Should hiatus be dissected in all patients submitted to LSG or is this overtreatment?

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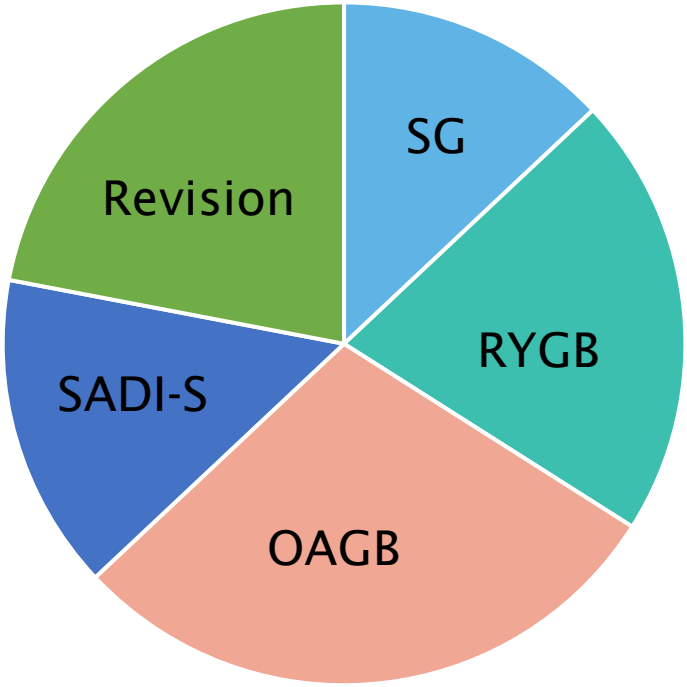
Disclosures

Nothing to disclose

Case mix

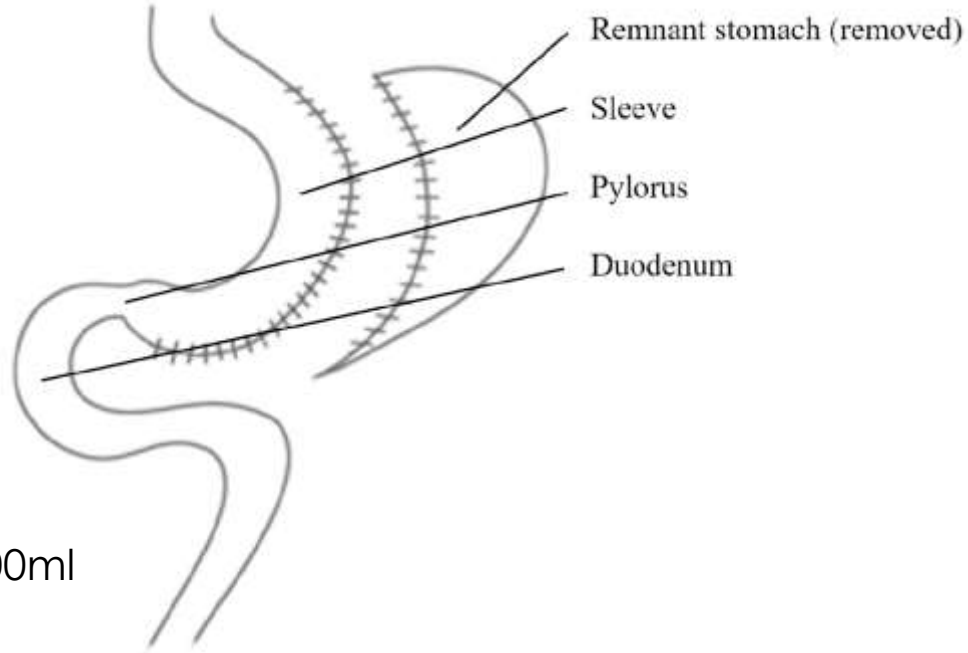


LAGB	0%
SG	13%
RYGB	21%
OAGB	29%
SADI-S	15%
Revision	22%

Technique:

Surgical technique of SG at Medical University Vienna

- 36fr (12mm) bougie
- 5 -7 reloads of 60mm staplers
  (stapler size: 3-4mm)



- Starting point: 2-4cm from pylorus
- Resected stomach volume 800-1500ml

Indications and contraindications

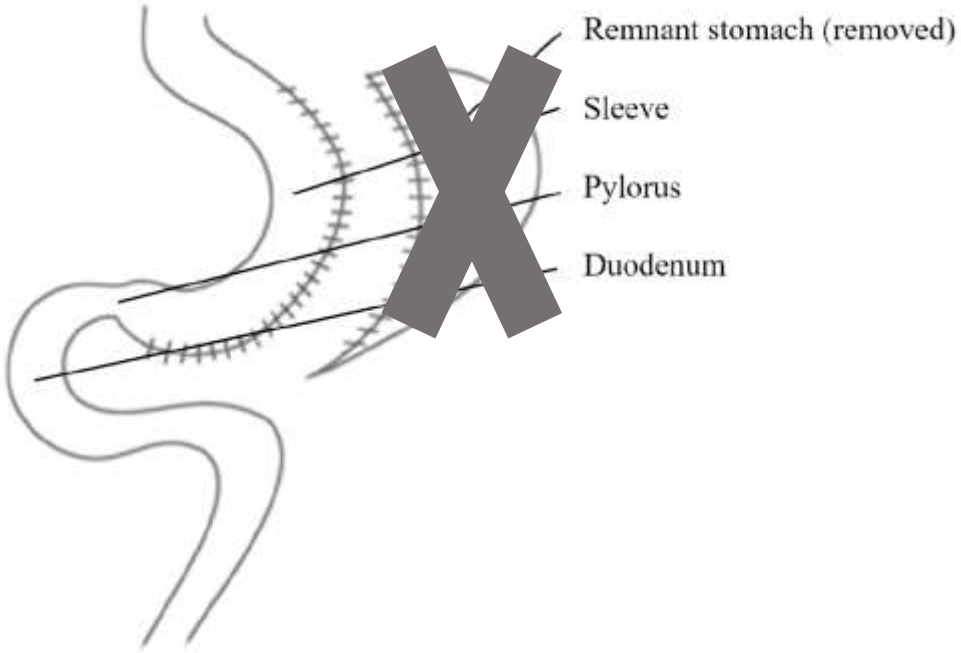
Indications of SG at Medical University Vienna

Indications:

- BMI >40kg/m^2
- BMI >35kg/m^2 + comorbidities

Contraindications:

- Syptomatic GERD (Reflux)
- Barrett´s Esophagus
- Hiatal hernias



ELSEVIER

SURGERY FOR OBESITY AND RELATED DISEASES

Surgery for Obesity and Related Diseases 16 (2020) 1171–1177

Original article

Sleeve gastrectomy with concomitant hiatal hernia repair in obese patients: long-term results on gastroesophageal reflux disease

Luigi Angrisani, M.D.[a], Antonella Santonicola, M.D.[b,*], Vincenzo Borrelli, M.D.[c], Paola Iovino, M.D.[b]

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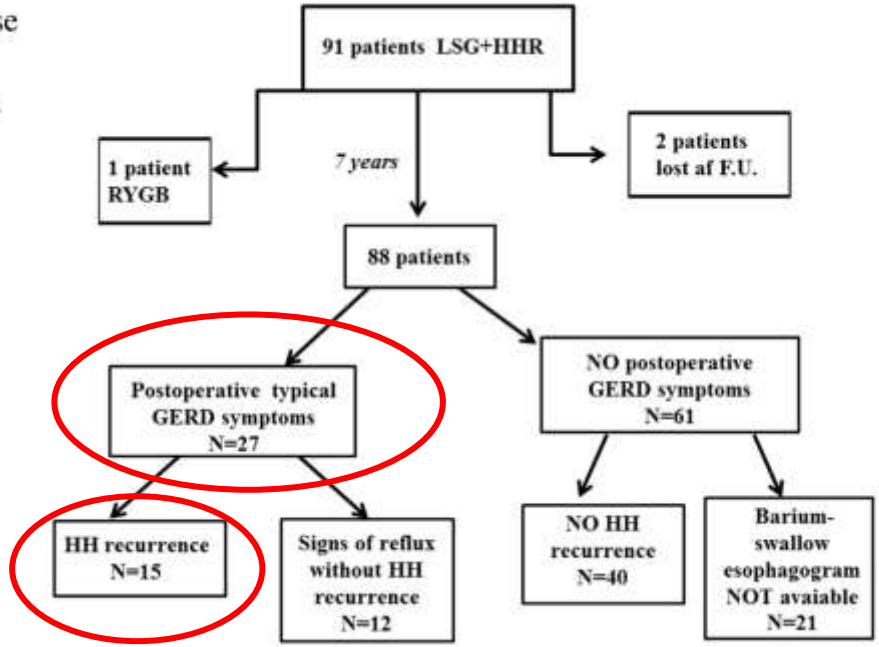
Received 7 January 2020; accepted 30 April 2020



91 SG + HHR patients

Min. ***7 years follow-up***

Patients with GERD preoperatively: **60% resolution** of GERD

Patients without GERD preoperatively: **30.6% new onset of GERD**
(of these **55% with a recurrent HH** – all of these with esophagitis)

Angrisani L. et al SOARD 2020

OBES SURG (2017) 27:2898–2904
DOI 10.1007/s11695-017-2702-x

ORIGINAL CONTRIBUTIONS

Gastroesophageal Reflux Disease After Laparoscopic Sleeve Gastrectomy with Concomitant Hiatal Hernia Repair: an Unresolved Question

Hanaa Dakour Aridi[1] · Mohammad Asali[1] · Tarek Fouani[1] · Ramzi S. Alami[1] · Bassem Y. Safadi[1]

Table 3 Change in gastroesophageal reflux disease symptoms at 1 year after LSG with and without HHR

	LSG alone ($n = 89$)	LSG+HHR ($n = 76$)	p value
Preoperative GERD*	37 (41.6)	47 (61.8)	0.04
GERD remission	11 (29.7)	10 (21.3)	0.45
GERD improvement	1 (2.7)	3 (6.4)	0.63
GERD persistence (no change)	11 (29.7)	15 (31.9)	0.83
GERD worsening	14 (37.8)	19 (40.4)	0.81
De novo GERD	24 (46.2)	12 (41.4)	0.68
De novo GERD on frequent PPI	18 (34.6)	9 (31.0)	0.74

LSG laparoscopic sleeve gastrectomy, *HHR* hiatal hernia repair, *GERD* gastroesophageal reflux disease, *PPI* proton pump inhibitor

*Statistically significant ($p<0.05$)

76 patients SG + HHR
89 patients SG

Group SG + HHR: GERD remission: **21.3%;** new GERD onset: **41.4%**
Group SG: GERD remission: **29.7%;** new GERD onset: **46.2%**

Conclusion: HHR at the time of SG does not show an improvement of GERD symptoms

Aridi H.D. et al Obes Surg 2017

Obesity Surgery (2021) 31:3905–3918
https://doi.org/10.1007/s11695-021-05545-0

ORIGINAL CONTRIBUTIONS

Effect of Concomitant Laparoscopic Sleeve Gastrectomy and Hiatal Hernia Repair on Gastroesophageal Reflux Disease in Patients with Obesity: a Systematic Review and Meta-analysis

Wenhui Chen[1] · Jia Feng[2] · Cunchuan Wang[1] · Yucheng Wang[1] · Wah Yang[1] · Zhiyong Dong[1] · on behalf of Chinese Obesity and Metabolic Surgery Collaborative[1]

Meta-analysis: 18 articles, 937 patients
(13 studies SG – HHR; 5 studies SG-HHR vs. SG)
Min. follow-up: follow-up 12 months

SG + HHR: GERD remission of 68%, de-novo GERD 12%, HH recurrence 11%

Conclusion: SG + HHR superior to SG (alone) in GERD remission but not in new-onset GERD

Chen W. et al. Obes Surg 2021

ORIGINAL ARTICLE

The Effect of Laparoscopic Sleeve Gastrectomy With Concomitant Hiatal Hernia Repair on Gastroesophageal Reflux Disease

Ozan Şen, MD,† Ümit Sekmen, MD,‡ and Ahmet G. Türkçapar, MD**

440 patients
SG: 395 patients
SG + HHR: 45 patients
Mean follow-up: 17 months

SG: 20% GERD
SG + HHR: 33% GERD

Conclusion: Symptomatic and **de-novo GERD** rates were detected to be **higher in the LSG+HH group** than LSG alone.

Sen O. et al Surg Laparosc Endosc Percutan Tech 2022

ELSEVIER

Surgery for Obesity and Related Diseases 19 (2023) 619–625

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Impact of concurrent hiatal hernia repair during laparoscopic sleeve gastrectomy on patient-reported gastroesophageal reflux symptoms: a state-wide analysis

Ahmad M. Hider, MPhil[a,*], Aaron J. Bonham, M.Sc.[b], Arthur M. Carlin, M.D., F.A.C.S., F.A.S.M.B.S.[d], Jonathan F. Finks, M.D.[a,c], Amir A. Ghaferi, M.D., M.S.[a,b,c], Oliver A. Varban, M.D.[a,c], Anne P. Ehlers, M.D., M.P.H.[a,b]

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Received 28 July 2022; accepted 2 December 2022

State-wide analysis USA
SG + HHR: 4015
SG: 7727
1 year follow-up

Higher complication rate and lower GERD improvement rate after **anterior HHR**

Table 2
Gastroesophageal reflux disease (GERD) outcomes between laparoscopic sleeve gastrectomy (LSG) alone, LSG with anterior hiatal hernia repair (HHR), and LSG with posterior hiatal hernia repair

GERD outcomes	No HH repair	Anterior repair	Posterior repair	Adjusted *P* value
GERD improvement	28.8%	30.8%	39.7%	<.0001
GERD score at baseline, Mean (SD)	2.02 (0.97)	2.11 (0.97)	2.20 (1.03)	<.0001
GERD score at 1 yr, Mean (SD)	0.37 (.69)	0.40 (.67)	0.37 (.67)	.8266
Change in GERD score, Mean (SD)	−1.65 (.83)	−1.71 (.82)	−1.83 (.93)	<.0001
GERD worsened	24.6%	27.6%	20.5%	<.0001
GERD score at baseline, Mean (SD)	.50 (.84)	.61 (.90)	.63 (.90)	.0014
GERD score at 1 yr, Mean (SD)	2.30 (1.17)	2.40 (1.26)	2.30 (1.14)	.4446
Change in GERD score, Mean (SD)	1.81 (.98)	1.80 (.99)	1.67 (.91)	.0171
New onset gERD	16.8%	17.1%	12.3%	<.0001
GERD score at 1 yr	1.94 (1.05)	1.87 (1.05)	1.81 (.98)	.1068
Discontinuation of GERD medications				
On PPI medications prior to surgery	26.5%	27.8%	38.5%	<.0001
Discontinued PPI medications at 1 yr	62.9%	65.9%	63.2%	.7781
Weight loss at 1 yr	86.7% (36.0)	83.6% (30.3)	80.4% (30.8)	<.0001
Total body weight loss%	29.3% (9.6)	30.4% (8.6)	29.1% (8.8)	.3521
BMI at 1 yr (kg/m^2)	33.4 (6.9)	31.1 (5.9)	31.8 (5.8)	<.0001

HH repair = hiatal hernia repair; GERD = gastroesophageal reflux disease; SD = standard deviation; BMI = body mass index; PPI = proton-pump inhibitor.

Carlin A. et. al SOARD 2022

ELSEVIER

Surgery for Obesity and Related Diseases 16 (2020) 365–371

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Safety of concurrent sleeve gastrectomy and hiatal hernia repair: a propensity score–matched analysis of the MBSAQIP registry

Michał R. Janik, M.D., Ph.D.[a,b,*], Christopher Ibikunle, M.D., F.A.C.S.[c,d], Amir H. Aryaie, M.D., F.A.C.S.[a,c,d]

[a]Bariatric Center of Excellence, Department of Surgery, Texas Tech University Health Science Center, Lubbock, Texas
[b]Department of General, Oncologic, Metabolic and Thoracic Surgery, Military Institute of Medicine, Warsaw, Poland
[c]Bariatric and Reflux Center, Georgia SurgiCare, Atlanta, Georgia
[d]Medical College of Georgia, Augusta, Georgia

Received 9 October 2019; accepted 7 December 2019

Table 3
Outcomes of patients undergoing laparoscopic sleeve gastrectomy with or without hiatal h

Outcome	With HHR n = 50,951	Without HHR n = 50,951
	Mean (SD) or %	Mean (SD) or
Days to hospital discharge from initial bariatric procedure	1.51 (1.31)	1.62 (1.26)
Length of bariatric procedure, min	77.03 (36.43)	72.62 (35.81)
Conversions to open approach	.06	.08
Emergency department visits within the 30 d postoperative, %	6.03	5.80
Inpatient readmission(s) by midnight of POD 30	4.01	2.96
Reoperations performed within 30 d	1.10	.77
Intervention performed within 30 d	1.24	.95
Leak within 30 d	.43	.45
Bleeding within 30 d	.63	.62
Death within 30 d	.02	.02
Any medical complications within 30 d	1.85	1.47

HH = hiatal hernia; SD = standard deviation; RR = risk ratio; CI = confidence interva

MBSAQIP registry 101,902 patients with SG or SG + HHR
50,951 matched pairs
Short-term follow-up

HHR slightly **increases the risk** of readmission, reoperation, and postoperative intervention, as well as morbidity.

Janik M. et. al SOARD 2019

ELSEVIER
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Surgery for Obesity and Related Diseases 11 (2015) 530–538
SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Gastroesophageal reflux in laparoscopic sleeve gastrectomy: hiatal findings and their management influence outcome

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[a]Surgical Outcomes Research Centre, University of Sydney, Royal Prince Alfred, Hospital, Camperdown, Sydney, Australia
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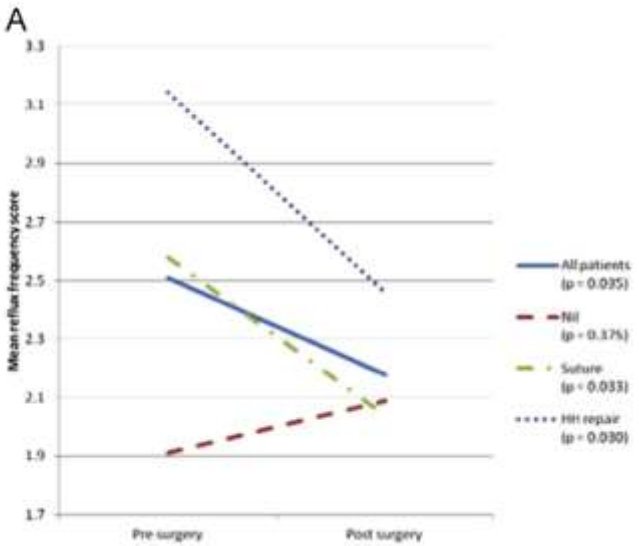
Received May 6, 2014; accepted August 11, 2014



262 patients managed by their intraoperative finding
No intervention or **anterior dissection and single stich** or **classic hiatoplasty**
Max. 3 years follow-up
81% follow-up rate
Method: Different GERD scores

Improvement of GERD symptoms in both HHR groups

Conclusion: An **aggressive approach** to the management of hiatal laxity improves reflux symptoms

Lyon A. et al. SOARD 2014

Journal of Clinical Medicine

MDPI

Systematic Review

Efficacy of Sleeve Gastrectomy with Concomitant Hiatal Hernia Repair versus Sleeve–Fundoplication on Gastroesophageal Reflux Disease Resolution: Systematic Review and Meta-Analysis

Lidia Castagneto-Gissey, Maria Francesca Russo, Vito D'Andrea, Alfredo Genco and Giovanni Casella *

Department of Surgery, Sapienza University of Rome, Viale Regina Elena, 324, 00161 Rome, Italy; lidia.castagnetogissey@uniroma1.it (L.C.-G.)
* Correspondence: giovanni.casella@uniroma1.it; Tel.: +39-0649975515

Meta-analysis: 15 articles, 1164 patients
554 patients **SG + HHR;**
610 patients **SG + Fundoplication**
Mean follow-up: 37months (min. follow-up 12 months)

SG + HHR: Perforations: 0%; mortality: 0%
SG + Fundoplication: Perforations: 3.1%; mortality: 0.5%

SG + HHR: GERD improvement: 58.5% → 20.4%
SG + Fundoplication: GERD improvement: 64.8% → 5%

Castagneto-Gissey L. et al JCM 2023

Surgical Endoscopy (2023) 37:3747–3759
https://doi.org/10.1007/s00464-022-09829-z

Reconstruction of the phreno-esophageal ligament (R-PEL) prevents the intrathoracic migration (ITM) after concomitant sleeve gastrectomy and hiatal hernia repair

I. Hutopila[1,2] · M. Ciocoiu[3] · L. Paunescu[3] · C. Copaescu[1,4,5]

Received: 1 September 2022 / Accepted: 12 December 2022 / Published online: 19 January 2023

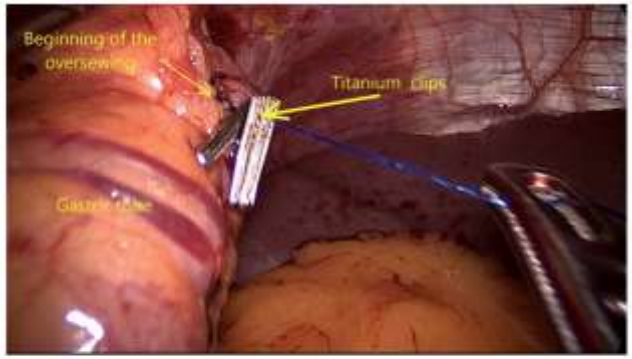
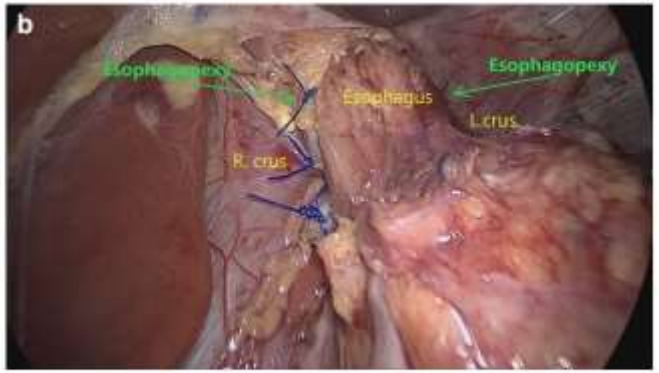


Fig. 3 LSG technique. Titanium ML clips are applied on the polypropylene thread to radiologically mark the GEJ

273 patients
SG + HHR: 147 patients
SG + HHR + reconstruction of the phrenicoesophageal ligament: 127 patients
Follow-up: 12-month swallow x-ray

SG + HHR: 50% ITM; GERD: 37%
SG + HHR + rPEL: 9% ITM; GERD 21%



the orientation of the phrenico-esophagian pexy, at 9 and 3 o'clock (Color figure online)

Hutopila I. et al Surgical Endoscopy 2023

Our data / 15 years after SG

Obesity Facts

Research Article

Obes Facts 2022;15:666–673
DOI: 10.1159/000526170

Received: May 6, 2022
Accepted: June 30, 2022
Published online: July 26, 2022

Fifteen Years after Sleeve Gastrectomy: Gastroscopies, Manometries, and 24-h pH-Metries in a Long-Term Follow-Up: A Multicenter Study

Daniel Moritz Felsenreich[a] Evi Artemiou[a] Lukas Wintersteller[a] Julia Jedamzik[a]
Jakob Eichelter[a] Lisa Gensthaler[a] Christoph Bichler[a] Christoph Sperker[b]
Philipp Beckerhinn[c] Ivan Kristo[a] Felix Benedikt Langer[a] Gerhard Prager[a]

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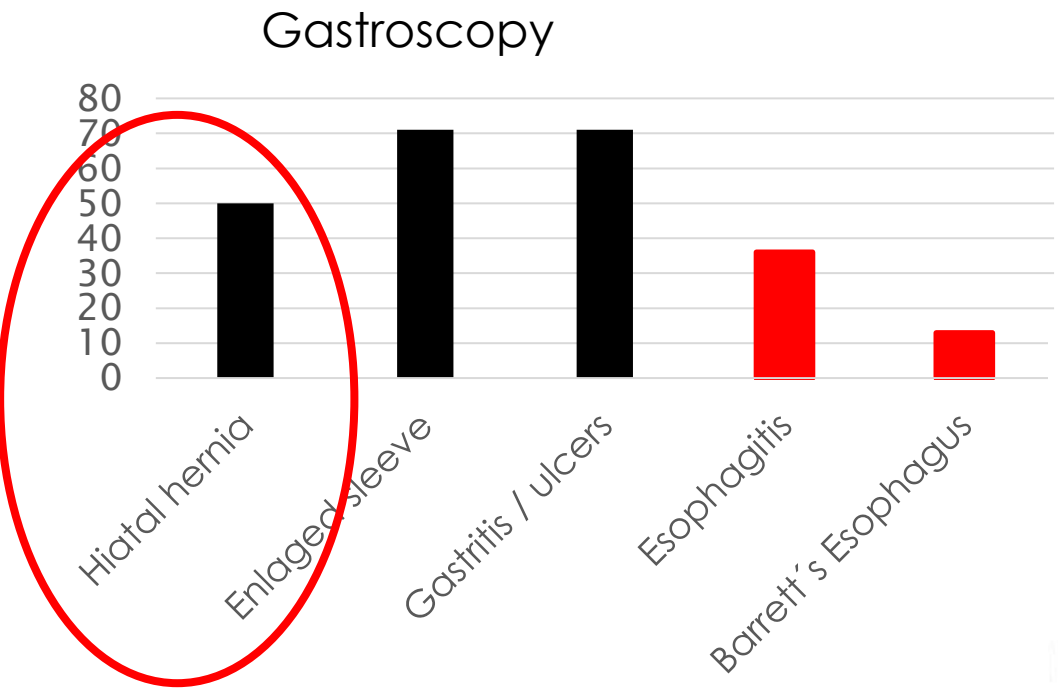
Felseneich D.M. et al Obesity Facts 2022

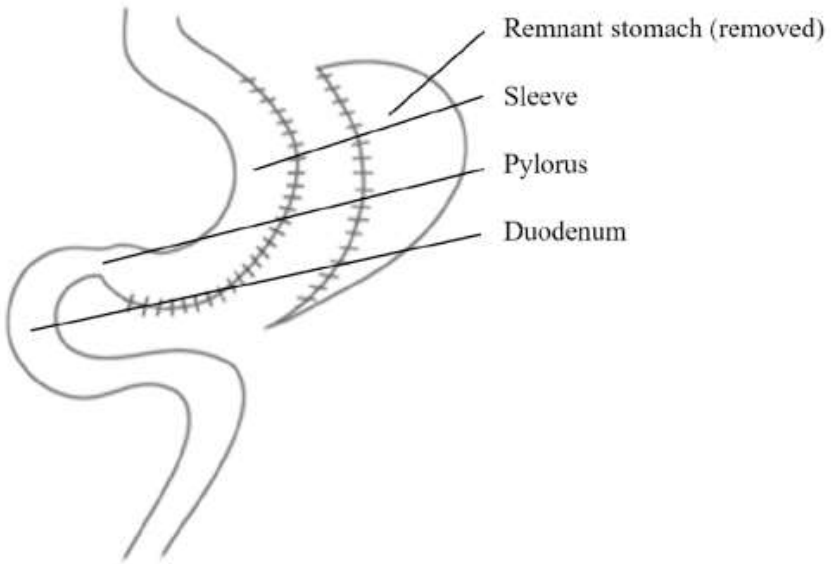
Our data / 15 years after SG



Non-converted patients:

46% symptomatic reflux (n=11)

54% no reflux (n=13)



Felseneich D.M. et al Obesity Facts 2022

Conclusion:

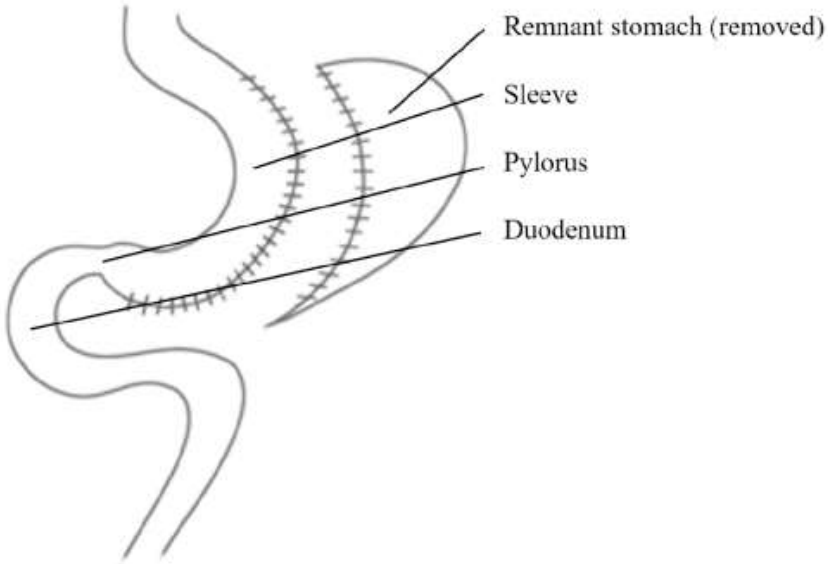


Table 3. 24-h pH-metry and manometry results 15 years after SG

	All non-converted patients	Non-converted patients with symptomatic GERD	Non-converted patients without GERD	*p* value
Manometry	(*n* = 11)	(*n* = 6, 55%)	(*n* = 5, 45%)	
LESP, mm Hg (normal 10–35 mm Hg)	20.2±14.1	22.1±18.6	19.1±9.1	0.71
Patients increased, %	9	17	0	
Patients decreased, %	9	17	0	
24-h pH-metry	(*n* = 11)	(*n* = 6, 55%)	(*n* = 5, 45%)	
Acid exposure, % (normal <4.2%)	12.9±9.7	14.7±10.2	10.3±9.1	0.22
Patients increased, %	91	100	80	
Reflux activity, *n* (normal <73)	98.0±80.8	112.0±81.3	87.0±0.79.7	0.18
Patients increased, %	55	67	40	
DeMeester score (normal <14.72)	55.3±36.3	65.3±42.4	42.3±33.1	0.15
Patients increased, %	82	83	80	

LESP, lower esophageal sphincter pressure; GERD, gastroesophageal reflux disease; SG, sleeve gastrectomy

Conclusion

Should hiatus be dissected in all patients submitted to LSG?

Weak evidence

- **No RCTs**
- Low number of patients
- No long-term data
- Results based on symptoms and questionnaires
- (**No data** from **manometry** and **24h pH-metry**)

- SG + HHR seems to improve GERD rates in short-, mid-term follow-up
- The complications rate seems to be slightly higher in SG + HHR

Conclusion

Should hiatus be dissected in all patients submitted to LSG?

- The crura of the hiatus should be **visualized** in LSG
- In patients with **hiatal hernias** (intraoperative), a **hiatal hernia repair** should be performed (posterior preferable to anterior)
- There is **no evidence to dissect** (and repair) the hiatus in patients **without hiatal hernia** in the intraoperative visualisation

Thank you for your attention!

Gerhard Prager

Felix Langer

Daniel Moritz Felsenreich

Larissa Nixdorf

Magdalena Eilenberg

Julia Jedamzik

Christoph Bichler

Paula Richwien

IFSO European Chapter

See you in Vienna

SAVE THE DATE

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