Management of GERD after Bariatric Surgery and Sleeve

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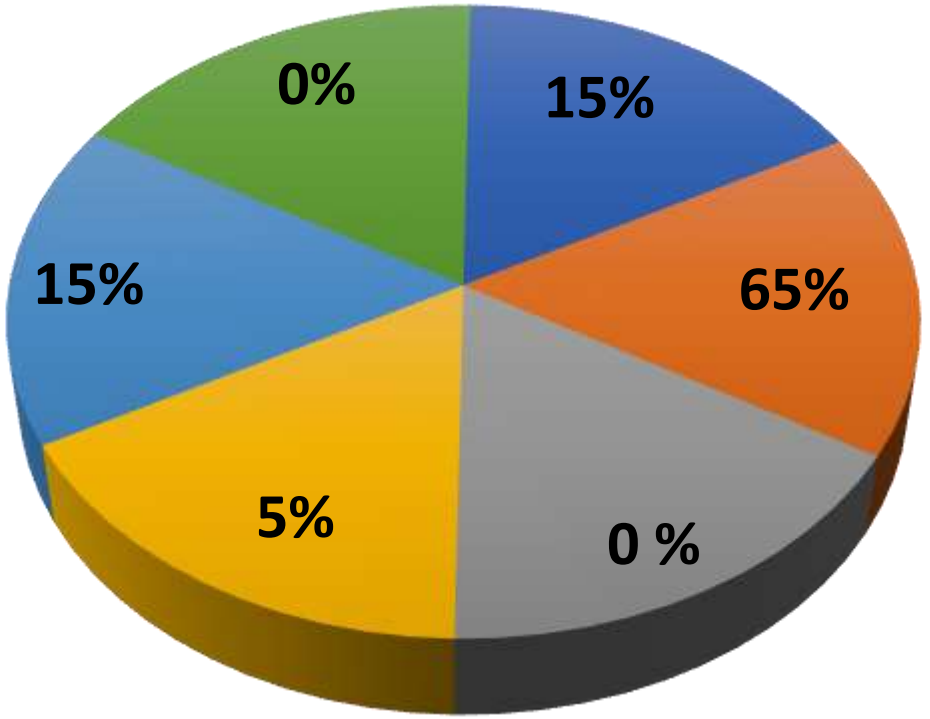
CONFLICT OF INTEREST DISCLOSURE

Honoraria for teaching:
WL Gore, Medtronic, Ethicon, Ezisurge, Stryker, Vivus

CASE MIX DISCLOSURE



- RYGB
- SG
- OAGB
- DS/SADI-S
- REVISIONAL
- ENDOSCOPIC

Total CASE Volume:

- RGB: 1800
- Sleeve: 1900
- Lap Band 2000
- Revisions: 1200

GERD in Obesity

- Caused by different physiological mechanisms
  - Decreased lower esophageal sphincter (LES) pressure
  - Inappropriate relaxation of the LES
  - Increased intra-abdominal pressure
  - Delayed emptying of gastric contents
  - Abnormal acid clearance from the esophagus
    - C Crawford, Surg Endosc 2017

Randomized Controlled Trial > JAMA Surg. 2022 Aug 1;157(8):656-666.
doi: 10.1001/jamasurg.2022.2229.

Effect of Laparoscopic Sleeve Gastrectomy vs Roux-en-Y Gastric Bypass on Weight Loss, Comorbidities, and Reflux at 10 Years in Adult Patients With Obesity: The SLEEVEPASS Randomized Clinical Trial

Paulina Salminen [1 2], Sofia Grönroos [1 2], Mika Helmiö [1 2], Saija Hurme [3], Anne Juuti [4], Risto Juusela [5], Pipsa Peromaa-Haavisto [6], Marja Leivonen [7], Pirjo Nuutila [8 9], Jari Ovaska [1 2]

Esophagitis was more prevalent after LSG (31% vs 7%; P < .001) with no statistically significant difference in BE (4% vs 4%; P = .29)

Randomized Controlled Trial > JAMA. 2018 Jan 16;319(3):255-265.
doi: 10.1001/jama.2017.20897.

Effect of Laparoscopic Sleeve Gastrectomy vs Laparoscopic Roux-en-Y Gastric Bypass on Weight Loss in Patients With Morbid Obesity: The SM-BOSS Randomized Clinical Trial

Ralph Peterli [1], Bettina Karin Wölnerhanssen [2 3], Thomas Peters [4], Diana Vetter [5], Dino Kröll [6], Yves Borbély [6], Bernd Schultes [7], Christoph Beglinger [2], Jürgen Drewe [8], Marc Schiesser [9], Philipp Nett [6], Marco Bueter [5]

- 205 patients
- Gastric reflux remission was observed more frequently after Roux-en-Y gastric bypass (60.4%) than post sleeve gastrectomy (25.0%).
- Gastric reflux worsened (more symptoms or increase in therapy) after sleeve gastrectomy (31.8%) than after Roux-en-Y gastric bypass (6.3%)

Anatomic Changes

- Fujiwara et al. measured the angle of His in patients with symptoms of reflux and compared these with the angle measured in asymptomatic patients
- The angle was significantly larger in the symptomatic patients.
  - C Crawford, Surg Endosc 2017

> Obes Surg. 2020 Jan;30(1):161-168. doi: 10.1007/s11695-019-04164-0.

Esophagitis After Bariatric Surgery: Large Cross-sectional Assessment of an Endoscopic Database

Reem Matar [1], Daniel Maselli [1], Eric Vargas [1], Jaruvongvanich Veeravich [1], Fateh Bazerbachi [1], Azizullah Beran [1], Andrew C Storm [1], Todd Kellogg [2], Barham K Abu Dayyeh [3]

- 517 patients had esophagogastroduodenoscopy after SG or RYGB
- EE was more prevalent after SG than RYGB (37.9% vs. 17.6%, p = 0.0001), including severe EE (10.7% vs. 3.1%, p = 0.0007).
- physiologic changes
  - decrease resting lower esophageal sphincter (LES) (mmHg) pressure (21.3 ± 14.1 vs. 39.8 ± 35.6, p = 0.004
  - lower maximal distal contractile integral (DCI) (mmHg-s-cm) (3814.8 ± 2684.8 vs. 5111.8 ± 7713, p = 0.034).
- **Conclusion:** EE is more prevalent after SG compared with RYGB in a pre-bariatric surgery cohort with GERD. SG is associated with significant esophageal physiologic changes conducive to GERD and its clinical consequences.

> Ann Surg. 2022 Jun 1;275(6):1143-1148. doi: 10.1097/SLA.0000000000004533.
Epub 2020 Nov 17.

Evaluation of Patient Reported Gastroesophageal Reflux Severity at Baseline and at 1-year After Bariatric Surgery

Anne P Ehlers [1 2], Jyothi R Thumma [2], Jonathan F Finks [1 3], Arthur M Carlin [4], Amir A Ghaferi [1 2 3], Oliver A Varban [1 3]

Affiliations + expand

- Although SG patients reported higher rates of worsening GERD symptoms when compared to RYGB, the majority of patients (>80%) in this study experienced improvement or no change in GERD regardless of procedure. Using clinically relevant patient-reported outcomes can help guide decisions about procedure choice in bariatric surgery for patients with GERD

> Aliment Pharmacol Ther. 2019 Jul;50(2):159-166. doi: 10.1111/apt.15274. Epub 2019 Jun 4.

Gastric bypass surgery in the treatment of gastro-oesophageal reflux symptoms

Dag Holmberg [1], Giola Santoni [1], Shaohua Xie [1], Jesper Lagergren [1 2]

- 2454 participants
- reflux recurred in 48.8% (95% confidence interval [95% CI], 46.8-51.0) of participants within 2 years of gastric bypass and remained stable up to 10 years after surgery
- Risk factors for recurring reflux were high preoperative dose of anti-reflux medication, older age, female sex and comorbidity
- **Conclusions:** Reflux symptoms decrease rapidly after gastric bypass, but around half of operated patients require continuous anti-reflux medication. The treatment efficacy of gastric bypass on reflux symptoms might have been overestimated

- ?? No manometry no ph testing

> Surg Obes Relat Dis. 2020 Nov;16(11):1828-1836. doi: 10.1016/j.soard.2020.06.016.
Epub 2020 Jun 17.

Incidence of GERD, esophagitis, Barrett's esophagus, and esophageal adenocarcinoma after bariatric surgery

Lisa A Bevilacqua [1], Nabeel R Obeid [2], Jie Yang [3], Chencan Zhu [4], Maria S Altieri [5], Konstantinos Spaniolas [5], Aurora D Pryor [6]

- 48,967 records analyzed; 30.3% GERD at the time of surgery and .4% had esophagitis and Barrett's
- Preoperative GERD/esophagitis/Barrett's associated with higher risk of GERD, esophagitis, and Barrett's but not esophageal adenocarcinoma postoperatively
- Roux-en-Y gastric bypass patients had lowest risk of being diagnosed with GERD postoperatively
- Esophageal adenocarcinoma incidence in the sample was .04%; the rate among patients with preoperative GERD and Barrett's was .1% and .9%, respectively. Incidence of esophageal adenocarcinoma did not differ by bariatric surgery type.

Meta-Analysis > Clin Transl Gastroenterol. 2020 Aug;11(8):e00225.
doi: 10.14309/ctg.0000000000000225.

Esophageal Pathophysiologic Changes and Adenocarcinoma After Bariatric Surgery: A Systematic Review and Meta-Analysis

Veeravich Jaruvongvanich [1], Reem Matar [1], Karthik Ravi [1], M Hassan Murad [2], Kornpong Vantanasiri [3], Nicha Wongjarupong [3], Patompong Ungprasert [4], Eric J Vargas [1], Daniel B Maselli [1], Larry J Prokop [5], Barham K Abu Dayyeh [1]

- 31 EAC cases have been reported to date after SG and RYGB
- 27 nonrandomized studies (SG: 612 patients; RYGB: 470 patients)
- After SG, lower esophageal sphincter pressure and esophageal body amplitude decrease
- The risk of ineffective esophageal motility increases
- Total and recumbent acid exposure times increased

Meta-Analysis > Clin Transl Gastroenterol. 2020 Aug;11(8):e00225.
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- After RYGB, an increased risk of ineffective esophageal motility was observed
- Total, upright, and recumbent acid exposure times were decreased
- The total reflux episodes remained unchanged but with increased nonacid reflux and decreased acid reflux events

Meta-Analysis > Clin Transl Gastroenterol. 2020 Aug;11(8):e00225.
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- An observed increased nonacid reflux after RYGB might contribute to failure of gastroesophageal reflux disease improvement
- This refluxate might be noxious to the esophagus, warranting further studies
- RYGB might not entirely preserve esophageal function as previously believed.

> Obes Surg. 2020 Nov;30(11):4654-4658. doi: 10.1007/s11695-020-04753-4. Epub 2020 Jul 16.

Antireflux Mucosectomy Band (ARM-b) in Treatment of Refractory Gastroesophageal Reflux Disease After Bariatric Surgery

Antoine Debourdeau [1 2 3], Véronique Vitton [4], Laurent Monino [4 5], Marc Barthet [4], Jean-Michel Gonzalez [4]

- Endoscopic antireflux mucosectomy band (ARM-b) technique in 6 LSG patients with refractory GERD
- 5 out of 6 patients had a clinical response with a reduction of the GERD-HRQL score of > 50
- adverse events: one esophageal stricture and one benign bleeding.

ARM-b

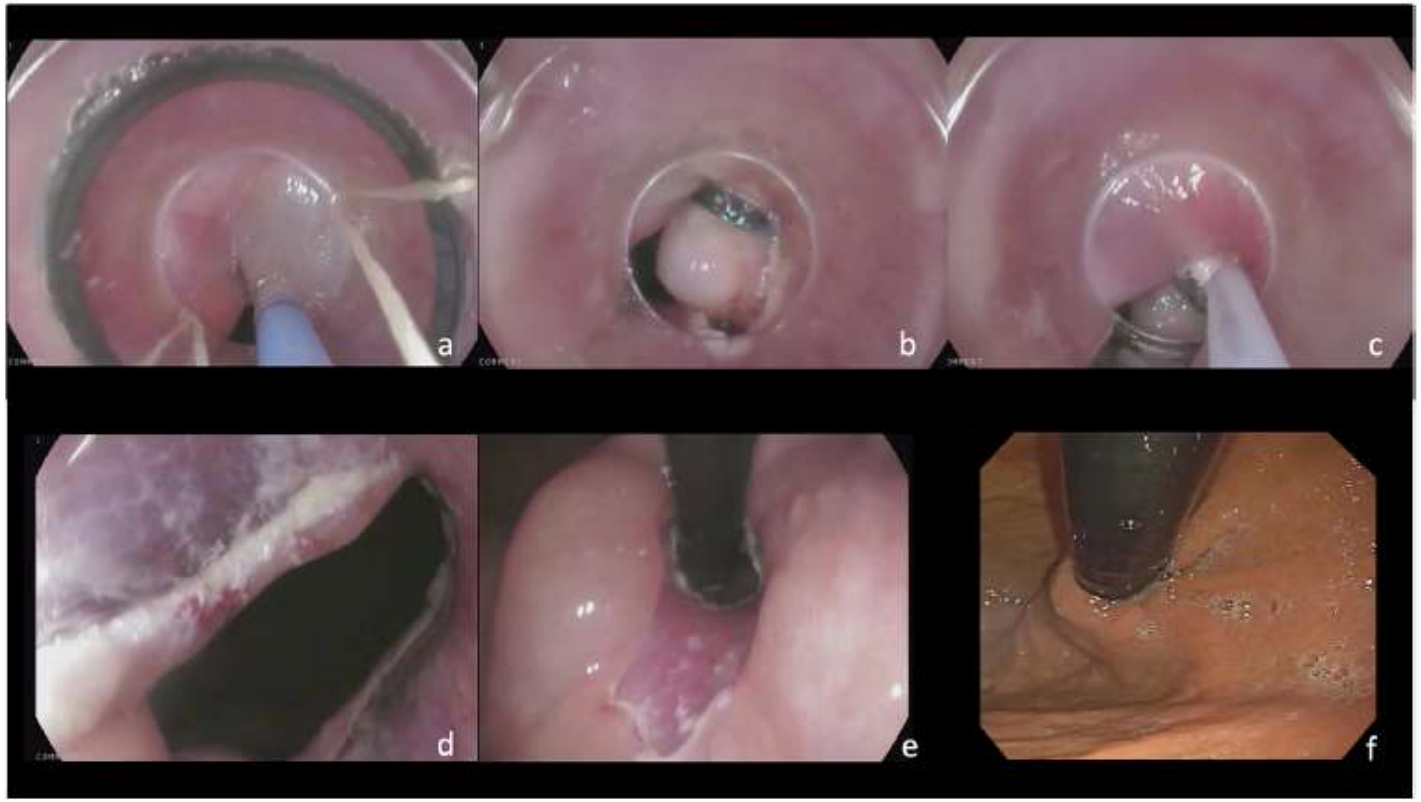

Fig. 1 **a** Submucosal injection. **b** Band ligation. **c** Mucoesctomy under the rubber. **d** Front view of the mucosectomy of the cardia. **e** Retroflexion view of the mucosectomy of the cardia. **f** Result at 3 months (retroflexion)

ARM-b

- 1. A 23-G needle was used to inject in the submucosa adrenaline serum (1/1000) for mucosal lifting.
- 2. The EGJ mucosa was capturedwith band ligation (1 cm in the esophagus and 2 cm in the stomach).
- 3. The captured mucosa was cut with a hexagonal snare (Duette, Cook Medical, Winston Salem, NC, USA).
- The electrosurgical unit setting was Endocut Q, effect 2 (Erbe, Erlangen, Germany).
- These three steps were repeated until completion of a piecemeal mucosectomy of three-quarters of the circumference, involving predominantly the gastric side of the EG junction

Stretta and MBS

- 7 received Stretta 27 +/- 6 months after RYGB.
- Patients underwent a 48-h Bravo pH study, which demonstrated re
- A
- Tl
- O

> Surg Endosc. 2006 Jun;20(6):850-4. doi: 10.1007/s00464-006-0513-6. Epub 2006 May 12.

Treatment of refractory gastroesophageal reflux disease with radiofrequency energy (Stretta) in patients after Roux-en-Y gastric bypass

S G Mattar [1], F Qureshi, D Taylor, P R Schauer

Electrical Stimulation of LES post Sleeve

- Seventeen patients with a median follow-up of 12 months received LES-ES.
- 7 (41%) were completely off PPI, 5 (29%) took PPI on an intermittent basis, and 5 (29%) were on single-dose PPI
- Median **GERD-health-related quality of life scores improved from 34 (on-PPI, 25-41) at baseline to 9 (6-13)** at last follow-up (off-PPI, P<.001
- LES-ES in post-LSG patients suffering from symptomatic, PPI-refractory GERD resulted in significant improvement of GERD-symptoms, esophageal acid exposure, and need for PPI
- **Preserving the post-LSG anatomy, it offers a valid option for patients unable or unwilling to undergo Roux-en-Y gastric bypass surgery**
    - Surg Obes Relat Dis. 2018 May;14(5):611-615. Electrical stimulation of the lower esophageal sphincter to address gastroesophageal reflux disease after sleeve gastrectomy. Borbély Y(1), Bouvy N(2), Schulz HG(3), Rodriguez LA(4), Ortiz C(5), Nieponice A(6).

Knowledge is power

- Ask questions re symptoms
- Ask questions re diet
- Testing testing testing
- Manometry findings
  - 38 year old female, 10 yrs p rgb w weight recurrence and HHR
  - Candidate for HHR, distalization
  - 100% ineffective swallows
  - I did the distalization and did nt do the HHR

Conclusions

- Not a lot of options
- Crural repair is perhaps 50-60% of the answer
- Linx, modified Dor or Toupet are also possible answers
- Endoscopic therapies are few
  - Stretta
  - ARM-B