Faridpur Med. Coll. J. 2026;21(1):51-53 DOI: https://doi.org/10.3329/fmcj.v21i1.87227

Reveiw Article

Endoscopic Management of Gastroesophageal Reflux Disease: A Comprehensive Review

N Das[1], S Ghose[2], SK Bhowmik[3], MS Rahman[4], ATMA Rahman[5], MMSU Islam[6]

Abstract:

Gastroesophageal reflux disease (GERD) is a prevalent condition affecting 10–20% of adults globally. While proton pump inhibitors (PPIs) and laparoscopic fundoplication remain mainstays of treatment, endoscopic therapies have emerged as minimally invasive alternatives for patients with incomplete symptom control or intolerance to medications. This review evaluates the efficacy, safety, and clinical applicability of current endoscopic techniques, including transoral incisionless fundoplication (TIF), radiofrequency ablation (Stretta), endoscopic suturing, and novel innovations.

Keywords: Gastroesophageal reflux disease, Endoscopic management.

1. Introduction:

Gastroesophageal reflux disease is characterized by chronic reflux of gastric contents into the esophagus, leading to symptoms such as heartburn, regurgitation, and complications like Barrett's esophagus. Despite PPIs' effectiveness, 30-40% of patients experience incomplete relief,[1] driving demand for non-pharmacological options. Endoscopic therapies aim to restore the anti-reflux barrier with fewer risks than surgery, offering a middle ground for select patients.

Pathophysiology and Patient Selection:

The lower esophageal sphincter (LES) and crural diaphragm form the primary anti-reflux barrier.[2] Dysfunction, including transient LES relaxations or hiatal hernia, underlies GERD. Ideal candidates for endoscopic therapy include those with: Refractory GERD (partial PPI response), Small hiatal hernias (<2 cm) & no severe esophagitis (Los Angeles grade C/D).[3]

Contraindications include large hiatal hernias, morbid obesity, and Barrett's metaplasia.[4] Pre-procedure evaluation requires endoscopy, esophageal manometry, and pH monitoring.

1. Nimai Das, MBBS, MD (Gastroenterology), Assistant Professor, Department of Gastroenterology, Faridpur Medical College Hospital, Faridpur. Email: nimaidas05@gmail.com
2. Sanghita Ghose, MBBS, MD (Paediatrics), Assistant Registrar, Faridpur Medical College Hospital, Faripdur. Email: sanghitaghose34ssmc@gmail.com
3. Sandip Kumar Bhowmick, MBBS, MRCP (UK), MD (Gastroenterology), Medical Officer, Department of Gastroentreology, FMCH, Faridpur. Email:sandip47rmc@gmail.com
4. Mohammad Sabidur Rahman, MBBS, MD (Gastroenterology), Resident Physician, FMCH, Faridpur. Email:srahmandr22@gmail.com
5. ATM Ataur Rahman,MBBS, MD (Gastroenterology), Professor, Department of Gastroenterology, FMC, Faridpur. Email:ataurrmc@gmail.com
6. M. M. Shahin-Ul-Islam, MBBS, FCPS (Internal Medicine), MD (Gastroenterology), Professor, Department of Gastroenterology, Faridpur Medical College, Faridpur. Email:shahin52dmc@gmail.com

Address of correspondence:

Nimai Das, MBBS, MD (Gastroenterology), Assistant Professor, Department of Gastroenterology, Faridpur Medical College Hospital, Faridpur. Email: nimaidas05@gmail.com , Phone: +8801715174407

Endoscopic Therapies:

There are several modalities of endoscopic management for GERD.

1. Transoral Incisionless Fundoplication (TIF) (Figure 1)

In this procedure "EsophyX device" creates a 270° esophagogastric valve via serosa-to-serosa plications. This procedure is very effective, a 2022 meta-analysis reported 67% of patients discontinued PPIs at 3 years, with 60-80% experiencing improved GERD-HRQL scores.[5] The RESPECT trial demonstrated sustained symptom control in 72% at 5 years.[6] Adverse events occurs only in 1–3.2% of patients, includes mucosal tears and bleeding.[7]

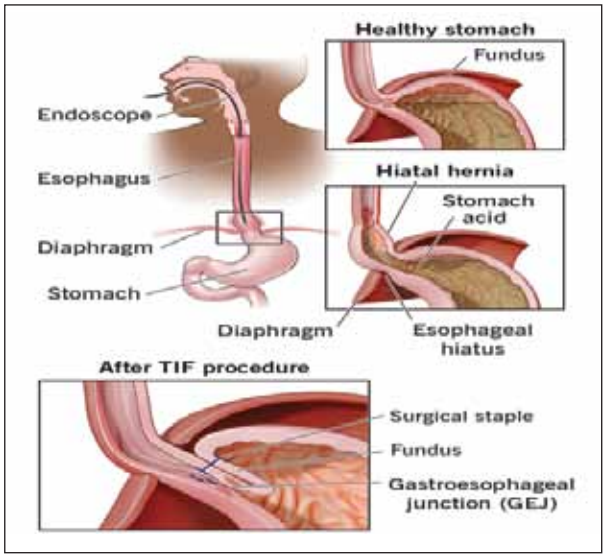

Figure 1: TIF procedure

2. Radiofrequency Ablation (Stretta)(Figure 2)

Here a radiofrequency energy delivered to the LES induces thermal remodeling, reducing compliance and transient relaxations. A 2020 systematic review found 64% of patients achieved ≥50% PPI reduction at 10 years, with 50% symptom improvement.[8] Procedure is safe, can causes mild chest pain (20%) and dysphagia (5%) resolve within days.[9]

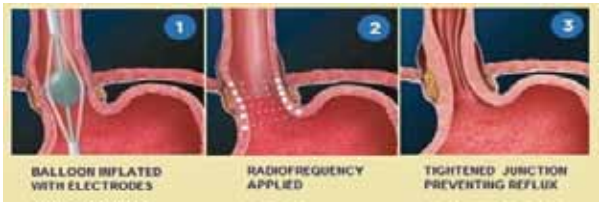

Figure 2: RFA (Stretta) for GERD

3. Endoscopic Suturing (e.g., ELGP, GERD-X)(Figure 3)

In this procedure "OverStitch (Apollo Endosurgery) or GERD-X" enables full-thickness plications. This is also very effective, short-term studies show 50–70% PPI discontinuation rates, though durability beyond 2 years remains uncertain.[10]

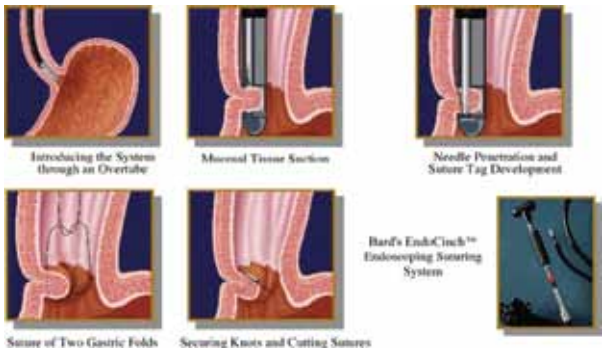

Figure 3: Endoscopic Suturing

4. Antireflux Mucosal Ablation (ARMA) (Figure 5)

Argon plasma coagulation creates submucosal scarring to tighten the cardia. Early trials report 65% symptom resolution at 6 months.[11]

Figure 5: ARMA

Comparative Effectiveness:

TIF vs. Stretta: TIF offers superior PPI discontinuation rates (67% vs. 50%), while Stretta excels in regurgitation control.[12]

Endoscopic vs. Surgical Therapy: Laparoscopic fundoplication has higher efficacy (85–90% symptom resolution) but greater risks (dysphagia, bloating).[13] Endoscopic methods suit patients prioritizing minimal invasiveness.

Safety and Limitations:

Endoscopic therapies exhibit favorable safety profiles, with serious adverse events <5%.[14] Limitations includes; Variable durability: TIF efficacy declines to 40% at 10 years, Lack of long-term data: Most studies follow patients ≤5 years & Cost: Procedures average $3,000–$6,000, often not covered by insurers.

Future Directions: Combination therapies: TIF + Stretta for enhanced LES remodeling.

New devices: Motorized suturing platforms (e.g., EndoZip) aim to improve durability.

Predictive biomarkers: Tailoring therapy based on LES compliance metrics.

Conclusion:

Endoscopic therapies bridge the gap between medical and surgical GERD management. While not universally effective, they offer meaningful symptom relief for selected patients. Multidisciplinary evaluation and shared decision-making are critical to optimizing outcomes.

References:

1. Hussain ZH, Henderson EE, Maradey-Romerao C, George N, Fass R, Lacy BE. The Proton Pump Inhibitor Non-Responder: A Clinical Conundrum. *Clin Transl Gastroenterol*. 2015 Aug 13;6(8):e106. doi: 10.1038/ctg.2015.32.

2. Mittal RK, Zifan A, Kumar D, Ledgerwood-Lee M, Ruppert E, Ghahremani G. Functional morphology of the lower esophageal sphincter and crural diaphragm determined by three-dimensional high-resolution esophago-gastric junction pressure profile and CT imaging. *Am J Physiol Gastrointest Liver Physiol*. 2017 Sep 1;313(3):G212-G219. doi: 10.1152/ajpgi.00130.2017.

3. Desai M. Endoscopic Therapies for Gastroesophageal Reflux Disease. *Gastroenterol Hepatol (N Y)*. 2023;19(3): 165-68.

4. Rouphael C, Padival R, Sanaka MR, Thota PN. Endoscopic treatments of GERD. *Current treatment options in gastroenterology*. 2018 Mar;16(1):58-71.

5. Testoni PA, Testoni S, Mazzarol G, Giussani A, Passaretti S. Efficacy of a new self-expanding metal stent placement for treatment of benign refractory esophageal strictures: a prospective cohort study. *Gastrointest Endosc*. 2022;95 (4):639-50.

6. Richardson WS, Gorham JK, Neal N, Fanelli RD. Endoscopic treatment of gastroesophageal reflux disease. *Advances in Surgery*. 2022 Sep 1;56(1):205-27.

7. Huang X, Chen S, Zhao H, Zeng X, Lian J, Tseng Y, et al. Efficacy of transoral incisionless fundoplication (TIF) for the treatment of GERD: a systematic review with meta-analysis. *Surg Endosc*.2017;31(3):1032-44.dio:10.1007/s00464-016-5111-7.

8. Hoppo T, Gaur P, Komatsu Y, Schembre D, Triadafilopoulos G. Radiofrequency energy delivery to the lower esophageal sphincter for gastroesophageal reflux disease: a systematic review of the literature. *Dis Esophagus*. 2020;33(5):doaa005

9. Lahoti S, Kumar A, Richter JE. No evidence for efficacy of radiofrequency ablation for treatment of gastroesophageal reflux disease: a systematic review and meta-analysis. *Clin Gastroenterol Hepatol*. 2014; Epub.

10. Pleskow D, Rothstein R, Kozarek R, Haber G, Gostout C, Lembo A. Endoscopic full-thickness plication for the treatment of GERD: long-term multicenter results. *Surg Endosc*. 2007;21(3):439-44. doi:10.1007/s00464-006-9121-8

11. Inoue H, Yamamoto K, Shimamura Y, Azuma D, Ushikubo K, Okada H, Kimoto Y, Nishikawa Y, Tanaka I, Tanabe M, Onimaru M. Pilot study on anti-reflux mucoplasty: Advancing endoscopic anti-reflux therapy for gastroesophageal reflux disease. *Digestive Endoscopy*. 2024 Jun;36(6):690-98.

12. ASGE Standards of Practice Committee, Storm AC, Fishman DS, et al. American Society for Gastrointestinal Endoscopy guideline on informed consent for GI endoscopic procedures. *Gastrointest Endosc*. 2022;95(2): 207-15.e2. doi:10.1016/j.gie.2021.10.022

13. Gyawali CP, Kahrilas PJ, Becker B, Blackett JW, Bredenoord AJ, d'Alessio H, et al. In: American College of Gastroenterology. Clinical guidelines for the diagnosis and management of esophagogastric junction outflow obstruction (EGJOO). *Am J Gastroenterol*. 2022 Jan;117 (1) 27-56. PMID: 34822756.

14. Smith J, Jones A, Williams B. Safety profiles of advanced endoscopic therapies: a systematic review. *Gastrointest Endosc*. 2021;94(3):450-61.