XXVIII IFSO World Congress
9-12 September 2025 | Santiago, Chile

Revision for GERD and/or Hiatal Hernia After Sleeve Gastrectomy

Luciano Poggi MD
Clinica AngloAmericana
Peru

IFSO 2025 Santiago
Combined Therapies, The Dawn of a New Era
ifso2025.org

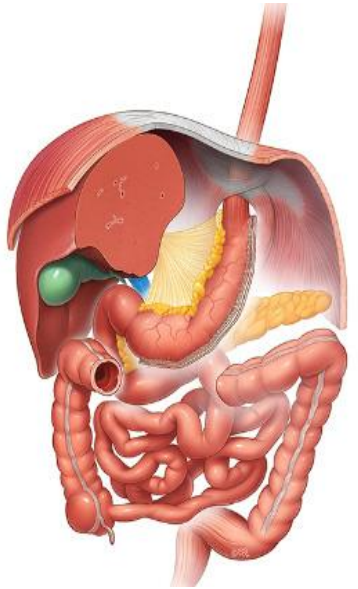
Disclosure Slide

	No, nothing to disclose
x	Yes, please specify:

Novonordisk: Speaker

Introduction

- Sleeve Gastrectomy is the most common Bariatric procedure performed worldwide.
- Despite adequate weight loss there is an increasing concern due to de Novo GERD, worsening of pre existent GERD or esophagitis.
- Symptoms may vary from 4.6%-68%.



Esophageal Disorders

- GERD prevalence 40-70% among patients awaiting bariatric and metabolic surgery (BMS).

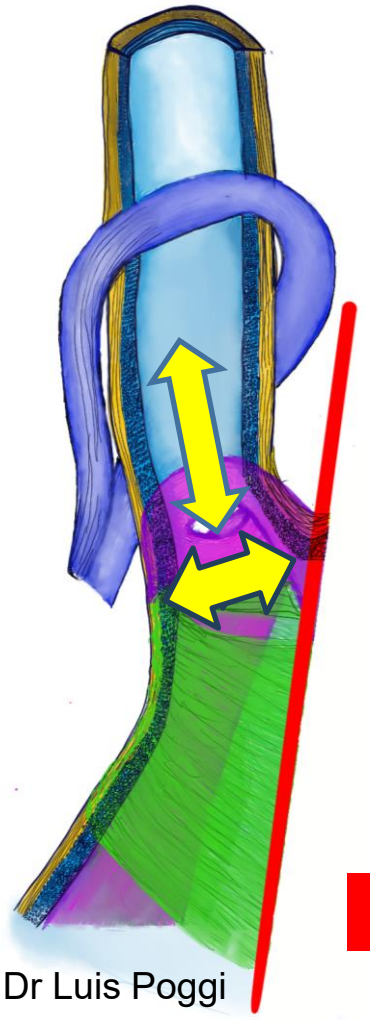
Daher et al world J Gastroenterology 2019

- Pathologic DeMeester 46.7%, Pathologic impedance 53.4% Esophageal Dismotility 22.7% preoperatives studies before BMS.

Bernui G, Poggi L et al. Foregut 2023

What happens when we do a Gastric Sleeve?

Sleeve



Dr Luis Poggi

Sleeve Gastrectomy Surgery will do:

1.- Dividing Sling yand Clasp fiber
2.- Loss of His Angle
3.- Decrease LES resting pressure
4.- Fundus Resection
5.- Relaxation of GE Junction
6.- Increase Intragastric pressure

+

Sleeve dilates with time

Increased gastric volume

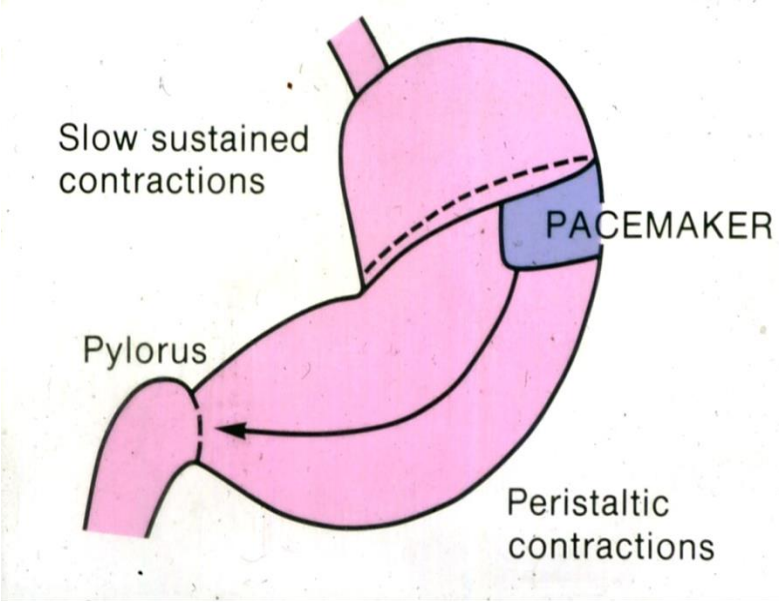
Intrathoracic Migration

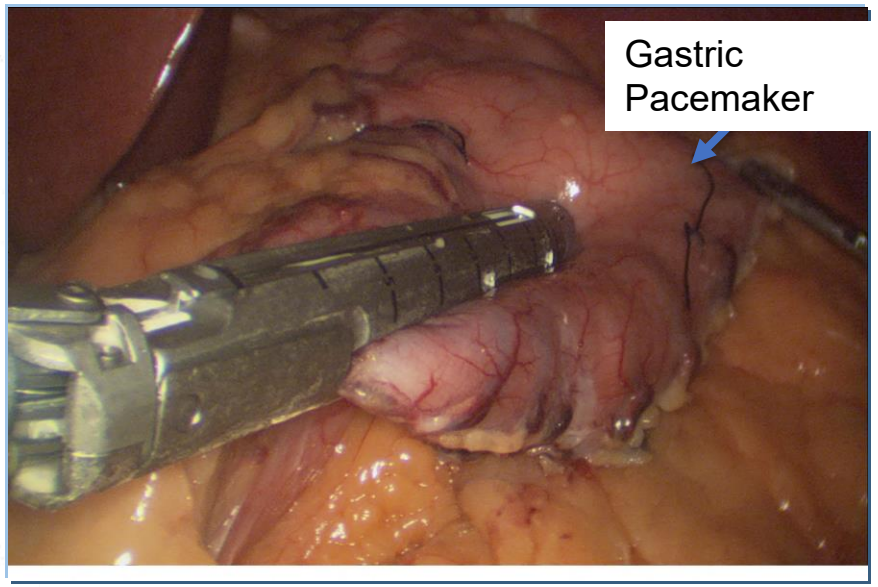
GE junction relaxation

Gastroesophageal Reflux

Poggi et al. Possible Technical aspects involved in the development of GERD after sleeve gastrectomy: Surgucal Technique consideration. Cirugia Española 2024

Gastric Motility





- ❑ Loss of gastric relaxation.
- ❑ Alters gastric migration complex.
- ❑ Loss of antral tone.
- ❑ Open Pylorus.
- ❑ Increase gastric emptying.

*Dr A.Csendes Slide

Narrative Review 2024: Evaluation & Management - Assessment

Clinical Assessment

- Clinical History (sensitivity 67%, specificity 70%)
- Questionnaires (sensitivity 62%, specificity 67%)
- PPI Trial (sensitivity 71%, specificity 44%)

Anatomical Assessment

- Abnormalities: esophageal dilation, hiatal hernia, neofundus or a retained fundus, sleeve dilation, antral dilation, and incisura stenosis and angulation or a combination of these
- Assessment:
  - Barium Swallow: Low sensitivity
  - Esophagoduodenoscopy and biopsy
  - CT Imaging: Better sensitivity than other conventional assessments

Functional Assessment

- High Resolution Manometry: Objectively assess esophageal motility
  - Detection of hypotensive EGJ, esophageal hypomotility, and or the presence of a HH provides supportive evidence for GERD diagnosis.
- 24-h pH Impedance: **Gold Standard** (SYMPTOMS CORRELATION)
  - Acid exposure time (AET) > 6%
  - DeMeester score > 14.7

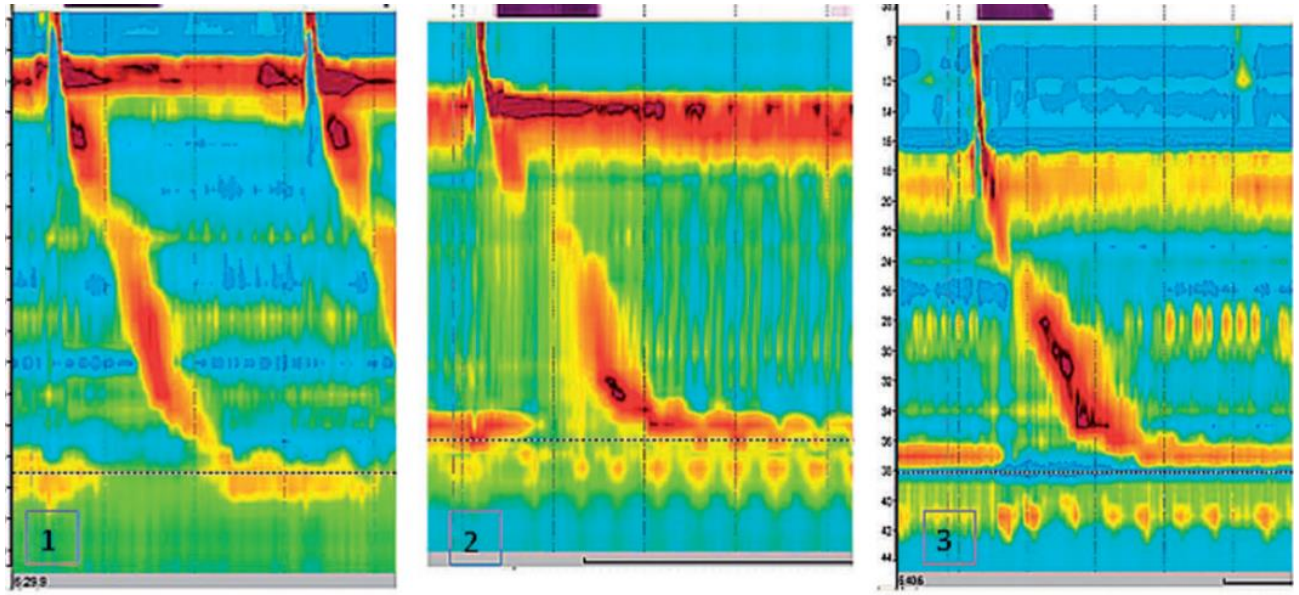
Chan DL, Chen KL, Indja BE, Talbot ML. The management of intractable gastroesophageal reflux following sleeve gastrectomy: a narrative review. **Curr Surg Rep.** 2024;12:408-416. doi:10.1007/s40137-024-00426-8.

High-resolution manometry is superior to endoscopy and radiology in assessing and grading sliding hiatal hernia: A comparison with surgical in vivo evaluation

Tolone et al.

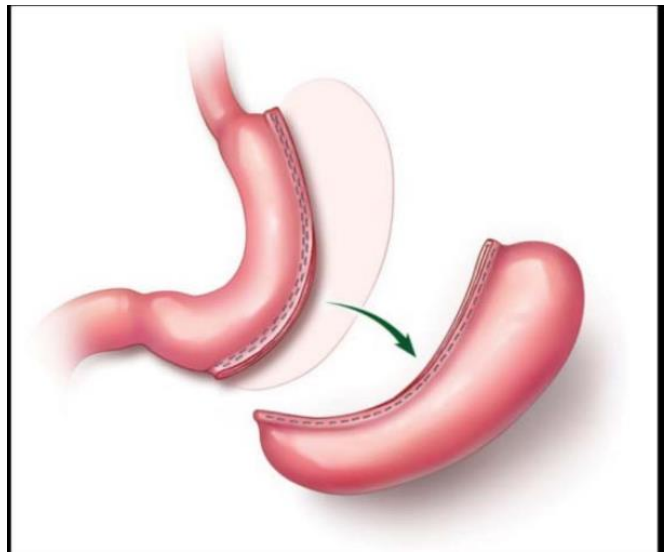
United European Gastroenterology Journal
2018, Vol. 6(7) 981–989

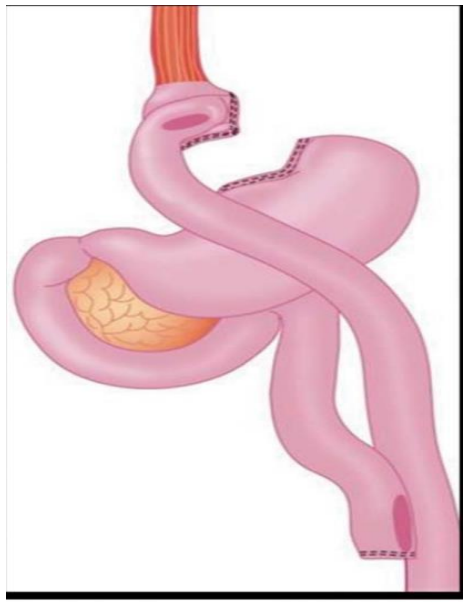
N=100
Esophagogram, Endoscopy & Manometry VS Surgery intraop diagnosis



Best test to diagnose hiatal hernia is manometry 88.9% and 91.5% vs Esophagogram 69.8 % and 97% for sensitivity and especifity respectively.

POSED (Postobesity Surgery Esophageal Dysfunction)





- Prevalence of dysphagia 13.7% at 3.9 years
- Dysmotility, POSED or achalasia are time dependent after surgery.
- Possible Mechanism: non compliant stomach/ pouch.

Miller et al. Postobesity Surgery Esophageal Dysfunction: A Combined Cross-Sectional Prevalence Study and Retrospective Analysis. Am J Gastroenterology 2020

Before planning a Revision rule out anatomical causes

Obesity Surgery (2023) 33:263–267
https://doi.org/10.1007/s11695-022-06375-4

ORIGINAL CONTRIBUTIONS

Incidence of Abnormalities of the Gastric Tube Following Sleeve Gastrectomy and Its Role on Esophagitis Progression

José-Tarcísio Dias da Silva[1,2] · Fernando Santa-Cruz[1] · Joyce Maria S. Cavalcanti[3] · Marina Viana Padilha[4] · Lucas R. Coutinho[4] · Luciana T. Siqueira[2] · Álvaro A. B. Ferraz[2,5]

METHODS

- 459 patients who underwent Sleeve gastrectomy
- Esophagogastroduodenoscopy realized in both pre- and post-operative periods

Endpoint: determine the relationship between morphological abnormalities of the gastric tube and esophagitis progression

RESULTS

The presence of abnormalities of the gastric tube was directly related with esophagitis progression: 27.7%, p=0.013

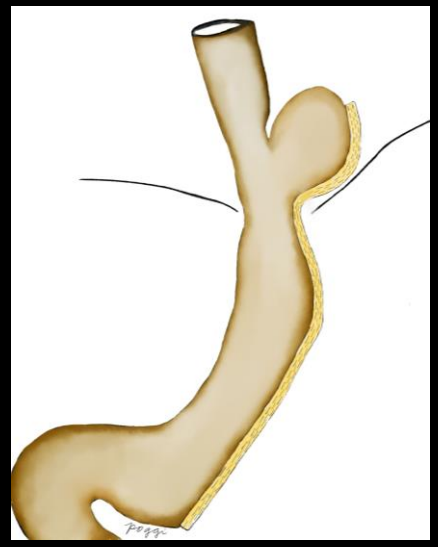
Gastric dilation (16.1%) > gastric twist (10.7% > neofundus (7.4%) > hiatal hernia (0.2%)

CONCLUSIONS

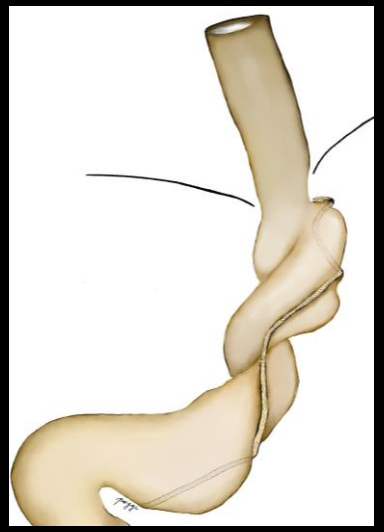
Abnormalities of the gastric tube are not uncommon after SG and seems to contribute partially to the relevant rates of GERD and esophagitis after this surgery.

De Novo GERD after Sleeve Gastrectomy

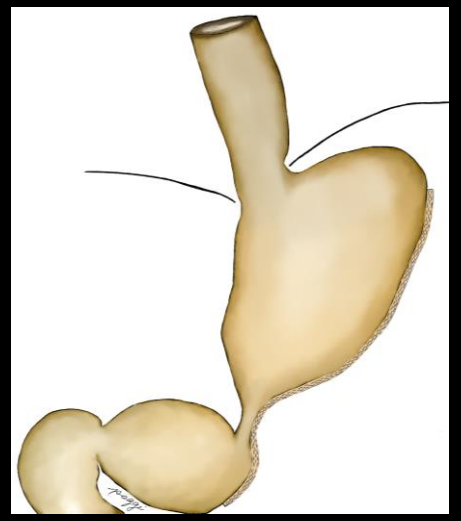
ITM



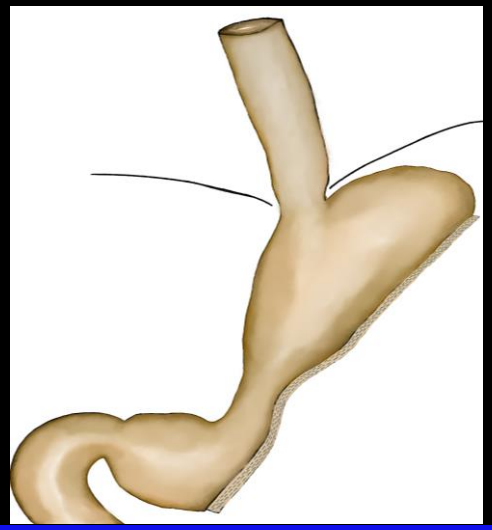
Sleeve Torsion



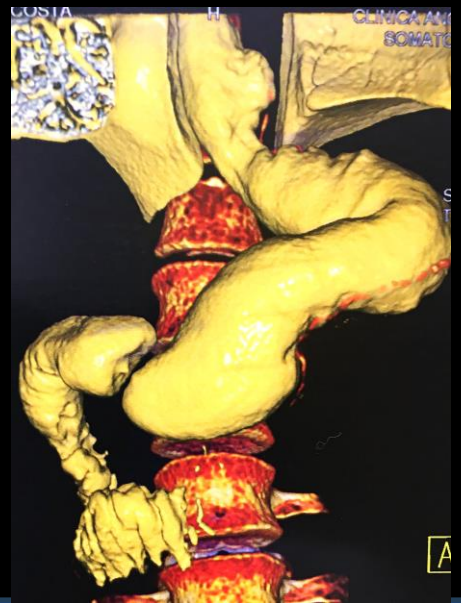
Sleeve Stenosis

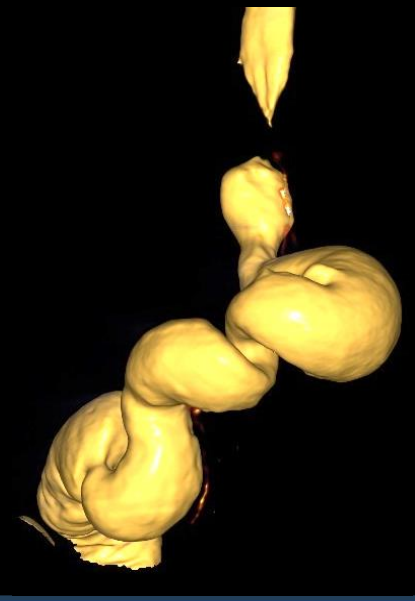


Neo Fundus vs unresected Fundus



3D Ct San Volumetry





Delphi 2023: Best-Practice Re-do Surgeries After SG

46 experts/25 countries; 72 statements; consensus on 62 (≥70%).

Minimum time before revision for GERD: 12 months (73.9% agreement).

Multidisciplinary team evaluation (91.3%) *Eating habits. Nutritional and psychological evaluation.*

Pre-revision esophagogastroduodenoscopy (95.6%) and

Upper gastrointestinal contrast series (barium swallow) (82.6%).

pH/HRM: no consensus.

→ Adequate weight loss: Continue medical treatment for at least 1 to 2 years is an acceptable option (86.9% agreement)

Kermansaravi M, Parmar C, Chiappetta S, Shikora S, Aminian A, Abbas SI, et al. Best practice approach for redo-surgeries after sleeve gastrectomy: an expert's modified Delphi consensus. **Surg Endosc.** 2023;37:1617-1628. doi:10.1007/s00464-023-09879-x.

Conversion after Sleeve for GERD rationale

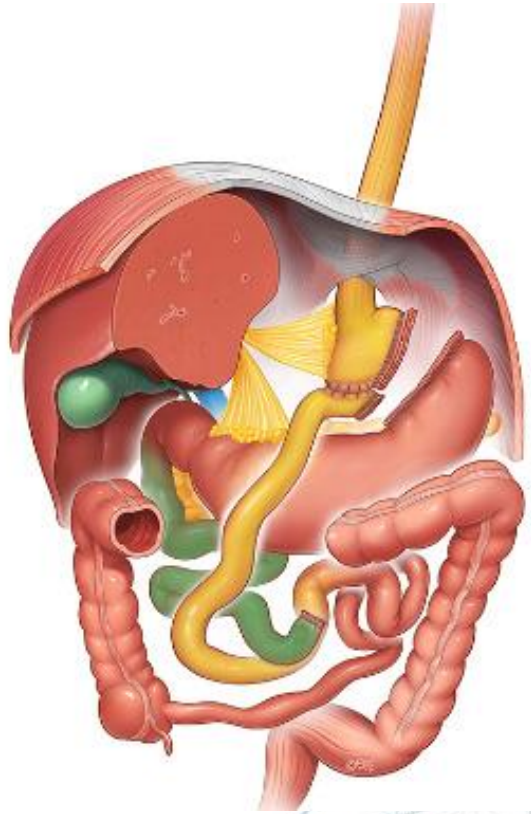
- Intrathoracic Migration.
- Decreased acid secretion
- Divert bile.
- Intragastric pressure
- Intrabdominal pressure (WR)

- Hiatal hernia repair.
- Small reservoir pouch
- Roux Y reconstruction.
- Good outlet anastomosis
- Weight Loss (if need it)

Conversion to RYGB, how does it possibly work?

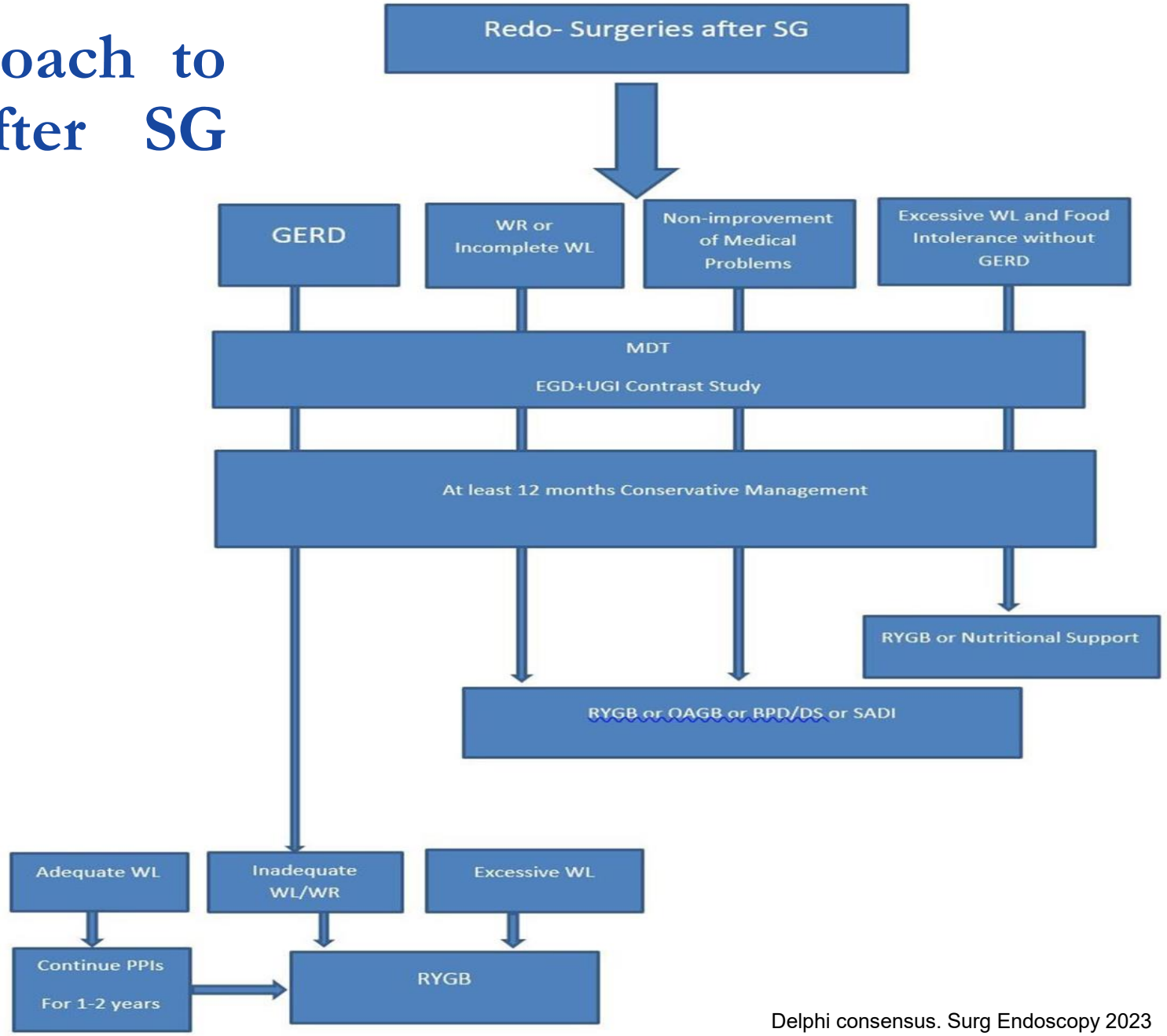
- RYGB has rapid pouch emptying.
- Decreased acid secretion
- No bile.
- Possible prevention of Hiatal hernia (GJ anchoring pouch).

- Create Small Pouch
- Repair Hiatal Hernia
- AL > 75cm
- Tailor limb length to objective (TALL>400cm).
- Address other possible problems (ie:Gallbladder disease)



…However according to some published cohort persistent reflux after RYGB 22-38% (symptoms)

Algorithmic approach to redo-surgeries after SG



Delphi consensus. Surg Endoscopy 2023

Delphi 2023: Best-Practice Re-do Surgeries After SG

46 experts/25 countries; 72 statements; consensus on 62 (≥70%).

For symptomatic GERD after sleeve gastrectomy (SG): revisional RYGB is appropriate across scenarios including good weight loss (≈97–98% agreement).

Technical note for RYGB in GERD: alimentary limb length ≥75 cm (≈97% agreement).

Other options for GERD regardless of WR or insufficient WL: disagreement/not recommended (OAGB, BPD-DS, SADI-S, SASI, SG-TB, LINX*). Hiatal repair alone: disagreement.

Kermansaravi M, Parmar C, Chiappetta S, Shikora S, Aminian A, Abbas SI, et al. Best practice approach for redo-surgeries after sleeve gastrectomy: an expert's modified Delphi consensus. **Surg Endosc.** 2023;37:1617-1628. doi:10.1007/s00464-023-09879-x.

Can we just close the Hiatal Hernia?

SAGES/EAES OFFICIAL PUBLICATION

Check for updates

SAGES guidelines for the management of comorbidities relevant to metabolic and bariatric surgery

Sunjay S. Kumar[1] · Claire Wunker[2] · Amelia Collings[3] · Varun Bansal[4] · Theofano Zoumpou[5] · Julietta Chang[6] · Noe Rodriguez[7] · Andrew Sabour[8] · Lisa Renee Hilton[9] · Omar M. Ghanem[10] · Bradley S. Kushner[11] · Lindsey Jean Loss[12] · Essa M. Aleassa[7] · Ivy N. Haskins[13] · Subhashini Ayloo[14] · Adam Reid[15] · David Wayne Overby[16] · Peter Hallowell[17] · Tammy Lyn Kindel[18] · Bethany J. Slater[19] · Francesco Palazzo[1]

When present, a hiatal hernia should be surgically repaired and in select circumstances it may be the only surgical intervention required.

- No other identified cause for GERD, normal BMI, RYGB refusal

Can we just close the Hiatal Hernia?

Revision of Sleeve Gastrectomy with Hiatal Repair with Gastropexy for Gastroesophageal Reflux Disease

Check for updates

Obes Surg 2019

Tien-Chou Soong[1,2] · Owaid M. Almalki[2,3] · Wei-Jei Lee[2] · Kong-Han Ser[2] · Jung-Chien Chen[2] · Chun-Chi Wu[2] · Shu-Chun Chen[2]

XXVIII IFSO World Congress
9-12 September 2025
Santiago, Chile

- N=28. Repair HH, Hill Gastropexy and Peripancreatic fascia pexy.
- Inclusion: GERD>6months. Refused RYGB. Exclusion: Barret esophagus, SG stenosis.
- Patient satisfaction 14 (50%)
- Off PPI 26%
- Repair of HH is not effective

GERD-HROL	Initial	27	24.3 ± 8.4	7–49
	1 month	20	12.3 ± 10.2*	0-40
	6 month	15	16.8 ± 12.5*	0-36
	1 year	17	17.4 ± 16.5*	4-45
	2 years	15	18.4 ± 16.5*	4-49

Table 3 Endoscopic findings at baseline and after surgery

Endoscopic Findings	Pre-op	Post-op	*P*
Total number (%)	28 (100)	16 (100)	< 0.001
No esophagitis	0	1 (6.2)	
Grade A	1 (3.6)	6 (37.5)	
Grade B	3 (10.7)	4 (25.0)	
Grade C	16 (57.1)	3 (18.8)	
Grade D	8 (28.6)	2 (12.5)	

Sleeve to RYGB Meta-analysis

XXVIII IFSO World Congress
9-12 September 2025
Santiago, Chile

Indications and Outcomes of Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass: a Systematic Review and a Meta-analysis

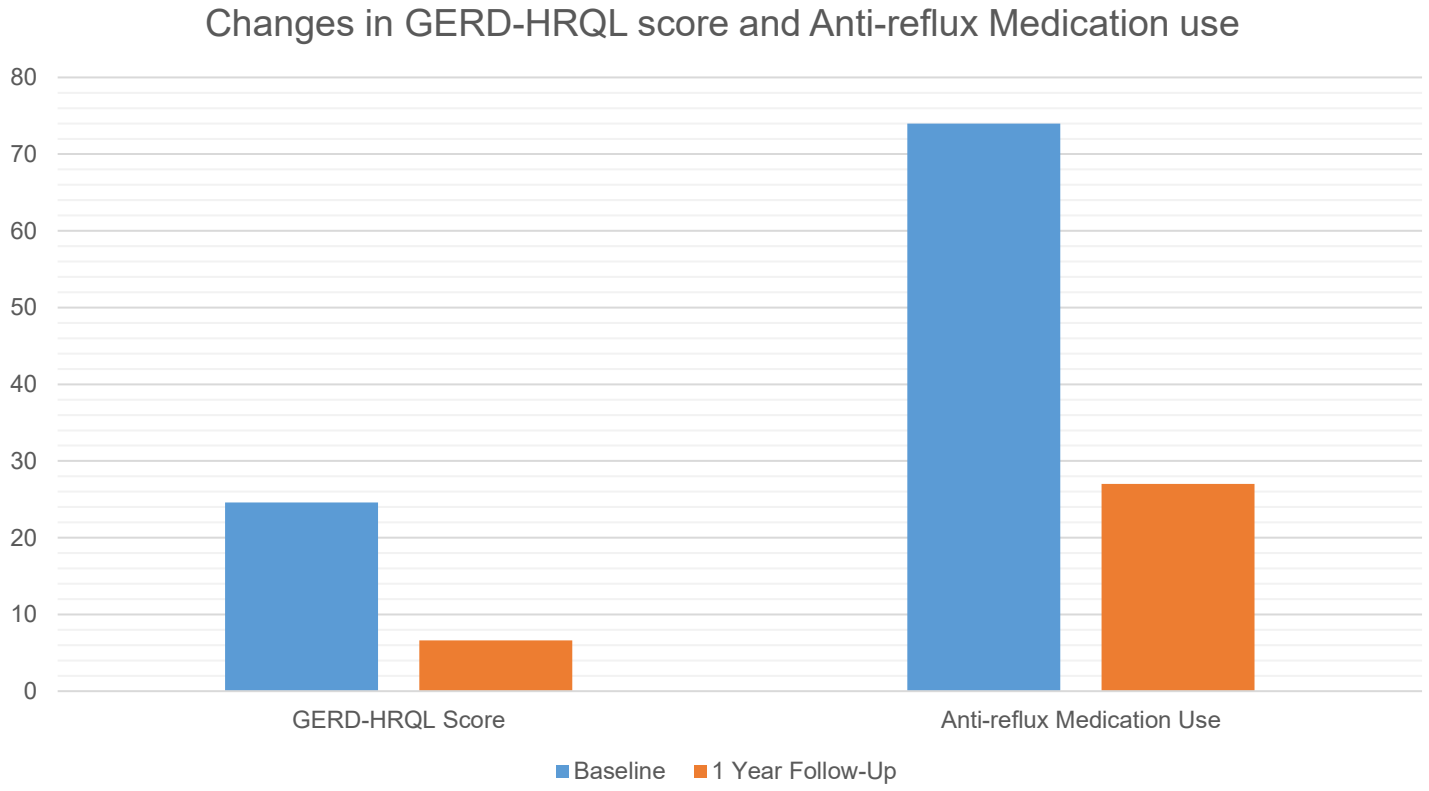
R Matar, N Monzer, V Jaruvongvanich, R Abusaleh, E. Vargas, D. Maselli, A Beran, T Kellogg, O Ghanem, B. Abu Dayyeh Obesity Surgery May 2021

- 17 articles N= 556
- Conversion to RYGB GERD 30.4%
- Insuf weight loss, Weight recurrence: 75.6% at
- BMI initial 38.5 to 32.1kg/m2 at 1 year.
- 1 year follow up: 79.7% resolution
- 2 year follow up 91.3% resolution
- EWL 40% at 1 year
- Reop 6% Complications 11.4%

Table 2 Descriptions of the reported comorbidities based on individual studies

	Length of follow-up (months)	Diabetes II			Hypertension			ǂ GERD		
		Total N	Improved	Resolved	Total N	Improved	Resolved	Total N	Improved	Resolved
*Landreneau et al. [24]	12	16	2	4	NA	NA	NA	17	NA	9
Iannelli et al. [25]	18.6	9	5	NA	13	4	6	11	NA	11
Boru et al. [26]	24	NA	NA	NA	NA	NA	NA	18	NA	15
**Barajas- Gamboa et al. [27]	12	6	NA	NA	8	NA	NA	29	NA	5
Nevo et al. [28]	24	6	NA	2	9	NA	4	NA	NA	NA
Quezada et al. [29]	12	NA	NA	NA	NA	NA	NA	16	5	10
Poghosyan et al. [30]	36	11	7	NA	13	13	NA	9	NA	9
Carmeli et al. [31]	19	4	3	1	3	2	NA	NA	NA	NA
Gautier et al. [32]	15.5	3	1	2	NA	NA	NA	6	NA	6
Parmar et al. [33]	16	5	2	3	13	8	4	10	2	8
Yorke et al. [35]	21.1	5	NA	4	4	NA	4	4	NA	3
Yilmaz et al. [36]	12	2	NA	2	1	NA	1	6	NA	6
Langer et al. [38]	14	NA	NA	NA	NA	NA	NA	3	NA	3
Casillas et al. [39]	24	2	1	0	NA	NA	NA	32	31	NA
Abdemur et al. [40]	18.3	NA	NA	NA	NA	NA	NA	9	NA	6

Conversion of Sleeve Gastrectomy to RYGB



Design	Population	Time
Retrospective Cohort Study (multicenter, Michigan)	2133 patients undergoing conversion, 279 (13%) patients had baseline and 1-year GERD-HRQL survey data and anti-reflux medication data.	2014 – 2022

Shen MR, Hammoud MM, Bonham AJ, Aaron B, Ghaferi AA, Varban OA, et al. Conversion of sleeve gastrectomy to Roux-en-Y gastric bypass: impact on reflux and weight loss. Surg Obes Relat Dis. 2024;20(8):738–744. doi:10.1016/j.soard.2024.04.001.

Esophagitis and Barrett's after SG to RYGB

- **Felsenreich et al Obes Surg 2020. n=10.**

8/10 remission of BE, 1BE LG dysplasia resolved, pH study acid exposure 36.8% to 3.8% reflux episodes 162 to 49.

- **Hong Lim et al Obes Surg 2020**

N=14, 6/7 resolution of esophagitis. 7/14 resolution of GERD 6/7 symptoms improvement

<u>Symptoms might not always improve.</u>

- **Carandina et al SOARD 2020 Multicenter SG to RYGB**

N=80. Symptoms improvement in most patients, but 23 patients with daily persistent GERD -19/23 had prior gastric band.

OAGB vs RYGB after Sleeve Gastrectomy

One-anastomosis gastric bypass (OAGB) versus Roux-en-Y gastric bypass (RYGB) as revisional procedures after failed laparoscopic sleeve gastrectomy (LSG): systematic review and meta-analysis of comparative studies

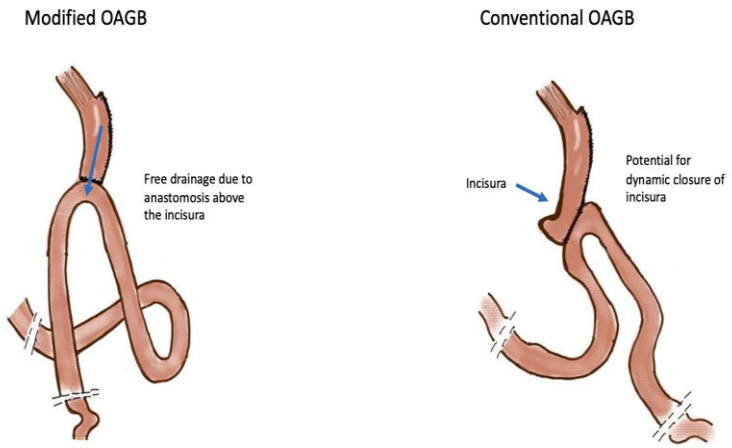
- 739 patients (OAGB 373; RYGB 366), FU 12–60 months
- No data on technical details about the procedures.

	OAGB	RYGB
GERD as indication for revisional surgery	31.6% (118/373)	50.8% (186/366)
GERD remission	68.6% (81/118)	80.6% (150/186)
De novo GERD	6.3% (16/255)	0.5% (1/180)

Vitiello A, Berardi G, Peltrini R, Calabrese P, Pilone V. One-anastomosis gastric bypass (OAGB) versus Roux-en-Y gastric bypass (RYGB) as revisional procedures after failed laparoscopic sleeve gastrectomy (LSG): systematic review and meta-analysis of comparative studies. **Langenbecks Arch Surg.** 2023;408:440. doi:10.1007/s00423-023-03175-x.

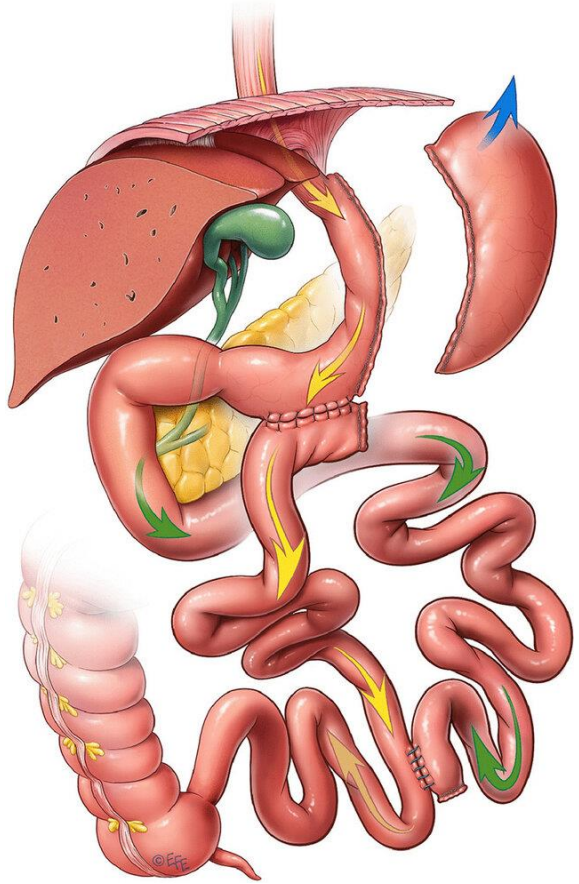
Modified One Anastomosis Gastric Bypass Following Sleeve Gastrectomy for Severe Reflux and Delayed Gastric Emptying

- Anastomosis performed above the incisura to improve drainage of the supraincisural component. Obj: Improve emptying
- Protocolized nuclear scintigraphy
- 24-h pH monitoring
- Gastroscopy
- Objective questionnaires

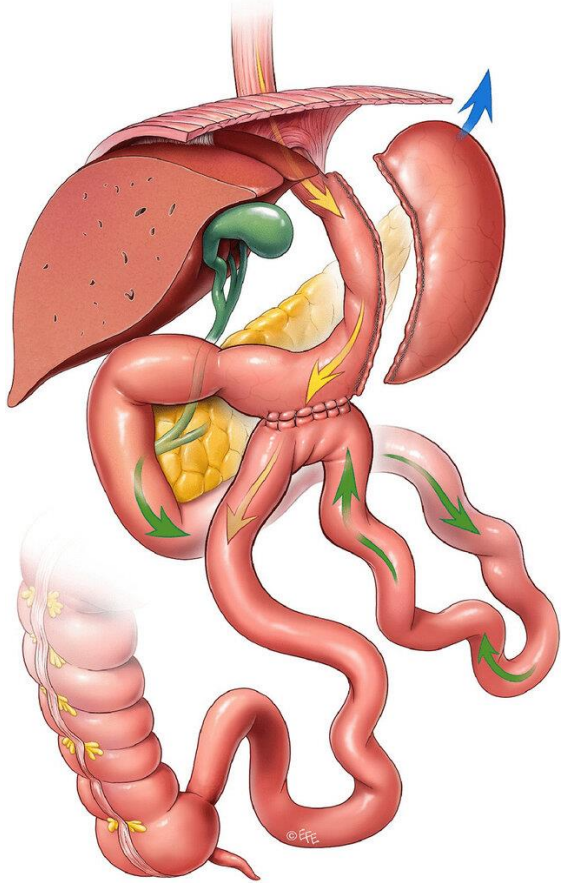


	Pre-OAGB	Post-OAGB	p-value
Total acid exposure (%)	6.9	1.0	p=0.009
# acid events (24h pH)	59.5	12	p=0.017
Reflux events in 90 min (scintigraphy)	39	26	p=0.001
Composite reflux score (0–72)	37.1	16.8	p=0.003
GE half-time (min)	34	24	p=0.008

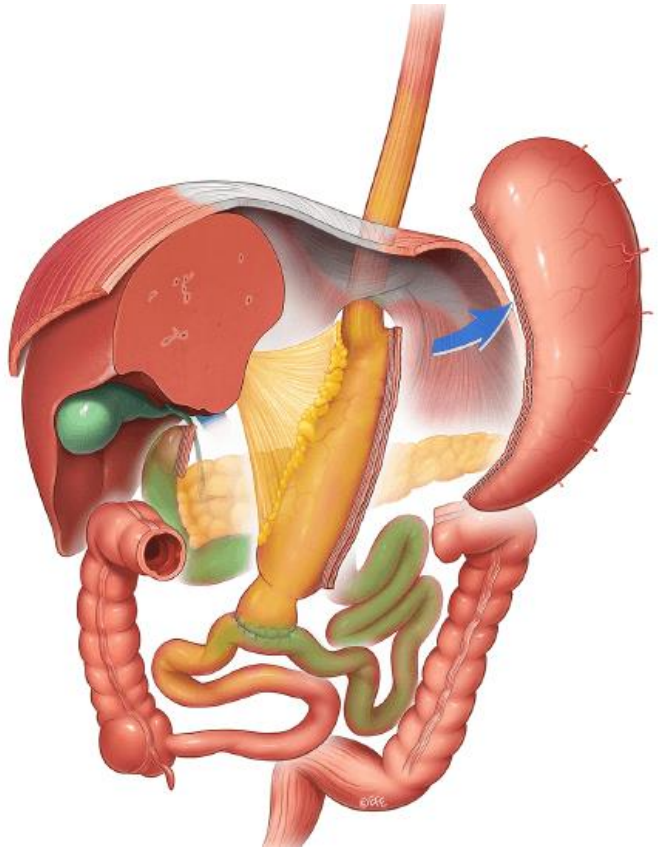
Decreasing intragastric pressure



Bipartition ✅



SASI ✅



SADI 🚫

Ligamentum Teres Cadiopexy

- **Mackey et al. Ligamentum teres cardiopexy for post vertical sleeve gastrectomy gastroesophageal reflux Surg Endoscopy 2023**

N=60 Hiatal hernia + Lig Teres for GERD after SG

At 1 year n=37, 81% improve 19% no change

Table 4 Surgical outcomes

Surgical outcomes	
Length of stay, *median* (IQR)	1.3 days (1.0–11.0)
Re-operation within 30 days, *n* (%)	2.0 (3.4%)
90-day mortality, *n* (%)	0.0 (0.0%)
Conversion to Bypass	2.0 (5.6%)

No long-term efficacy data

- **Lind R, Texeira A et al Obes Surg 2024.**

N=29 . FU 17.3 monthsSymptom resolution 72.4%. Off PPI 12 (57%)
Not improved 1 pt

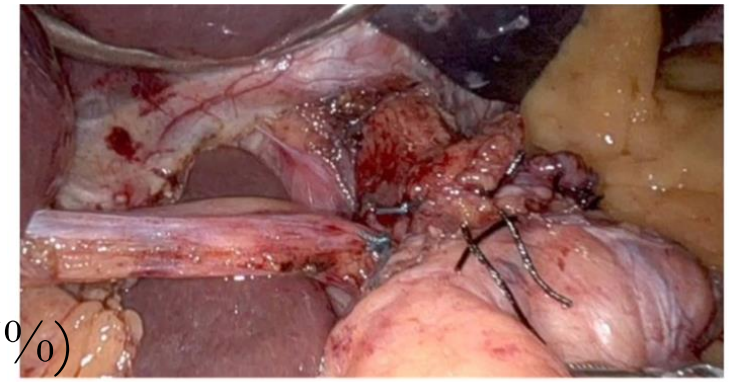


Fig. 1 Intraoperative image of complete ligamentum teres cardiopexy

Obesity Surgery (2023) 33:387–396
https://doi.org/10.1007/s11695-022-06381-6

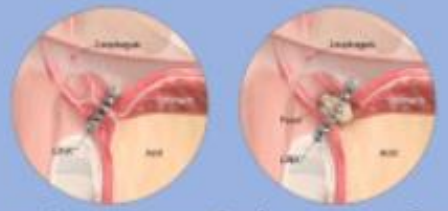
NEW CONCEPT

Feasibility and Efficacy of Magnetic Sphincter Augmentation for the Management of Gastroesophageal Reflux Disease Post-Sleeve Gastrectomy for Obesity

Leena Khaitan[1] · Michael Hill[2] · Michael Michel[3] · Patrick Chiasson[4] · Philip Woodworth[5] · Reginald Bell[5] · Ragui Sadek[6] · Aaron Hoffman[7] · Kari Loing[8] · Paula Veldhuis[8] · William Petraiuolo[8] · Carlos Anciano[9]

METHODS

Magnetic Sphincter Augmentation (MSA) was performed on subjects with GERD after laparoscopic sleeve gastrectomy (LSG)



Primary aim: prospectively assess safety and efficacy of MSA in patients after LSG during 12-month follow-up

RESULTS

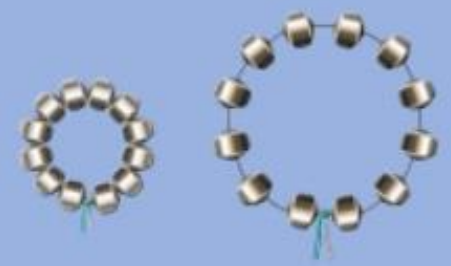
- n=30, 90% female, mean age 47.1 yrs., baseline mean BMI 29.9 kg/m^2
- 2 serious adverse events: (*dysphagia*, device removed; *pain,* resolved without sequelae in 1 day)
- 2 devices removed (1 device-related)

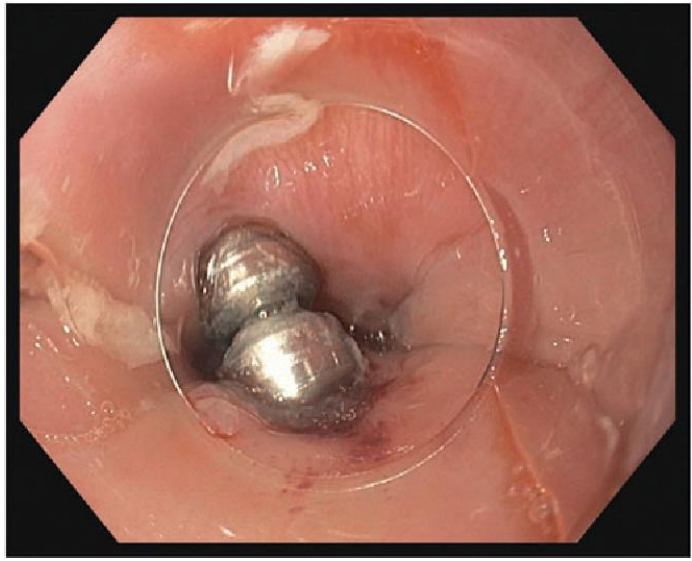
- PPI use lower or eliminated in 95.8%
- Regurgitation lower in 61.5%
- Patient satisfaction up in 80.8%
- Esophagitis better in 53.8%

- No device migration or erosion, zero deaths

CONCLUSIONS

In patients who had sleeve gastrectomy for obesity and who still experience GERD symptoms, MSA appears to be a safe and effective option with comparable morbidity to those who did not have LSG.





Obesity Surgery (2024) 34:4232–4243
https://doi.org/10.1007/s11695-024-07523-8

REVIEW

Magnetic Sphincter Augmentation for Gastroesophageal Reflux After Sleeve Gastrectomy: A Systematic Review

Francesco Cammarata[1,2] · Martina Novia[1,2] · Alberto Aiolfi[1] · Riccardo Damiani[1,2] · Michele Manara[1,2] · Alessandro Giovanelli[1] · Rossana Daniela Berta[3] · Marco Anselmino[3] · Cristina Ogliari[1] · Davide Bona[1,2] · Luigi Bonavina[2,3]

	N = 91
	29/91 (31.8%)
AEs, *n* (%)	10 (11%)*
Dysphagia	3 (3.3%)
Pain	2 (2.2%)
Nausea	1 (1.1%)
Diarrhea	1 (1.1%)
Esophageal	1 (1.1%)
spasm	2 (2.2%)
Pneumothorax	2 (2.2%)
Stricture	4 (4.4%)**
Reflux	1 (1.1%)°
Broken device	8 (8.8%)¶
Erosion	
Others	

- 31.8% experience device adverse events-complications
- 60.4% discontinued use off PPI.
- Daily use 97.4% to 25.3%
- No long-term safety and efficacy

Long-term outcomes of magnetic sphincter augmentation in sleeve gastrectomy and Roux-en-Y gastric bypass patients: a comprehensive analysis

Mina A. Ibrahim[1] · Daniel P. Mowoh[1] · Mai Al Khadem[1] · Mujjahid Abbas[1] · Leena Khaitan[1]

Surg Endoscopy 2024

XXVIII IFSO World Congress
9-12 September 2025
Santiago, Chile

- N=16 MSA after SG (14) MSA after RYGB (2)
- Ph and Manometry. 16 pts had low LES FU 0.5-84 months
- SG-RYGB 6/16 Hiatal Hernia repair.
- Normal esophageal Motility
- Device removal 3/16 (19%) 2 patient dysphagia 1 pain (no erosions)

n=16	Prior to MSA	2 weeks (n =16)	1 month (n=15)	1 year (n= 12)	>3 years (n=8)	P-Value
GERD – HRQL (mean (SD))	50.6 (17.8)	9.10 (17.8)	9.6 (16.7)	12.3 (11.5)	5.8 (9.1)	P<.001
Reflux	100%	19%	50%	50%	25%	
Regurgitation	50%	19%	25%	25%	0%	
Daily PPI use	88%	75%	27%	33%	25%	
Dysphagia	38%	25%	20%	17%	25%	
BMI (mean (SD))	32.7 (5.5)	32 (6.1)	32 (5.3)	31.8 (6.0)	33.3 (4.3)	P<.75

Conclusions

- Preoperative studies can help to understand severity of GERD and make a surgical plan.
- RYGB remains the preferred and most evidence-based option for sleeve gastrectomy patients with refractory GERD,.
- Ligament teres and Magnetic Sphincter augmentation could be an option in selected cases but there is no long-term literature.
- Other options that promote rapid gastric emptying can have a favorable outcome however there is a lack of data.

XXVIII IFSO World Congress
9-12 September 2025 | Santiago, Chile

Revision for GERD and/or Hiatal Hernia After Sleeve Gastrectomy

Luciano Poggi MD
Clinica AngloAmericana
Peru

IFSO 2025 Santiago
Combined Therapies, The Dawn of a New Era
ifso2025.org

XXVIII IFSO World Congress
9-12 September 2025
Santiago, Chile

Revision for GERD and/or Hiatal Hernia After Sleeve Gastrectomy

Luciano Poggi MD
Clinica AngloAmericana
Peru

XXVIII IFSO
World Congress
9-12 September 2025
Santiago, Chile

Magnetic sphincter augmentation: a viable rescue therapy for symptomatic reflux following bariatric surgery

Ryan C. Broderick[1] · C. Daniel Smith[2] · Joslin N. Cheverie[1] · Pablo Omelanczuk[3] · Arielle M. Lee[1] · Rebeca Dominguez-Profeta[1] · Robert Cubas[1] · Garth R. Jacobsen[1] · Bryan J. Sandler[1] · Karl-Hermann Fuchs[1] · Santiago Horgan[1]

Surg endoscopy 2020

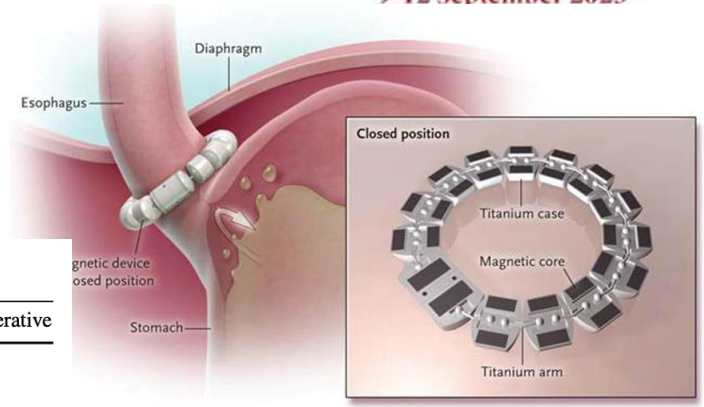
13 patients after SG and RYGB
Symptoms improvement – GERD HRQL
Decrease use of PPI

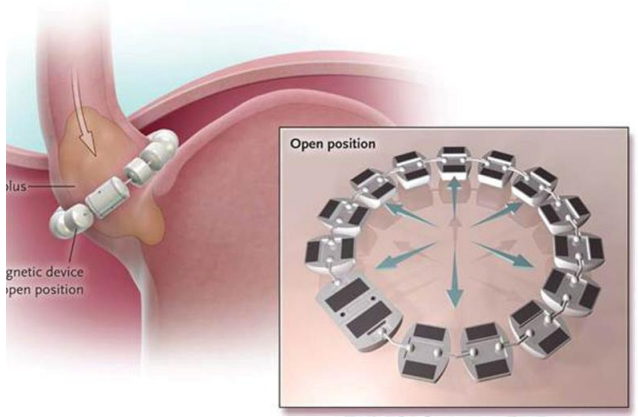
Limitations: Small cohort, retrospective.

Table 2 Pre-operative and post-operative PPI use

	Pre-operative	Post-operative
1	BID	None
2	BID	None
3	BID + H_2B	QD
4	None	None
5	QD	QD
6	BID	None
7	BID	None
8	BID	QD
9	QD	None
10	BID	QD
11	QD	None
12	QD	None
13	BID	None

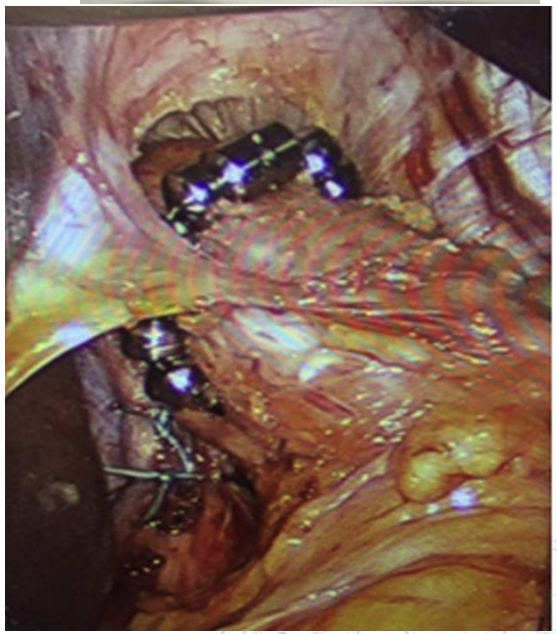
BID: Double dose PPI, QD: Single dose PPI, H_2B: H_2 Blocker





Miscellaneous

Radiofrecuencia



Linx post Manga

Miscellaneous

Radiofrecuencia

- GERD: RYGB
- GERD + IWL:

XXVIII IFSO
World Congress
9-12 September 2025
Santiago, Chile

Narrative Review 2024: Evaluation & Management - Treatment

Medical Therapy: Lifestyle modifications + PPI

Endoscopic Therapies: Long term evidence is limited

- Obvious mechanical cause like incisura stenosis: Balloon dilation, gastric myotomy .
- Anti Reflux Mucosectomy (ARM): endoscopic mucosal resection of 75% of the GEJ.
- Endoscopic radiofrequency with Stretta system: increased LES tone and reduced transient inappropriate LES relaxation

Revisional Surgery:

- Roux-en-Y Gastric Bypass: Alone or with HH repair
- Hiatal Hernia Repair
- Magnetic LES augmentation

Chan et al. The Management of Intractable Gastroesophageal Reflux Following Sleeve Gastrectomy: A Narrative Review
Current Surgery Reports (2024) 12:408–416

	Time	GERD	Weight	Complications
Sleeve to RYGB		74-94% at 1 years resolution. 97% reduction on PPI.	13-23% TWL at 1 Y	Up to 16%
Sleeve to OAGB				
Sleeve to SASI				