Session: “REFLUX AFTER SLEEVE GASTRECTOMY”
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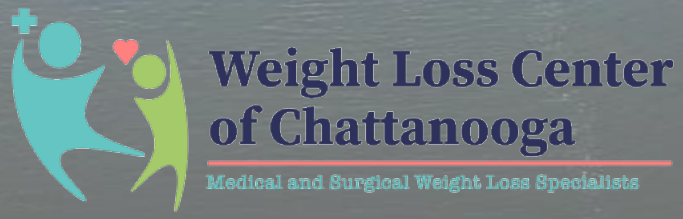
GERD after Sleeve: “Not so important”

Jaime Ponce MD, FACS, FASMBS, FIFSO

Medical Director of Bariatric Surgery – Parkridge Medical Center
President, Weight Loss Center of Chattanooga PLLC
Chattanooga, TN USA



Conflict of Interest Disclosures

- Gore: speaker
- ReShape Lifesciences: consultant
- Olympus: speaker
- Allurion: consultant
- Medtronic: consultant, speaker
- Applied Medical: consultant
- Ethicon: speaker
- Intuitive: speaker
- GT Metabolic: consultant, speaker

Case Mix Disclosure Slide

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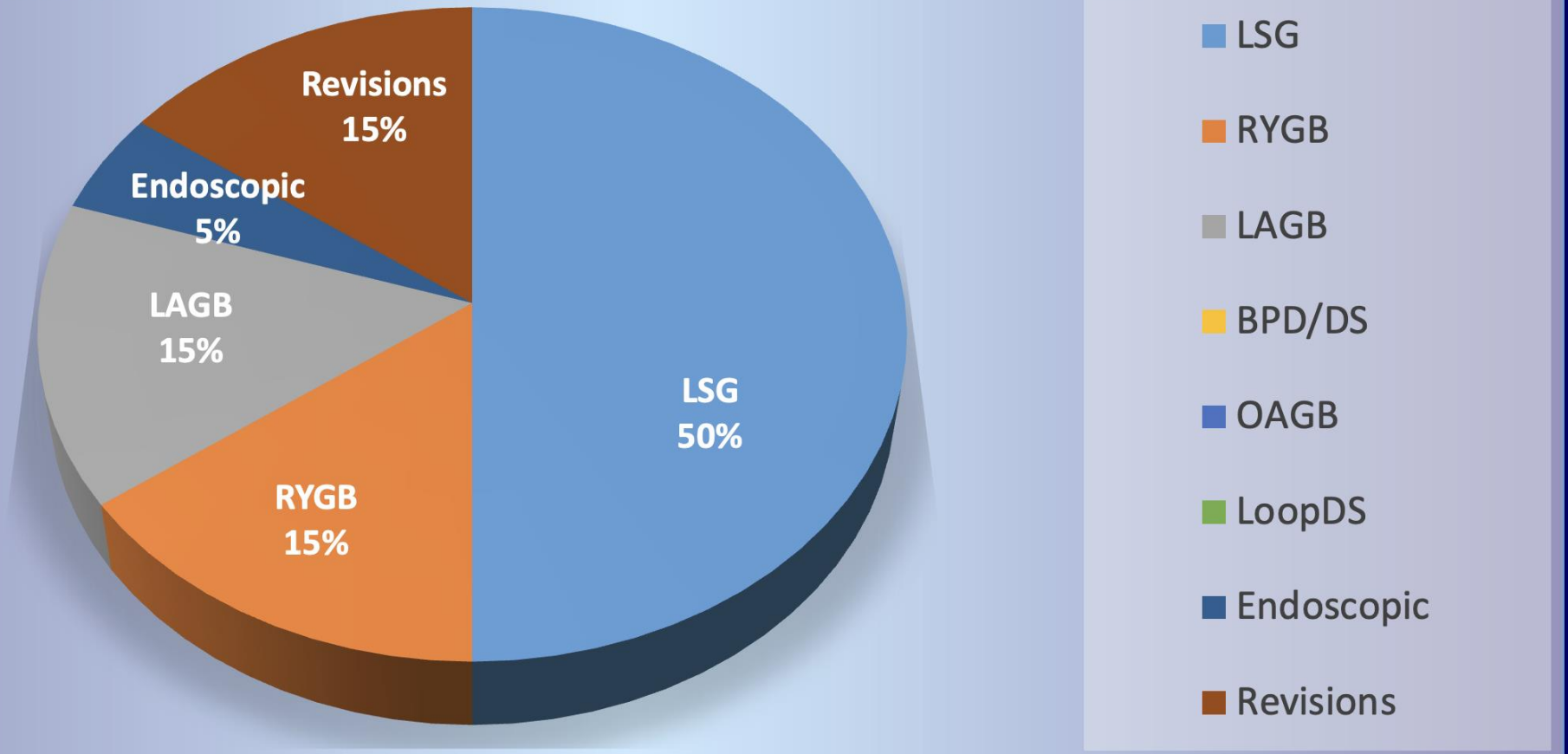
Whole career procedures



Understanding the Impact of GERD Post-Sleeve Gastrectomy – Questions:

1. **Does Sleeve make reflux worse?**
2. **Does Sleeve create de novo reflux?**

Potential issues with surgical technique

- How tight is the sleeve?
- How close to the incisura?
- How much funds left?
- Inadequate dissection at the posterior fundus/crura
- Was cruropexy needed/performed?

What is the published evidence?

Effect of SG on GERD: a systematic review

SOARD 2011

- Of the 15 studies, 4 found an increased prevalence of GERD after SG

	Pts (n)	FU (mo)	GERD (%)		GERD Outcome	Bougie (F)
			Preop	Postop		
Arias (2009)	130	24	0	2		40
Frank (2009)	119	NR	29	35	RNY > effective than DS	NR
Lakdawala (2010)	100	12	5	9	Worse after SG Resolved after RNY	36
Nocca (2008)	163	24	6	12		36

Effect of SG on GERD: a systematic review

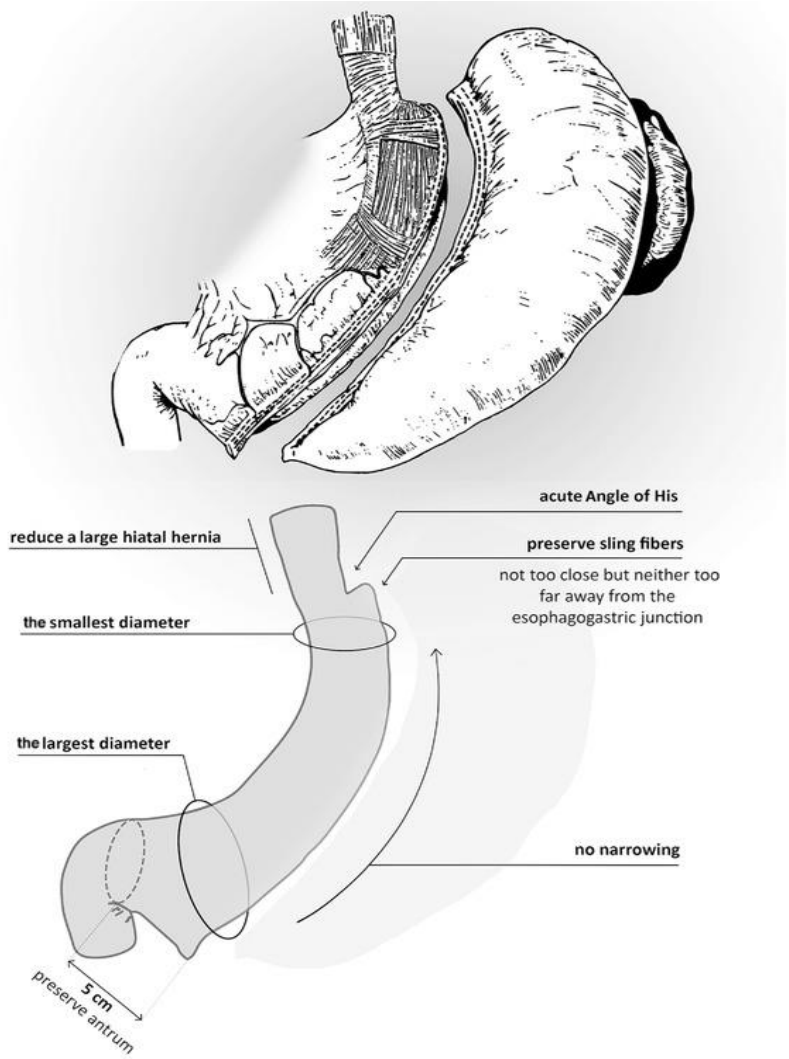
SOARD 2011

- Of the 15 studies, 7 showed reduced prevalence of GERD after SG

	Pts (n)	FU (mo)	GERD (%)		Bougie (F)
			Preop	Postop	
Cottam (2006)	126	12	36	70% resolved	46-50
Han (2005)	60	12	8	0	48
Himpens (2006)	40	36	20	3	34
Melissas (2007)	14	24	35	22	NR
Melissas (2008)	23	12	14	7	34
Omana (2010)	49	15	18	14	46
Weiner (2007)	120	60	35	15	32-44

Data in favor and against
Why?
What are the contributing factors?

Do we understand the pathophysiology of GERD after sleeve gastrectomy?



Annals of the New York Academy of Sciences, Volume: 1482, Issue: 1, Pages: 26-35, First published: 06 September 2020, DOI: (10.1111/nyas.14467)

Original article

Effect of sleeve gastrectomy on gastroesophageal reflux disease: a systematic review

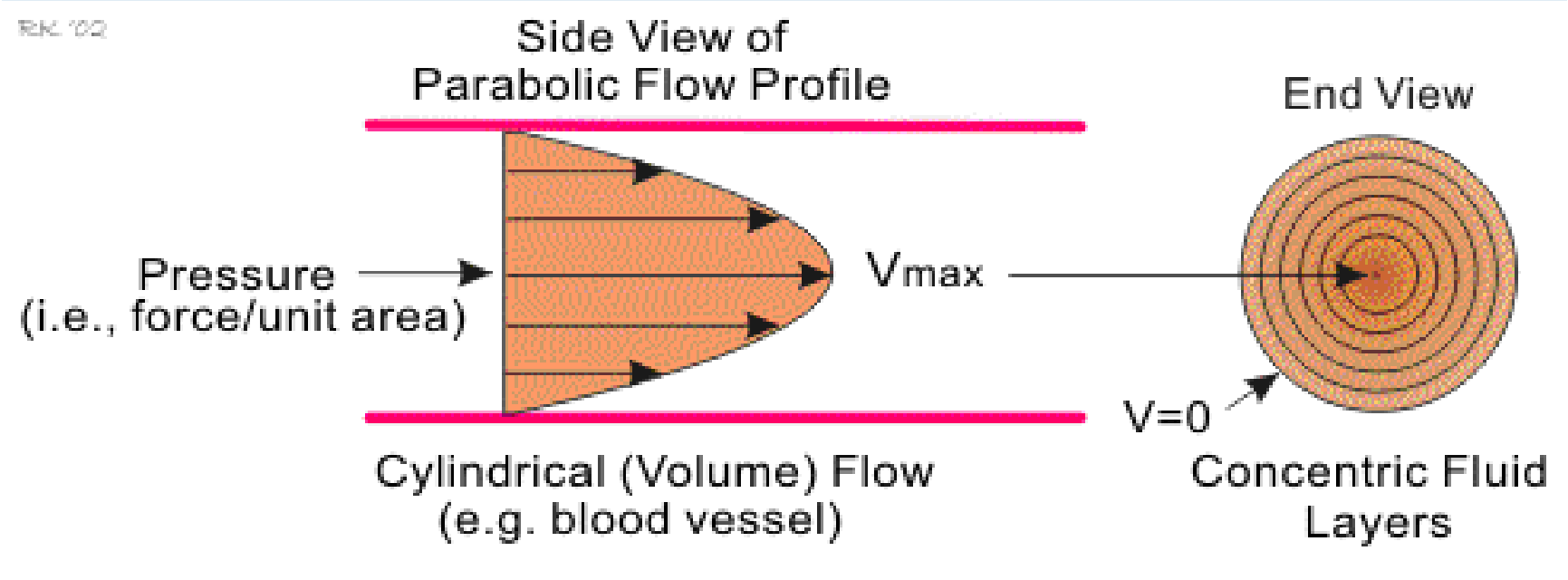
Sharon Chiu, M.D.[a], Daniel W. Birch, M.D., F.R.C.S.C.[b], Xinzhe Shi, M.Sc.[b], Arya M. Sharma, M.D., Ph.D., F.R.C.P.C.[c], Shahzeer Karmali, M.D., F.R.C.S.C.[b,*]

- **WORSENING GERD**
- Decreased gastric emptying
- Lower LES pressure
- Blunting angle of His
- Decreased gastric compliance and volume
- Increased gastric pressure

- **IMPROVING GERD**
- Accelerated gastric emptying
- Weight loss
- Reduced acid production
- Removal of fundus
- Reduced wall tension

Surg Obes Relat Dis. 2011;7(4):510-5.

What about Intragastric Pressure?



La Place's Law

Tension = Pressure x Radius / Wall Thickness

Laparoscopic Sleeve Gastrectomy Volume and Pressure Assessment

Obes Surg (2008) 18:1083–1088

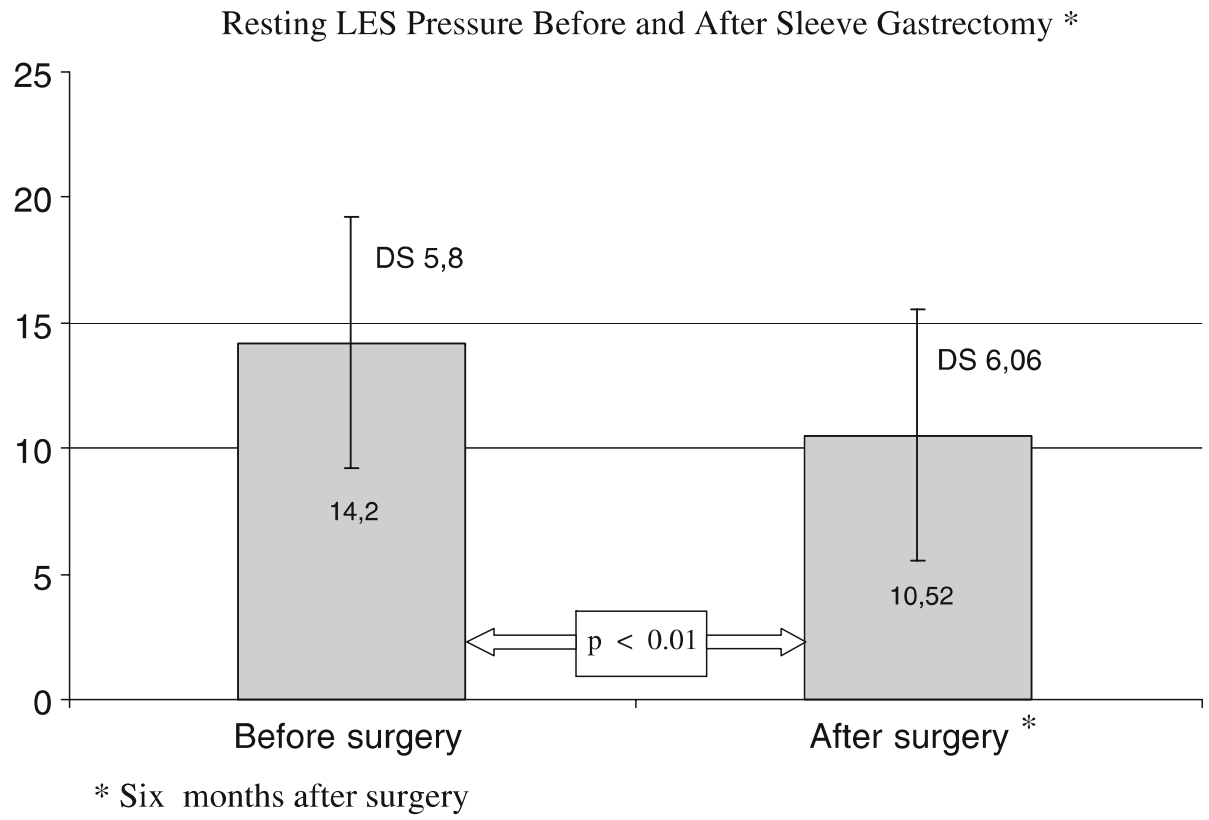
- Higher pressures and lesser distensibility will have an adverse impact on symptoms of GERD after SG.

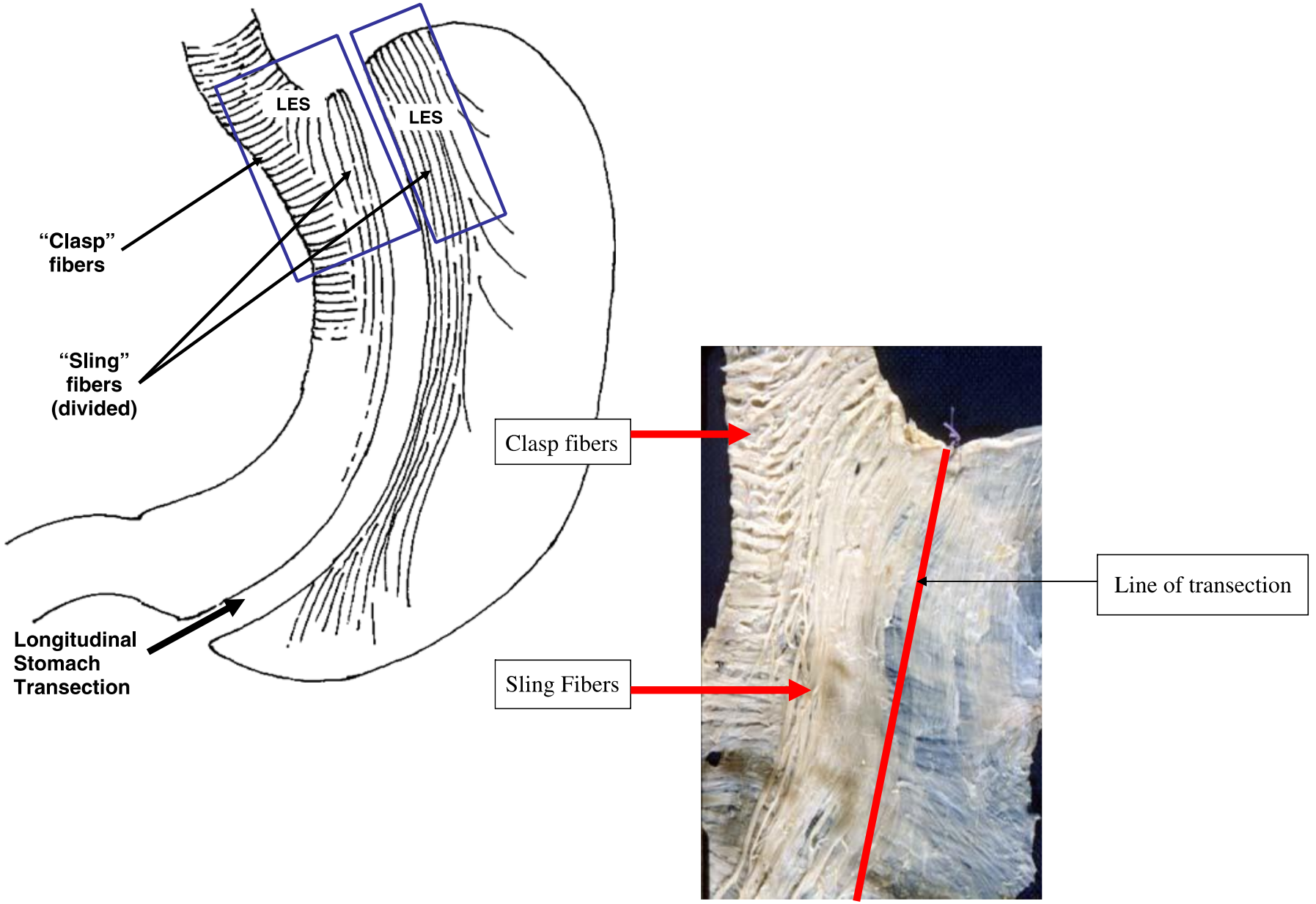
Lower Esophageal Sphincter (LES)

- LES tone is an important anti-reflux mechanism
- Alterations in LES pressure following SG could have impact on incidence and prevalence of GERD.

LES manometric changes after LSG

Braghetto et al (2010) Obes Surg




LES
LES
"Clasp" fibers
"Sling" fibers (divided)
Longitudinal Stomach Transection
Clasp fibers
Sling Fibers
Line of transection

Sage Journals
Foregut
OnlineFirst

https://doi.org/10.1177/26345161231218918

Review Article

Physiological Archetypes of *de novo* Gastroesophageal Reflux Disease After Laparoscopic Sleeve Gastrectomy

Vitor Ottoboni Brunaldi, Omar M. Ghanem, and Barham K. Abu Dayyeh

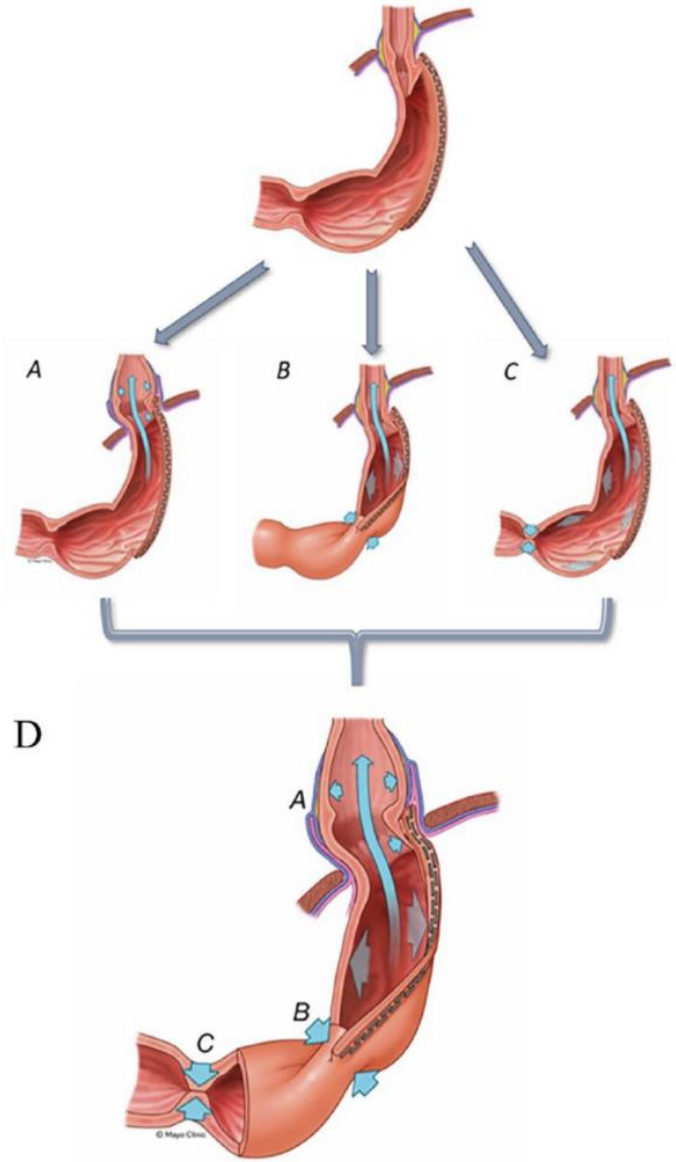


Figure 3. The functional archetypes of gastroesophageal reflux disease after sleeve gastrectomy. (A) Disruption of the antireflux barrier mechanism; (B) Hyperpressurization of the proximal chamber; (C) Hyperpressurization of the distal chamber; (D) Combined archetype.

Increased sleeve pressure and decreased LES pressure will increase reflux!

Does Sleeve Gastrectomy Expose the Distal Esophagus to Severe Reflux?

A Systematic Review and Meta-analysis

Kai Tai Derek Yeung, BMBS, MRCS, Nicholas Penney, MBBS, MRCS, Leanne Ashrafian, PhD, MRCS, Ara Darzi, MD, FRCS, FACS, FMedSci, FRS, and Hutan Ashrafian, PhD, MRCS, MBA

Annals of Surgery, 2019
published online March 20, 2019

35 studies demonstrated **reflux increase of 19% following SG**

[95% confidence interval (CI), 15%–22%, P < 0.0001]

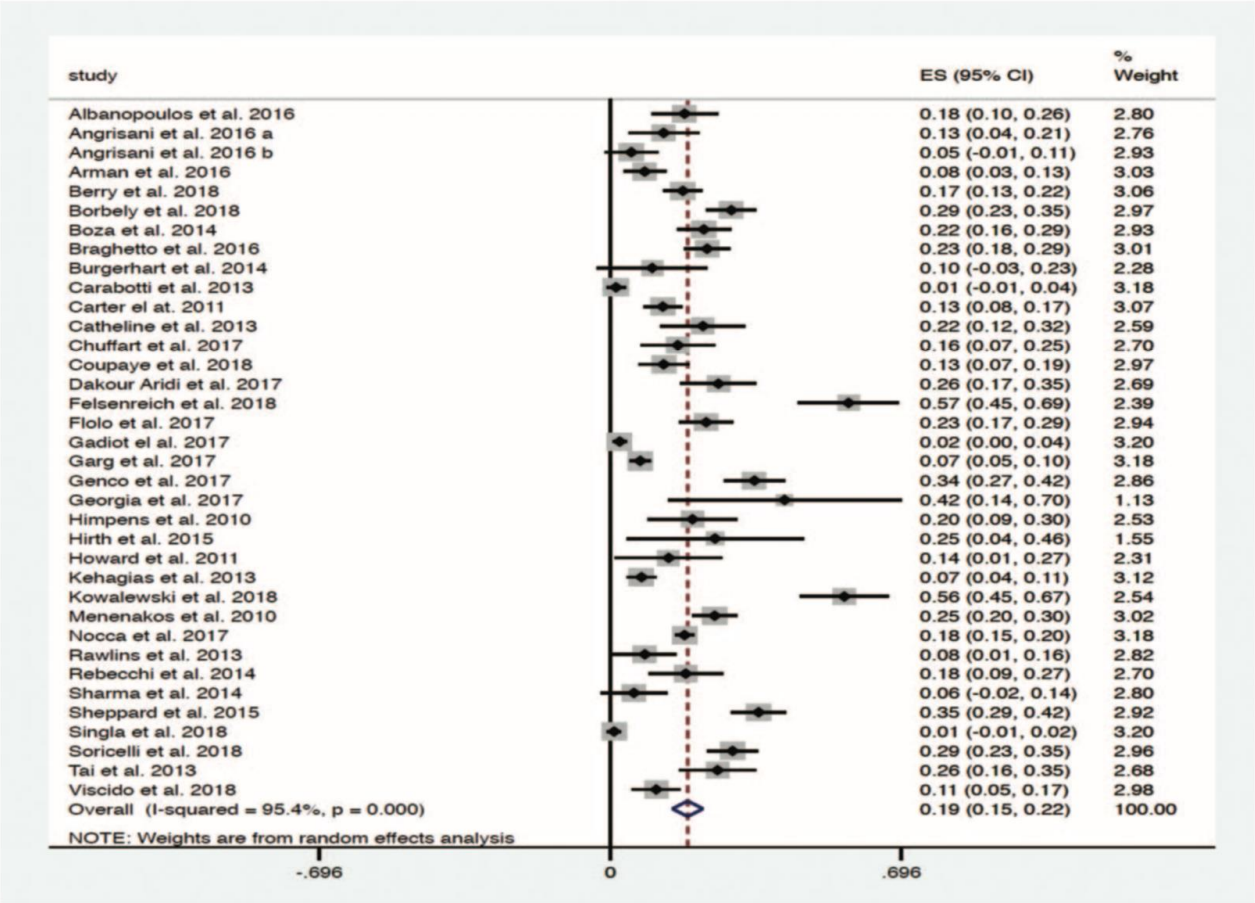
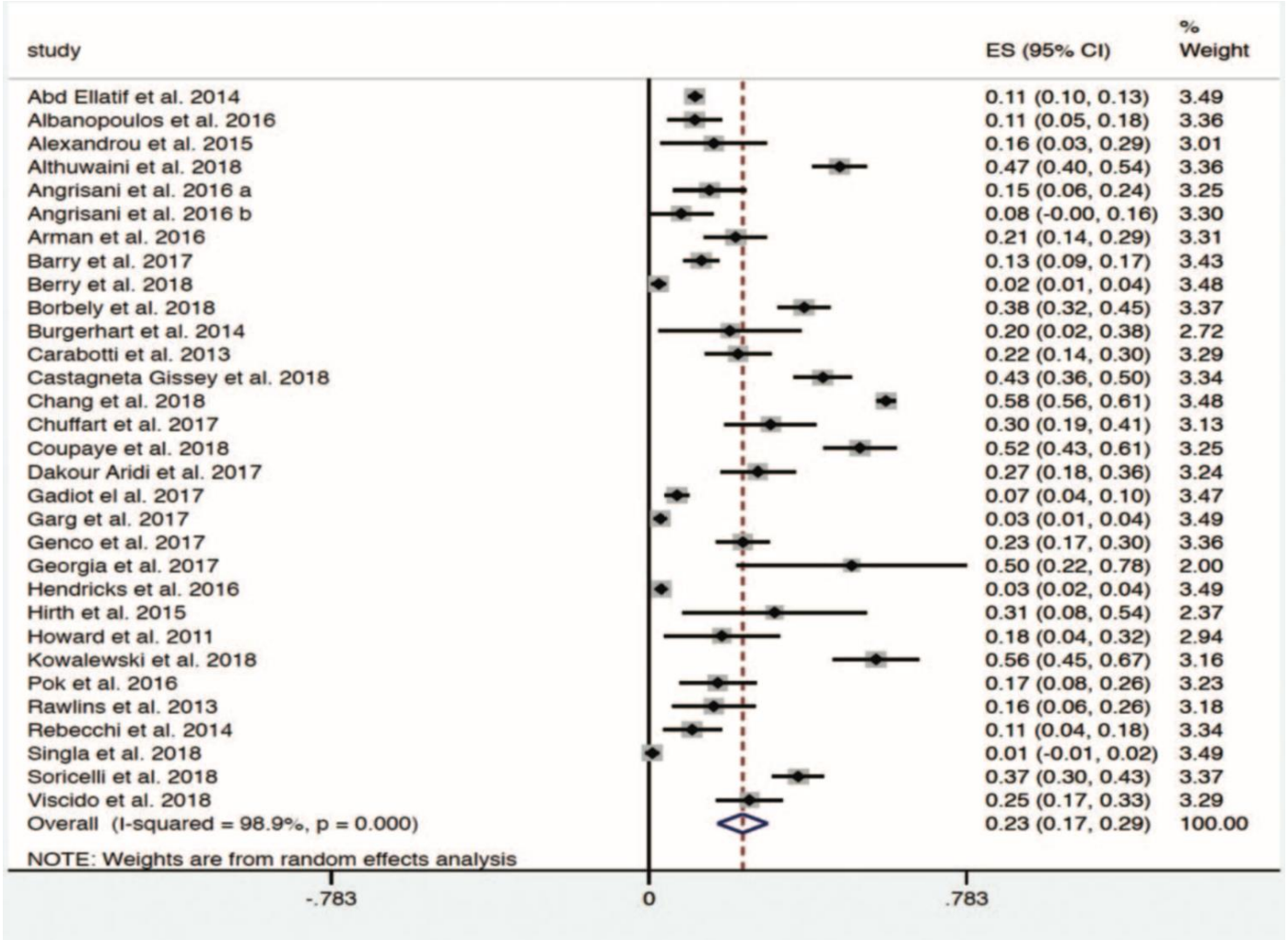


FIGURE 1. Forest plot of change in reflux for all studies.

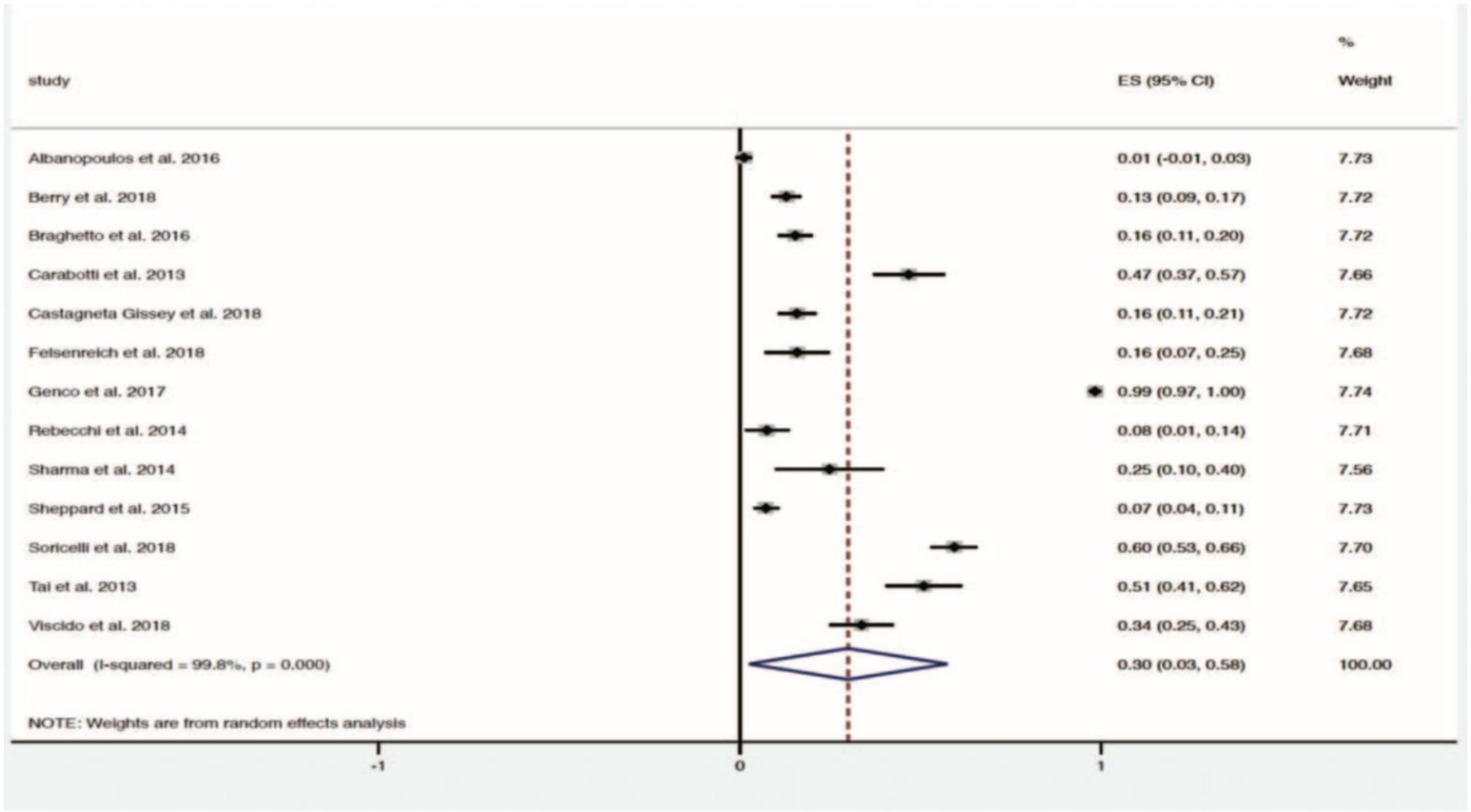
30 studies reported rates of **de novo reflux after SG was 23%**

(95% CI, 17% – 29%, P < 0.0001)



13 studies reported **rates of esophagitis after SG was 30%**

(95% CI, 3%–58%, P < 0.0001)



8 studies reported **rates of Barrett's after SG was 8%**
(95% CI, 4%–13%, P < 0.0001)

What about Level 1 evidence?

JAMA Surgery | Original Investigation

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

OBJECTIVE To compare long-term outcomes of weight loss and remission of obesity-related comorbidities and the prevalence of gastroesophageal reflux symptoms (GERD), endoscopic esophagitis, and Barrett esophagus (BE) after LSG and LRYGB at 10 years.

DESIGN, SETTING, AND PARTICIPANTS This 10-year observational follow-up evaluated patients in the Sleeve vs Bypass (SLEEVEPASS) multicenter equivalence randomized clinical trial comparing LSG and LRYGB in the treatment of severe obesity in which 240 patients aged 18 to 60 years with median body mass index of 44.6 were randomized to LSG (n = 121) or LRYGB (n = 119). The initial trial was conducted from April 2008 to June 2010 in Finland, with last follow-up on January 27, 2021.

INTERVENTIONS LSG or LRYGB.

Table 2. Proton Pump Inhibitor (PPI) Intake, Gastroesophageal Reflux Disease (GERD) Symptoms, GERD–Health-Related Quality of Life (HRQL), and Endoscopic Findings Between Laparoscopic Sleeve Gastrectomy (LSG) vs Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) at 10 Years

	No./total No. (%)		
	LSG (n = 91)	LRYGB (n = 85)	*P* value
All patients who underwent endoscopy	91/121 (75.2)	85/119 (71.4)	
PPI intake preoperatively	11/89 (12)	5/81 (6)	.20[a]
PPI intake at 10 y	58/90 (64)	30/84 (36)	<.001[a]
GERD symptoms			
No symptoms preoperatively or at any poin			
Symptoms similar to preoperatively			
Symptoms alleviated postoperatively			
Symptoms worsened postoperatively			
GERD-HRQL total score, median (range)			

Table 2. Proton Pump Inhibitor (PPI) Intake, Gastroesophageal Reflux Disease (GERD) Symptoms, GERD–Health-Related Quality of Life (HRQL), and Endoscopic Findings Between Laparoscopic Sleeve Gastrectomy (LSG) vs Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) at 10 Years

	No./total No. (%)		
	LSG (n = 91)	LRYGB (n = 85)	*P* value
All patients with esophagitis	28/91 (31)	6/85 (7)	<.001[d]
Los Angeles classification			
Gradus A	14/28 (50)	3/6 (50)	.66[a]
Gradus B	12/28 (43)	2/6 (33)	
Gradus C	2/28 (7)	1/6 (17)	
Gradus D	0/28 (0)	0/6 (0)	
PPI intake preoperatively	3/28 (11)	1/5 (20)	.50[a]
PPI intake at 10 y	16/28 (57)	2/5 (40)	.64[a]

Table 2. Proton Pump Inhibitor (PPI) Intake, Gastroesophageal Reflux Disease (GERD) Symptoms, GERD–Health-Related Quality of Life (HRQL), and Endoscopic Findings Between Laparoscopic Sleeve Gastrectomy (LSG) vs Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) at 10 Years

	No./total No. (%)		
	LSG (n = 91)	LRYGB (n = 85)	*P* value
All patients with Barrett esophagus[e]	4/91 (4)	3/85 (4)	.29[a]
PPI intake preoperatively	0/4 (0)	1/2 (50)[f]	.33[a]
PPI intake at 10 y	3/4 (75)	2/3 (67)	.99[a]
GERD symptoms			
No symptoms preoperatively or at any point	0/4 (0)	1/3 (33)	.49[a]
Symptoms similar to preoperatively	1/4 (25)	0/3 (0)	
Symptoms alleviated postoperatively	0/4 (0)	1/3 (33)	
Symptoms worsened postoperatively	3/4 (75)	1/3 (33)	
GERD-HRQL total score, median (range)	11.0 (3.0-20.0)	4.5 (0.0-9.0)	.25[b]

Barrett's

4% vs 4%

Do we still need to improve Surgical Technique?

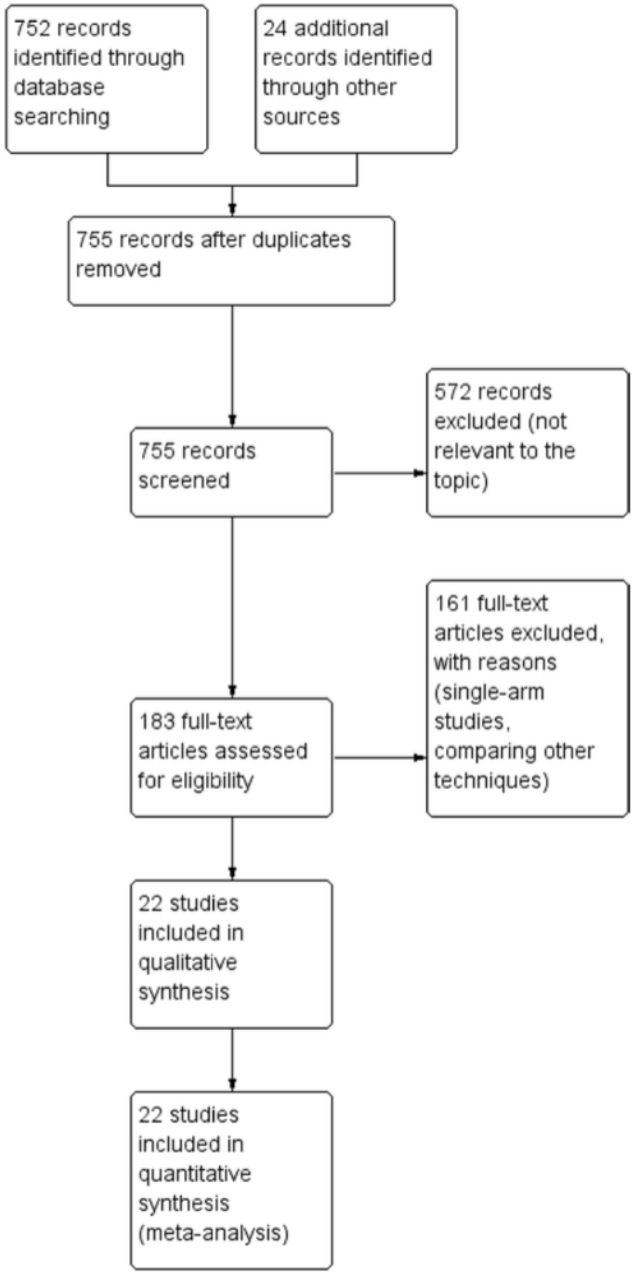


Fig. 1 PRISMA flow chart

Obesity Surgery (2024) 34:218–235
https://doi.org/10.1007/s11695-023-06956-x

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REVIEW

Check for updates

Does Omentopexy Make a Difference in Laparoscopic Sleeve Gastrectomy for Obesity Treatment? A Systematic Review and Meta-Analysis

Ali Yasen Y. Mohamedahmed[1] · Mohammed Hamid[2] · Shafquat Zaman[3,4] · Hashim E. Abdalla[1] · Ali Ahmed Wuheb[1] · Amir Khan[5] · Jitesh Parmar[1]

Received: 14 June 2023 / Revised: 4 November 2023 / Accepted: 13 November 2023 / Published online: 1 December 2023

- 22 studies, N= 9,321 patients
  - LSG with omentopexy (n = 4,805)
  - LSG without omentopexy (n = 4,516)
- 8 of the included studies were RCTs (n = 901)

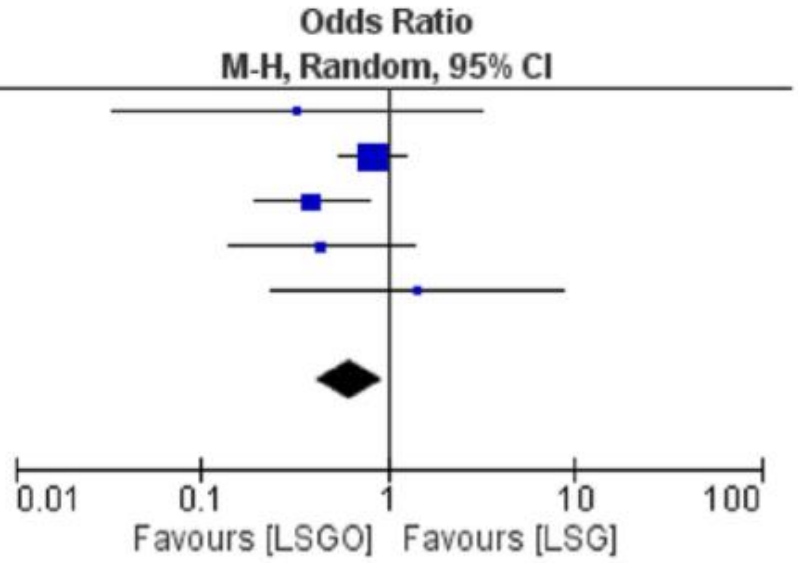
Omentopexy showed statistically significant lower rate of development GERD (9.7% vs. 11.1%), (*P = 0.03*)

Development of Gastro-oesophageal reflux disease.

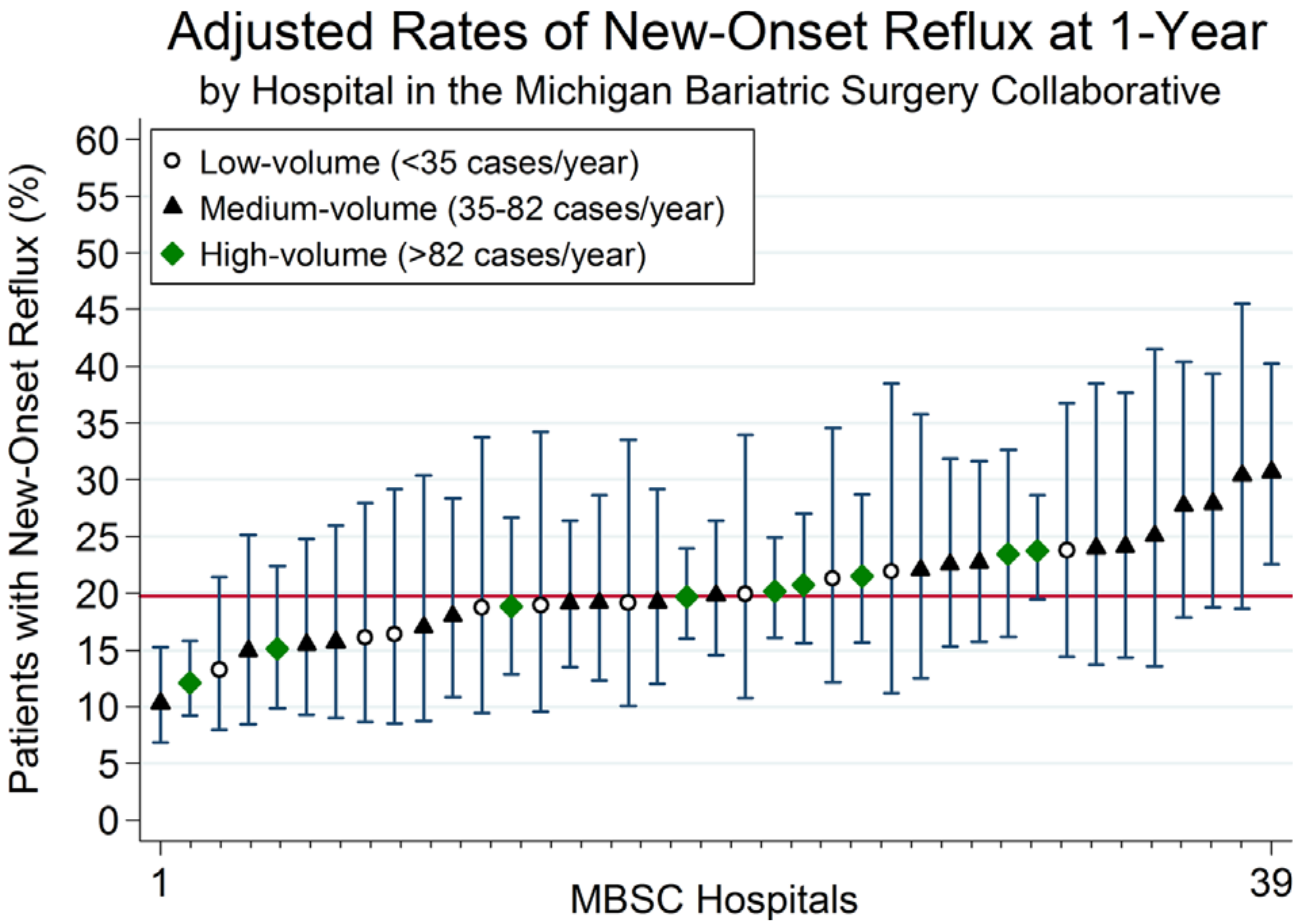
Study or Subgroup	LSGO Events	LSGO Total	LSG Events	LSG Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Labib 2020	1	86	3	86	3.4%	0.33 [0.03, 3.19]	2020
Sharma 2020	49	370	57	367	52.3%	0.83 [0.55, 1.25]	2020
AlHaddad 2021	18	70	33	70	26.6%	0.39 [0.19, 0.79]	2021
Elghandour 2021	5	60	10	59	12.3%	0.45 [0.14, 1.39]	2021
Derebey 2022	2	180	3	387	5.4%	1.44 [0.24, 8.68]	2022
Total (95% CI)		**766**		**969**	**100.0%**	**0.63 [0.41, 0.96]**	
Total events	75		106				

Heterogeneity: $Tau^2 = 0.05$; $Chi^2 = 4.86$, df = 4 (P = 0.30); $I^2 = 18\%$

Test for overall effect: Z = 2.14 (P = 0.03)



Variability among surgeons



SOARD 2016

Conclusions

- GERD is common post-sleeve but varies in severity
- Not all GERD requires surgical intervention, the great majority can be managed with PPIs
- Proper patient selection & sleeve technique matter
- So GERD after of Sleeve happens, most manageable without major consequences and NOT SO IMPORTANT

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