ADVANCES IN ENDOSCOPY

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New Approaches and Old Struggles in Antireflux Endoscopy

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G&H Could you briefly review the history of endoscopic antireflux interventions and explain why most of them failed?

NK Historically, several endoscopic therapies for gastroesophageal reflux disease (GERD) emerged with promising concepts to bridge the gap between medication, primarily proton pump inhibitors (PPIs), and invasive surgery. Many early devices and procedures, such as the suturing systems EndoCinch and Plicator, endoscopic submuscosal implantation of a prosthesis or injection of a bulking agent (Gatekeeper, Enteryx), and transesophageal endoscopic gastroplasty (MUSE), to name a few, focused on altering the gastroesophageal junction to prevent reflux. However, these interventions largely failed owing to insufficient efficacy, durability concerns, and procedural complications. Lack of robust data supporting long-term results led to poor adoption, and many early antireflux endoscopic interventions were ultimately discontinued.

G&H Have any endoscopic therapies for GERD withstood the test of time?

NK Although most early endoscopic GERD therapies did not last, Stretta, which is a radiofrequency treatment to the lower esophageal sphincter, is still performed in some places. Other interventions like transoral incisionless fundoplication (TIF) have shown promise with ongoing support from clinical data, suggesting that some endoscopic therapies may be beneficial for select patient populations. For example, achalasia patients with reflux after peroral endoscopic myotomy are a very small subset of patients for TIF. Other candidates for TIF are patients with typical GERD symptoms who have suboptimal control of their symptoms on PPIs and who do not have a large hiatal hernia or esophageal motility problems, or patients preferring an alternative management strategy for GERD that does not involve long-term medication use.

G&H Can you explain the new endoscopic approaches of antireflux mucosectomy and antireflux mucosal ablation and describe the concept behind them?

NK Antireflux mucosectomy (ARMS) and antireflux mucosal ablation (ARMA), collectively termed antireflux mucosal intervention (ARMI) procedures, are newer techniques that aim to reshape the gastroesophageal junction. ARMS involves partial resection of mucosal tissue in the gastric cardia, creating a scarring effect that helps prevent reflux by reinforcing the junction. ARMA, on the other hand, uses ablation techniques to achieve a similar result, inducing tissue contraction and stiffening to reduce reflux. Both approaches aim to offer a minimally invasive alternative to traditional antireflux surgery, especially for patients who may not respond fully to PPIs.

G&H What clinical data support the effectiveness of ARMI procedures?

NK Emerging clinical data suggest that both ARMS and ARMA show promise in reducing GERD symptoms and improving patient quality of life. Studies have reported symptomatic relief and reduced PPI use postprocedure, although long-term data remain limited. Continued research is essential to establish these techniques as via-

ble long-term solutions for GERD management, as most studies are retrospective and lack control groups.

In one systematic review and meta-analysis by Yeh and colleagues, the pooled clinical success rate for ARMI was found to be approximately 75%, with half of patients able to discontinue PPIs. The adverse events were mainly bleeding (immediate or delayed; up to 3%), perforation (0%-16%), and dysphagia (up to 30%). Overall, 10.5% of patients underwent salvage antireflux procedures after an ARMI. Most (63.6%) of the salvage procedures were repetitive endoscopic procedures, and the remaining procedures were antireflux surgeries, including fundoplication and magnetic sphincter augmentation.

P-CABs may alter the therapeutic landscape by providing a more effective pharmacologic option, potentially reducing the need for endoscopic or surgical intervention.

G&H What are some of the advantages and shortcomings of endoscopic antireflux procedures compared with PPIs or surgery?

NK The initial management of reflux is noninvasive and typically involves lifestyle modifications, dietary changes, and medication therapy. Such measures include weight loss in overweight and obese patients, avoiding meals 2 to 3 hours before bedtime, tobacco cessation, and a low-acid diet (avoiding coffee, chocolate, carbonated beverages, spicy foods, and acidic foods such as citrus and tomatoes). Initial medical therapy may consist of a PPI or histamine-2 receptor antagonist.

Endoscopic procedures offer a less invasive option with shorter recovery times and reduced risk compared with surgical interventions, and they can be suitable for patients who are unresponsive to PPIs or who wish to minimize their use of PPIs. However, limitations include varied efficacy and durability, as well as the potential for recurrence of symptoms. Unlike surgery, endoscopic therapies cannot fully address anatomic dysfunction such as large hiatal hernia size or crural defects, and outcomes may not be as predictable or long-lasting as with surgical fundoplication.

G&H How might new antireflux drugs change the algorithm for GERD management and affect the likelihood of adopting endoscopic therapies?

NK Potassium-competitive acid blockers (P-CABs), such as vonoprazan and tegoprazan, are a new class of antisecretory medications that are absorbed systemically and reversibly bind to hydrogen potassium adenosine triphosphatase (the proton pump) in the gastric parietal cell, blocking potassium ion access to the potassium-binding site of the proton pump, thereby suppressing gastric acid secretion. Unlike PPIs, P-CABs are acid-stable, and they do not require either premeal dosing or conversion to an active form to provide their pharmacologic effect, leading to a more rapid onset of action.

Currently, gastroenterologists are using PPIs as first-line therapy and considering P-CABs when PPIs fail. P-CABs may alter the therapeutic landscape by providing a more effective pharmacologic option, potentially reducing the need for endoscopic or surgical intervention. However, nonclinical factors (including cost, greater obstacles to obtaining medication, and fewer long-term safety data) may limit widespread adoption.

G&H Based on current GERD management guidelines, which endoscopic antireflux therapies may be considered, and when is their use inappropriate?

NK Presently, the only endoscopic GERD treatments still widely available are the radiofrequency antireflux treatment Stretta (Restech) and TIF (EndoGastric Solutions). Studies of these endoscopic procedures generally have excluded patients with hiatal hernias greater than 2 cm, Los Angeles grade C and D esophagitis, Hill grade III and IV, esophageal strictures, and long-segment Barrett esophagus.

The Stretta procedure is difficult to evaluate, in part because it is not totally clear how it functions as an antireflux therapy. Initially, it was believed to control reflux by inducing swelling and mechanical alteration at the esophagogastric junction. However, an early sham-controlled trial found that 6 months after treatment, radiofrequency energy delivery to the gastroesophageal junction had significantly improved GERD symptoms and quality of life, but it did not decrease esophageal acid exposure. This raised the possibility that the procedure might alleviate GERD symptoms by altering sensation in the distal esophagus. Systematic reviews and meta-analyses have arrived at contradictory conclusions regarding Stretta's efficacy.

In TIF, the endoscopist uses a series of T-fasteners to

plicate a portion of the proximal stomach, creating a flap valve with up to 270° of the circumference of the esophagogastric junction. Randomized trials have shown that TIF is effective for treating troublesome regurgitation, but the long-term benefit of TIF is not well established.

As new endoscopic approaches like ARMS and ARMA continue to be validated, they may be incorporated as alternative therapies for patients with mild to moderate GERD who seek to minimize PPI use or avoid surgery.

A systematic review and meta-analysis by McCarty and colleagues on the use of TIF for refractory GERD found that TIF resulted in significant improvements in GERD health-related quality of life and DeMeester scores, enabling approximately 90% of patients to discontinue PPIs.

G&H How might new endoscopic approaches be incorporated into these guidelines?

NK As new endoscopic approaches like ARMS and ARMA continue to be validated, they may be incorporated as alternative therapies for patients with mild to moderate GERD who seek to minimize PPI use or avoid surgery. Incorporating them into guidelines would require robust long-term data demonstrating efficacy, safety, and durability.

G&H What should future research on endoscopic antireflux therapy focus on?

NK Future research should prioritize long-term outcomes to assess the durability and safety of endoscopic antireflux procedures. Comparative studies examining endoscopic therapies vs new pharmacologic agents like P-CABs would be valuable. Additionally, studies identifying ideal patient populations and predictors of success for each therapy can help personalize GERD treatment options, ultimately improving patient satisfaction and outcomes.

Disclosures

Dr Kumta is a consultant for Boston Scientific, Olympus, and SafeHeal.

Suggested Reading

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