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Surgical Innovations for GERD: Comparing Outcomes of Magnetic Sphincter Augmentation and Nissen Fundoplication

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Abstract

Gastroesophageal reflux disease (GERD) is a common chronic upper gastrointestinal disease with both objective and subjective components. While most cases of GERD are uncomplicated and can be managed with oral medication, refractory cases require surgical intervention. The purpose of this study is to compare the efficacy of GERD's gold standard surgical technique, the Nissen fundoplication, with a new surgical technique, magnetic sphincter augmentation.

Introduction

Dating back to the 1950s, GERD was treated surgically with the Nissen fundoplication, which wraps the fundus of the stomach around the lower esophageal sphincter to reinforce it and cease pathologic refluxate (Allaix, 2014). Later, with the advent of proton pump inhibitors (PPIs), a medication which decreases gastric acid production, rates of surgery greatly declined. However, the Nissen still has its place in the spectrum of treatments for GERD. It serves to this day as the gold-standard surgical option, predominantly for patients experiencing persistent symptoms or disease progression despite maximum pharmacologic therapy. A new anti-reflux procedure, magnetic sphincter augmentation, was approved by the FDA in 2012. This procedure reinforces and restores competency to the lower esophageal sphincter via a bracelet of magnetic beads. The purpose of this literature review is to reveal the efficacy of this new surgical technique compared to the gold-standard Nissen fundoplication.

Statement of the Problem

The first Nissen fundoplication was described in 1955 (Min, 2014) and has stood as the gold standard for anti-reflux surgery since then. Due to its long-standing history, it is a well-known procedure, and there is a plethora of data analyzing its efficacy and indications. With the recent advent of magnetic sphincter augmentation, there is a smaller but ever-growing quantity of data available analyzing this procedure's place in the spectrum of treatments for GERD.

Research Question

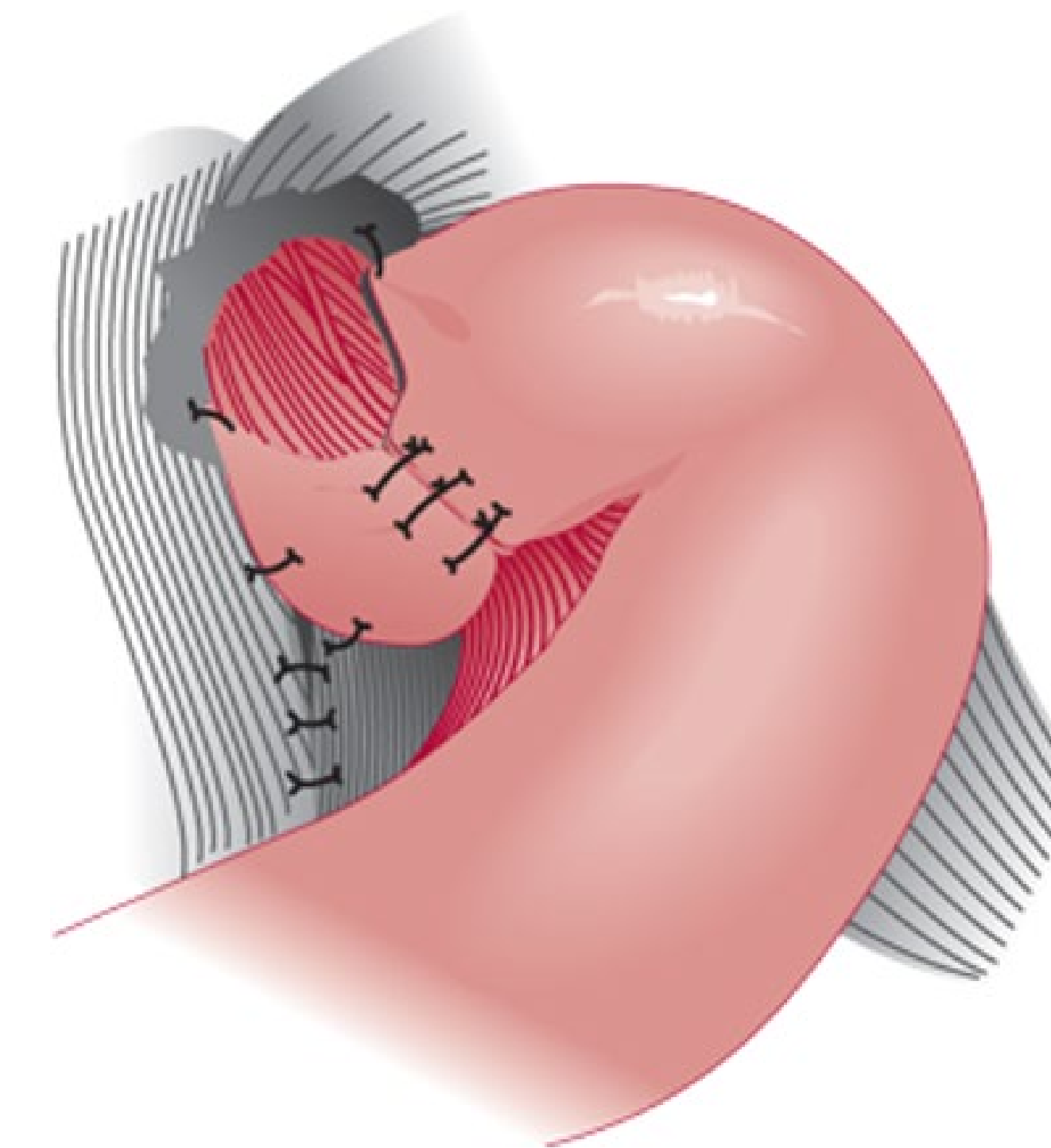
In the surgical treatment of GERD, is there a statistical difference in the efficacy of magnetic sphincter augmentation (MSA) versus Nissen fundoplication (NF) for patients who qualify for both procedures?

Literature Review

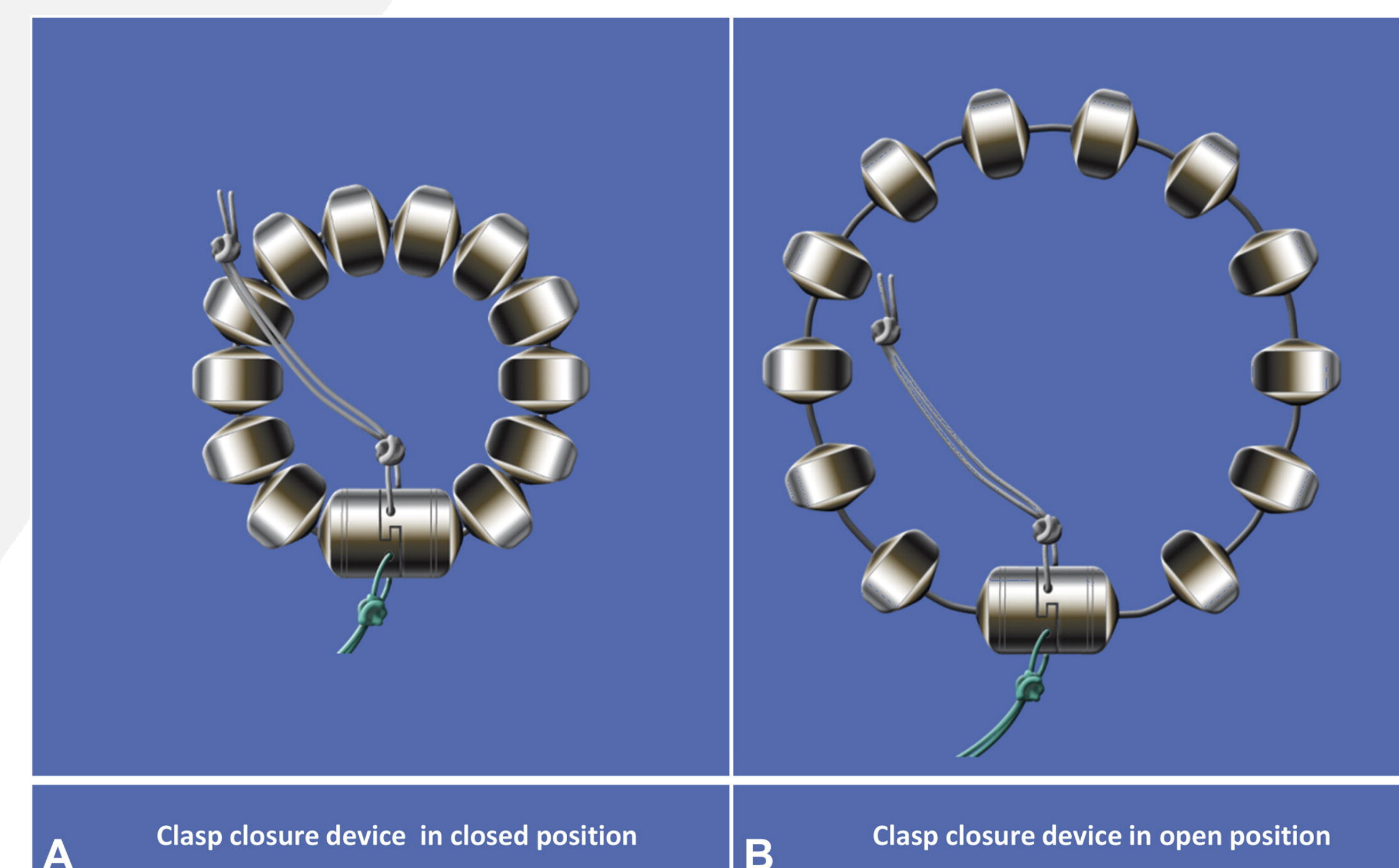
- GERD is a multifactorial disease with a complex interplay of anatomic and physiologic factors contributing to its disease severity.
- GERD is first diagnosed clinically and treated with PPIs or H2-antagonists.
- Indications for surgery include being refractory to medication, a desire to cease medical therapy, worsening or changing symptoms, esophageal mucosal changes.
- EGD, pH-metry, and manometry are used to objectively diagnose GERD and guide surgical selection.
- NF is a proven surgical technique for reducing pathologic reflux (Anvari, 2011; Lafullarde, 2001). MSA has evidence that it can reduce pathologic reflux as well (Ganz, 2016; Bell, 2019).
- NF produces a more drastic reduction in reflux than MSA (Sheu, 2014; Louie, 2015). MSA consistently shows fewer gas-bloat, belching, and vomiting side effects (Chen, 2017; Reynolds, 2016; Skubleny, 2017; Warren, 2015).

Discussion

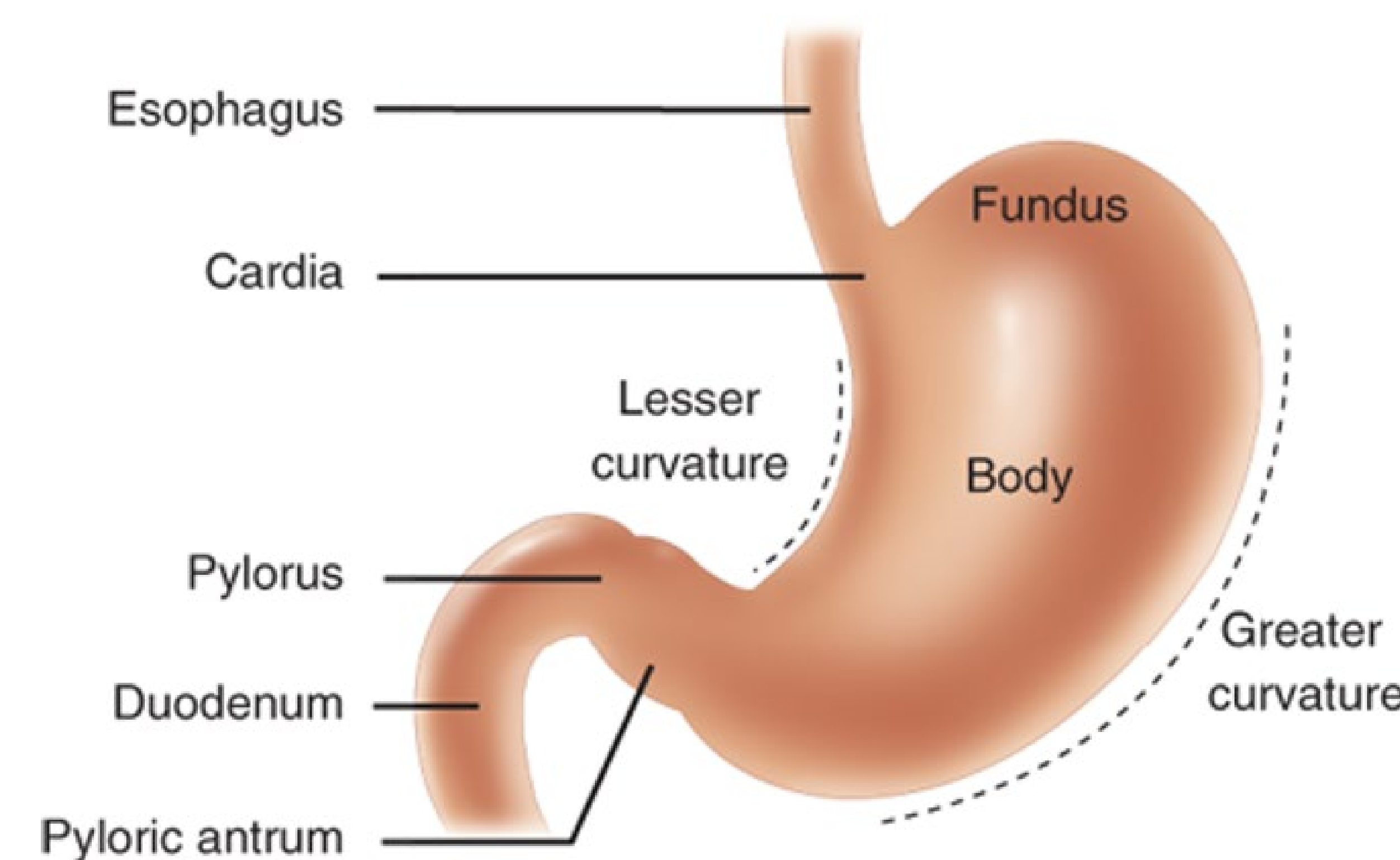
- Overall, there is no clear advantage of one procedure over the other.
- The data available for MSA is very small at this time and research performed has been on small sample sizes.
- Larger and longer studies need to be conducted to more accurately compare the two surgical techniques. There is promise that MSA may control reflux as effectively as NF in patients who qualify for either surgery.



Source: Gerard M. Doherty: Current Diagnosis & Treatment: Surgery, 14th Edition
www.accessmedicine.com
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Bonavina, L., Saino, G., Bona, D., Sironi, A., & Lazzari, V. (2013). One hundred consecutive patients treated with magnetic sphincter augmentation for gastroesophageal reflux disease: 6 years of clinical experience from a single center. *Journal of the American College of Surgeons*, 217, 577-585. <https://doi.org/10.1016/j.jamcollsurg.2013.04.039>



Source: F.C. Brunnicardi, D.K. Andersen, T.R. Billiar, D.L. Dunn, L.S. Kao, J.G. Hunter, J.B. Matthews, R.E. Pollock: *Schwartz's Principles of Surgery*, 11e
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Applicability to Clinical Practice

Readers can understand the utility and efficacy of the newest anti-reflux surgery available with this information. This allows physician assistants in primary care and general surgery to provide the best education on GERD management, including the pros and cons of PPIs versus surgical therapy, the steps needed to explore surgical therapies, the potential surgical options, and the side effects and possible outcomes of these two procedures. It will also help primary care providers to make informed surgery referrals and provide the best pre-operative and post-operative care.

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