



Magnetic Sphincter Augmentation for the Treatment of Gastroesophageal Reflux Disease

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Dr. Bologheanu and colleagues retrospectively analyzed the outcome of the Magnetic Sphincter Augmentation (MSA) in 268 patients with gastroesophageal reflux disease (GERD), operated between 2012 and 2020 in Vienna, Austria, under the supervision of Professor Sebastian F. Schoppmann [1]. The primary end point of this study was the incidence of postoperative dysphagia while secondary end points were the effect of the operation on the gastrointestinal symptoms, and the HERD-HRQL.

Patients were evaluated preoperatively by a standardized interview, endoscopy, manometry and 24-h impedance pH monitoring. A diagnosis of GERD was not uniformly made by “positive pH results”, but also by [1] an increased number of reflux episodes, [2] esophagitis on endoscopy, [3] typical symptoms sensitive to PPI medications, and [4] if patients did not have spastic or absent motility on manometry. Unfortunately, criteria 1 to 5 do not follow the current standard of preoperative diagnosis clearly outlined by expert consensus of both gastroenterologists and surgeons [2], raising the question that some of the patients in this report had symptoms suggestive of GERD but not a pathologic amount of reflux.

The operation was performed laparoscopically by or under the supervision of the senior Author. In 81% of patients crural closure with non-absorbable sutures was performed in addition to the implantation of the magnetic ring. There were no intra-operative complications. At a median follow-up of 23 months complete elimination of

heartburn, regurgitation and respiratory symptoms occurred in about 2/3 of patients. Esophageal function tests were repeated in 13 of 50 patients who had residual heartburn, and pathologic reflux was detected in 4 of them (31%). The absence of dysphagia was reported by 63% of patients. Three patients required balloon dilatation, and six patients had a reoperation (2 for device removal). The Authors analyzed 15 preoperative predictors of postoperative dysphagia and a multivariate logistic regression analysis and found that the only predictor was a device size less than 13.

Overall, this is an important study from a well-known center that shows that this device is effective in controlling symptoms in most patients, with a low rate of complications when the operation is performed by an experienced surgeon. While we think that MSA has a place in the armamentarium of a surgeon treating GERD, we feel that it is important to make some points about the treatment of GERD in general, and specifically about this device.

Until recently, a laparoscopic fundoplication has been considered the standard of care for patients who do not have their symptoms controlled by proton pump inhibitors (PPI) – refractory GERD. Most clinicians consider the terms “Nissen” and “fundoplication” equivalent and interchangeable even though other types of funduplications have been described. The Nissen fundoplication is a 360° fundoplication based on well-described steps [3]: key technical elements are dissection of the esophagus in the posterior mediastinum with the aim of having the gastroesophageal junction (GEJ) 3–4 cm below the diaphragm, approximation of the crura with non-absorbable sutures, and a 360° wrap using the fundus of the stomach over the GEJ. The operation corrects symptoms and reflux in about 90% of patients, but is sometimes associated to postoperative dysphagia, and difficulty in belching and vomiting [3]. To avoid these side effects, a partial

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fundoplication (either anterior or posterior) can be used, with excellent control of reflux and minimal side effects [4].

During the last decade, a new concept has emerged regarding the treatment of patients with refractory GERD. A different therapeutic approach has been proposed, either endoscopic (radiofrequency ablation, transoral incisionless fundoplication) or laparoscopic (MSA), suggesting that about 30% of patients with GERD can be successfully treated with one of these procedures [5]. After the initial enthusiasm and numerous trials, a consensus statement of expert gastroenterologists was published by the American Gastroenterological Association in 2018 [6]. This panel made the following recommendations: (1) radiofrequency ablation (RFA) and transoral incisionless fundoplication (TIF) should never be considered under any circumstances; and (2) MSA can be chosen for patients with objective evidence of GERD and a small hiatal hernia (< 3 cm). Unfortunately, these recommendations are not always followed, and today RFA is still used, while TIF is sometimes performed in conjunction to a laparoscopic reduction of a hiatal hernia.

But what are the advantages and disadvantages of the MSA?

- **Advantages** The implantation of the magnetic ring is technically much simpler than a fundoplication. Particularly in the absence of a hiatal hernia, minimal dissection is needed, the short gastric vessels are left intact, and the magnetic ring can easily be placed around the GEJ. As shown by the study of Bologheanu, the operating time is short, with no intraoperative complications, and symptom control is achieved in about 2/3 of patients [1]. In addition, the device can be used in patients who develop pathologic reflux after a sleeve gastrectomy, as the elimination of the gastric fundus would make a fundoplication not feasible. Indeed it is much simpler to implant a ring than converting a sleeve gastrectomy into a Roux-en-Y gastric bypass,
- **Disadvantages** The cost of the device is often quoted as an impediment for the use of this device. Several insurance companies often deny the authorization as there is evidence today that a partial fundoplication is as effective as Nissen fundoplication, with minimal dysphagia or problems with vomiting and belching.

As shown in this study and other studies, some patients need a second operation for removal of the ring. For instance, Asti and colleagues showed that 11 of 164 patients (6.7%) needed removal of the ring because of heartburn of regurgitation (5 patients), dysphagia (4 patients), and chest pain with erosion of the ring (2

patients) [7]. In addition, history has shown that devices placed around the GEJ eventually tend to find their way inside the esophageal lumen: this was the case of the Angelchik prosthesis for GERD and the inflatable band for morbid obesity. Moreover, patients with an implanted ring cannot undergo a magnetic resonance above 1.5 Tesla. Finally, one of the claimed main advantage of the device is to limit technical variability making it suitable for naive surgeons [8]. Why would Dr. Schoppmann, with his well-known expertise, would risk leaving a foreign body in the esophagus?

In summary, the MSA device is going to be part of the armamentarium of surgeons treating GERD. As foregut surgeons, we do prefer to perform a fundoplication (total or partial) in patients with refractory GERD. We do recognize; however, that the MSA is less challenging and more reproducible than a fundoplication, clearly a valuable alternative for less experienced and low volume surgeons.

Declarations

Conflict of interest The authors have no conflict of interest to declare.

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