

A 3D totally absorbable synthetic mesh in antireflux surgery: Gore Bio-A tissue reinforcement for hiatal hernia repairing

A. Agrusa, G. Romano, G. Frazzetta, A. Inviati, G. De Vita, S. Di Giovanni, D. Chianetta, G. Di Buono, S. Bonventre, G. Gulotta

Department of General and Emergency Surgery, University of Palermo, Italy

Introduction

Hiatal hernia, defined as *transitory or stable dislocation of a part of the stomach in mediastinum through the diaphragmatic crura delimiting esophageal hiatus*. Its appearance presupposes anatomic anomalies or weakening of structures and mechanisms able to maintain esophago-gastric junction and stomach in the abdominal cavity.¹ Classically hiatal hernia was classified in four types using Hill's classification: Type I hiatal hernia is associated with GERD in 50-90% of cases, in fact its presence gradually compromises esophago-gastric junction's continence favouring the backwater of acid secretion and its reflux in contact with esophageal mucosa during transient relaxations of the LES and also reducing clearing systems overall for large hiatal hernias.^{2,3} Several randomized controlled trials with long-term follow-up comparing surgical with medical therapy for the treatment of GERD, strongly support surgery as an effective alternative to medical therapy.⁴ Fundoplication has also been demonstrated to lead to improved or at least comparable quality of life to that of medically treated patients and it is associated with high patients satisfactions rate.⁵ A laparoscopic total fundoplication is considered today the procedure of choice increasing the resting pressure and length of the lower esophageal sphincter, decreasing the number of transient LES relaxations and improving quality of esophageal peristalsis and follow-up demonstrates complete symptoms control in 80-90% of patients 10 years later.⁶ However primary laparoscopic hiatal hernia repair is associated with up 42% recurrence rate.⁷ Several level data suggest that mesh reinforcement of the crural closure for hiatal hernia repair decreases the recurrence of hernia, but can lead to esophageal erosion and stenosis or dysphagia, above all non-absorbable mesh.^{8,9} For this clinical case, we experiment a new totally absorbable Gore Bio-A® mesh.¹⁰

Correspondence: Giorgio Romano, Department of General and Emergency Surgery, University of Palermo, Via L. Giuffrè 5, 90128 Palermo, Italy.
E-mail: giorgio.romano@unipa.it

©Copyright A. Agrusa et al., 2015
Licensee PAGEPress, Italy
Journal of Biological Research 2015; 88:5161

This article is distributed under the terms of the Creative Commons Attribution Noncommercial License (by-nc 3.0) which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

Clinical Case

Female patient; 65-year old; 6-year classic history of GERD (regurgitation, belching, bloating, acid in the throat treated for several years by multiple proton pump inhibitors); BMI 22. An EGDS revealed a >3 cm hiatal hernia, grade B Los Angeles esophagitis. 24-hour pH study was positive for acid reflux and esophageal manometry revealed LES intrathoracic dislocation. With laparoscopic 5-trocars approach, the hiatal hernia defect was identified and primarily repaired, by crural closure, with size 0 permanent suture (ETHIBOND). GORE BIO-A® Tissue Reinforcement was trimmed to fit the defect with a U shape cutout to accommodate the esophagus. It was secured using two absorbable sutures (VICRYL). At least A Nissen fundoplication was performed without incident. Result: Gore BIO-A® mesh was easily placed through a 10-12 mm trocar. It had good handling characteristics laparoscopically, and no pre-operative preparation was required of the prosthetic. It can be cut and tailored intraoperatively to an optimal adaptation. There were no short-term complications from the mesh. The patient had not significant post-operative sequelae.

Conclusions

Crural closure reinforcement during hiatal hernia repair can be done readily with this new totally absorbable Gore Bio A Tissue Reinforcement: it is a 3D web of completely absorbable synthetic polymers replaced by soft tissue over six months; it is a mix of glycolic acid and trimethylene carbonate and its function consists in stimulating collagens deposition and ingrowth of new connective soft tissue.¹¹ It was demonstrated that Gore Bio-A increases cellular in-growth in 7-30 days more and more previously than biologic mesh; it also increases new blood vessels formation in 7-14 days reaching the greatest vascular in-growth. Instead the biologic meshes gore BIO-A seems to induce the least inflammatory infiltrate. Gore BIO-A tissue reinforcement seems to have all the best characteristics to hernia hiatal laparoscopic repair reducing both recurrence rates and post-operative mesh-related complications, even if several other cases and studies are necessary. However further data and studies are needed to evaluate long-term efficacy and complications associated with its use.

References

- Schmidt E, Shaligram A, Reynoso Jf, et al. Hiatal hernia repair with biologic mesh reinforcement reduces recurrence rate in small hiatal hernias. *Dis Esophagus* 2014;27:13-7.

2. Obeid N, Velanovich V. The choice of primary repair or mesh repair for paraesophageal hernia: a decision analysis based on utility scores. *Ann Surg* 2013;257:655-64.
3. Braghetto MI, Korn BO, Cardemil HG, et al. Laparoscopic surgery for benign esophageal diseases. *Rev Med Chil* 2012;140:703-12.
4. Grubnik V, Malinovski A. Analysis of long-term results of laparoscopic repair of hiatal hernias and Nissen fundoplication. *Klin Khir* 2012;10:34-6.
5. Hermann J, Kościński T, Malinger S, et al. Strangulation of the stomach and the transverse colon following laparoscopic esophageal hiatal hernia repair. *Wideochir Inne Tech Malo Inwazyjne* 2012;7:311-4.
6. Brandalise A, Aranha N, Brandalise N. The polypropylene mesh in the laparoscopic repair of large hiatal hernias: technical aspects. *Arq Bras Cir Dig* 2012;25:224-8.
7. Porziella V, Cesario A, Lococo F, et al. Complete transmural gastric migration of ptfе mesh after surgery for a recurrent hiatal hernia. *Eur Rev Med Pharmacol Sci* 2012;16:42-3.
8. Carlson M, Richards C, Frantzides C. Laparoscopic prosthetic reinforcement of hiatal herniorrhaphy. *Dig Surg* 1999;16:407-10.
9. Frantzides C, Carlson M. Prosthetic reinforcement of posterior cruroplasty during laparoscopic hiatal herniorrhaphy. *Surg Endosc* 1997;11:769-71.
10. Masullo JM, Singh TP, Dunnican WJ, Binetti BR. Preliminary study of hiatal hernia repair using polyglycolic acid: trimethylene carbonate mesh. *Jlss* 2012; 16:55-9.
11. Sutton P, Evans J, Uzair S, Varghese J. The use of gore bio-a in the management of the open abdomen. *Bmj Case Rep* 2013; 25:2013.

Non commercial use only