



Long term laparoscopic Sleeve gastrectomy outcomes

Gerhard Prager

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Long-term results of gastric sleeve resection / Gerhard Prager
Metabolic and Bariatric Surgery

Disclosures



Medtronic

unrestricted educational grant
travel grants





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Long-term results of gastric sleeve resection / Gerhard Prager
Metabolic and Bariatric Surgery

The Medical University of Vienna is...

- a medical research and education facility with a tradition spanning over almost **650 years**
- autonomous since 2004 (formerly the “Medical School of the University of Vienna”)
- **Europe’s largest school of medicine** with almost **8,000 enrolled students** located in close vicinity to Europe’s largest hospital (**Vienna General Hospital**), whose **1,500 physicians** it sources
- the employer of more than 5.500 staff members (including 3.600 scientific researchers)



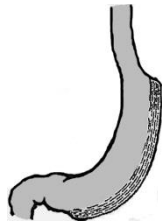


Patient Care - University Departments/ Vienna General Hospital

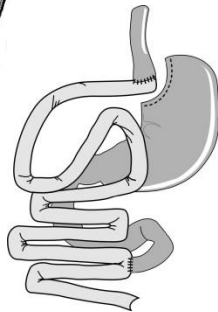
- 26 Clinical Departments with
39 Clinical Divisions,
3 Clinical Institutes
- 62 Outpatient departments,
351 Specialized outpatient departments
- 106.869 inpatient cases
- 539.611 outpatient cases
- 53.174 surgeries
- 1.603 physicians



1996 lap. Gastric Banding



2002 lap. Sleeve Gastrectomy



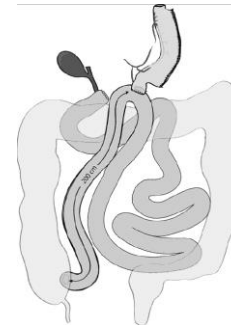
lap. Y-Roux Gastric Bypass



2009 lap. BPD



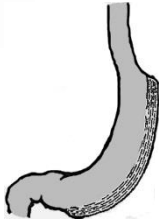
2010 lap. Omega Loop



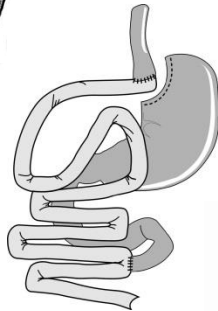
2016 lap SADI-S



lap. Gastric Banding



lap. Sleeve Gastrectomy



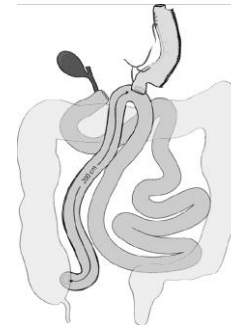
lap. Y-Roux Gastric Bypass



lap. BPD



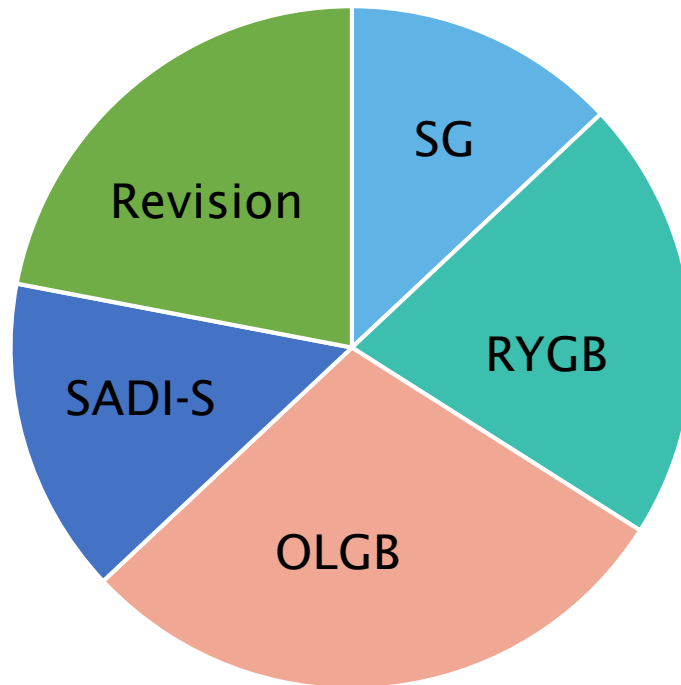
lap. Omega Loop



lap SADI-S

Disclosures

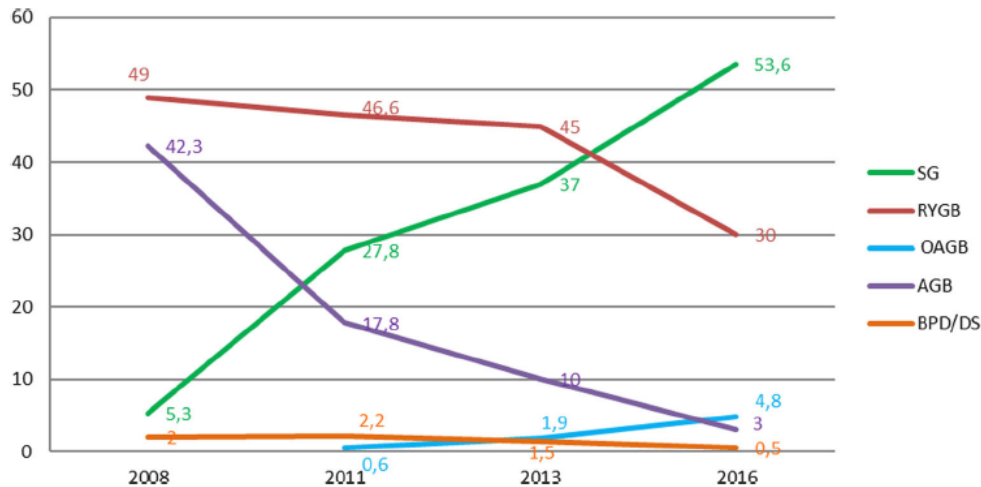
Case-Mix



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

Background

Bariatric procedures worldwide 2016:



Procedure	Number
Gastric banding	19.332
Sleeve gastrectomy	340.550
Roux-en-Y GB	191.326
One-anastomosis GB	30.563
BPD/DS	3.346
Total	685.874

Angrisani, Obes Surg 2018

Bariatric Operations Austria 2015 in %

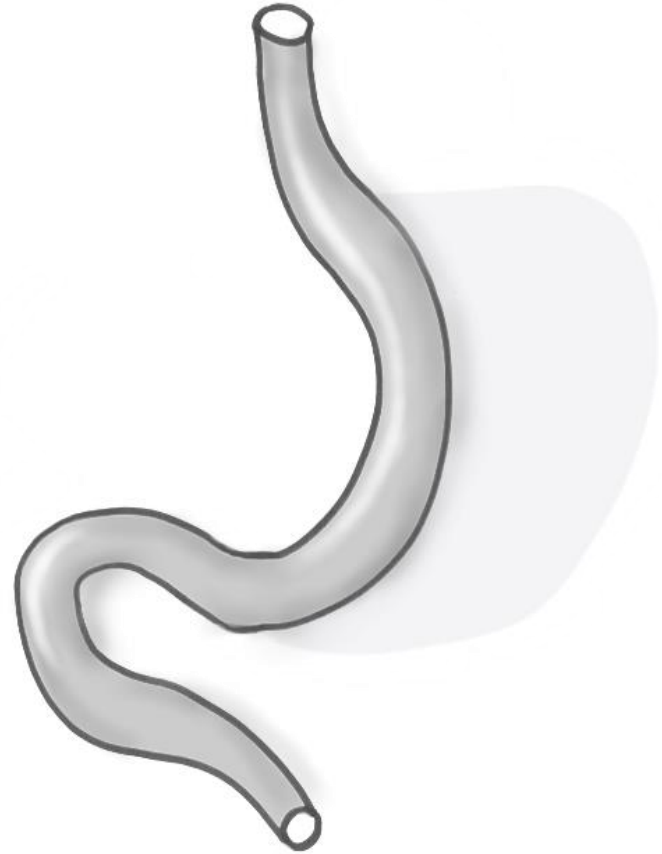


Operation:

Laparoscopic Gastric Banding	2,0%
Laparoscopic Sleeve Gastrectomy	25,0%
Laparoscopic Y-Roux Bypass	51,0%
Laparoscopic Omega Loop Bypass/OAGB	21,0%
Others	1,0%

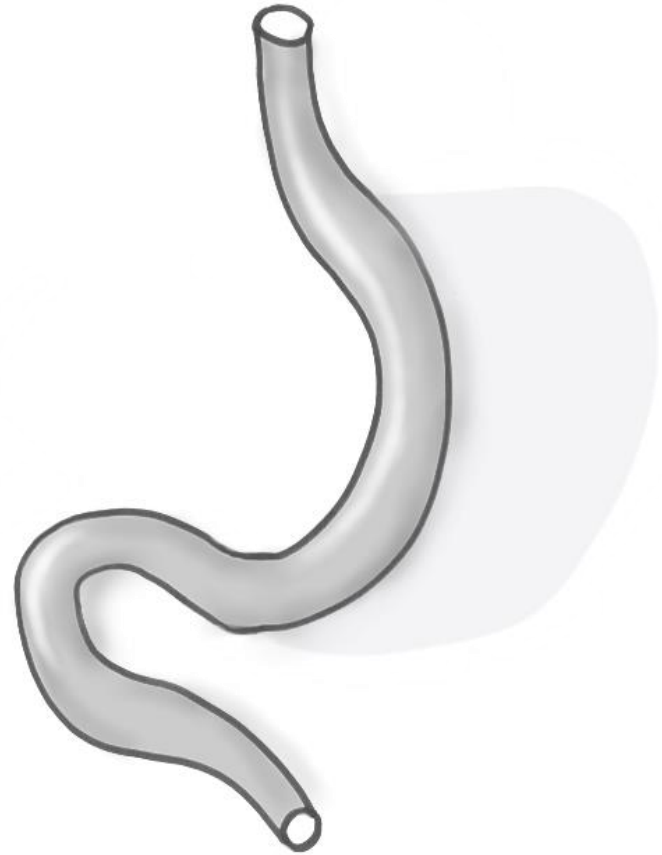
Long term results

- weight loss/regain
- reflux
- Barrett's Metaplasia
- (impaired) QoL



Surgical technique comparable?

- > 10years ago?
- today?



Surgical technique - 10 years ago



The First International Consensus Summit for Sleeve Gastrectomy (SG), New York City, October 25–27, 2007

Mervyn Deitel • Ross D. Crosby • Michel Gagner

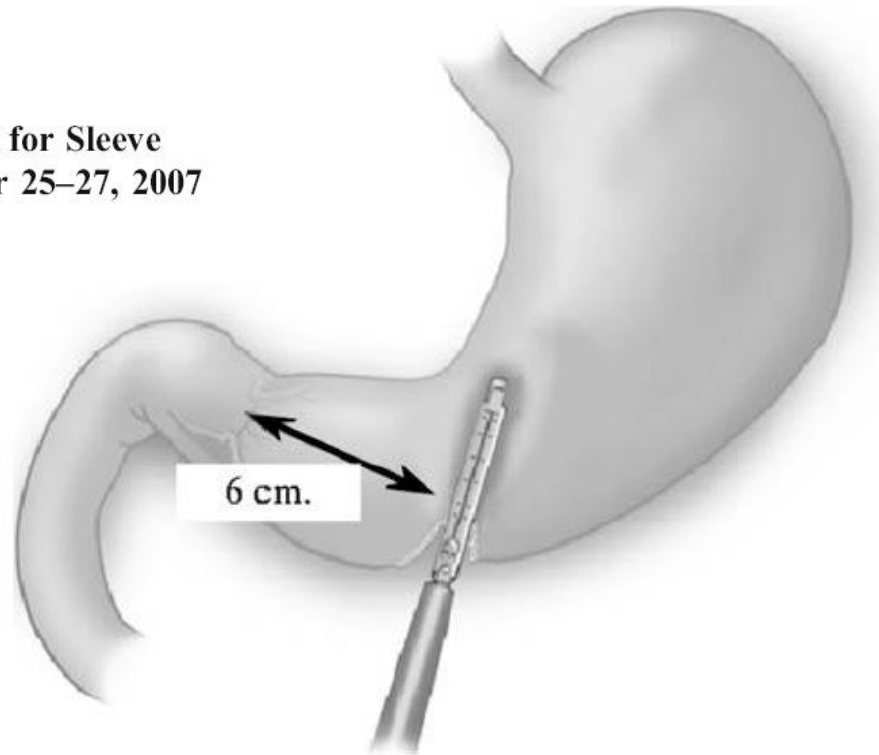
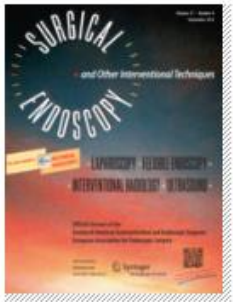


Fig. 2 Laparoscopic placement of endoscopic stapler, 6 cm proximal to the pyloric valve (method of Gagner) at approximately the incisura angularis [5]

Deitel et al., Obes Surg 2008

Surgical technique



Three-dimensional stomach analysis with computed tomography after laparoscopic sleeve gastrectomy: sleeve dilation and thoracic migration

Tobias Baumann · Jodok Grueneberger · Gregor Pache · Simon Kuesters · Goran Marjanovic · Birte Kulemann · Philipp Holzner · Iwona Karcz-Socha · Dorothea Suesslin · Ulrich T. Hopt · Mathias Langer · Wojciech K. Karcz

Baumann T, Surg Endosc 11

Surgical technique

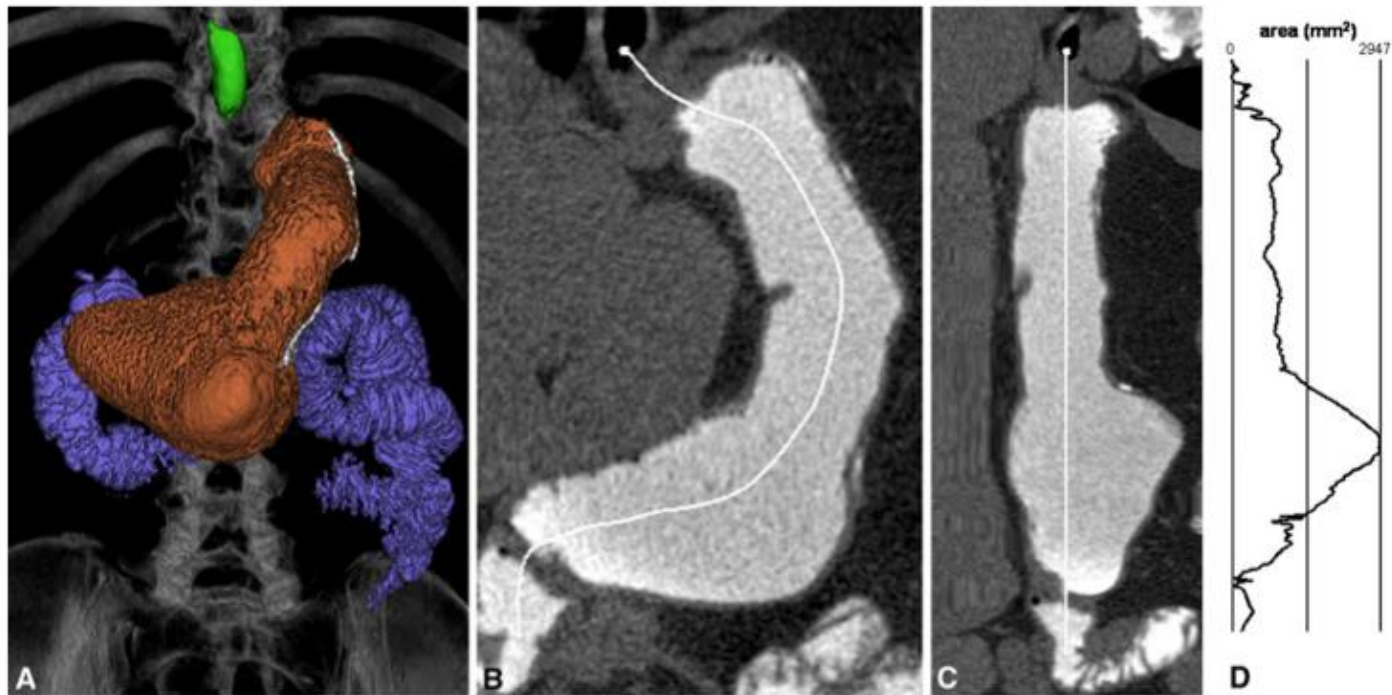
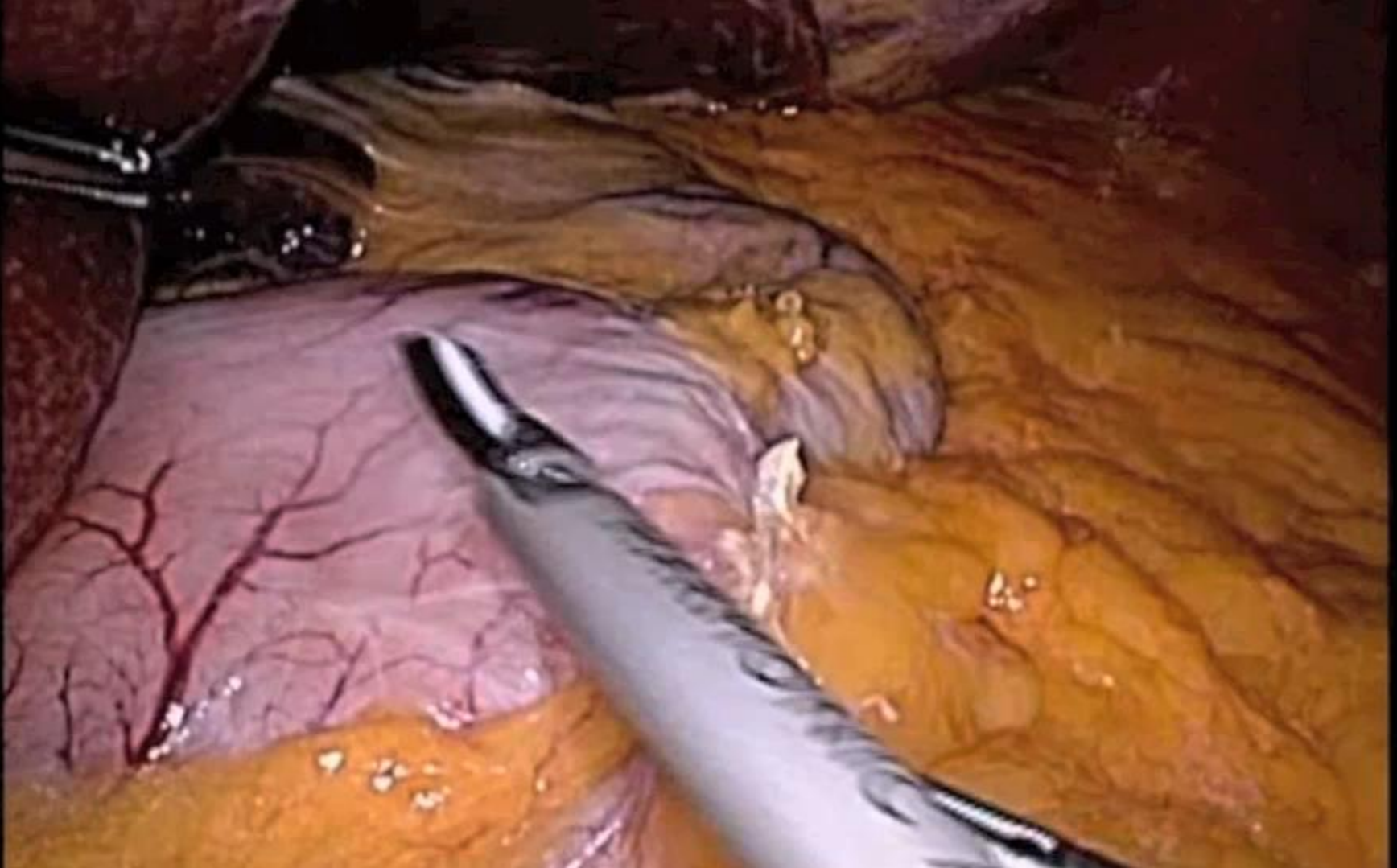


Fig. 1 **A** Volume-rendering image showing an enlarged sleeve stomach with a volume of 330 ml in a 34-year-old female patient 7 months after laparoscopic sleeve gastrectomy. Different transfer functions were applied to each 3D mask to show the stomach (center foreground, *orange* in electronic version), the staple line (left along the stomach, *white* in electronic version), the duodenum and proximal intestine (center background, *blue* in electronic version), and the esophagus (top, *green* in electronic version). The curved planar

reformat along the center of the stomach (**B**) and the stretched view (**C**) show a sleeve with a maximum cross-sectional area of 8.5 cm². This area can be obtained from the automatically generated area profile (**D**). For each position along the same centerline as depicted in (**C**), the cross-sectional area of the stomach is automatically calculated by using a density threshold that identifies the contrast media inside the stomach. The area is given in mm². The maximum value of 2947 mm² corresponds to the widest part of the antrum

Surgical technique – 10 years ago



Surgical technique



The First International Consensus Summit for Sleeve Gastrectomy (SG), New York City, October 25–27, 2007

Mervyn Deitel • Ross D. Crosby • Michel Gagner

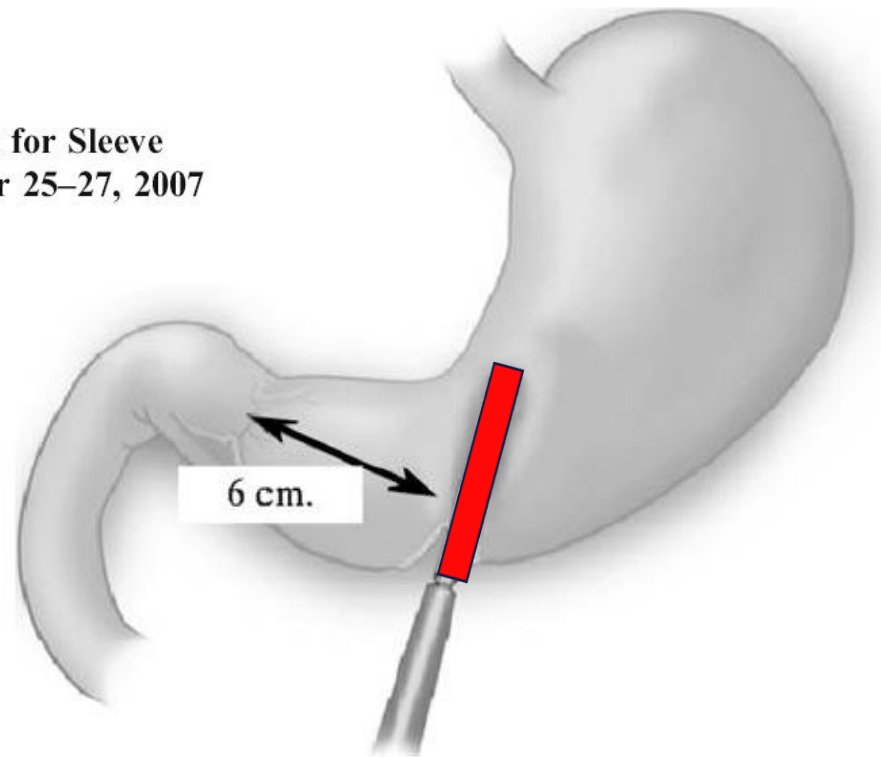
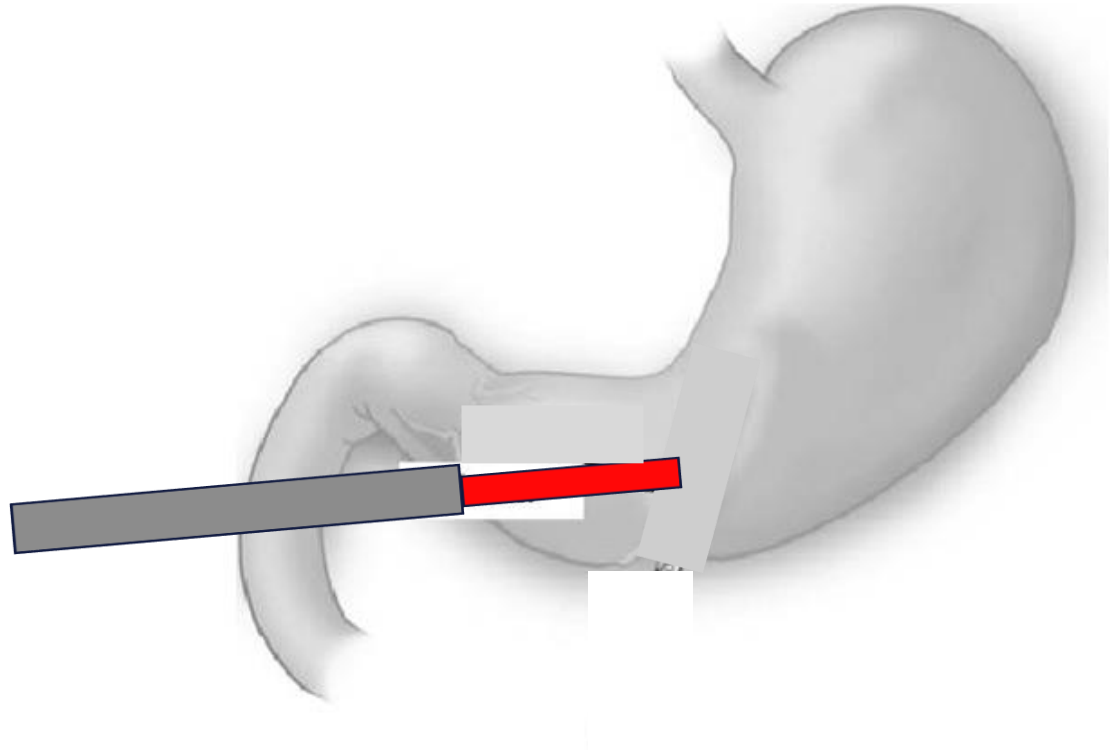


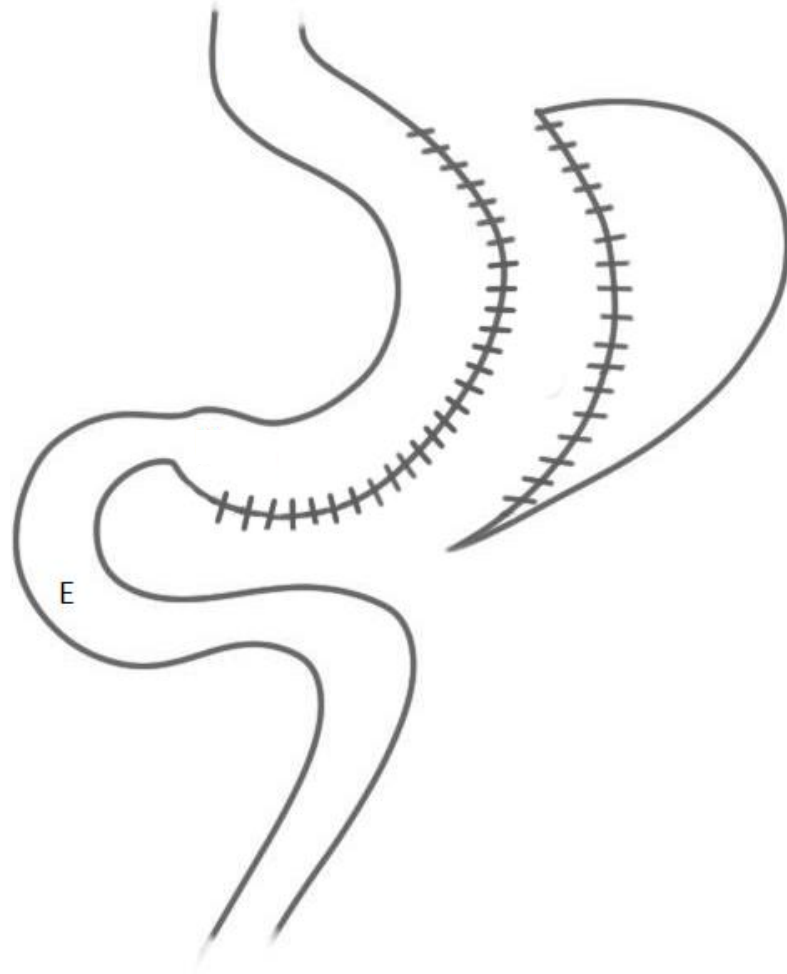
Fig. 2 Laparoscopic placement of endoscopic stapler, 6 cm proximal to the pyloric valve (method of Gagner) at approximately the incisura angularis [5]

Deitel et al., Obes Surg 2008

Surgical technique - today

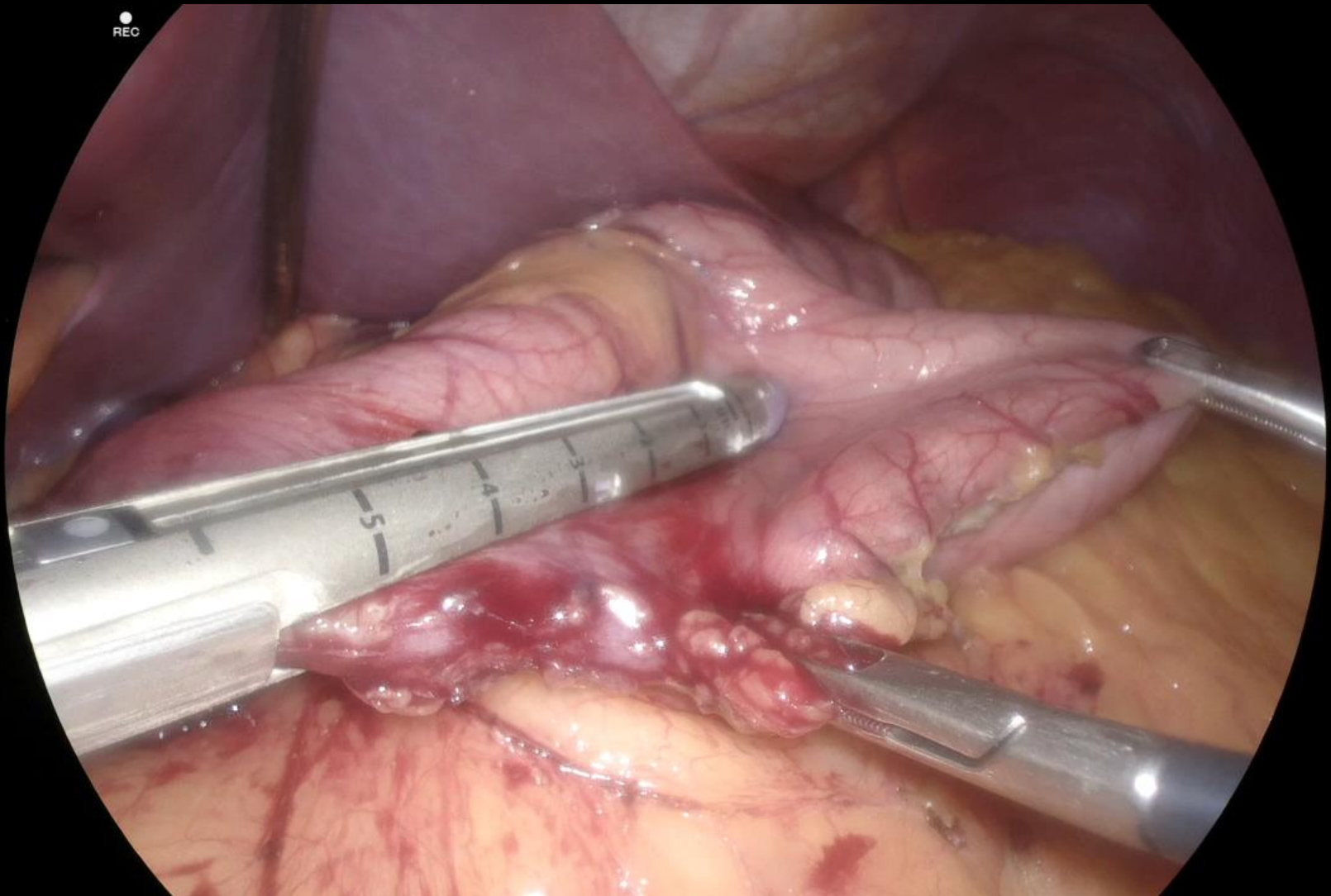


Surgical technique - today



2017

Surgical technique



Antral resection



Midterm Clinical Outcomes of Antrum Resection Margin at Laparoscopic Sleeve Gastrectomy for Morbid Obesity

Serdar Yormaz¹ • Huseyin Yilmaz¹ • Ilhan Ece¹ • Farise Yilmaz² • Mustafa Sahin¹

Yormaz et al., Obes Surg 2017

Antral resection



Midterm Clinical Outcomes of Antrum Resection Margin at Laparoscopic Sleeve Gastrectomy for Morbid Obesity

Serdar Yormaz¹ • Huseyin Yilmaz¹ • Ilhan Ece¹ • Farise Yilmaz² • Mustafa Sahin¹

- A: Antrum resected 2cm from the pylorus 84 patients
- B: Antrum resected 6cm from the pylorus 68 patients

Yormaz et al., Obes Surg 2017

Antral resection

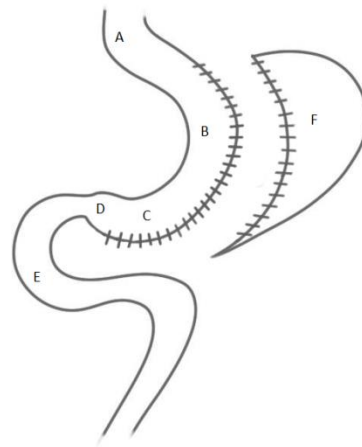


Midterm Clinical Outcomes of Antrum Resection Margin at Laparoscopic Sleeve Gastrectomy for Morbid Obesity

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A: Antrum resected 2cm from the pylorus 84 patients

B: Antrum resected 6cm from the pylorus 68 patients



better weight loss (6,12,24 months)

less short-term GERD (6,12 months)

Yormaz et al., Obes Surg 2017

Antral resection

Review article

Antral resection versus antral preservation during laparoscopic sleeve gastrectomy for severe obesity: Systematic review and meta-analysis

Emma Rose McGlone, M.B.B.S., M.A., M.R.C.S.^{a,*}, Ajay K. Gupta, M.B.B.S., M.R.C.P., Ph.D.^{b,c},
Marcus Reddy, M.B.B.S., B.Sc., F.R.C.S.^{d,e}, Omar A. Khan, M.B.B.S., Ph.D., F.R.C.S.^{d,f}

^aDepartment of Metabolic and Investigative Medicine, Hammersmith Hospital Campus, Imperial College London, London, United Kingdom



8 studies (619 participants)

6 randomized controlled trials, 2 cohort studies.

24-month follow-up: mean EWL 70% antral resection
 mean EWL 61% antral preservation

no difference: perioperative bleeding
 leak
 de novo gastroesophageal reflux disease

McGlone et al., SOARD 18

Long term data

Long term data - literature



Weight loss, weight regain, and conversions to Roux-en-Y gastric bypass: 10-year results of laparoscopic sleeve gastrectomy

Daniel M. Felsenreich, M.D.^a, Felix B. Langer, M.D.^a, Ronald Kefurt, M.D.^a,
Peter Panhofer, M.D.^a, Martin Schermann, M.D.^b, Philipp Beckerhinn, M.D.^c,
Christoph Sperker, M.D.^b, Gerhard Prager, M.D.^{a,*}

^aDivision of General Surgery, Department of Surgery, Medical University of Vienna, Vienna, Austria

^bDepartment of Surgery, Hospital Rudolfstiftung, Vienna, Austria

^cDepartment of Surgery, Hospital Hollabrunn, Hollabrunn, Austria

Received October 28, 2015; accepted February 21, 2016

first >10-years data

Complete follow-up

53 patients

Felsenreich DM et al., SOARD 2016

Long term data – weight loss

Table 4
Review of the literature on long-term (≥ 5 yr) weight loss of SG

Study	FU	Patients	Bougie size	Nonconverted (n)	%EWL*	Conversion Rate (procedure)
Bohdjalian 2010 [5]	5 yr	26	48Fr	22	55%	15.4% (4 RYGB)
Sieber [7]	5 yr	68	35Fr	60	57%	11.8% (2 RYGB, 6 DS)
Alexandru 2014 [6]	5 yr	30	29Fr	25	56%	16.7% (5 RYGB)
Lemanu 2015 [8]	5 yr	96	38Fr	55	40%	0
Keren 2015 [30]	5 yr	130	n.a.	123	45%	3.1% (7 BPD)
Himpens 2010 [11]	6 yr	53	34Fr	30	53%	24.5% (11 DS, 2 ReS)
D'Hondt 2011 [17]	6 yr	102	30Fr	23	56%	0
Hirth 2015 [18]	7 yr	16	32Fr	14	59 %	0
Eid 2012 [19]	8 yr	126	50Fr	69	46%	40.0% (51 RYGB)
Sarella 2012 [10]	8–9 yr	20	32Fr	13	69%	20.0% (3 RYGB, 1 DS,)
Present study	10 yr	53	48Fr	32	52%	35.8% (18 RYGB, 1 DS)

SG = sleeve gastrectomy; FU = follow up; %EWL = percent excess weight loss; RYGB = Roux-en-Y gastric bypass; DS = duodenal switch; n.a. = not available; BPD = biliopancreatic diversion; ReS resleeve gastrectomy.

*%EWL of non-converted sleeves at end of follow-up.

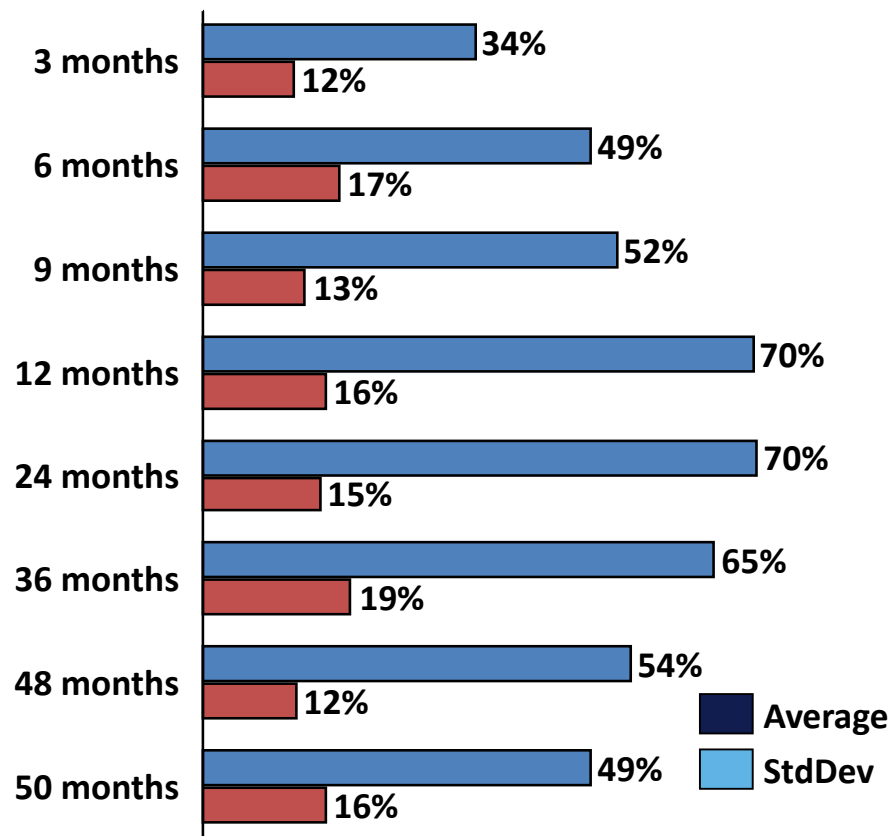
Felsenreich DM et al., SOARD 2016



Sleeve consensus Miami 2011

	Average	Std. Deviation
Number of cases	10,544	192
Age	43.1	3.8
Female %	72%	9%
BMI	45.1	3.9
Bougie size	36.5	5.1
Average Hospital Stay	2.4	1
Leak rate	1%	2%
Stricture rate	6%	22%
Rate of Postop GERD	13%	12%
% of Conversions	2%	4%

Average Weight Loss



Max. %EWL at 24 months follow-up

Long term data



Original article

Long term (7 or more years) outcomes of the sleeve gastrectomy: a meta-analysis

Benjamin Clapp, M.D., F.A.C.S., F.A.S.M.B.S.*, Matthew Wynn, Colin Martyn, M.D.,
Chase Foster, Montana O'Dell, Alan Tyroch, M.D., F.A.C.S.

Texas Tech University Health Sciences Center El Paso, Paul L. Foster School of Medicine, El Paso, Texas

Received December 13, 2017; accepted February 28, 2018

Nine cohort studies met the inclusion criteria,
with a total of **2280 patients included.**

Only 652 patients had completed ≥ 7 years of follow-up.

Clapp et al., SOARD 2018

Long term data



Long-term (11+ years) outcomes in weight, patient satisfaction, comorbidities, and gastroesophageal reflux treatment after laparoscopic sleeve gastrectomy

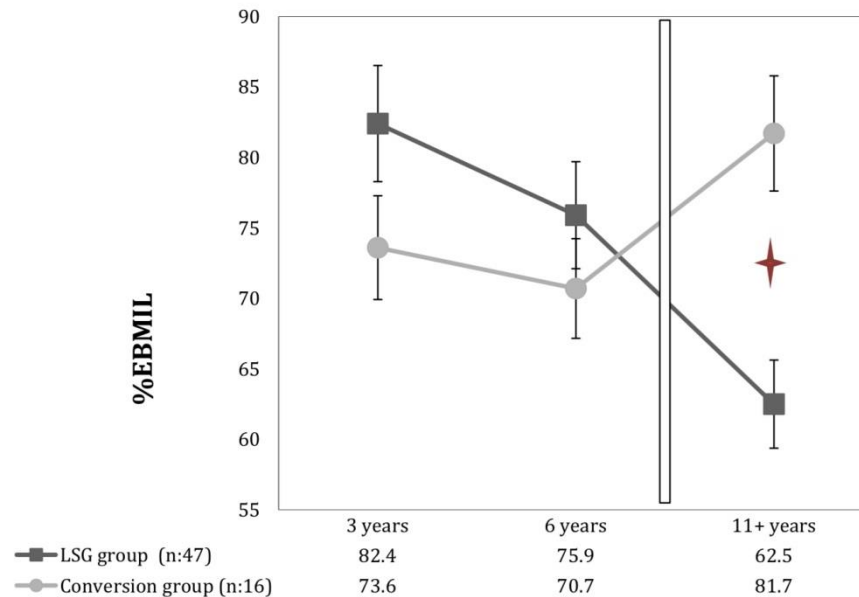
Gustavo A. Arman, M.D.^{a,b,*}, Jacques Himpens, M.D., Ph.D.^{a,b}, Jeroen Dhaenens, M.D.^a,
Thierry Ballet, M.D.^b, Ramon Vilallonga, M.D., Ph.D.^a, Guido Leman, M.D.^a

^aDivision of Bariatric Surgery, AZ St-Blasius, Dendermonde, Belgium

^bCavell Obesity Center, CHIREC, Brussels, Belgium

110 consecutive patients,
complete **follow-up 59.1%**

**Reoperations:
20 patients (31.7%)**



Arman et al., SOARD 16

Long-term studies

Study / Author	Year	Nr. patients	Mean follow-up (years)	Conversion (%)	Weight loss (%EWL)	Reflux (%)	Barrett (%)	ΔBMI Kg/m2
Noel	2017	168	8.0	16.6	67.0	31.0	N/A	11.4
Kowalewsky	2018	100	8.0	16.0	51.1	56.0	N/A	12.1
Mandeville	2017	100	8.5	29.5	60.8	47.8	N/A	9.1
Sarela	2012	20	8.0-9.0	20.0	68.0	35.0	N/A	14.0
Gissey	2018	144	10.0	2.0	52.5	24.0	N/A	15.1
Chang	2018	65	10.0	16.9	70.5	50.0	N/A	10.9
Felsenreich	2018	103	11.0	33.0	50.0	57.0	14.0	13.5
Arman	2016	110	11.7	25.0	62.5	21.4	N/A	10.1

Our Data

Obesity Surgery


<https://doi.org/10.1007/s11695-018-3399-1>



ORIGINAL CONTRIBUTIONS



Update: 10 Years of Sleeve Gastrectomy—the First 103 Patients

Daniel M. Felsenreich¹ • Lukas M. Ladinig¹ • Philipp Beckerhinn² • Christoph Sperker³ • Katrin Schwameis¹ • Michael Krebs⁴ • Julia Jedamzik¹ • Magdalena Eilenberg¹ • Christoph Bichler • Gerhard Prager¹  • Felix B. Langer¹

100% Follow-up

Felsenreich et al., Obesity Surgery 2018



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Sleeve Gastrectomy and Reflux / Gerhard Prager
Metabolic and Bariatric Surgery

Design – Our Data

Multicenter cross-sectional study:

Deadline: Dec. 31, 2006 → minimal follow-up of 10 years

Criterion for inclusion: lap. sleeve gastrectomy

Number of patients	103		
Age at the time of surgery	38.8 (15-74) years		
Sex	<i>male</i>	25 (25.0%)	
	<i>female</i>	77 (75.0%)	
Weight at the time of surgery	140.1	± 27.9 kg	(100 - 230)
BMI at the time of surgery	49.0	± 9.1 kg/m ²	(40 - 90)

Felsenreich et al., Obesity Surgery 2018

Multicenter-cross-sectional-study:

Deadline: 31.12.2006 → minimal follow-up of 10 years

Criterion for inclusion: lap. sleeve gastrectomy

Follow up on weight Loss: **100%!!!**

All patients had gastroscopy and biopsy of the GE junction before surgery

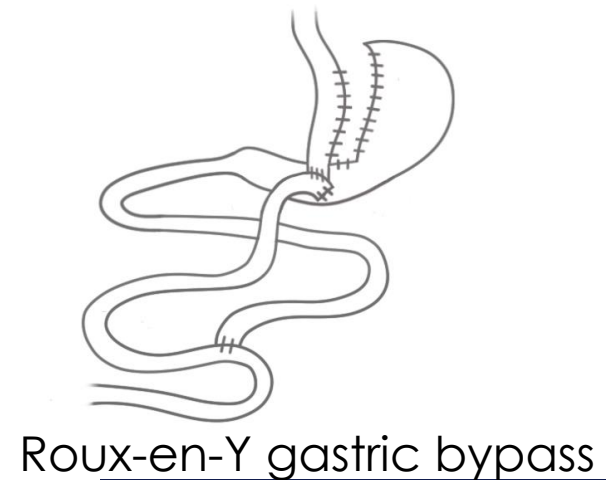
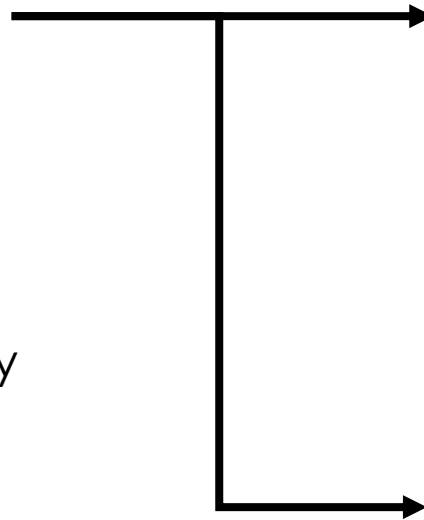
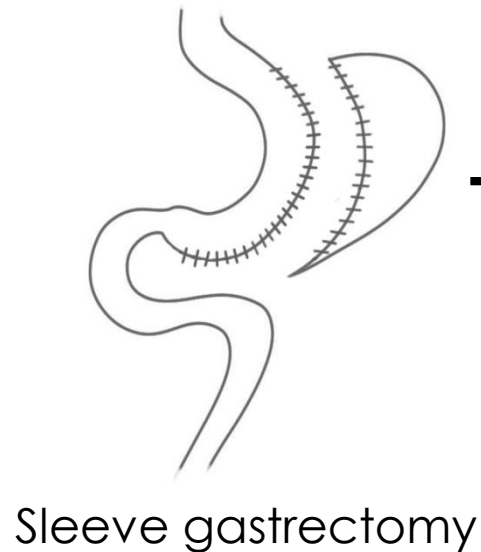
Contraindication for Sleeve were:

Hiatal hernia

Reflux

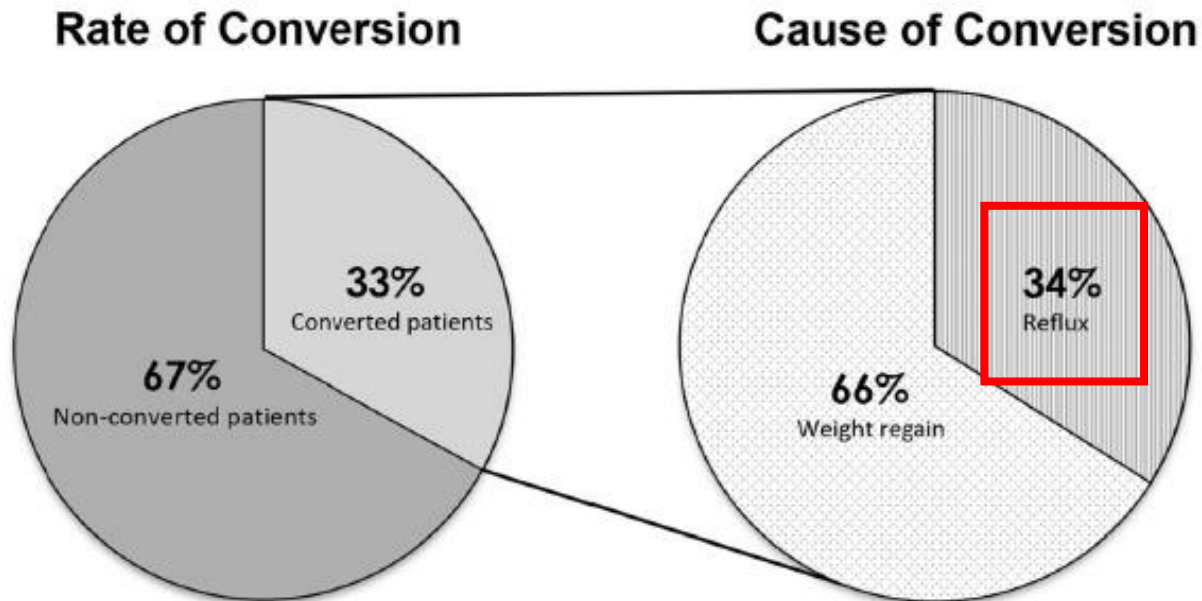
Barrett`s metaplasia

10 years follow-up:



Conversion – Our Data

10 years follow-up:



Felsenreich et al., Obesity Surgery 2018

METABOLIC & BARIATIC Surgery

University Clinic for General Surgery – AKH Vienna



DEPARTMENT OF SURGERY
MEDICAL UNIVERSITY OF VIENNA

	Total (n=96)*	Not converted (n=65)*	Converted (n=31)*
Weight (surgery)	139.9 ±28.3	138.7 ±25.0	142.4 ±31.8
BMI	48.9 ±9.3	48.7 ±9.0	49.4 ±9.4



	Total (n=96)*	Not converted (n=65)*	Converted (n=31)*
Weight (surgery)	139.9 ±28.3	138.7 ±25.0	142.4 ±31.8
BMI	48.9 ±9.3	48.7 ±9.0	49.4 ±9.4
Weight (nadir)	91.6 ±22.9	86.4 ±18.1	100.4 ±27.4
BMI	32.3 ±7.2	30.9 ±6.2	34.2 ±8.0
EWL(%)	68.1 ±24.5	74.30 ±19.1	64.5 ±31,8

	Total (n=96)*	Not converted (n=65)*	Converted (n=31)*
Weight (surgery)	139.9 ±28.3	138.7 ±25.0	142.4 ±31.8
BMI	48.9 ±9.3	48.7 ±9.0	49.4 ±9.4
Weight (nadir)	91.6 ±22.9	86.4 ±18.1	100.4 ±27.4
BMI	32.3 ±7.2	30.9 ±6.2	34.2 ±8.0
EWL (%)	68.1 ±24.5	74.30 ±19.1	64.5 ±31,8
Weight (conversion)			121.5 ±28.2
BMI			41.7 ±8.3
EWL (%)			27.1 ±31.3

* Dead (n=4) and acute converted (n=3) patients removed

METABOLIC & BARIATIC Surgery

University Clinic for General Surgery – AKH Vienna



DEPARTMENT OF SURGERY
MEDICAL UNIVERSITY OF VIENNA

	Total (n=96)*	Not converted (n=65)*	Converted (n=31)*
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EWL(%)	68.1 ±24.5	74.30 ±19.1	64.5 ±31,8
Weight (conversion)			121.5 ±28.2
BMI			41.7 ±8.3
EWL (%)			27.1 ±31.3
Weight (current)	98.4 ±25.2	97.0 ±26.8	100.7 ±22.5
BMI	35.5 ±7.1	35.9 ±7.3	34.9 ±7.0
EWL(%)	53.2 ±25.1	51.6 ±23.1	55.7 ±28.3

* Dead (n=4) and acute converted (n=3) patients removed



EWL - Our Data

10 years Follow-Up:

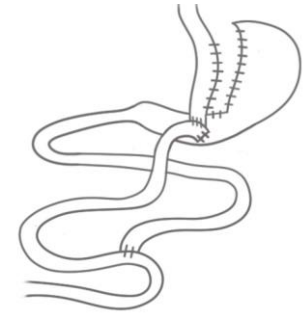
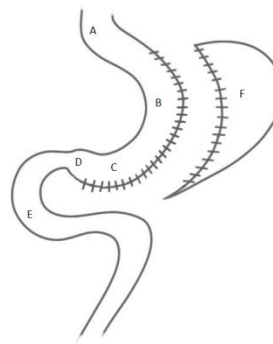


Table 1 Patient characteristics and history of weight

	All patients* (n = 97)	Non-conversion* (n = 65) 67%	Conversion* (n = 32) 33%	
			Weight regain (n = 21)	Reflux (n = 11)
10 years				
Weight (Today) in kg	99.3 ± 21.5	99.6 ± 20.7	101.5 ± 23.8	96.2 ± 22.3
BMI (Today) in kg/m ²	35.1 ± 7.1	35.5 ± 6.7	35.2 ± 8.2	33.8 ± 6.8
Change BMI (kg/m ²)	14.0 ± 8.6	13.3 ± 8.5	16.1 ± 10.3	13.5 ± 5.1
EWL (Today) in %	52.5 ± 24.9	50.0 ± 22.5	55.5 ± 32.4	57.1 ± 21.0
TWL (%)	28.2 ± 13.9	26.2 ± 12.7	31.5 ± 17.0	30.7 ± 13.6
Median post OP time (months)	132.1	131.8	133.0	145.2

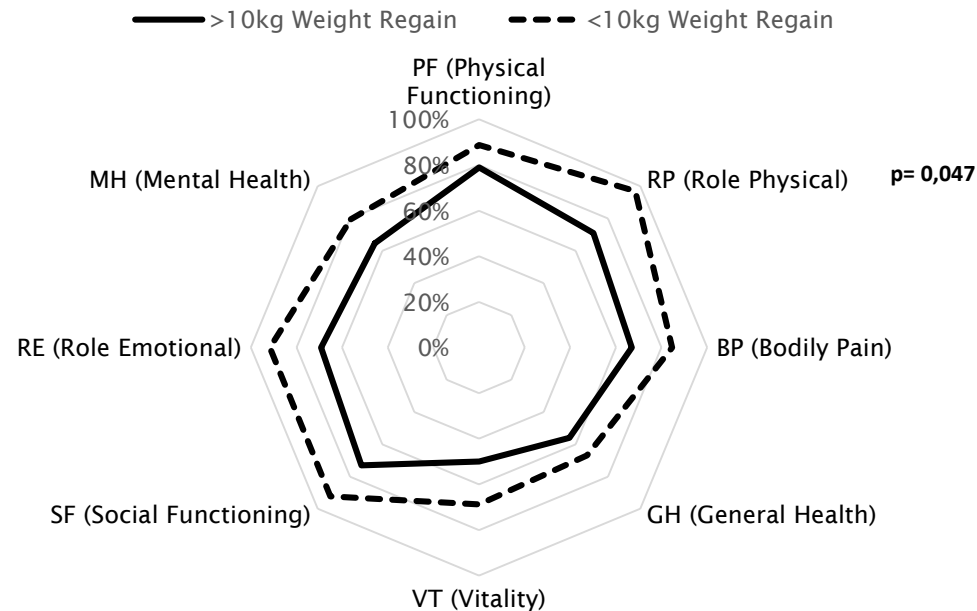
SG Sleeve Gastrectomy, BMI Body Mass Index, EWL Excess Weight Loss, TWL Total Weight Loss, OP Operation

*Four deceased patients and two acutely converted patients were removed from this calculation

Felsenreich et al., Obes. Surg. 2018

Long term data – QoL +/- weight regain

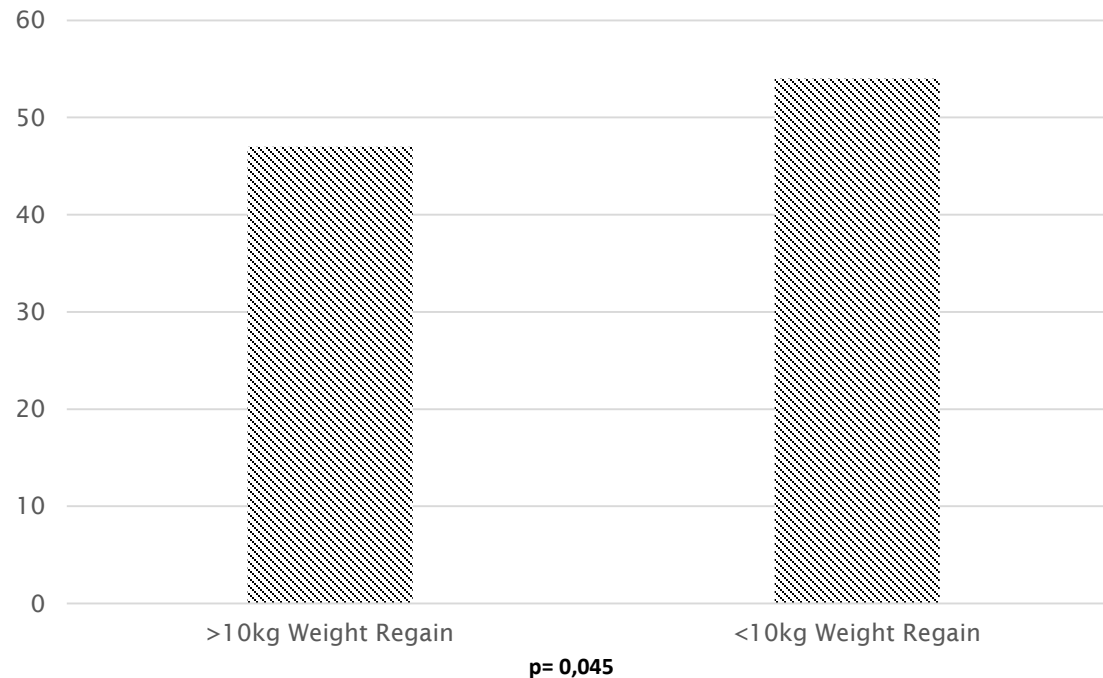
SF36 in patients >10kg and <10kg Weight Regain



Felsenreich DM et al., unpublished data

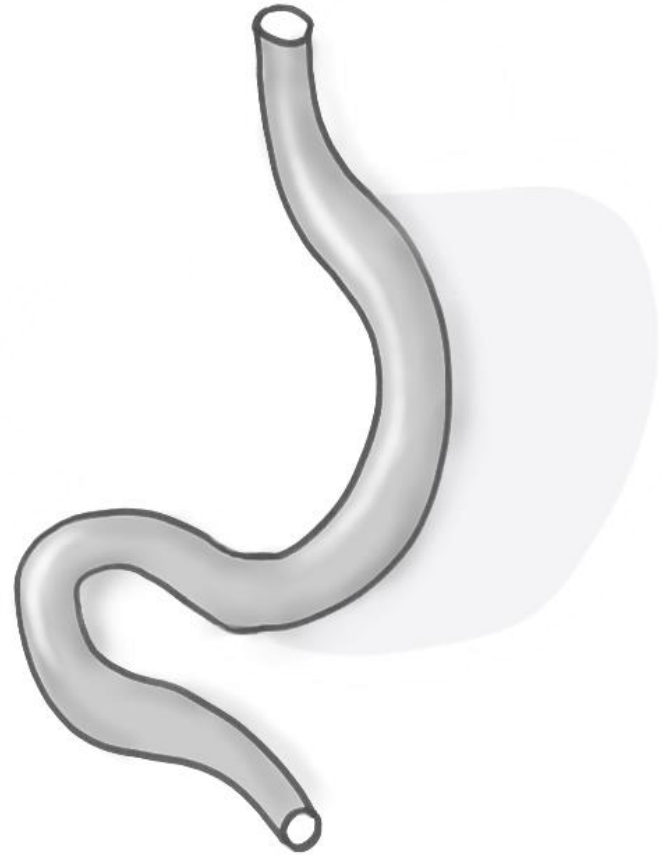
Long term data – QoL +/- weight regain

BQL in patients >10kg and <10kg Weight Regain



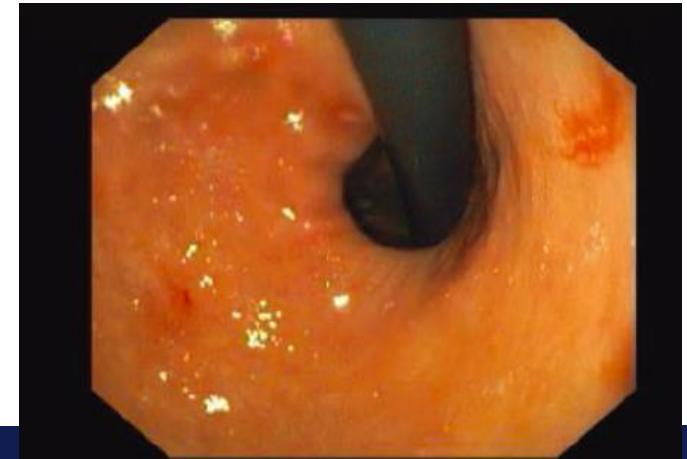
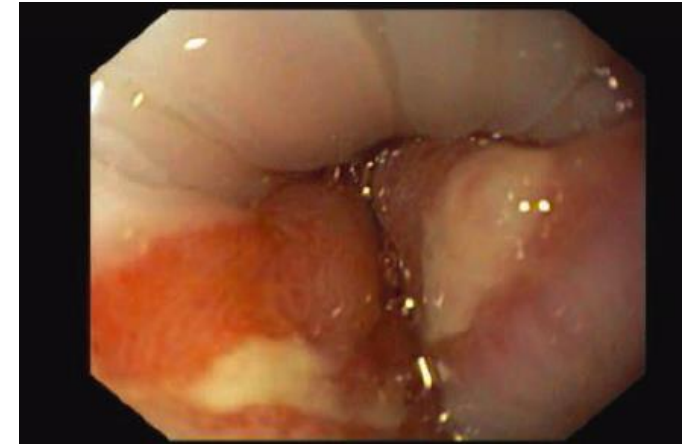
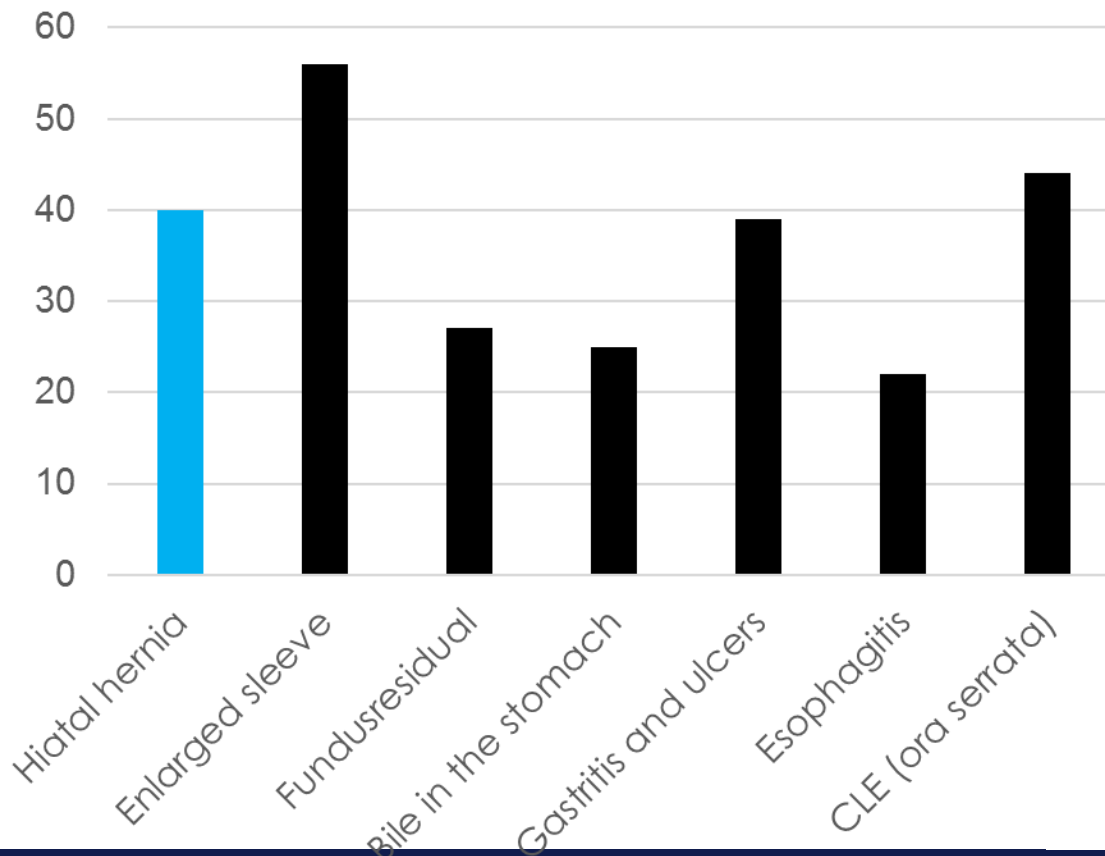
Felsenreich DM et al., unpublished data

Long term data – endoscopy



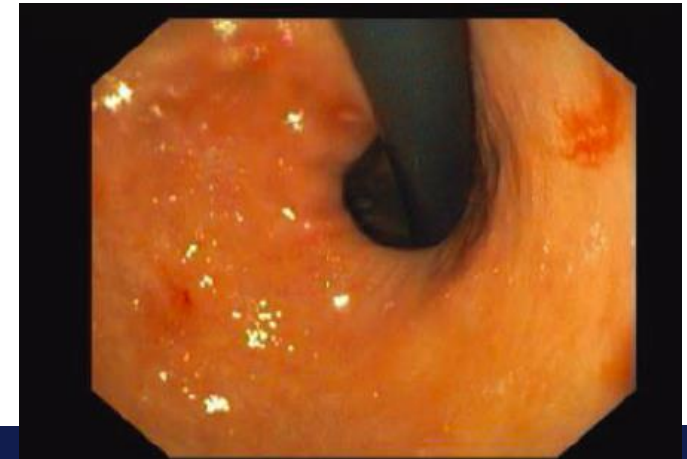
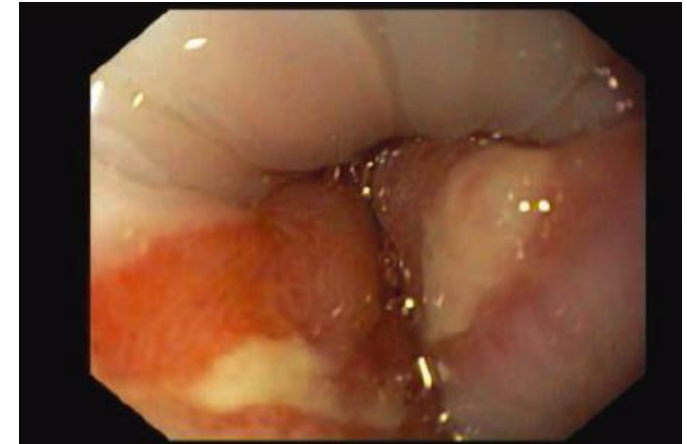
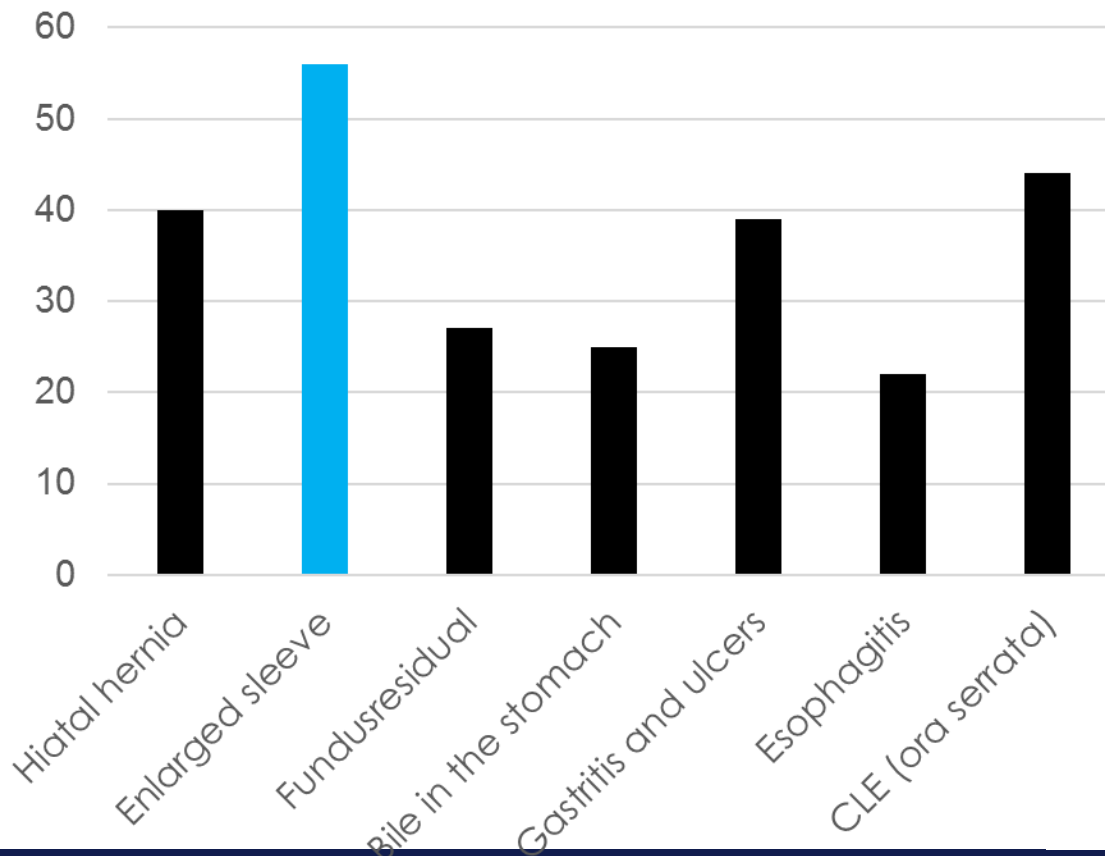
Sleeve not converted n=50

Gastroscopy macroscopic (%)



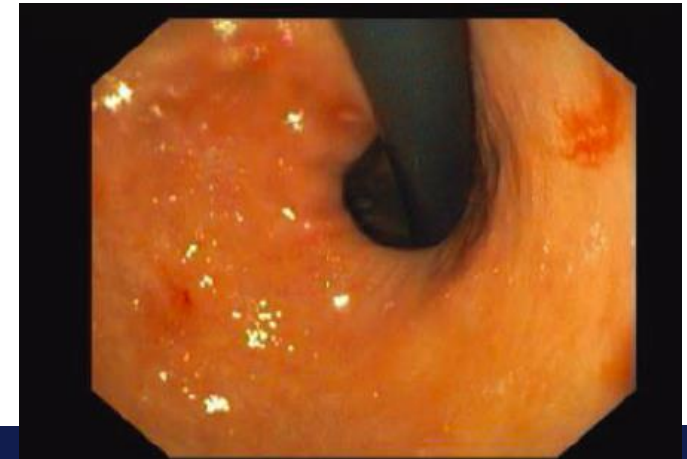
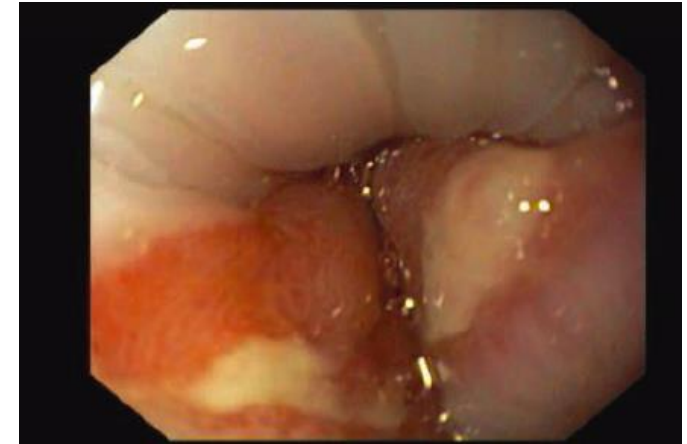
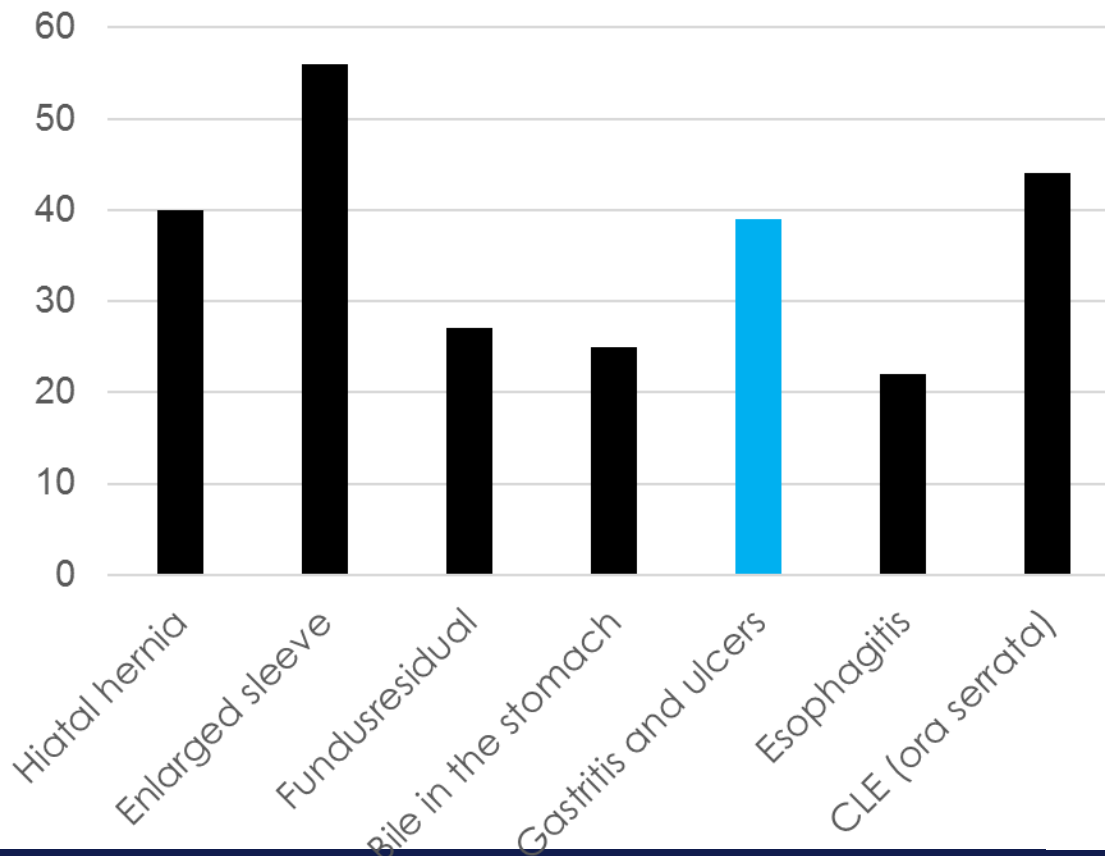
Sleeve not converted n=50

Gastroscopy macroscopic (%)



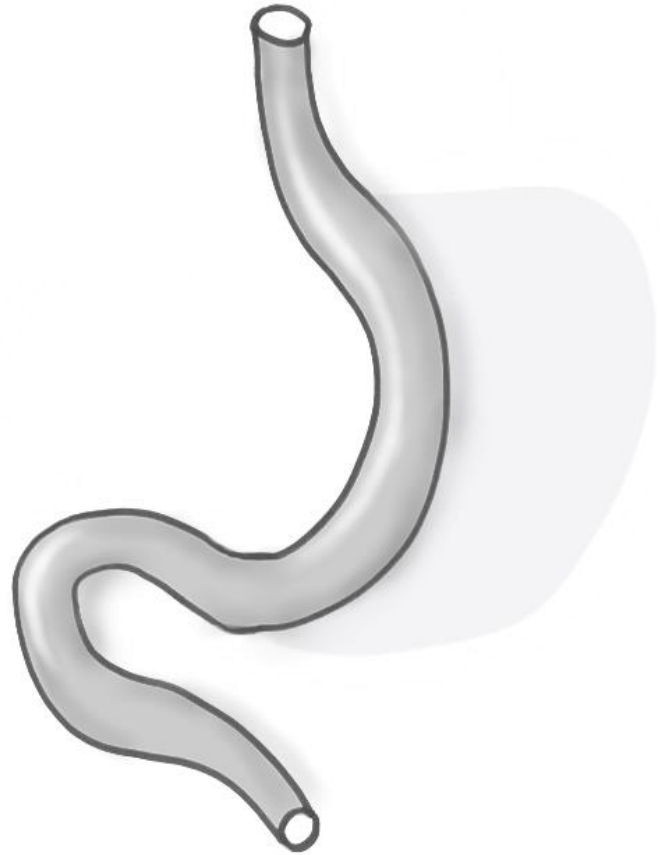
Sleeve not converted n=50

Gastroscopy macroscopic (%)



Long term complications

- Weight regain
- Reflux
- Barrett
- QoL



Reflux

Short-term studies:



(decrease)

Mid-term studies:



Long-term studies:



(increase)

Long-term studies

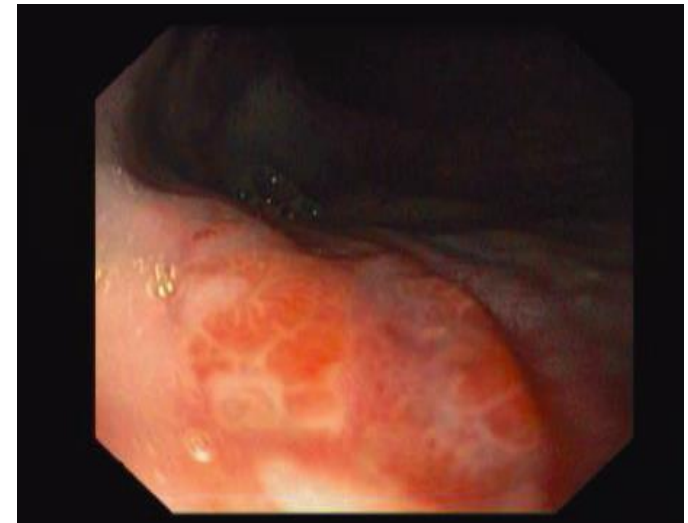
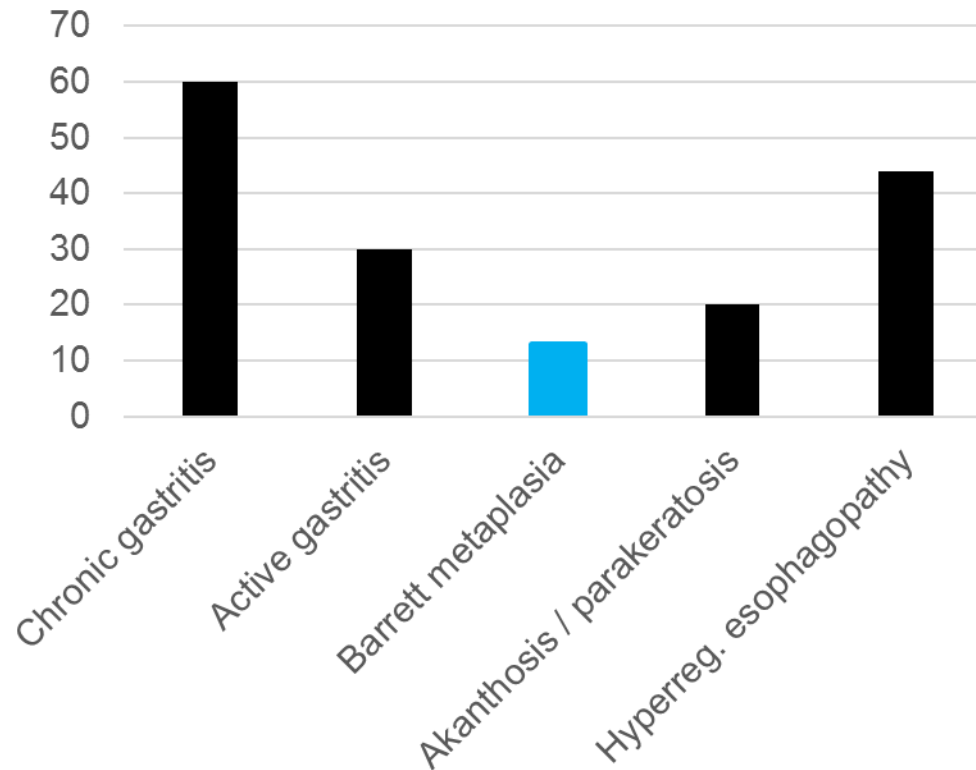
Study / Author	Year	Nr. patients	Mean follow-up (years)	Conversion (%)	Weight loss (%EWL)	Reflux (%)	Barrett (%)	ΔBMI Kg/m2
Noel	2017	168	8.0	16.6	67.0	31.0	N/A	11.4
Kowalewsky	2018	100	8.0	16.0	51.1	56.0	N/A	12.1
Mandeville	2017	100	8.5	29.5	60.8	47.8	N/A	9.1
Sarela	2012	20	8.0-9.0	20.0	68.0	35.0	N/A	14.0
Gissey	2018	144	10.0	2.0	52.5	24.0	N/A	15.1
Chang	2018	65	10.0	16.9	70.5	50.0	N/A	10.9
Felsenreich	2018	103	11.0	33.0	50.0	57.0	14.0	13.5
Arman	2016	110	11.7	25.0	62.5	21.4	N/A	10.1

Long-term studies

Study / Author	Year	Nr. patients	Mean follow-up (years)	Conversion (%)	Weight loss (%EWL)	Reflux (%)	Barrett (%)	ΔBMI Kg/m2
Noel	2017	168	8.0	16.6	67.0	31.0	N/A	11.4
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Arman	2016	110	11.7	25.0	62.5	21.4	N/A	10.1

Sleeve not converted n=50

Gastroscopy histology (%)



6 patients (14%) Barrett metaplasia (without dysplasia)

Barrett's Esophagus



Surgery for Obesity and Related Diseases 13 (2017) 568–574

SURGERY FOR OBESITY
AND RELATED DISEASES

Original article

Gastroesophageal reflux disease and Barrett's esophagus after laparoscopic sleeve gastrectomy: a possible, underestimated long-term complication

Alfredo Genco, M.D.^a, Emanuele Soricelli, M.D.^{a,*}, Giovanni Casella, M.D., Ph.D.^a,
Roberta Maselli, M.D.^a, Lidia Castagneto-Gissey, M.D.^a, Nicola Di Lorenzo, M.D.^b,
Nicola Basso, M.D.^a

110 patients

5 years follow-up

Follow-up rate: 69.1%

Barrett's esophagus: 17.1%

GERD: pre-OP 34%; post-OP 68%

110 patients	Preoperative	Follow-up	<i>P</i>
GERD symptoms	33.6% (37 pts)	68.1% (75 pts)	<.0001
VAS score	1.8	3	.018
Daily PPI intake	19.1% (21 pts)	57.2% (63 pts)	<.0001
Class A esophagitis	12.7% (14 pts)	46.3% (51 pts)	<.0001
Class B esophagitis	8.1% (9 pts)	32.7% (36 pts)	<.0001
Class C esophagitis	3.6% (4 pts)	11.8% (13 pts)	.04
Class D esophagitis	0	9.1% (10 pts)	.0016
Barrett's esophagus	0	17.2% (19 pts)	<.0001

Reflux after SG

Clinical Review & Education

JAMA Network Insights

Gastroesophageal Reflux After Sleeve Gastrectomy

Marco G. Patti, MD; Francisco Schlottmann, MD

The presence of preoperative GERD should be considered a relative contraindication to SG, and patients should be properly counseled.

Follow-up after SG should focus not only on weight loss and comorbidities but also on detection and treatment of GERD.

Patti M et al., Jama Surg 2018

Esophagitis after SG

Obesity Surgery
<https://doi.org/10.1007/s11695-018-3509-0>



ORIGINAL CONTRIBUTIONS



Correlation Between Symptomatic Gastro-Esophageal Reflux Disease (GERD) and Erosive Esophagitis (EE) Post-vertical Sleeve Gastrectomy (VSG)

Chin Hong Lim¹ · Phong Ching Lee² · Eugene Lim¹ · Jeremy Tan¹ · Weng Hoong Chan¹ · Hong Chang Tan² · Sonali Ganguly² · Kwang Wei Tham² · Alvin Eng¹

97 patients LSG

Gastroscopy 13 month after SG


Follow-up rate: 64.9%

Symptoms	EGD findings		
	Erosive esophagitis	Without esophagitis	Total
Gastro-esophageal reflux disease	11 (40.7%)	16 (59.3%)	27
Asymptomatic	9 (32.1%)	19 (67.9%)	28
Total	20	35	55

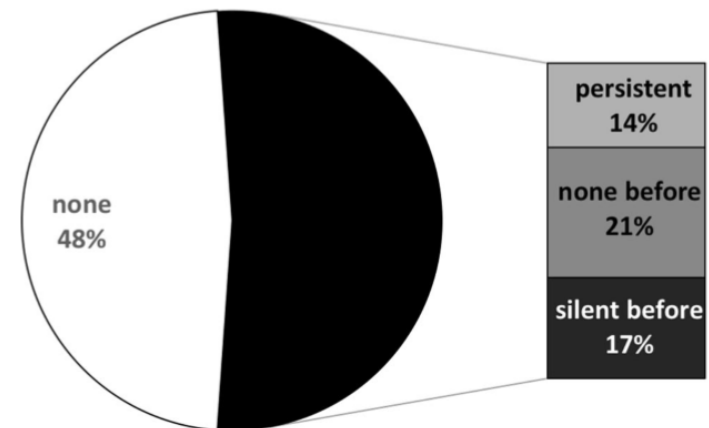
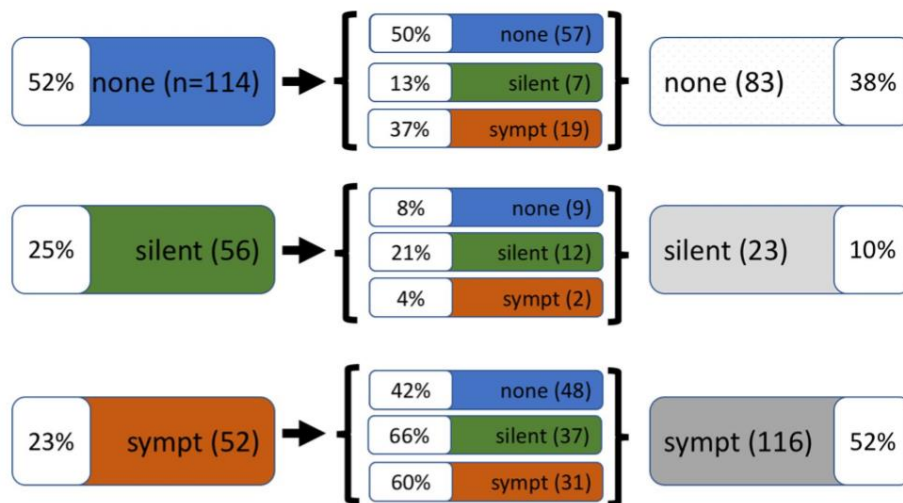
Interestingly, there was no correlation between GERD symptomology with endoscopic evidence of erosive esophagitis.

Hong Lim C et al., Obes Surg 2018

De novo gastroesophageal reflux disease after sleeve gastrectomy: role of preoperative silent reflux

Yves Borbély¹  · Esther Schaffner¹ · Lara Zimmermann¹ · Michael Huguenin¹ · Gabriel Plitzko¹ · Philipp Nett¹ · Dino Kröll¹

Received: 19 April 2018 / Accepted: 6 July 2018
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Conclusion LSG leads to a considerable rate of post-operative GERD. De novo-GERD consist of around half of pre-operative silent GERD and completely de novo-GERD. Most patients with pre-operative silent GERD became symptomatic.

Borbely Y et al., Surg Endosc 2018

Barrett's Esophagus



Surgery for Obesity and Related Diseases 13 (2017) 568–574

SURGERY FOR OBESITY
AND RELATED DISEASES

Original article

Gastroesophageal reflux disease and Barrett's esophagus after laparoscopic sleeve gastrectomy: a possible, underestimated long-term complication

Alfredo Genco, M.D.^a, Emanuele Soricelli, M.D.^{a,*}, Giovanni Casella, M.D., Ph.D.^a,
Roberta Maselli, M.D.^a, Lidia Castagneto-Gissey, M.D.^a, Nicola Di Lorenzo, M.D.^b,
Nicola Basso, M.D.^a

No significant correlations were found between GERD symptoms and endoscopic findings.



As a consequence, **routine careful endoscopic evaluation** in the **postoperative surveillance** of SG patients should be encouraged, regardless of presence or absence of GERD symptoms.

Barrett's Esophagus

Surg Endosc (2018) 32:930–936
<https://doi.org/10.1007/s00464-017-5768-6>



CrossMark

Barrett's esophagus before and after Roux-en-Y gastric bypass for severe obesity

Brandon Andrew¹ · Joshua B. Alley² · Cristina E. Aguilar³ · Robert D. Fanelli⁴

19 patients


12 months follow-up

42.9% Barrett's regression after RYGB +/- Hiatal hernia repair

Barrett's Esophagus

Barrett's esophagus after Roux-en-Y gastric bypass: does regression occur?

Verónica Gorodner¹

 Rudolf Buxhoeveden¹ · Gastón Clemente¹ · Christian Sañchez² · Luis Caro² · Alejandro Grigaites¹

11 patients

Mean follow-up: 41±31 months

36% Barrett's regression after RYGB, no progression to dysplasia

Barrett's Esophagus

The Evaluation and Management of Suspicious Gastric Lesions Following Bariatric Surgery



RYGB best treatment option for morbid obesity complicated with Barrett's esophagus

Braghetto I, Obes Surg 2016;26:1622–6

RYGB has shown the ability to induce regression of BE in the obese in terms of decreased length of BE, improvement in the degree of dysplasia, and reconstitution of cardiac mucosa.

Houghton SG, Surg Obes Relat Dis 2008;4:1–4.

Csendes A, J Gastrointest Surg 2006;10:259–64

Cobey F, Obes Surg 2005;15:710–2.

Csendes A, Surgery 2006;139:46–53.

Surg Clin N Am 97 (2017) 467–474

Barrett's Esophagus

The Evaluation and Management of Suspicious Gastric Lesions Following Bariatric Surgery



Roux-en-Y gastric bypass (**RYGB**) has shown a **superior therapeutic effect for GERD resolution** when compared with restrictive operations, including gastric band and sleeve gastrectomy

Pallati PK, SOARD 2014

Li J, Obes Surg 2016

Surg Clin N Am 97 (2017) 467–474

Reflux – Our Data

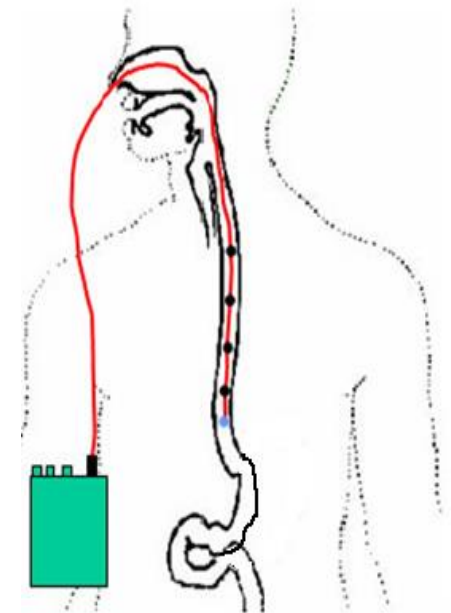
Sleeve not converted n=34

24h pH-metry:

Increased acid exposure time: 55.6% patients
 $8.8\% \pm 8.3$ (normal $<4.2\%$)

Increased reflux activity in 24h: 44.5% patients
 72 ± 52 (normal <73)

Increased De-Meester Score: 59.3% patients
 40.2 ± 36.6 (normal <14.72)

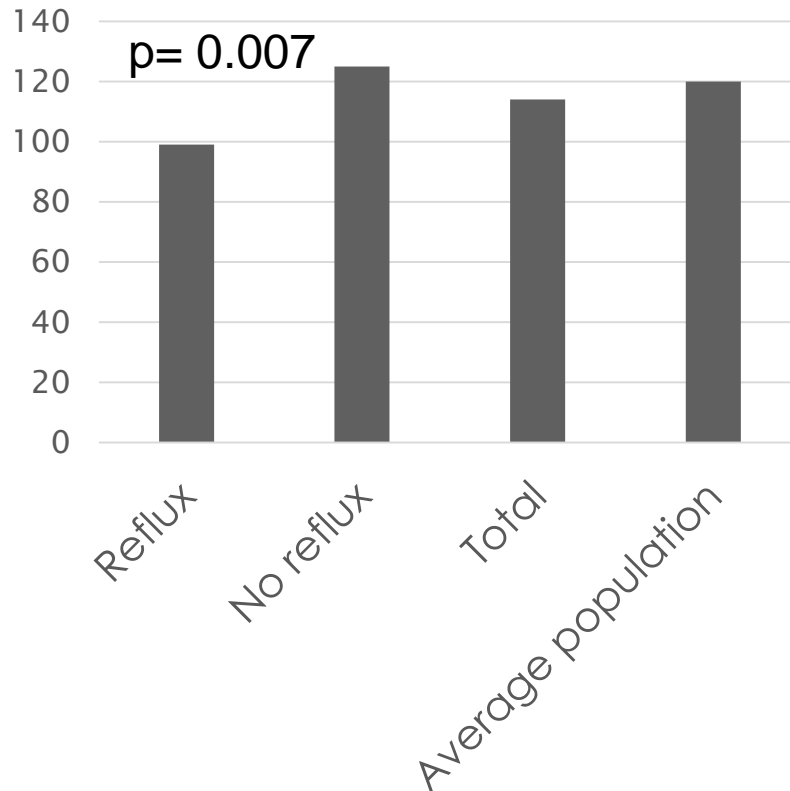


Quality of Life – Our Data

Sleeve not converted n=54

GiQLI

(Gastrointestinal Quality of Life Index)



Non-converted patients:

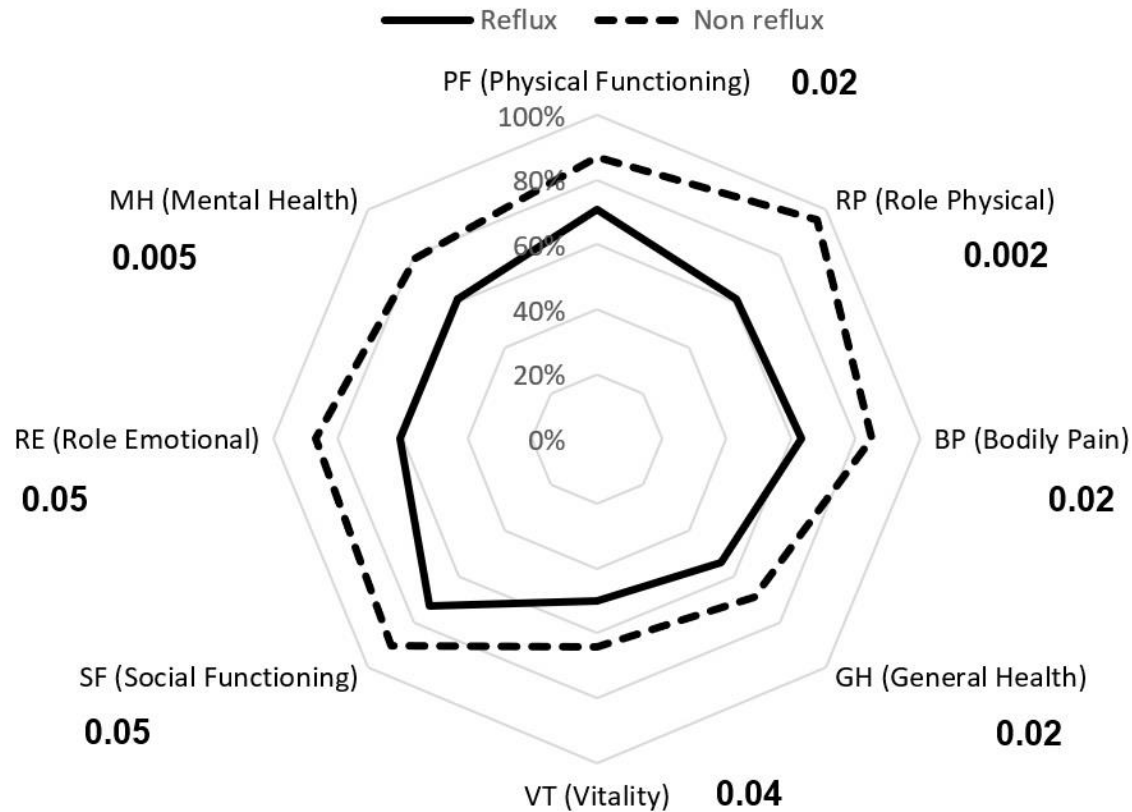
Reflux: 54.6%

Non-Reflux: 45.4%

Quality of Life – Our Data

Sleeve not converted n=54

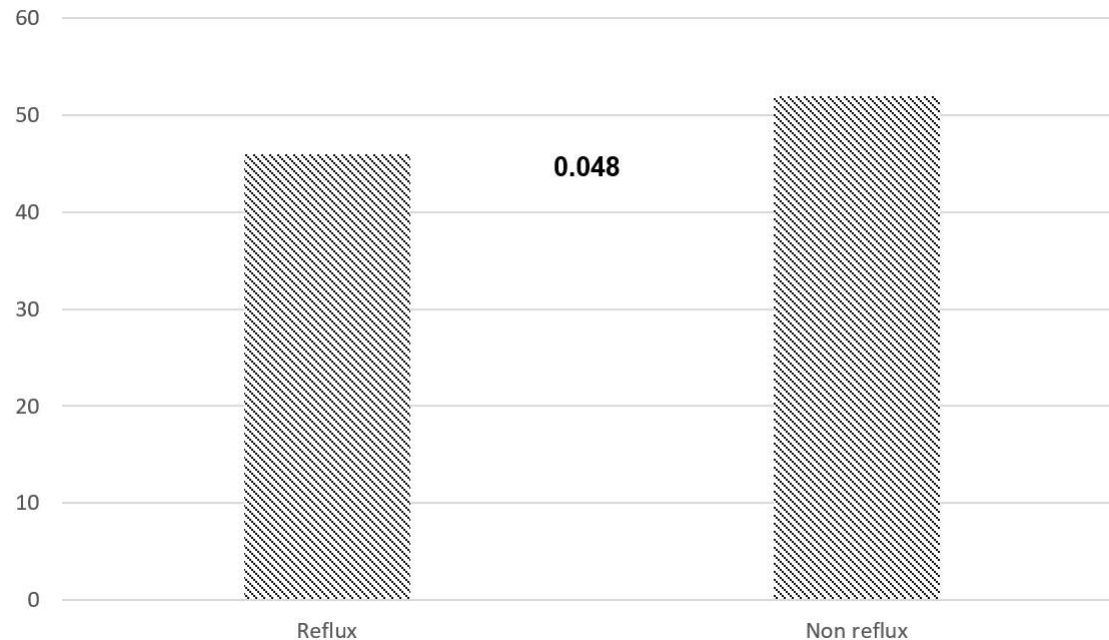
SF-36 - Reflux



Quality of Life – Our Data


Sleeve not converted n=54

BQL - Reflux



Long-term follow-up

Moderating the Enthusiasm of Sleeve Gastrectomy: Up to Fifty Percent of Reflux Symptoms After Ten Years in a Consecutive Series of One Hundred Laparoscopic Sleeve Gastrectomies

Yannick Mandeville¹  • Ruth Van Looveren¹ • Peter-Jan Vancoillie¹ • Xander Verbeke¹ • Katrien Vandendriessche¹ • Patrick Vuylsteke¹ • Paul Pattyn¹ • Bart Smet¹

Follow-up: 8.5 years

Follow-up rate: 88%

Revisional rate: 29.5%

%EWL: 60.8%

Table 4 Evolution of reflux disease and PPI use

	Preoperative	Postoperative	<i>p</i> value
Reflux disease	17 (17%)	44 (52%)	<0.0001
PPI use	15 (15%)	40 (47%)	<0.0001

Table 5 Indications for secondary RYGB

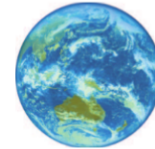
Indication	Number of patients (%)
Total	26 (100%)
Insufficient weight loss	19 (73.1%)
Insufficient weight loss + reflux disease	5 (19.2%)
Reflux disease without insufficient weight loss	2 (7.7%)

The chance of developing de novo reflux after LSG was 47.8% (32/67).

Mandeville Y et al., Obes Surg 2017

Adenocarcinoma

IMAGES FOR SURGEONS

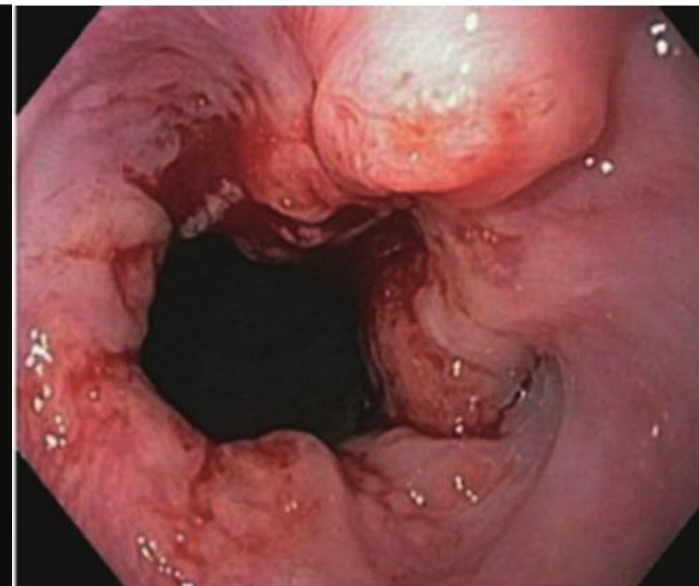


ANZJSurg.com

Adenocarcinoma of the gastro-oesophageal junction after sleeve gastrectomy: a case report

2.5 years after SG

No postoperative reflux



Sohn Set al., Anz J Surg 2017

Adenocarcinoma



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International Journal of Surgery Case Reports

journal homepage: www.casereports.com



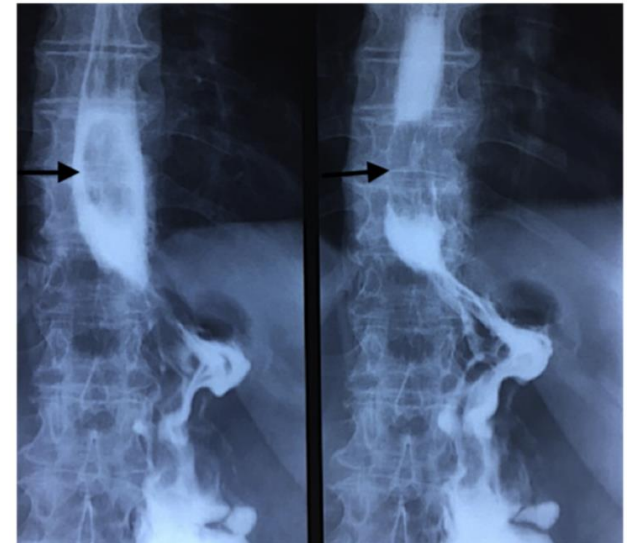
Esophageal adenocarcinoma in Barrett's esophagus after sleeve gastrectomy: Case report and literature review

Lionel El Khoury, Rosa Benvenga, Rodolfo Romero, Regis Cohen*, Joel Roussel, Jean-Marc Catheline

3 years after SG

Perioperative Barrett's esophagus without dysplasia

CONCLUSION: : Preoperative endoscopy should be performed in order to detect GERD, BE, and potential carcinomas of the upper gastrointestinal tract before undergoing bariatric surgery. The long-term monitoring after SG is essential.



El Khoury E et al., Int J Surg Case Rep 2018

Adenocarcinoma



Contents lists available at [ScienceDirect](#)

International Journal of Surgery Case Reports

journal homepage: www.casereports.com



Esophageal adenocarcinoma five years after laparoscopic sleeve gastrectomy. A case report



Fernando Gabriel Wright, Agustin Duro*, Juan Rodolfo Medici, Santiago Lenzi, Axel Federico Beskow, Demetrio Cavadas

5 years after SG

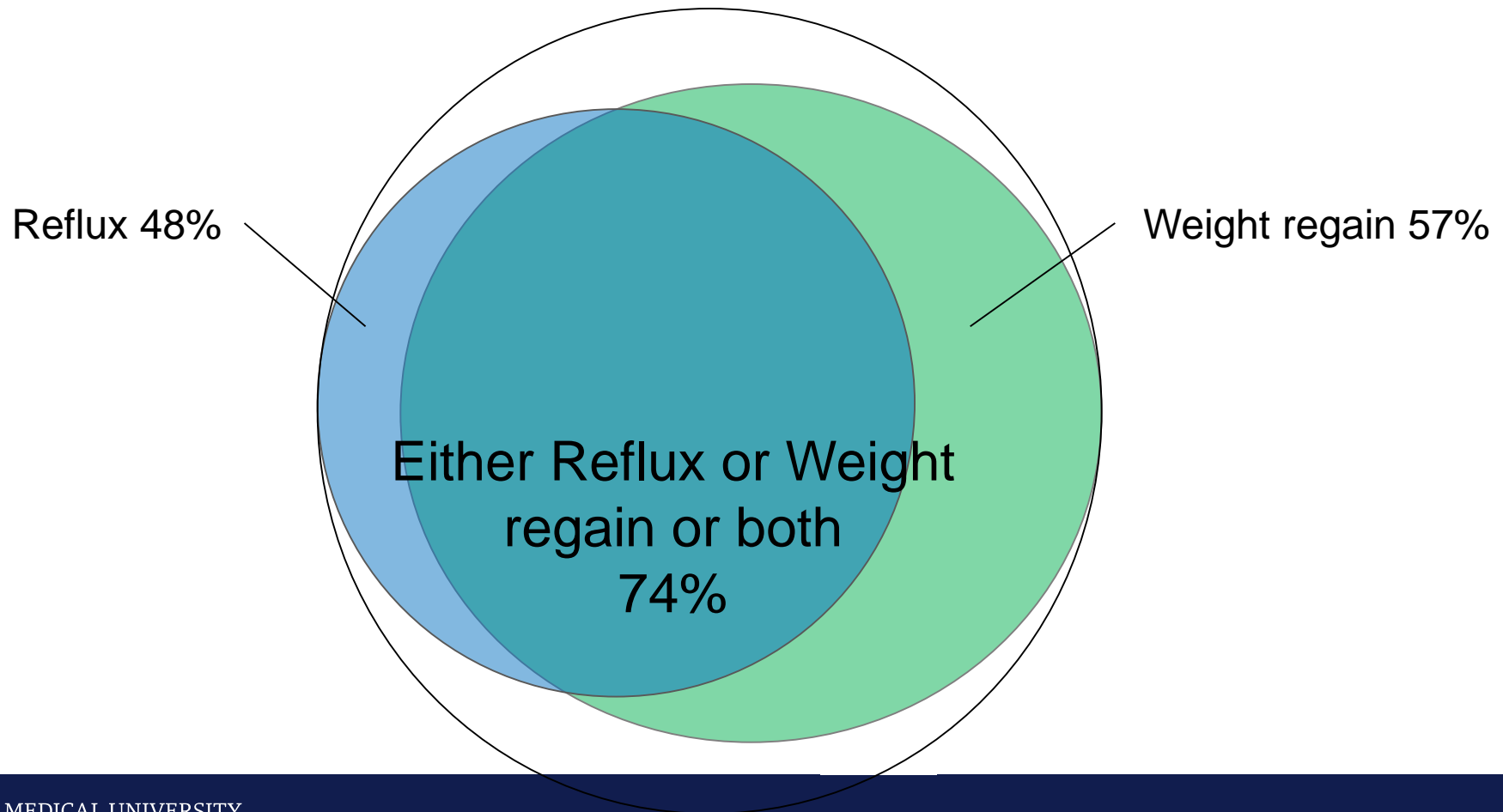
No reflux preoperative

Reflux started 15 months after SG



Wright F G et al., Int J Surg Case Rep 2017

Conclusion:



Conclusion:

Weight loss:



57% of all patients showed a mean value of 20kg weight regain after 10 years

Reflux:



48% of all patients have symptomatic reflux after 10 years


Outcome:



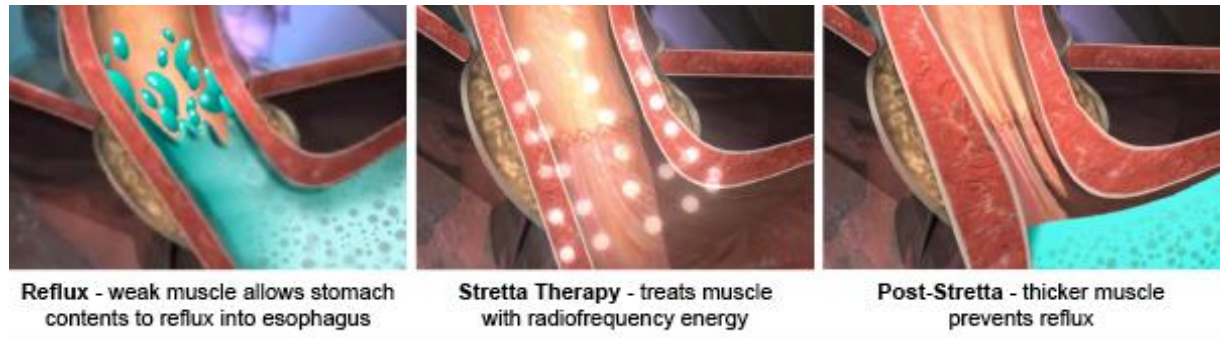
SG only moderate successful on the BAROS-score after 10 years

Experimental / New Treatment of Reflux after SG

Initial Experience of Endoscopic Radiofrequency Waves Delivery to the Lower Esophageal Sphincter (Stretta Procedure) on Symptomatic Gastroesophageal Reflux Disease Post-Sleeve Gastrectomy

Nesreen Khidir¹  • Luigi Angrisani² • Jowhara Al-Qahtani³ • Sheraz Abayazeed³ • Moataz Bashah^{1,4}

Patients: 15



Stretta: Endoscopic Radiofrequency of the LES

Conclusions Stretta did not improve GERD symptoms in patients post-LSG at short-term follow-up, and about 6.7% complication rate was reported. Patients were not satisfied despite the decrease in PPI dose.

Khidir N et al., Obesity Surgery 2018

Experimental / New Treatment of Reflux after SG

Original article

Electrical stimulation of the lower esophageal sphincter to address gastroesophageal reflux disease after sleeve gastrectomy

Yves Borbély, M.D., F.A.C.S.^{a,*}, Nicole Bouvy, M.D.^b, Henning G. Schulz, M.D.^{c,†}, Leonardo Antonio Rodriguez, M.D.^d, Camilo Ortiz, M.D.^e, Alejandro Nieponice, M.D.^f

^aClinic for Visceral Surgery and Medicine, Inselspital, Bern University Hospital, and University of Bern, Bern

^bUniversity of Maastricht, Maastricht, the Netherlands

^cEvangelisches Krankenhaus, Castrop-Rauxel, Germany

^dSurgery, CCO Obesidad, Santiago, Chile

^eDepartment of Surgery, Hospital El Tunal, Bogota, Colombia

^fEsophageal Surgery Program, University of Favaloro, Buenos Aires, Argentina

Received July 16, 2017; accepted February 3, 2018

Patients: 17

Follow-up: 6 months

Conclusions

Electrical stimulation of LES in post-LSG patients suffering from symptomatic GERD refractory to medication led to a significant improvement of GERD-symptoms, esophageal acid exposure, and overall decrease of need for PPI. Preserving the post-LSG anatomy, it offers a valid option for patients unable or unwilling to undergo RYGB.



Fig. 1. Electrodes sewn into the esophageal wall beneath the lower esophageal sphincter.

Borbey Y et al., SOARD 2018

Experimental / New Treatment of Reflux after SG

Gastroesophageal Reflux Management with the LINX® System for Gastroesophageal Reflux Disease Following Laparoscopic Sleeve Gastrectomy

Kenneth Desart¹ • Georgios Rossidis¹ • Michael Michel¹ • Tamara Lux¹ • Kfir Ben-David²

Patients: 7

Follow-up: 2-4 weeks

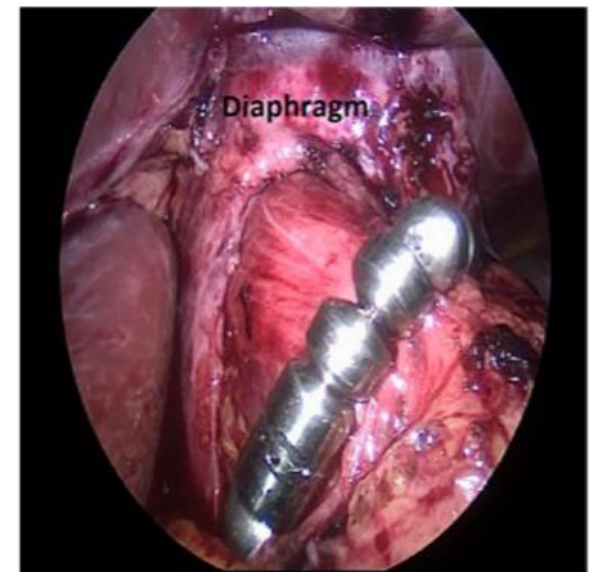


Fig. 2 Placement of LINX® device

Conclusion This is the first reported pilot case series, illustrating that the LINX® device is a **safe and effective option** in patients with de novo refractory gastroesophageal reflux disease after a laparoscopic sleeve gastrectomy despite appropriate weight loss.

Desart K et al., J Gastrointestinal Surg 2015

Conclusion

Which Treatment of Severe Reflux and Esophagitis After Sleeve Gastrectomy?

Symptoms Control: PPI, Sucralan, ...

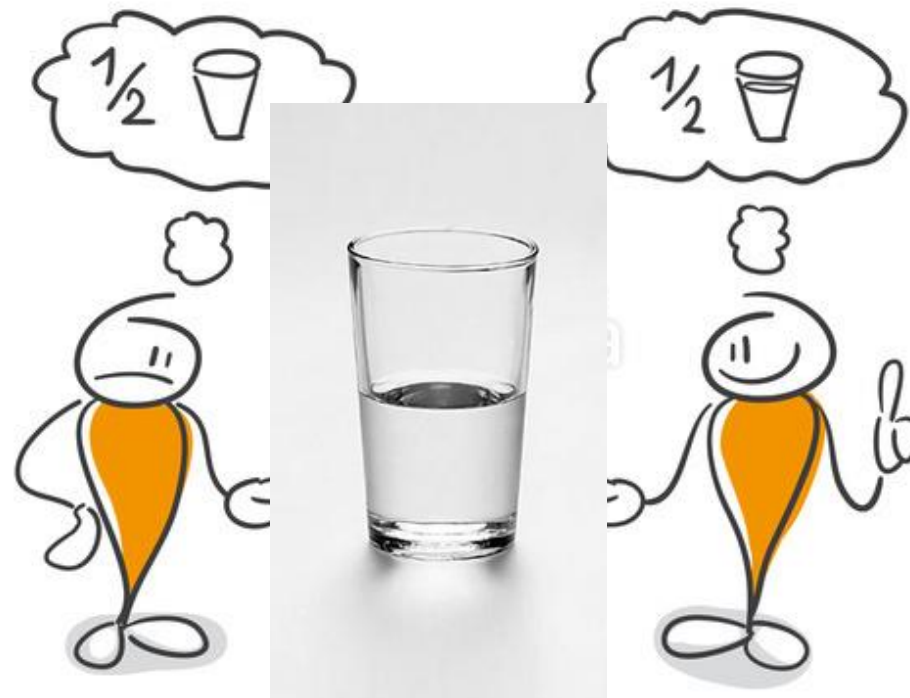
Reflux / Barrett's Esophagus:

- RYGB

Reflux and Weight Regain:

- RYGB with **short alimentary limb** (app. 60-70cm) and a **longer BPL** (100 – 150cm)

Long term data



#86217410



DEPARTMENT OF SURGERY
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