

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

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Speaker: Matteo Ucelli



POLICLINICO  
SAN MARCO



NAPOLI  
2023



THURSDAY, 31 AUGUST

MEDITERRANEO BUILDING  
THEATRE

SLEEVE IN GERD: CURRENT OPTIONS  
12.00 - 13.30

Chair: Luigi Angrisoni (Italy)

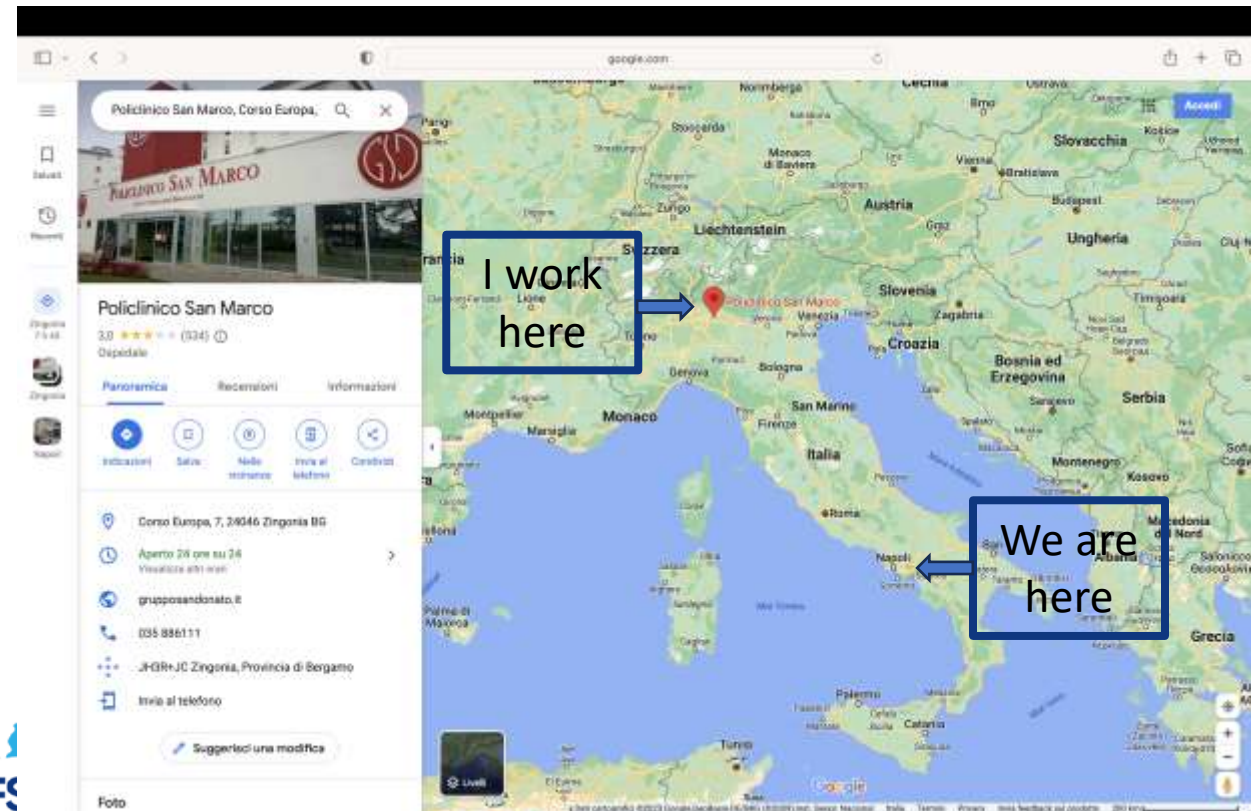
Moderators: Peng Zhang (China), Antonio Iannelli (France)

12.00 - 12.10	Sleeve gastrectomy and oesophageal physiology: a complex relationship	Silvana Pierretta	France
12.10 - 12.20	Closure of Hiatal Hernia with esophageal fixation. Durability?	Catalin Copoescu	Romania
12.20 - 12.30	Magnetic sphincter augmentation for sleeve, latest results, but erosion, now what?	Camilo Boza	Chile
12.30 - 12.40	Partial fundoplication (anterior), is there a role?	Gianmattia Del Genio	Italy
12.40 - 12.50	Toupet-sleeve, an option in case of preoperative GERD	Philippe Hauters	Belgium
12.50 - 13.00	Nissen Sleeve vs Toupet Sleeve	Rossella Palma	Italy
13.00 - 13.10	Long Term results of Sleeve-Rossetti	Stefano Olmi	Italy
13.10 - 13.20	Complications of Nissen-Sleeve and how to avoid them	David Nocca	France
13.20 - 13.25	Discussion and Q&A		
13.25 - 13.30	Adjourn		

In accordance with «EACCME criteria for the Accreditation of Live Educational Events», please disclose whether you have or you have not any conflict of interest with the companies:

**If you don't have any conflict, please delete the conflict interest report points:**

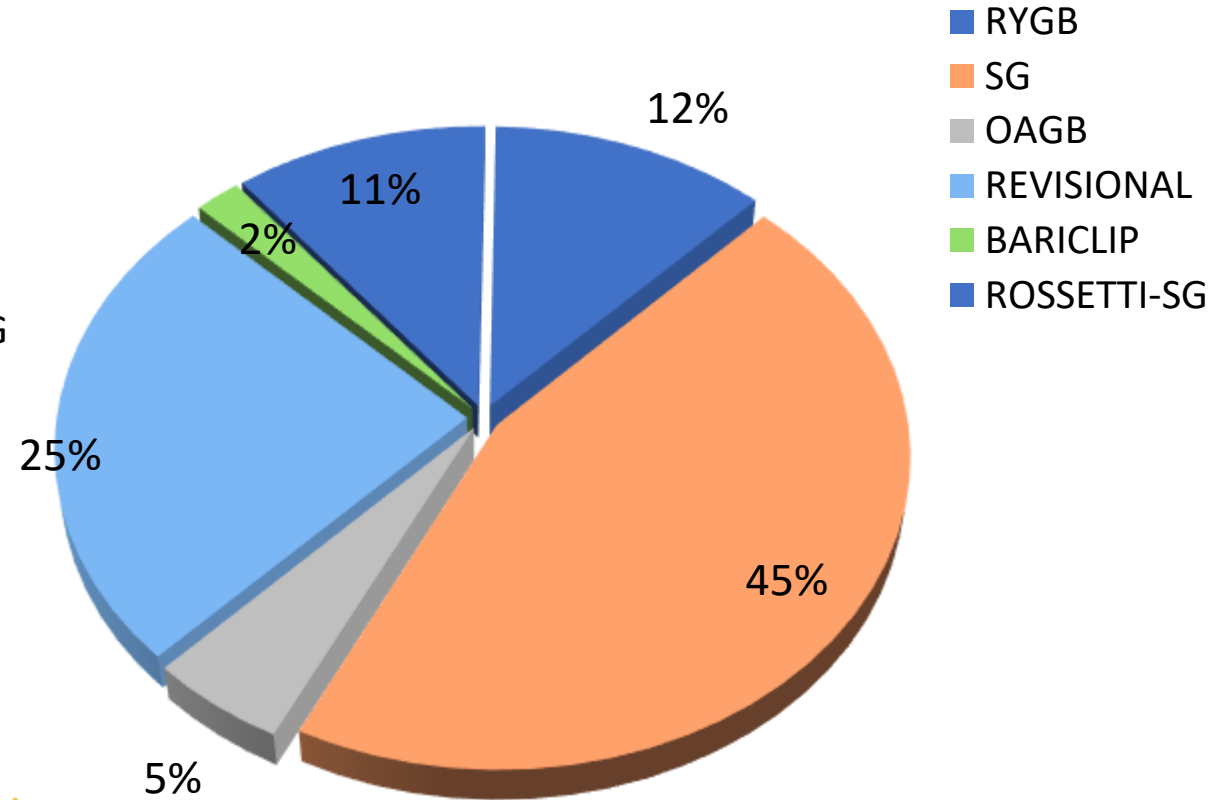
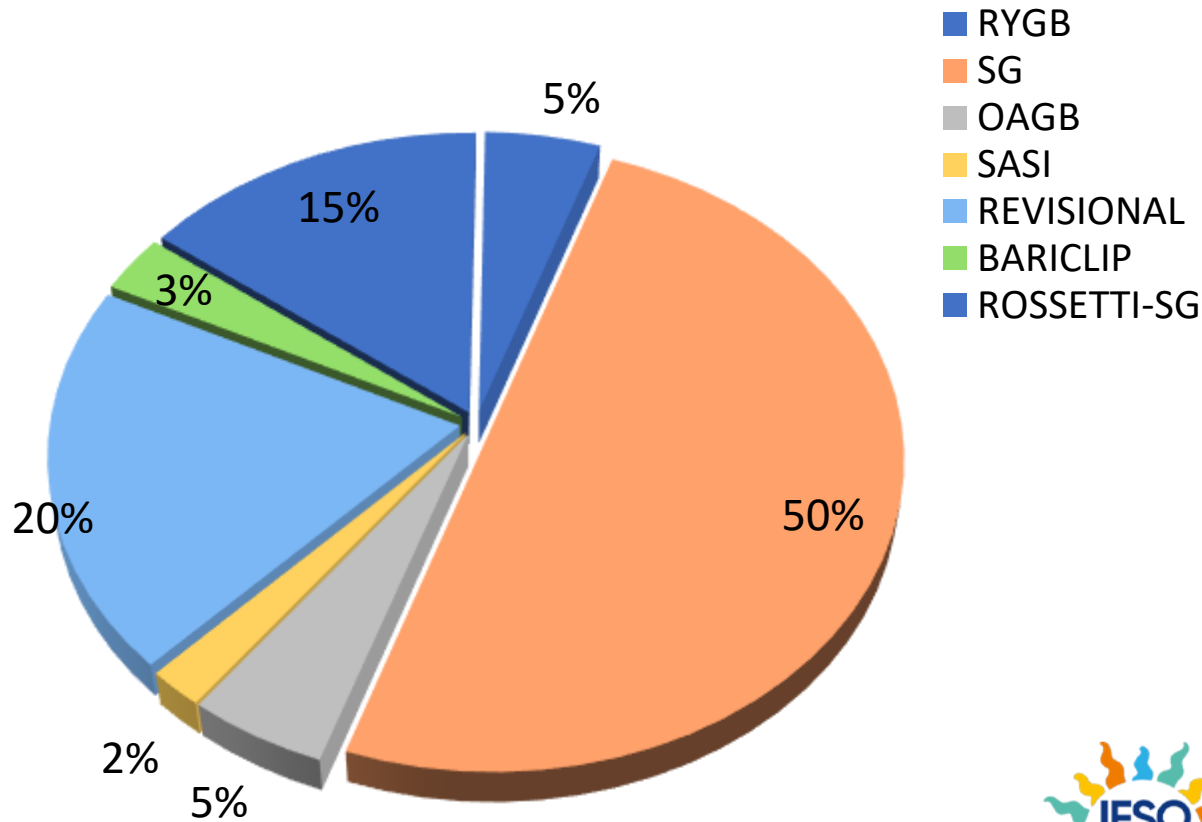
**[X] I have no potential conflict of interest to report**



# CASE MIX DISCLOSURE

High volume Center: 1400 operations/year  
Equipe: 10 surgeons

Personal case mix disclosure



# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## Gastroesophageal reflux and obesity

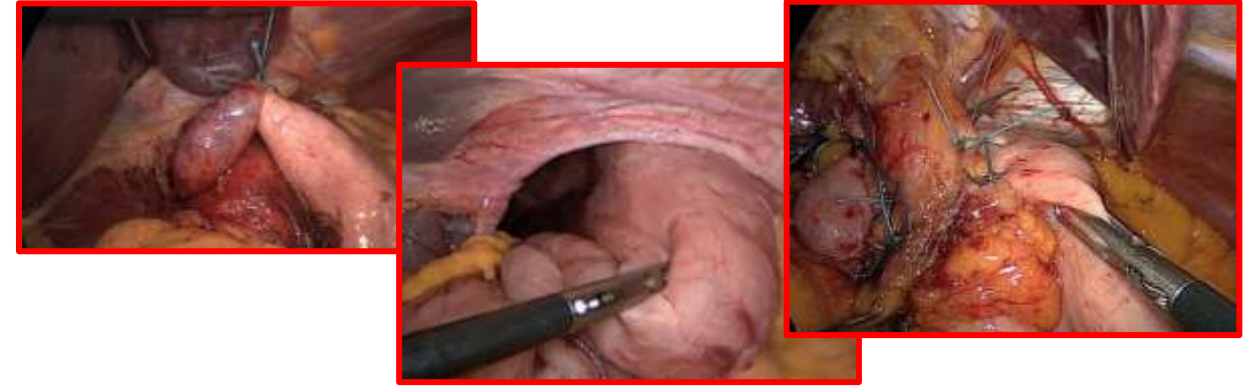
Obesity is a chronic disease that affects about 11% of the Italian population (over 6 million obese patients ). Almost 3 million with diabetes

Hypertension, cardiovascular diseases, diabetes mellitus, OSAS are among the most important diseases that develop and worsen with obesity

BUT ALSO

Gastroesophageal reflux disease (GERD) is present in 30% of obese patients

Obesity increases the incidence of GERD complications (esophagitis; Barrett's esophagus; adenocarcinoma)



The obese patient is a poor candidate for functional reflux surgery alone

Gagner M, Deitel M, Erickson AL, et al. Survey on LSG at the Fourth International Consensus Summit on Sleeve Gastrectomy. *Obes Surg.* 2013;23(12):2013-7

Pallati PK et al. Improvement in GERD symptoms after various bariatric procedures: review of the Bariatric Outcomes Longitudinal Database. *Surg Obes Relat Dis.* 2014 May-Jun;10(3):502-7

Chiu S et al. Effect of sleeve gastrectomy on gastroesophageal reflux disease: a systematic review. *Surg Obes Relat Disease* 2011;7(4):510-5

Kindel TL et al. The Improvement of Gastroesophageal Reflux Disease and Barrett's after Bariatric Surgery. *Obes Surg.* 2016 Apr;26(4):718-20

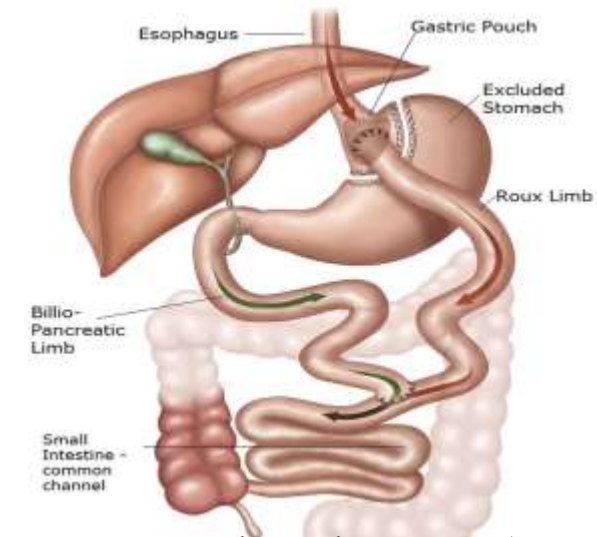
# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## Bariatric surgery in Italy

**Even in 2022,  
LSG is the most  
performed  
surgery in Italy**



Michel Gagner 1999



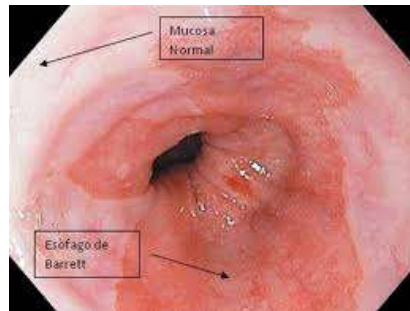
Edward Mason 1967

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## SLEEVE GASTRECTOMY AND GERD

GERD post LSG **8 – 76 %**; BE 8 % - 18.8 %

	POST-SLEEVE
GERD	8 – 76 %
Esophagitis	15 – 41 %
Use of PPIs	70 %
<b>Barrett's esophagus</b>	<b>8 – 18.8 %</b>



High pressure gastric tube  
His angle alteration  
SLE dysfunction  
Gastric fundus excess  
Postoperative hiatal hernia  
Persistence of unhealthy eating habits

GERD:  
Results on 1950 cases with a 5-year follow-up

↓

24% use of PPI after Sleeve  
23.4% oesophagitis (A 64.4%, B 31.6%, C 4.0%)  
Conversions to RYGBP 352 patients (18%) GERD resolution 82 %

Chiu S et al.. Surg Obes Relat Disease 2011;7(4):510-5  
Kindel TL et al. The improvement of Gastroesophageal Reflux Disease and Barrett's after Bariatric Surgery. Obes Surg. 2016 Apr;26(4):718  
Howard et al, Surg Obes Relat Dis, 2011; Brandon A, Obes Surg, 2018; Gorodner V, Obes Surg, 2018; Kindel TL et al. Obes Surg. 2016

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## RYGB AND GERD

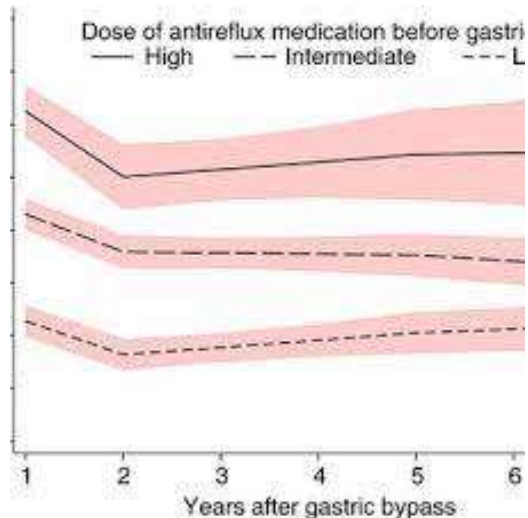
Received: 1 March 2019 | First decision: 14 March 2019 | Accepted: 29 March 2019

DOI: 10.1111/apt.15274

AP&T Alimentary Pharmacology & Therapeutics WILEY

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

Dag Holmberg<sup>1</sup> | Giola Santoni<sup>1</sup> | Shaohua Xie<sup>1</sup> | Jesper Lagergren<sup>1,2</sup>



Gastric bypass leads to rapid improvement of GERD in obese patients, but about 50% of patients continue to need PPIs even after surgery

2454 pts with GERD undergoing RYGBP in Sweden (2006 – 2015). Holmberg 2019

One year after the intervention, 55.8% of the patients had persistent GERD symptoms and 48.8% continued to have symptoms also for the second year, continuing to regularly take PPIs

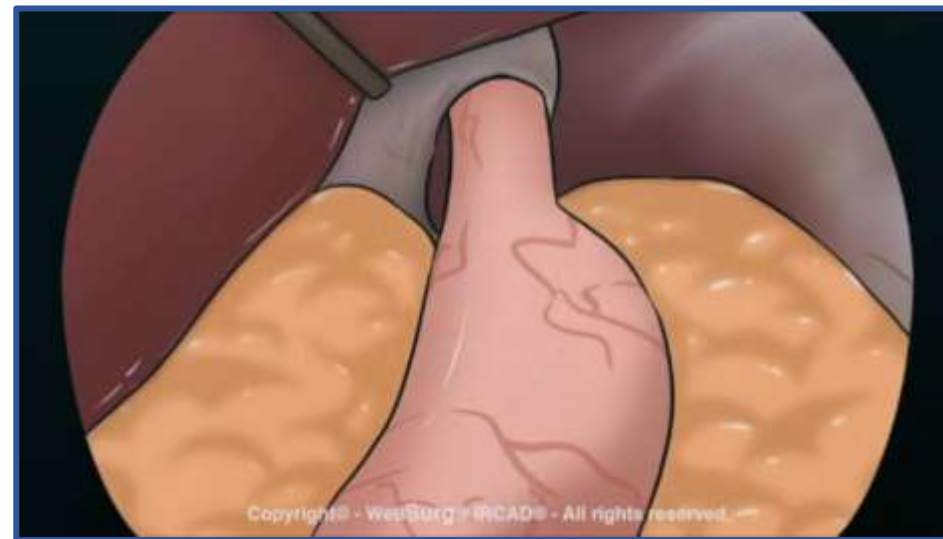
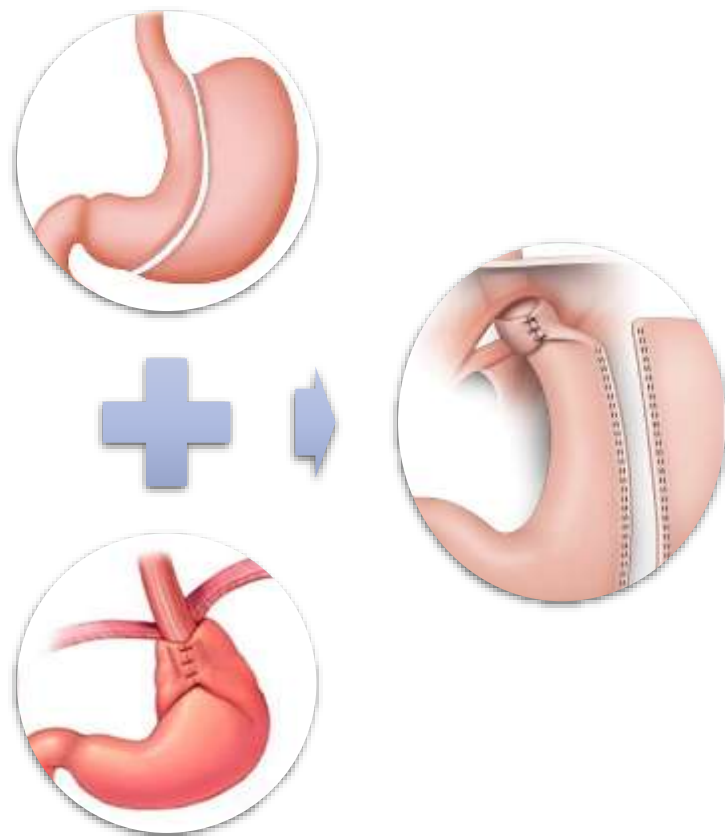
# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## Sleeve gastrectomy with associated fundoplication: why?

Laparoscopic Sleeve Gastrectomy is the most commonly performed procedure for the treatment of obesity

360° anti-reflux plastic is the gold standard in the treatment of GERD

The first references to this associated technique can be found in the literature between 2015 and 2017



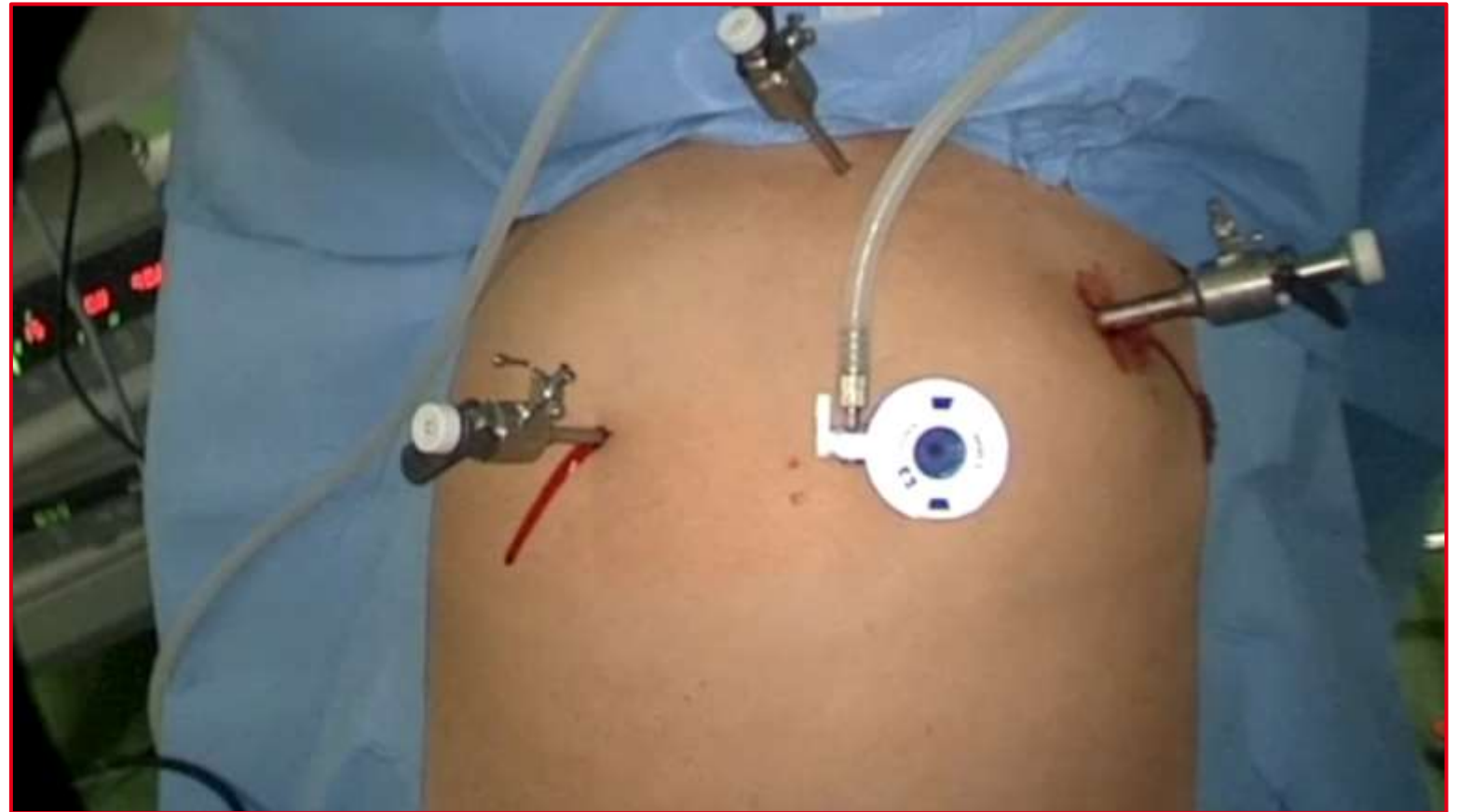
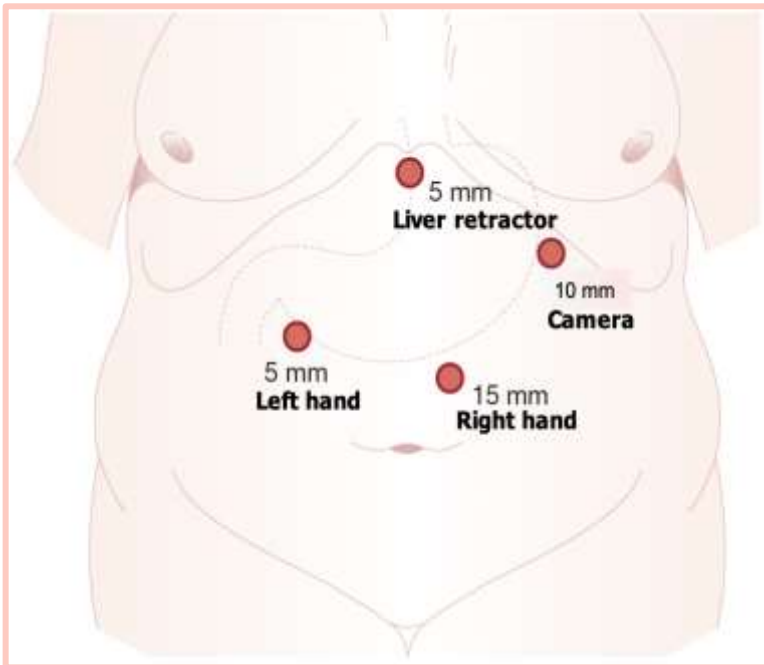
Nocca D, Skalli EM, Boulay E, Nedelcu M, Michel Fabre J, Loureiro M. Nissen Sleeve (N-Sleeve) operation: preliminary results of a pilot study. Surg Obes Relat Dis. 2016

Olmi S, Caruso F, Uccelli M, Cioffi S, Ciccarese F, Cesana G. Laparoscopic sleeve gastrectomy combined with Rossetti fundoplication (R-Sleeve) for treatment of morbid obesity and gastroesophageal reflux. Surg Obes Relat Dis. 2017

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## Sleeve gastrectomy with associated fundoplication: surgical technique

### Trocar placement



# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## OBSERVATIONAL STUDY (58 pts)

### Study design

- ✓ Single center, prospective, observational study
- ✓ Patients recruited from June 2017 to September 2018 (58 pts)
- ✓ Data analyzed by an independent research center (Research Center on Public Health, University of Milan-Bicocca)

### Inclusion criteria

- ✓ Patients with morbid obesity and indication for surgery according to SICOB guidelines
- ✓ Patients with gastro-oesophageal reflux disease, with an endoscopic diagnosis of esophagitis according to the Los Angeles classification

### Exclusion criteria

- ✓ Patients aged < 18 years and > 65 years
- ✓ Patients with symptoms of achalasia
- ✓ Patients who have undergone previous bariatric surgery or on the oesophageal-gastric region
- ✓ Patients not eligible for video laparoscopic surgery

### Secondary goals

evaluate the improvement of comorbidities

evaluate the incidence of post-operative gastric fistula and the complication rate of the operation



Olmi S, Cesana G, D'Angiolella L, Bonaldi M, Uccelli M, Mantovani L. Sleeve gastrectomy with tailored 360° fundoplication according to Rossetti in patients affected by obesity and gastroesophageal reflux: a prospective observational study. Surg Obes Relat Dis. 2021 Jun;17(6):1057-1065

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## OBSERVATIONAL STUDY: BMI and comorbidities



Surgery for Obesity and Related Diseases 17 (2021) 1057–1068

SurGERY FOR OBESITY AND RELATED DISEASES

Original article

**Sleeve gastrectomy with tailored 360° fundoplication according to Rossetti in patients affected by obesity and gastroesophageal reflux: a prospective observational study**

Stefano Olmi, M.D.<sup>a,b</sup>, Giovanni Cesana, M.D.<sup>b,c,\*</sup>, Lucia D'Angiolella, Ph.D.<sup>d</sup>,  
Marta Bonaldi, M.D.<sup>b,c</sup>, Matteo Uccelli, M.D.<sup>a</sup>, Lorenzo Mantovani, D.Sc.<sup>d</sup>

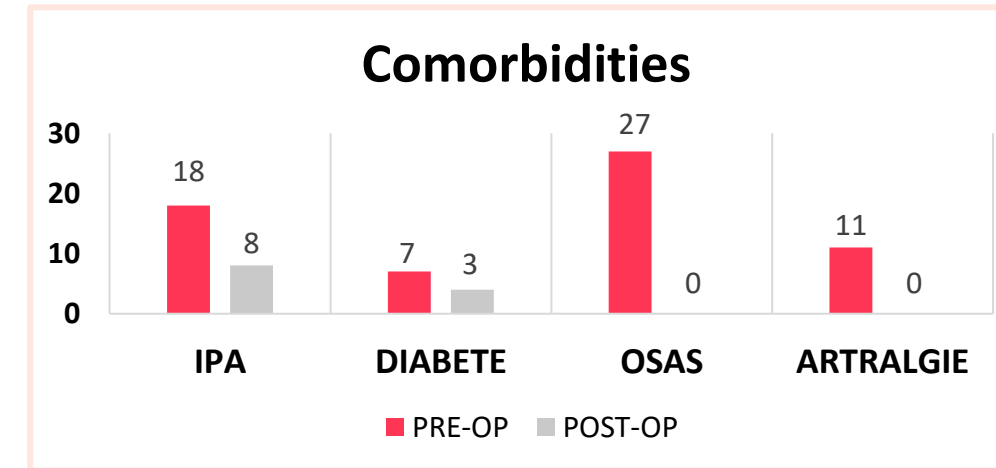
<sup>a</sup>Department of Surgery, S.I.C.O.R. (Italian Society of Bariatric Surgery) Referral Center for Bariatric Surgery, Policlinico San Marco, GSD University and Research, Bergamo, Italy

<sup>b</sup>Vita-Salute San Raffaele University, Milan, Italy

<sup>c</sup>University of

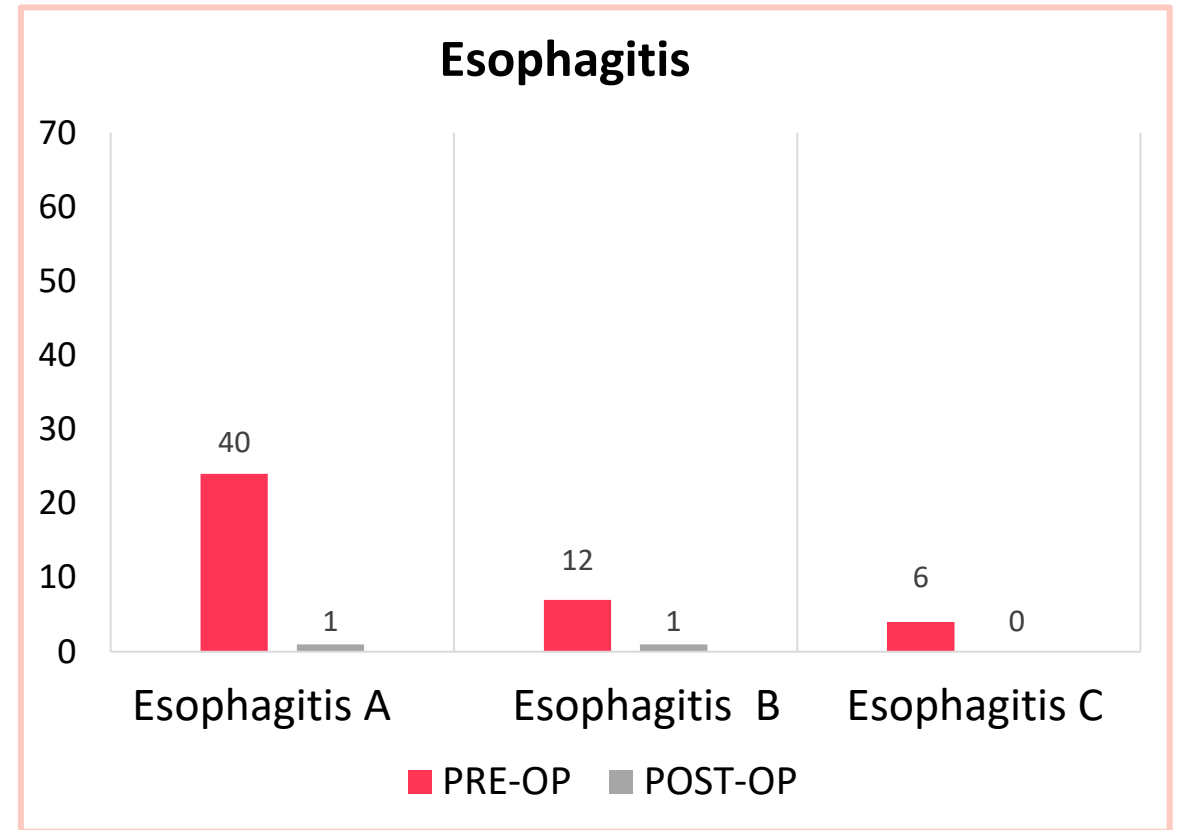
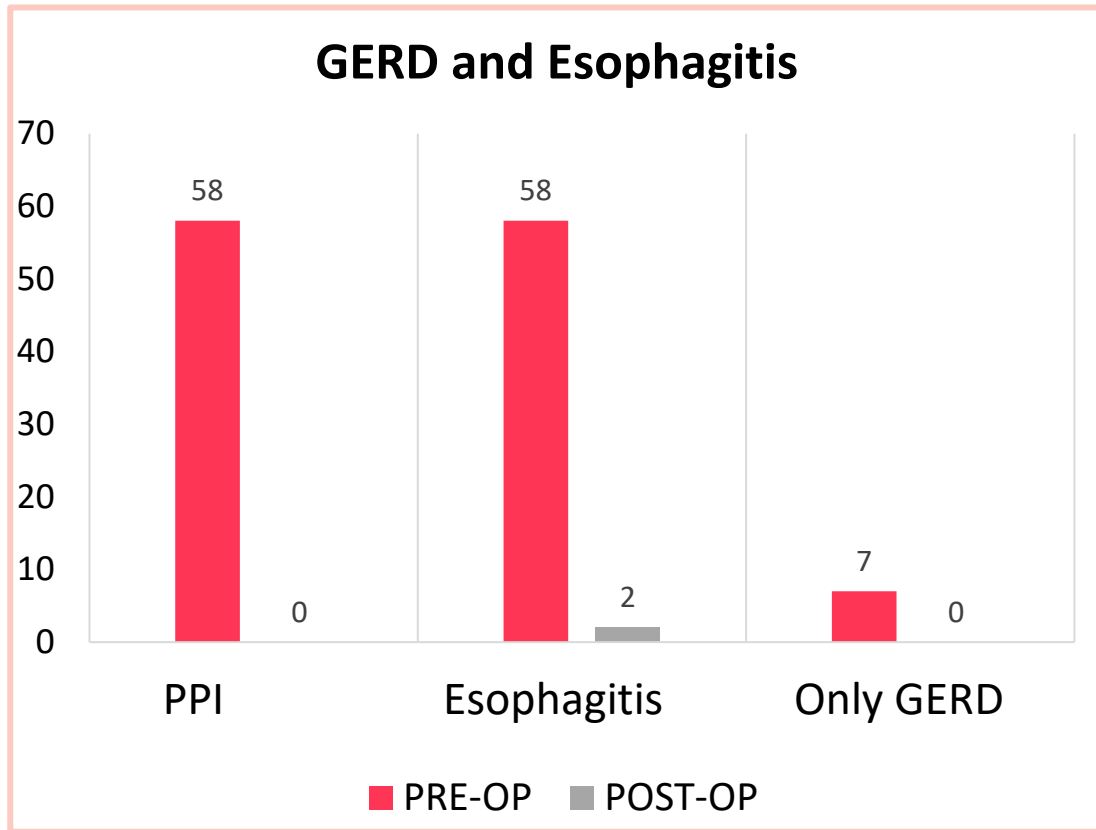
<sup>d</sup>Research Centre in Public Health (CESP)

Population	n=58
Male, n (%)	16 (27.6)
Age, years, mean ± DS	43.0 ± 8.4
Weight, Kg, mean ± DS	112.9 ± 16.7
BMI, kg/m <sup>2</sup> , mean ± DS	41.9 ± 4.6
<b>Comorbidities, n (%)</b>	
Hypertension	18 (31 %)
OSAS	27 (46.6 %)
DM type II	7 (12.1 %)
Artopathy	11 (19 %)
<b>Oesophagitis</b>	<b>58 (100)</b>
A	40 (69 %)
B	12 (20.7 %)
C	6 (10.3 %)



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## OBSERVATIONAL STUDY: GERD and Oesophagitis



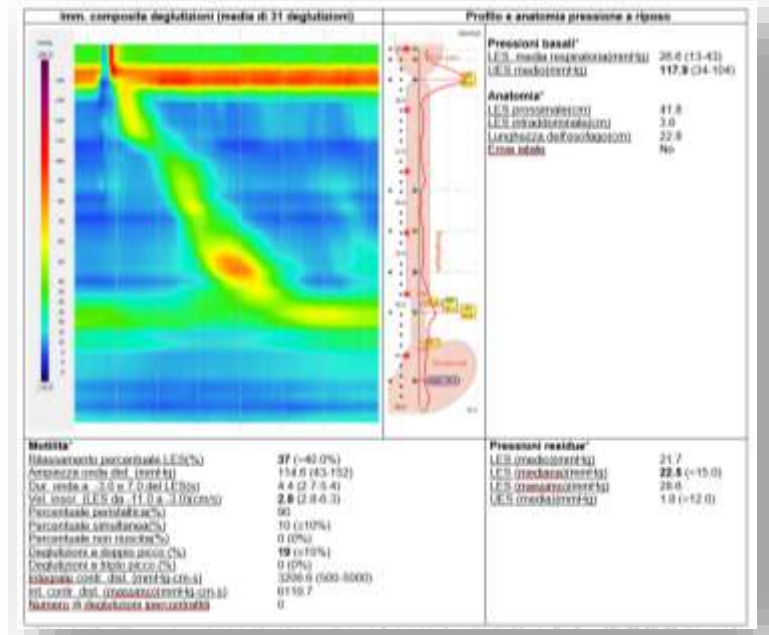
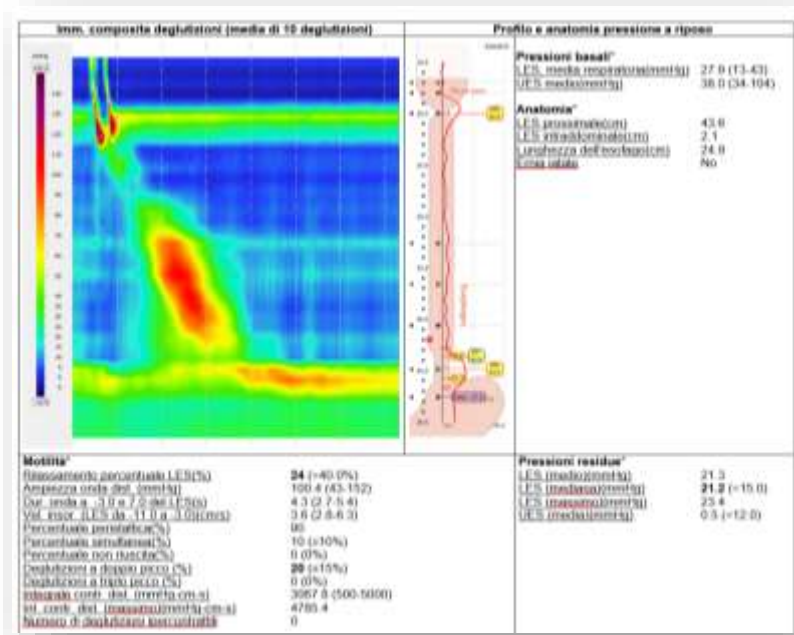
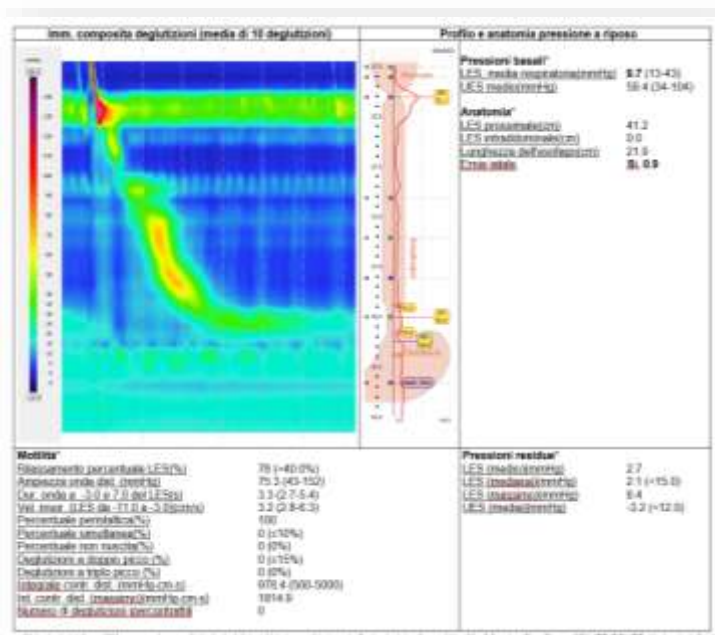
# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## OBSERVATIONAL STUDY: High Resolution Manometry (HRM)

LES pre-op 9.7 mmHg

LES post-op 27.9 mmHg

LES 12 months: 26.8 mmHg



# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## RCT: DE NOVO GERD (278 pts)

### Study design

- ✓ Single center and two parallel arm (1:1) randomized controlled clinical trial.
- ✓ Experimental arm: morbidly obese patients without GERD undergoing sleeve gastrectomy associated with antireflux plasty (138 pts)
- ✓ Control arm: morbidly obese patients without GERD undergoing sleeve gastrectomy surgery conducted according to the classic technique (140 pts)
- ✓ Patients recruited from May 2017 to January 2021
- ✓ Data analyzed by an independent research center (Research Center on Public Health, University of Milan-Bicocca)

### Inclusion criteria

- ✓ Patients with morbid obesity and indication for surgery according to SICOB guidelines

### Secondary goals

- evaluate the improvement of comorbidities
- evaluate the incidence of post-operative gastric fistula and the complication rate of the operation

### Exclusion criteria

- ✓ Patients aged < 18 years and > 65 years
- ✓ Presence of gastroesophageal reflux according to endoscopic and clinical criteria.
- ✓ Patients who have undergone previous bariatric surgery or on the oesophageal-gastric region
- ✓ Patients not eligible for VLS surgery



Olmi S, Cesana G, Gambioli A, Bonaldi M, Ferrari D, Uccelli M, Ciccarese F, Stefano C, Riccardo G, Lorenzo M. Effect of laparoscopic sleeve gastrectomy vs laparoscopic sleeve + Rossetti fundoplication on weight loss and de novo GERD in patients affected by morbid obesity: a randomized clinical study. *Obes Surg.* 2022 May;32(5):1451-1458

# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## RCT: DE NOVO GERD (278 pts)

	Sleeve gastrectomy (n: 140)	Sleeve gastrectomy + funduplicatio (n: 138)	p-value
Male, n (%)	40 (28.6)	30 (21.7)	0.189
Agey, years, mean ± DS	41.3 ± 9.8	40.8 ± 11.1	0.741
BMI, kg/m <sup>2</sup> , mean ± DS	45.1 ± 7.0	43.4 ± 5.9	0.015
Peso, kg, mean ± DS	123.7 ± 26.7	117.7 ± 18.8	0.677
<b>Comorbidità</b>			
Hypertension	45 (32 %)	36 (26.1 %)	0.279
DM type II	12 (8.6 %)	7 (5.0 %)	0.234
OSAS	65 (46.4 %)	52 (37.7 %)	0.142

Complications	Sleeve gastrectomy (n:140)	Sleeve gastrectomy + funduplicatio (n:138)	
<b>Early</b>	2 (1.4 %)	6 (4.3 %)	p = 0.0707
• Bleeding, n (%)	1 (0.7 %)	1 (0.7 %)	p = 1.0000
• Gastric perforation, n (%)	0	5 (3.5 %)	p = 0.0122
• Gastric fistula, n (%)	1 (0.7 %)	0	p = 0.3257
<b>Late</b>			
• Weight regain, n (%)	1 (0.7 %)	1 (0.7 %)	p = 0.1608

Obesity Surgery (2022) 32:1451–1458  
<https://doi.org/10.1007/s11695-022-05955-8>

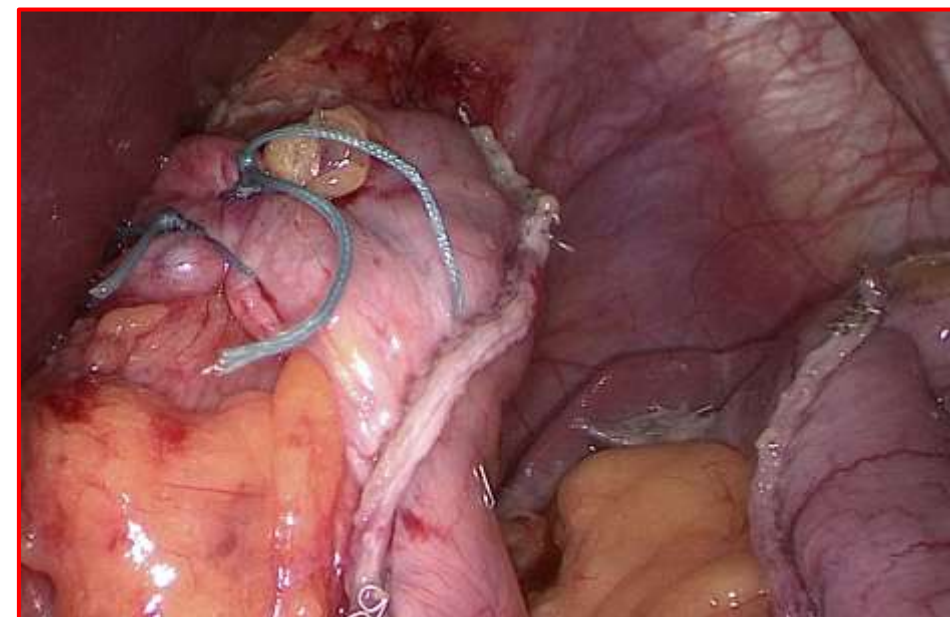


ORIGINAL CONTRIBUTIONS



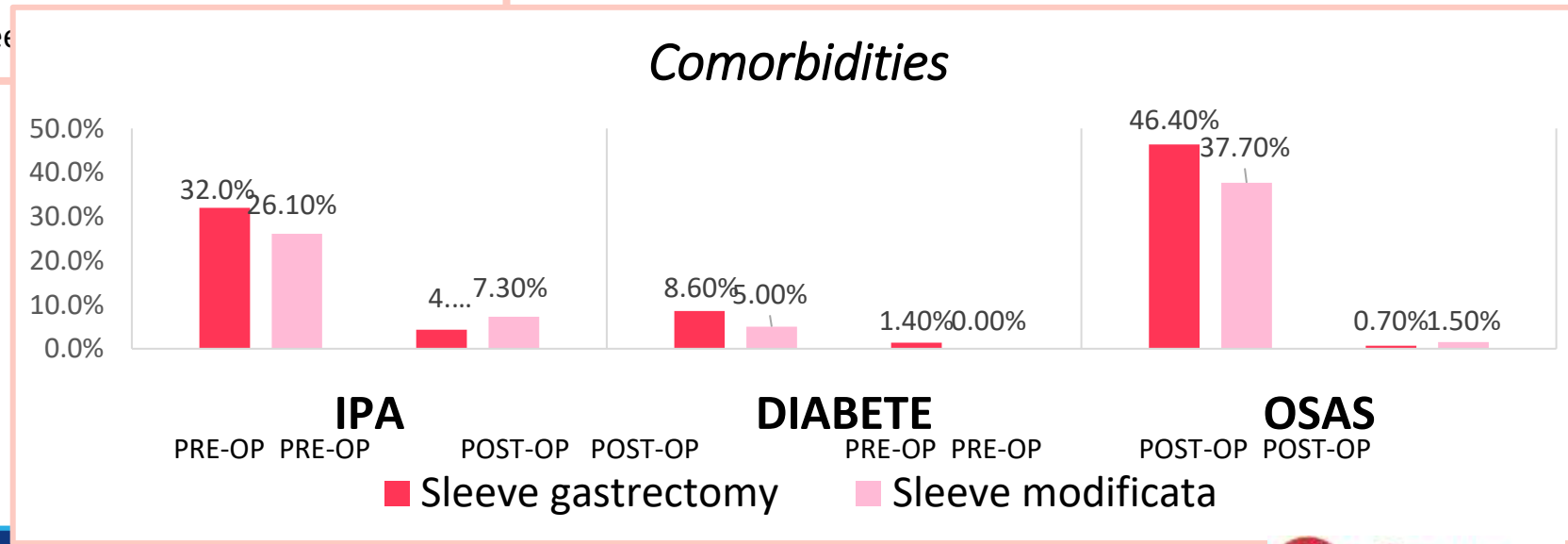
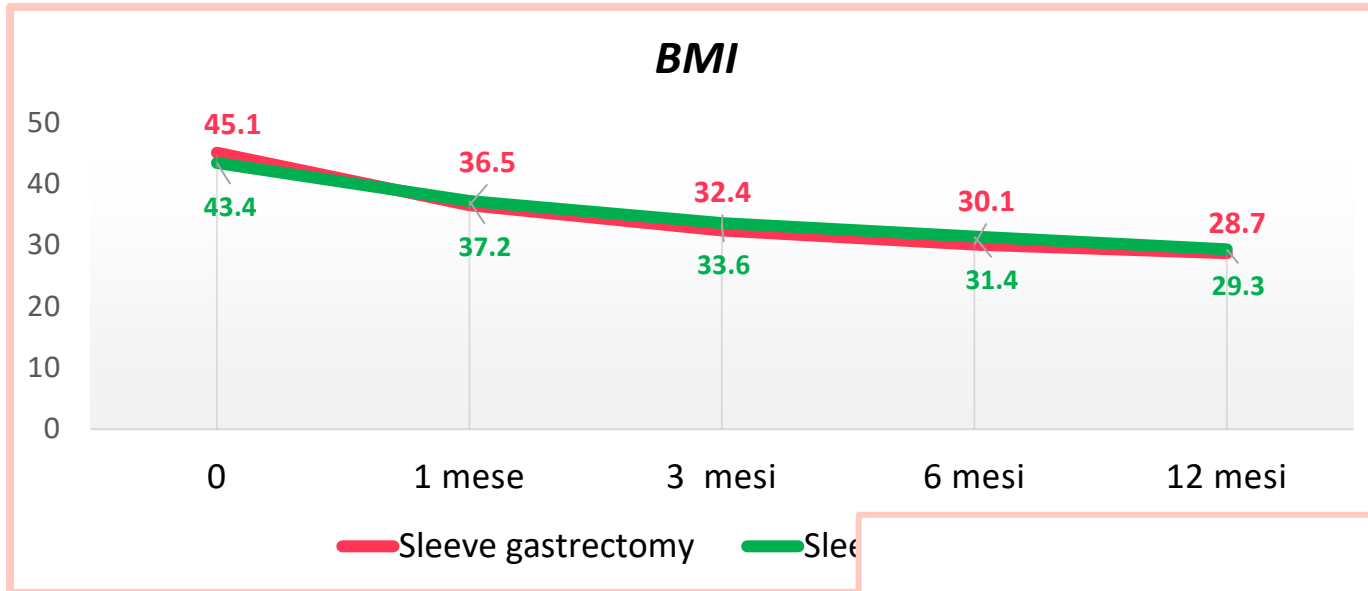
**Effect of laparoscopic sleeve gastrectomy vs laparoscopic sleeve + Rossetti fundoplication on weight loss and de novo GERD in patients affected by morbid obesity: a randomized clinical study**

Stefano Olmi<sup>1,2</sup> · Giovanni Cesana<sup>1,3</sup> · Angela Gambioli<sup>4</sup> · Marta Bonaldi<sup>1</sup> · Davide Ferrari<sup>1,3</sup> · Matteo Uccelli<sup>1</sup> · Francesca Ciccarese<sup>1,3</sup> · De Carli Stefano<sup>1</sup> · Giorgi Riccardo<sup>1</sup> · Mantovani Lorenzo<sup>4</sup>



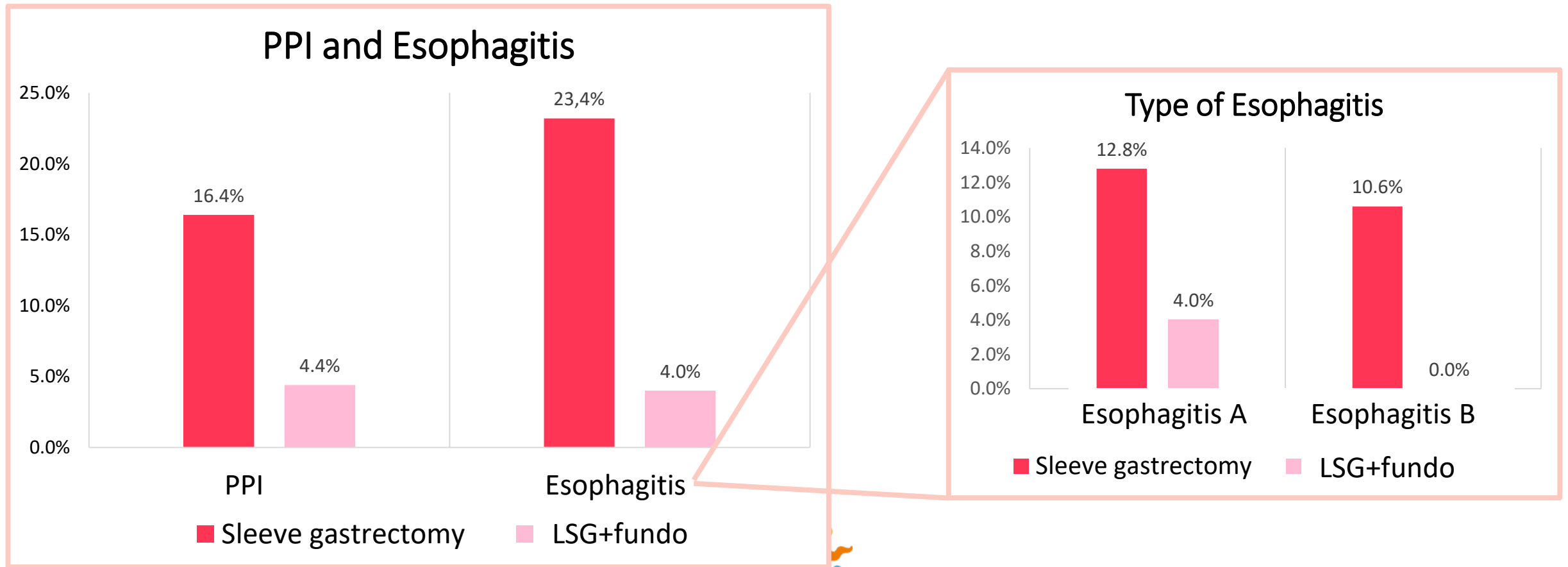
# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## RCT: BMI and comorbidities



# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## RCT: GERD and Esophagitis



# LONG TERM RESULTS OF SLEEVE-ROSSETTI

## Laparoscopic Sleeve Gastrectomy with Rossetti fundoplication Long-term (5 years) follow up

### PRE-OPERATIVE DATA

450 LSG+fundoplicatio dal 2015

**127 patients with complete 5-year follow-up**

Mean BMI 42

- 21% with Esophagitis (any grade)
- 33% with hiatal hernia
- 74% with GERD

### POST-OPERATIVE DATA

**Reoperations 3.1 % (Gastric perforation)**

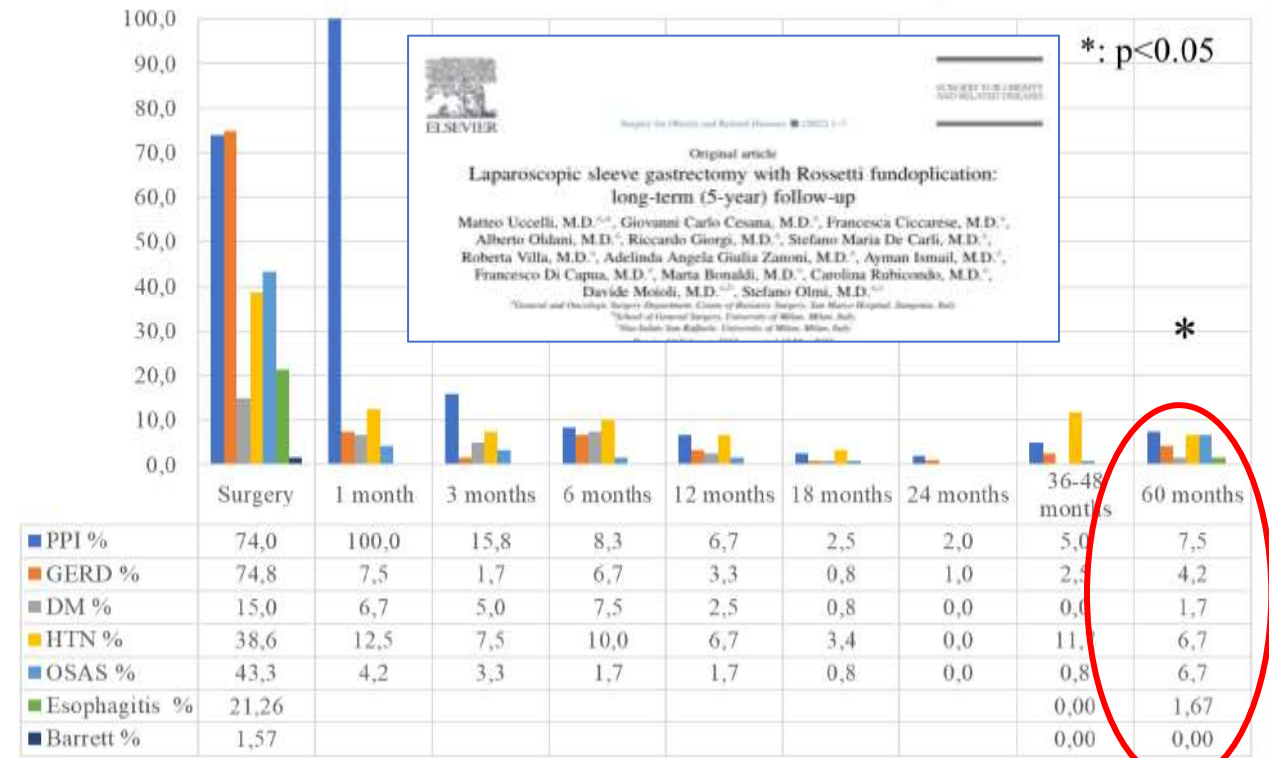
**Only 3% take PPIs every day**

**4.5% take PPIs occasionally**

**EWL and comorbidity resolution comparable to LSG**

**Esophagitis: 1.7% (grade A esophagitis)**

### FOLLOW-UP: comorbidities and weight



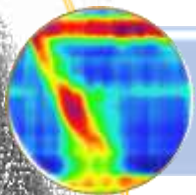
Olmi S, Uccelli M, et al R. Modified laparoscopic sleeve gastrectomy with Rossetti antireflux fundoplication: results after 220 procedures with 24-month follow-up. Surg Obes Relat Dis. 2020 Sep;16(9):1202-1211  
Uccelli M, Cesana GC, et al. Laparoscopic sleeve gastrectomy with Rossetti fundoplication: long-term (5-year) follow-up. Surg Obes Relat Dis. 2022 Oct;18(10):1199-1205

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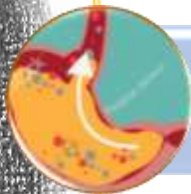
## CONCLUSIONS



Standardized, reproducible and effective surgery in terms of weight loss and improvement of comorbidities



Improved oesophageal-gastric junction



Resolution of gastroesophageal reflux symptoms



Improvement of esophagitis



Reduced occurrence of de novo GERD

