

Current interventional management of gastroesophageal reflux disease

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Gastroesophageal reflux disease (GERD) is a chronic condition with a tremendous negative impact on both health-related quality of life and healthcare resource utilization. It is also a progressive disease that may lead to Barrett's esophagus and adenocarcinoma. In addition, more than one third of GERD patients are partially responders/non-responders to proton-pump inhibitors and there is growing concern regarding the safety of long-term pharmacological therapy. Interventional therapy in these patients can be performed either through laparoscopy or flexible endoscopy. Both methods have the potential to reinforce the lower esophageal sphincter and to protect the esophageal mucosa from retrograde flow of both acid and alkaline gastric contents. However, a concomitant hiatal repair is feasible only through a laparoscopic approach.

There have been three major historical steps in the development of current interventional management of GERD. Philip Allison first attributed to gastroesophageal reflux the spectrum of symptoms that had previously been associated to the presence of a hiatal hernia, and suggested to repair the diaphragmatic defect through a thoracotomy (1). Therefore, crura approximation became the first antireflux operation based on the assumption that the pinchcock effect of the diaphragm was the only mechanism responsible for protection of the esophagus from the deleterious effects of gastroesophageal reflux. The second historical step was the recognition of the lower esophageal sphincter (LES) as a physiological barrier to reflux (2). Indeed, this discovery represented a paradigm shift that profoundly influenced the development of the current antireflux operations. The third historical step was the birth of the modern antireflux surgery

through the work of Rudolf Nissen who discovered that a 360° fundoplication around the distal esophagus healed reflux esophagitis (3). Later on, a partial 270° posterior fundoplication was described by André Toupet in France (4).

Potential candidates for interventional antireflux therapy should undergo a thorough preoperative assessment to determine the GERD phenotype and exclude the presence of major motility disorders such as achalasia (5). Large hiatal hernia is a frequent indication to laparoscopic antireflux repair because of the concomitant obstructive symptoms, exertional dyspnea, aspiration pneumonia, recurrent anemia, and the increased risk of intrathoracic gastric volvulus (6).

The ideal interventional technique should improve anatomy and function, and should provide relief of symptoms and complications of GERD while permitting physiological swallowing and minimizing side-effects such as bloating and inability to belch and vomit. Antireflux surgery prevents gastroesophageal reflux by restoring the position of the esophago-gastric junction in the abdomen, remodeling the hiatal orifice, and reducing distensibility of LES. Laparoscopic Nissen fundoplication, first reported in 1991, is a safe, effective, and durable antireflux procedure when performed in specialized centers and by expert surgeons. More recently, both the magnetic (Linx®) and electrical (Endostim®) sphincter augmentation procedures have emerged as feasible alternatives to fundoplication in selected patients (7). Nonetheless, laparoscopic surgery is still underused because of its perceived side-effects, being generally reserved to patients with long-lasting severe disease and large hiatal hernia. In an effort to reduce the potential morbidity of Nissen fundoplication, the

270° Toupet fundoplication and the magnetic sphincter augmentation procedures have emerged as primary surgical options. A recent randomized clinical trial comparing Nissen and Toupet fundoplication has shown that the partial wrap is associated with equivalent results in terms of reflux control and a lower rate of side-effects and revisional surgery (8). Although the results of magnetic sphincter augmentation are promising, only observational comparative studies are available at present.

It appears that GERD is complex and heterogeneous disease. Management requires a patient-centered and multidisciplinary approach, but is still imprecise. Systematic assessment of symptoms, anatomy, motility, burden of reflux, and histopathology are mandatory to identify patients with evidence of progressive disease who may benefit from early interventional management. The laparoscopic surgical approach is the current standard of care. The transoral endoscopic approach is still in an early stage of evolution, but has the potential to become the approach of choice in the future due to continuous technological advancements. All interventional antireflux procedures should be performed in referral centers that provide comprehensive diagnosis and a spectrum of techniques tailored to the individual patient.

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