

Montefiore
THE UNIVERSITY HOSPITAL

 **EINSTEIN**
Albert Einstein College of Medicine
OF YESHIVA UNIVERSITY

Revisional Bariatric Surgery

Jenny J. Choi, M.D.

Director of Bariatrics

Assistant Professor of Surgery

Albert Einstein School of Medicine

Montefiore Medical Center



Background

- ~200,000 bariatric operations done a year in the US
- Usually a nadir weight is reached at 1-2 years
- Weight gain after bariatric operation may be under reported
- Mechanism for weight regain is poorly understood

Different Surgical Options

	2011	2012	2013	2014	2015
Total	158,000	173,000	179,000	193,000	196,000
RNY	36.7%	37.5%	34.2%	26.8%	23.1%
Band	35.4%	20.2%	14%	9.5%	5.7%
Sleeve	17.8%	33%	42.1%	51.7%	53.8%
BPD/DS	0.9%	1%	1%	0.4%	0.6%
Revisions	6%	6%	6%	11.5%	13.6%
Other	3.2%	2.3%	2.7%	0.1%	3.2%
Balloons					~700 cases
V-Bloc					18 cases

Ponce J, Nguye NT, Hutter M, Sudan R, Morton JM. American Society for Metabolic and Bariatric Surgery estimation of bariatric surgery procedures in the United States, 2011-2014. Surg Obes Relat Dis 2015;11:1199-1200

Primary Bariatric Procedures

- Lap Band
- Sleeve Gastrectomy
- Roux-en-y Gastric Bypass
- *Duodenal Switch*

Reasons for Revision after Lap Band

- Inadequate weight loss
- Weight regain
- Motility Issues (pouch, esophageal dilation)
- GERD
- Mechanical Issues
 - Slippage
 - Erosion
 - Port, tubing failure

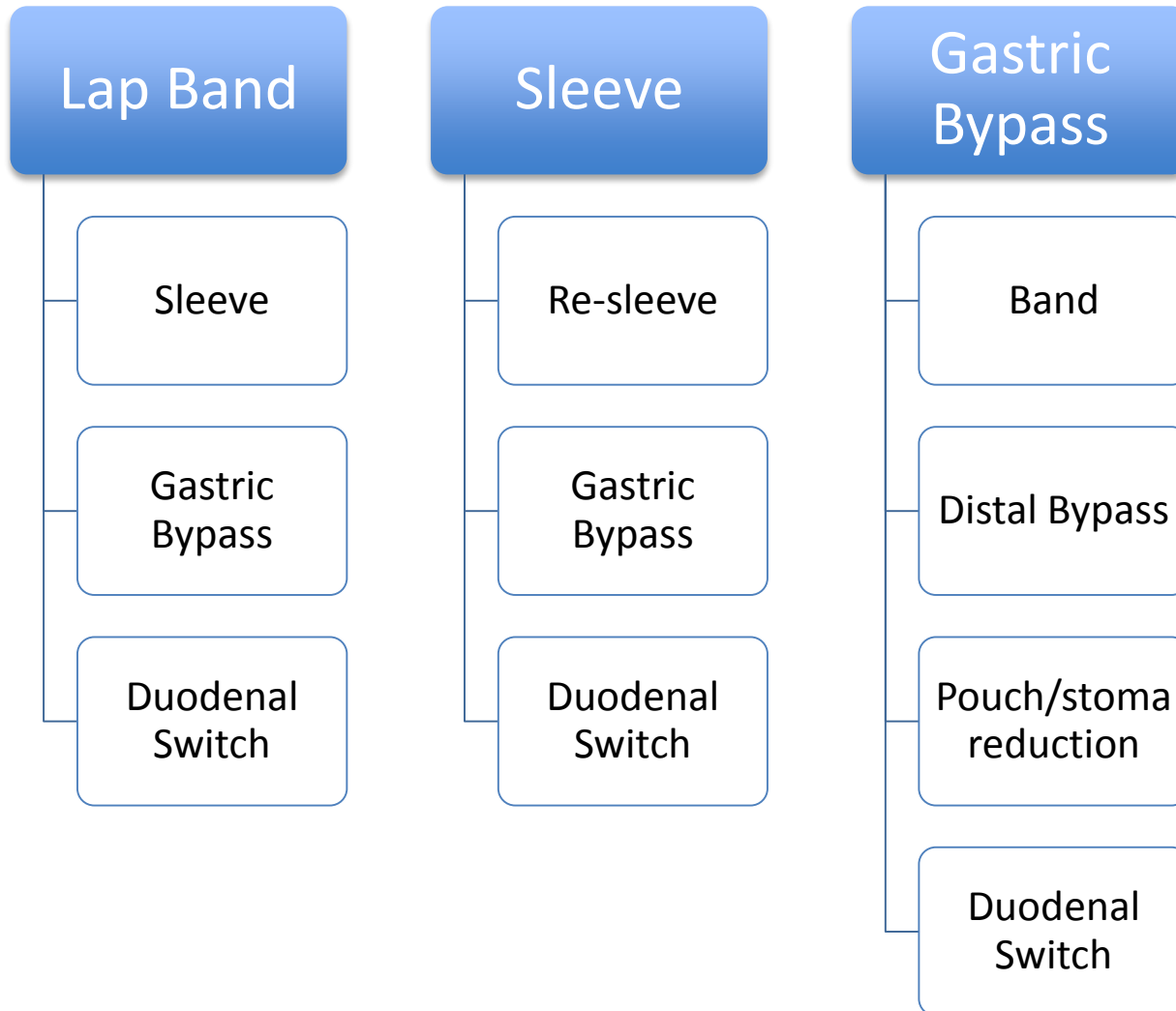
Reasons for Revision after Sleeve

- Inadequate weight loss
- Weight regain
- GERD
- Stricture, outlet obstruction
- Dilation of the stomach
- Leaks

Reasons for Revision after Roux-en-y Gastric Bypass

- Inadequate weight loss
- Weight regain
- Severe weight loss or malnutrition
- Technical or mechanical failure
 - Gastrogastric fistula
 - Chronic marginal ulcer or stricture
 - Internal hernia
- Nutritional or endocrine derangements

Revision Options for Weight Loss



Band to Sleeve

- Review of 8 studies (286 patients) evaluating conversion of LAGB to SG
- Complication rate (major and minor) 12.2%
- Staple line leak rate 5.6%
- %EWL ranged from 31–60% (follow up 6-36 mo)

Coblijn UK. *Obes Surg* 23(2013), pp 1899-1914.

Band to Gastric Bypass

- Review of 15 studies (588 patients)
- Overall complication rate 8.5%
- Anastomotic leak 0.9%
- Bleeding rate 1.8%
- %EWL--23% and 74% with follow-up periods ranging from 7–44 months
- Decreases in body mass index (BMI) ranged from 6–12 points with the majority of studies reporting around a 10-point decrease

Montefiore Data: Lap Band to Sleeve vs. GBP

- Mean BMI 45.6 for both groups
- Similar weight loss
 - BMI 34.6 (GBP) vs. 35.1 (sleeve)
- Higher complication rate in sleeve group
 - 21% vs. 5%

Pre-Revision Characteristics

	Conversion to Bypass (n=79)	Conversion to Sleeve (n=23)
Age (years)	42	44
Male	77.8%	22.2%
Female	77.4%	22.6%
Years to Revision	4.5	4.4
Pre-revision BMI (kg/m ²)	45.6	45
No. of Co-morbidities	1.6	2

Post-Revision Characteristics

	Conversion to Bypass (n=79)	Conversion to Sleeve (n=23)
Post-revision BMI (kg/m ²)	34.6	35.1
Weight lost (lbs)	63.5	57.1

Band to Duodenal Switch

- 366 consecutive patients BMI 44.3 (35-75) kg/m² evaluated for two-stage operative concept: Band to Duodenal Switch
- A very good-to-excellent result was found in 118 patients (32%), 141 (39%) had a good results, 76 (21%) a fair result, and 31 (8%) were failures
- 39 patients needed re-banding due to slippage, 68 a DS, and 11 patients had band removal
- Early morbidity of the Lap-Band was 3.8%, DS 13%, and mortality was zero. The excess weight loss at last follow-up of all the patients was 44%

40% after Lap-Band/rebanding

82% 2 years after DS

Peterli. Obes Surg. 2007 Mar;17(3):334-40.

Sleeve Revision Options

Revisional procedure grouping	Aggregate sample size (<i>n</i>)	Weighted age (years)	Weighted percentage female (%)	Weighted pre-op BMI
LSG to laparoscopic gastric bypass (LGB)	114	45.3	61	41.9
LSG to laparoscopic re-sleeve gastrectomy (LRSG)	45	43.9	83	38.5
LSG to other surgical intervention (OSI)	59	36.9	84	44.4

Cheung D. *Obes Surg.* 2014 Oct;24(10):1757-63.

Sleeve Revision

Weight Loss and Follow up

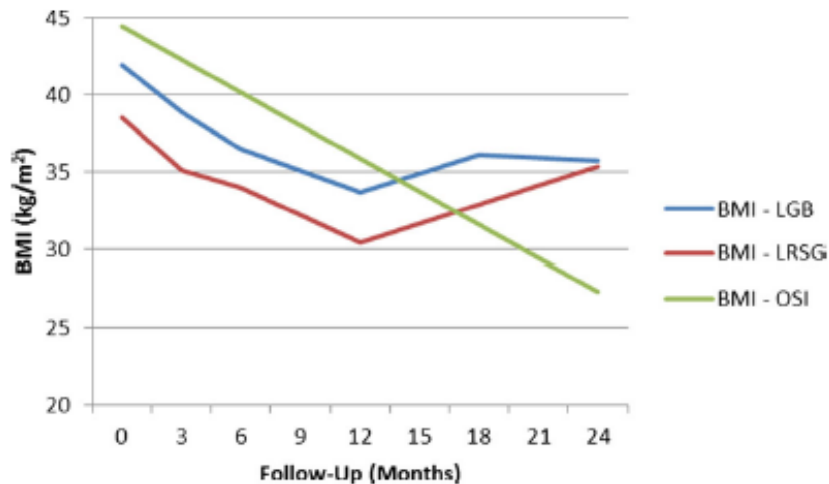


Fig. 2 Body mass index (BMI) at various follow-up intervals

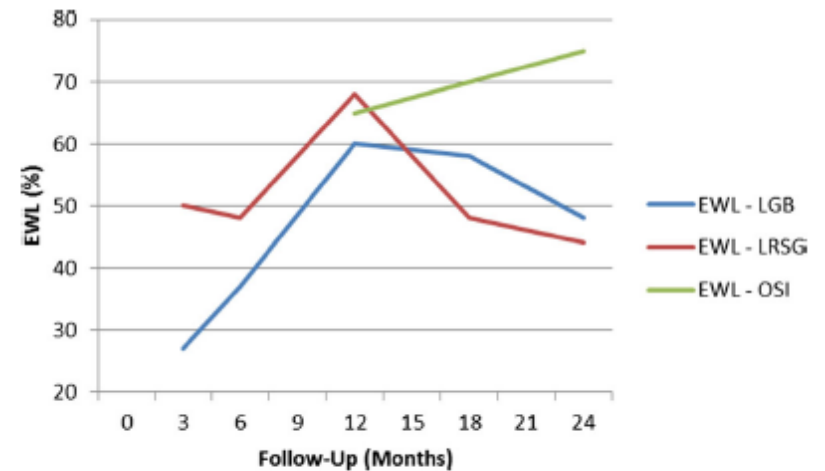


Fig. 3 Excess weight loss (EWL) at various follow-up intervals

Cheung D. Obes Surg. 2014 Oct;24(10):1757-63

Band over Gastric Bypass

- Review of 7 studies, with a total of 94 patients
- Varied results from 55.9%-94.2% excess body mass index loss (EBMIL) after 12-42 months of follow-up
- Complication rate 18% (17/94)
- Re-revision in 17% (16/94)

Vijgen GH. Surg Obes Relat Dis. 2012 Nov-Dec;8(6):803-8

Band over Gastric Bypass: NYU

- 43 patients (9 men and 34 women)
- Average interval to LAGB was 6.6 years
- Mean BMI before RYGB was 50.4 kg/m² and before LAGB was 43.3 kg/m² (%EWL was 17% after RYGB)
- At follow-up after LAGB, the average BMI was 35.2 kg/m², with a %EWL of 38% (calculated from LAGB only) at 26 months (range 6-66)
- At the 1- and 2-year follow-up visit, the BMI had decreased by 8.7 kg/m²
- The reoperation rate for complications related to LAGB was 10% and included 2 band erosions, 1 band slip, and 1 port flip.

Irani K. Surg Obes Relat Dis. 2011 Mar-Apr;7(2):219-24

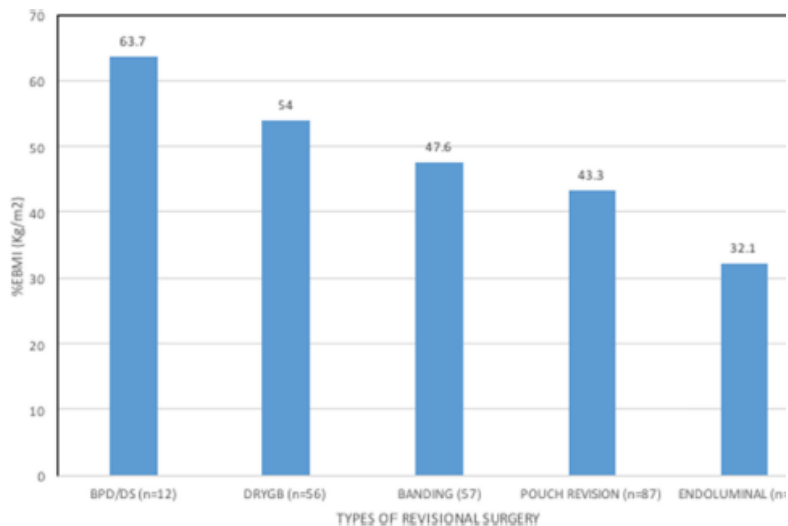
Band over Gastric Bypass: CUMC

- 22 patients, mean BMI 44.8 +/- 6.34 kg/m(2)
- %EWL of 19%, 27%, 47.3%, 42.3%, 43%, and 47% at 6, 12, 24, 36, 48, and 60 months after the revisional procedure
- 5 year follow up
- 3 major complications occurred requiring reoperation
- No band erosions

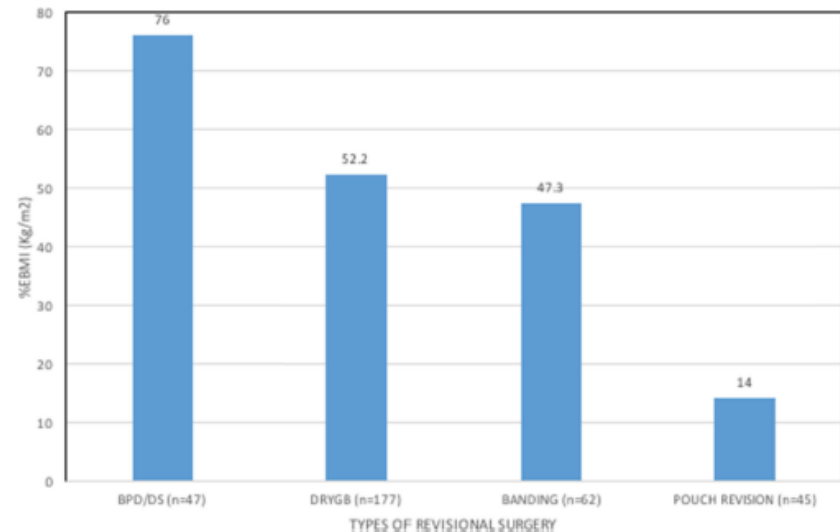
Bessler M. Surg Obes Relat Dis. 2010 Jan-Feb;6(1):31-5

GBP Revision Techniques

%EBMI Loss 1 year



%EBMI Loss at 3 year

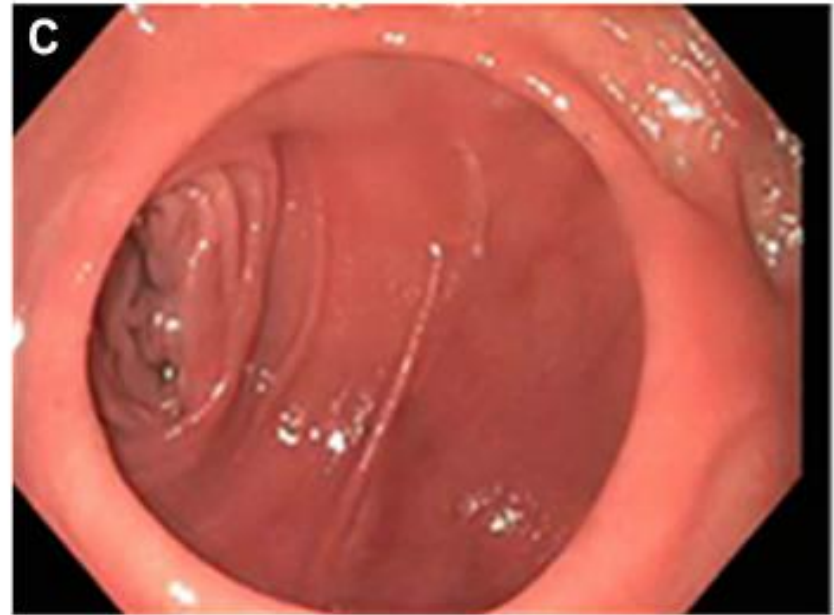
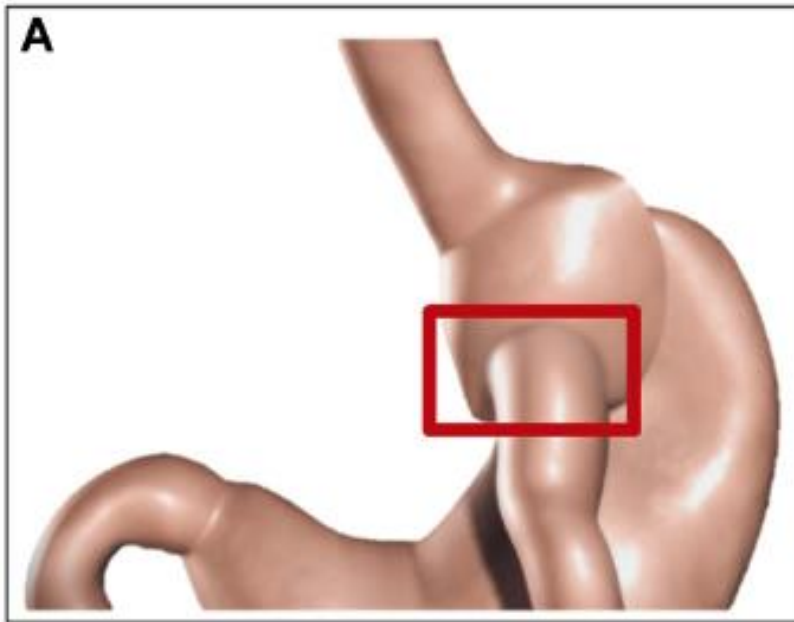


Tran DD. Obes Surg. 2016 Jul;26(7):1627-34

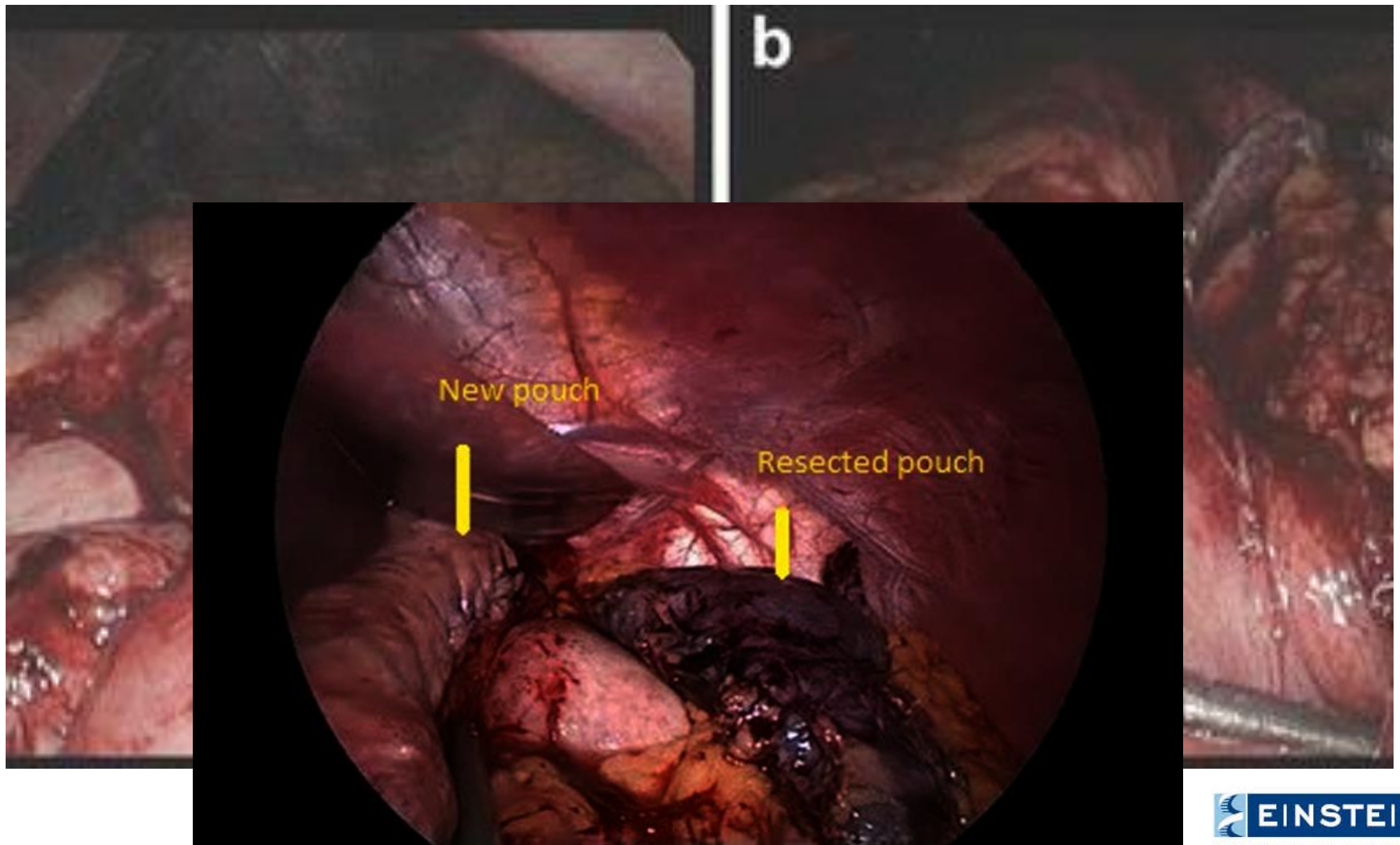
Distal Bypass: Randomized Trial

- A total of 113 patients with BMI from 50 to 60 were randomly assigned to standard (n = 57) or distal (n = 56) Roux-en-Y gastric bypass (RYGB)
- At 2 years, the total BMI loss was 17.8 (95% CI, 16.9–18.6) kg/m² after standard and 17.2 (95% CI, 16.3–18.0) kg/m² after distal, with no significant between-group differences ($p = 0.32$)
- There were no statistically significant regarding weight loss, obesity-related quality of life, weight-related symptoms, anxiety, depression, or eating behavior

Svanevik M. Obes Surg. 2017 [Epub]



Resection of Gastrojejunostomy



Reduction of Gastrojejunostomy

- 32 patients
 - BMI 38.8 ± 6.4 kg/m²
 - Weight 101.7 ± 22.8 kg
 - Complication and reoperation rates were 15.6 and 3.1 %
 - Follow up: 14.1 ± 6.2 months
 - Mean postoperative BMI 32.8 ± 7.3 kg/m²
 - Median %EWL 29.1%
- 9 patients
 - BMI 43.4 ± 8.6 kg/m²
 - No complications or reoperations
 - Follow up: 14 months
 - Mean postoperative BMI 43.4 ± 8.6 kg/m²
 - Median %EWL $64.6\% \pm 19.9$ (P < 0.05)

Elbahrawy, et al. Obes Surg. 2017 May 3.

Montefiore Data: GBP Revision

- 66 patients, BMI 44.3 ± 7.79 kg/m²
- 3-16 yrs after initial surgery
- Average weight 263.4 ± 52.69 lb
- Patients lost an average of 28.8 lb (p=0.008) at 6 months and 30.1 lb (p=0.006) at 12 months
- 34.3% EWL at 6 months and 36.4% EWL at 12 months
- Complications: 5 readmissions (7.6%), 1 leak (1.5%), and 4 required blood transfusions (6.1%)

Gastric Bypass to Duodenal Switch

- Very little available data
- 9 patients, BMI 45.6 ± 8.7 (28.8-60.2) corresponding to excess weight loss (EWL) of $33.1\% \pm 17.7\%$ (10.6%-68.1%), before conversion
- Average operative time was 402.6 ± 65.8 (328-515) minutes for 1-stage conversions
- No morbidities, reoperation, or readmission over 30 days postoperatively were reported. No leaks or mortalities were identified
- Follow-up postconversion is 16.3 ± 13.6 (3-42) months
- After conversion surgery, the mean BMI was 35.8 ± 8.2 (27.6-49.5) kg/m², while mean EWL loss was $64.1\% \pm 18.8\%$ (45.9%-88.7%)
- The BMI of the cohort decreased by a mean of 9.8 ± 5.1 (0.5-16.8) and the EWL increased by $31\% \pm 23.1\%$ (4%-76.6%)

Halawani HM. Surg Obes Relat Dis. 2017 Aug;13(8):1272-1277

Summary

- Multifactorial reasons for weight loss failure
- Surgical revision likely most durable
- Higher risk
- No clear best option
- Patient selection remains very important