to reinforce the closure of the diaphragmatic hiatus of large and complicated hiatal hernia is still debated due to mesh-related complications (stricture, dysphagia, erosion into the esophagus or stomach) and recurrence rates [3-5]. There are many types of mesh, synthetic and biologic mesh, introduced more recently (polypropylene, polytetrafluoroethylene, polyester, polyglactin, porcine small intestine submucosa, human acellular dermal matrix, other composite/non-absorbable and other biologic mesh). The ideal mesh should be easy to handle and able to generate adhesions to the diaphragmatic surface but not to the visceral side [1,4,6].

In a recent study, Weyhe et al. [10] tried to establish the exact cut-off of hiatal surface area for mesh implantation, because the potential for relapse increases with hernia size, but it remained unclear especially for patient-related factors.

A survey on the use of mesh for hiatal hernia repair by members of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) showed that only 9% of surgeons reported routine use of mesh, and an additional 15% used it in more than half of their cases. When using mesh, 33% of surgeons preferred nonabsorbable to absorbable mesh. This reflects the fact that prosthetic mesh has the advantage of reducing hiatal hernia recurrence, but it can increase mesh-related complications that may require esophagectomy or gastrectomy. On the other hand, biomaterial and biologic mesh reinforcement of the crural closure seems to lower the incidence of complications but it tends to be associated with failure and recurrences [11].

Other notable findings come from Fumagalli et al. [9] in an Italian study aimed to provide data about the utility of biomesh to

reinforce repairs of large hiatal hernias. In a small series of six patients who underwent laparoscopic repair of primary or recurrent large hiatal hernia, and with intraoperative finding of weak diaphragmatic pillars, biomesh was employed to assist the repair and the short-term recurrence rate was unexpectedly high at 50%. Thus, in their experience, biomeshes can be safely used as on lay reinforcement in hiatoplasty, but are not effective in reducing late recurrences after laparoscopic repair of large hiatal hernias with weak diaphragmatic pillars.

Oelschlager et al. [12] reported in a multi-institutional, randomized study of laparoscopic paraesophageal hernia repair that the anatomic recurrence rate at a median of approximately 5 years was >50% with no significant difference between the first groups of patients that received a biologic mesh and the second group that underwent primary repair only.

We reported our own multicenter experience, involving seven institutes in our region (Sicily). We found a low recurrence rate in our series (10%), without mesh placement during hiatal hernia repair. Probably, size of hiatal hernia, tension on the crura, poor crural tissue, obesity and other patient-related factors could represent indications for mesh use just like reinforcement in hiatoplasty and not for reducing recurrence.

Likely, through a multicenter trial we could obtain a large number of patients and analyzing a greater volume of data, as it is considered for other pathologies [13], we can better evaluate these problems.

Conclusion

In conclusion mesh use during hiatal hernia repair is controversial. The significant complications that could derive from its use can be dramatic and could need a major resection, gastrectomy or esophagectomy. On the other hand the use of mesh could decrease recurrence rates especially in patients with hernia defects >5 cm.

In our opinion we need more strict and precise indications so that the use of mesh will be considered useful and safe in some conditions only, according to the hiatal surface hernia. Furthermore, the ideal type of mesh or method of its placement should be also established. A prospective multicenter study could be, probably, a valid solution in order to give unitary answers to these questions.

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