The Sleeve with Reflux and Recurrent Weight Gain – Conversion to RYGB

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No disclosures related to this presentation

Session 3.2.1 – 2:00pm – Revisional Surgery
Chair: Muffazal Lakdawala
Moderator: Almino Ramos

Part I
Sleeve Gastrectomy
Moderators: Gerhard Prager, Kelvin Higa

Options with recurrent weight gain after ESG, Manoel Galvao Neto 6 min

Debate: The Sleeve with Reflux and Recurrent Weight Gain

Hybrid Procedures: Michel Gagner 6 min
RYGB: Almino Ramos 6 min
OAGB: Chetan Parmar 6 min
SADI-S: Antonio Torres 6 min
Other Sleeve Plus Procedures : TBA 6 min
Sum up 6 mins

Conversions in Sleeve Gastrectomy

- ✓ Gastroesophageal Reflux
  - ✓ With or without Hiatal Hernia
- ✓ Suboptimal weight results
  - ✓ Weight recurrence
  - ✓ Insufficient weight loss
- ✓ Mechanical complications – Strictures
- ✓ Fistula/Leak

Conversions in Sleeve Gastrectomy

- ✓ Gastroesophageal Reflux
  - ✓ With or without Hiatal Hernia
- ✓ Suboptimal weight results
  - ✓ Weight recurrence
  - ✓ Insufficient weight loss

Conversion from SG to RYGB
Is it safe?

ELSEVIER

SURGERY FOR OBESITY AND RELATED DISEASES

Surgery for Obesity and Related Diseases ■ (2019) 1–6

Original article

Conversion of sleeve gastrectomy to Roux-en-Y gastric bypass for complications: outcomes from a tertiary referral center in the Middle East

Juan S. Barajas-Gamboa, M.D.[a], Joshua Landreneau, M.D.[b], Carlos Abril, M.D.[a], Javed Raza, M.D.[a], Ricard Corcelles, M.D.[a,c], Matthew Kroh, M.D.[a,b,c,*]

- **Conclusion:** In this series, representing the largest reported single-center experience in the Middle East, **conversion of SG to RYGB was safe** and effective for the treatment of symptoms and mechanical complications after SG.

- Barajas-Gamboa JS et al. Surg Obes Relat Dis.

Conversion of sleeve gastrectomy to Roux-en-Y gastric bypass for complications: outcomes from a tertiary referral center in the Middle East

Table 2
Procedural details and outcomes

Procedural details and outcomes	
Successful laparoscopic approach, n (%)	47 (100)
Operative time, min, mean ± SD	203 ± 48
Estimated blood loss (≤ 25 mL), n (%)	46 (97.8)
Technique for GJ anastomosis	
Hand-sewn, n (%)	39 (82.9)
Circular-stapled EEA, n (%)	8 (17.1)
Length of stay, d, median (IQR)	3 (2–5)
Complications within 30 d, n (%)	
Superficial SSI	2 (4.2)
Leak	1 (2.1)
Gastrointestinal hemorrhage	1 (2.1)
Reoperation	2 (4.2)
Readmission	5 (10.6)
BMI at 12 mo postoperatively, kg/m^2, median (IQR)	29 (23–39)
Duration of follow-up, mo, median (IQR)	17 (4–26)
Mortality, n (%)	0 (0)

SD = standard deviation; GJ = gastrojejunal; EEA = end-to-end, IQR = interquartile range; SSI = surgical site infection, BMI = body mass index.

Successful procedure 100%

No/few conversion to open

Estimated operative time: 3 h

Minimal blood loss

GJ: Manual, Linear or Circular

Hospitalization 2-3 days

Main complication: Bleeding

May be done with similar problems or complications than a regular primary LSG

Barajas-Gamboa JS et al. Surg Obes Relat Dis. 2019;15(10):1690-1695.

OBES SURG (2010) 20:835–840
DOI 10.1007/s11695-010-0125-z

CLINICAL RESEARCH

Conversion from Sleeve Gastrectomy to Roux-en-Y Gastric Bypass—Indications and Outcome

Felix B. Langer · Arthur Bohdjalian · Soheila Shakeri-Leidenmühler · Sebastian F. Schoppmann · Johannes Zacherl · Gerhard Prager

- **Conclusion:** **Conversion to RYGB is an effective treatment for weight regain or intractable reflux symptoms following SG.** Thus, SG can be performed, intended as sole and definitive bariatric intervention, with conversion from SG to RYGB as an exit strategy for these complications.

Table 2 Data on indications and weight loss outcome for laparoscopic conversion from Sleeve gastrectomy (SG) to Roux-en-Y gastric bypass (RYGB)

Weight SG (kg)	Nadir Weight (kg)	Weight RYGB (kg)	EWL (%)	Interval SG-RYGB (months)	Weight loss[a] (kg)	Follow-up (months)
Reflux						
120	65	65	98	15	10	62
120	95	103	36	70	14	2
110	65	77	63	33	5	14
Weight regain						
167	130	146	28	54	17	24
157	140	178	−27	24	20	52
100	82	104	−10	31	25	42
115	75	88	63	36	6	7
214	167	184	21	32	8	1

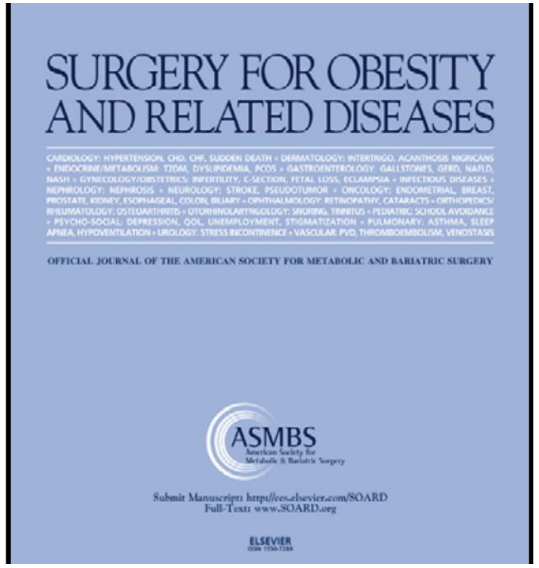
[a] Weight loss starting from conversion to gastric bypass

Langer FB et al. Obes Surg. 2010;20(7):835-40.

Weight Loss, Weight Regain and Conversions to Roux-en-Y Gastric Bypass 10-Year Results of Laparoscopic Sleeve Gastrectomy

Weight Loss, Weight Regain and Conversions to Roux-en-Y Gastric Bypass - 10-Year Results of Laparoscopic Sleeve Gastrectomy

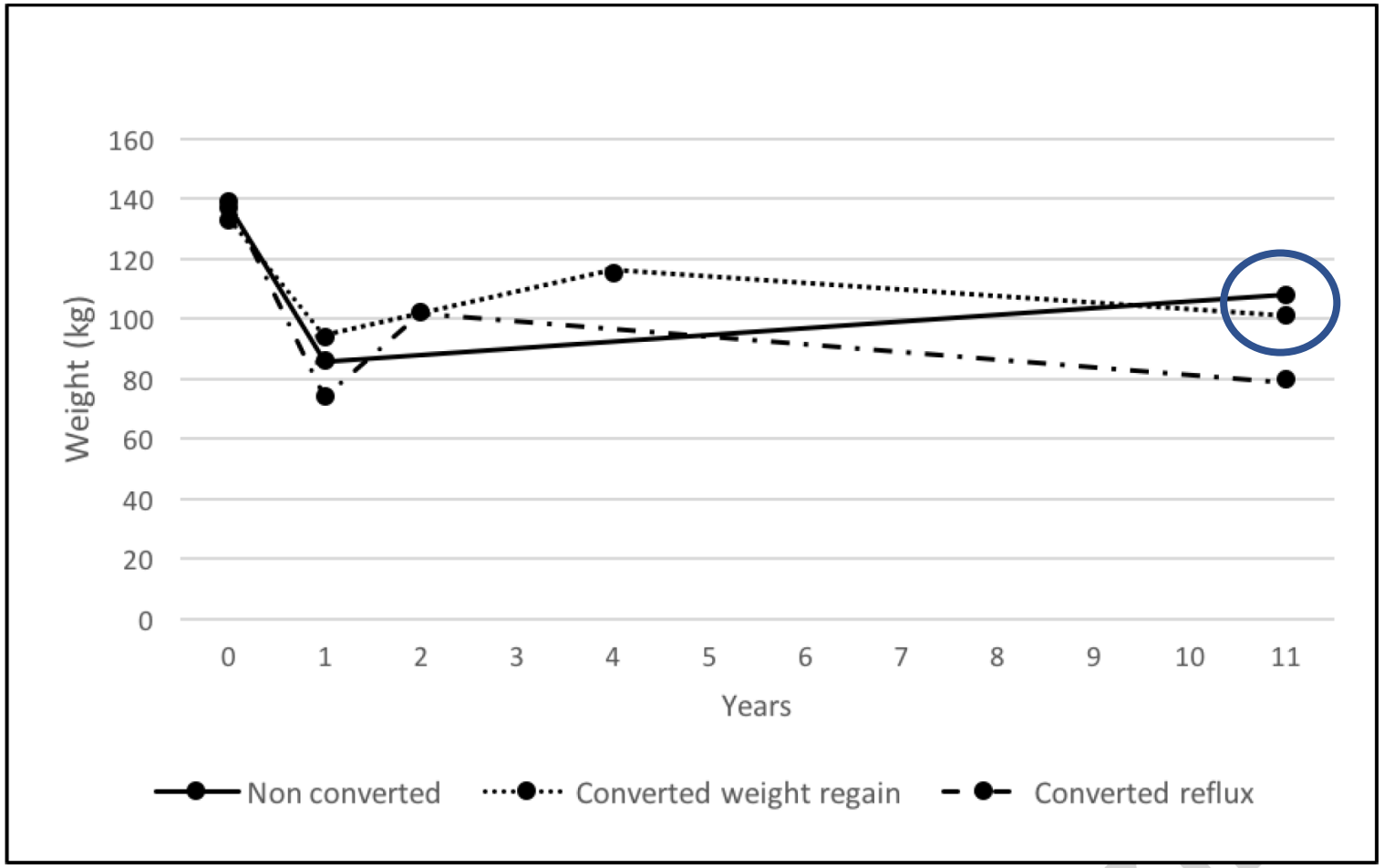
D.M. Felsenreich, F.B. Langer, R. Kefurt, P. Panhofer, M. Schermann, P. Beckerhin, C. Sperker, G. Prager



- **Conclusions:** **Within a long-term follow-up of 10 years or more after SG, a high incidence of both significant weight regain and intractable reflux was observed leading to conversion** - most commonly to Roux-en-Y gastric bypass.

- Felsenreich DM et al. Surg Obes Relat Dis.

Weight Loss, Weight Regain and Conversions to Roux-en-Y Gastric Bypass - 10-Year Results of Laparoscopic Sleeve Gastrectomy



- Felsenreich DM et al. Surg Obes Relat Dis. 2016;12(9):1655-1662.

Weight Loss, Weight Regain and Conversions to Roux-en-Y Gastric Bypass 10-Year Results of Laparoscopic Sleeve Gastrectomy

TABLE 1 Patient characteristics and history of weight

	All patients (n=49)**	Non- conversion (n=32)*	Weight regain (n= 11)	Reflux (n= 6)
SG				
Median Age OP (years)	40.4 (R 15-66)	42.0 (R 17-66)	39.0 (R 15-65)	37.2 (R 32-53)
Sex (female) in %	80	84	73	83.0
Weight (kg)	137.1 ±28.5	137.2 ±28.5	133.3 ±27.3	139.0±36.6
BMI (kg/m2)	48.9 ±9.4	49.7 ±9.9	47.1 ±9.4	46.8 ±7.4
Superobese BMI >50 (%)	36.7	44.0	27.3	16.6
Nadir				
Weight (kg)	86.7 ±20.5	86.0 ±19.1	93.7 ±26.0	74.3 ±7.2
BMI (kg/m2)	31.0 ±6.2	31.0 ±6.2	32.8 ±6.5	26.4 ±2.5
Change BMI (kg/m2)	17.4 ±8.1	19.2 ±8.5	11.8 ±5.8	17.5 ±3.5
EWL (%)	71.3 ±24.8	75.30 ±19.8	63.1 ±29.3	67.4 ±39.9
Median post OP time (months)	12 (R 12-120)	12 (R 12-120)	12 (R 12-48)	12 (R 12-48)
Conversion				
Weight (kg)			115.3 ±22.7	102.3 ±30.8
BMI (kg/m2)			40.6 ±5.1	36.2 ±9.7
Change BMI (kg/m2)			4.9 ±11.5	14.2 ±10.1
EWL (%)			22.0 ±30.3	37.9 ±56.1
Median post OP time (months)			48 (R 24-84)	24 (R 12-84)
Ten years				
Weight (Today) in kg	98.1 ±21.3	100.8 ±22.1	98.0 ±20.5	80.0 ±5.9
BMI (Today) in kg/m2	35.5 ±7.0	36.4 ±7.4	34.7 ±5.7	28.7 ±4.7
Change BMI (kg/m2)	13.8 ±10.0	13.9 ±10.1	9.9 ±6.4	15.3 ±5.0
EWL (Today) in %	54.0 ±26.7	52.5 ±24.8	52.8 ±32.7	73.5 ±20.2
Median post OP Time (months)	130 (R 120-152)	128 (R 122-150)	124 (R 121-152)	134 (R 123-151)

Abbreviations: BMI: Body Mass Index; EWL: Excess Weight Loss; SG: Sleeve Gastrectomy: R: Range

Felsenreich DM et al. Surg Obes Relat Dis 2016;12(9):1655-1662.

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass is Effective for Gastro-Oesophageal Reflux Disease but not for Further Weight Loss

OBES SURG
DOI 10.1007/s11695-017-2542-8

ORIGINAL CONTRIBUTIONS

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass is Effective for Gastro-Oesophageal Reflux Disease but not for Further Weight Loss

Chetan D Parmar[1] · Kamal K Mahawar[1] · Maureen Boyle[1] · Norbert Schroeder[1] · Shlok Balupuri[1] · Peter K Small[1]

- **Conclusion:** This study demonstrates that conversion of SG to RYGB is effective for GERD symptoms but not for further weight loss, which was modest in both groups. Future studies need to examine the best revisional procedure for IWL/WR after SG.

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass is Effective for Gastro-Oesophageal Reflux Disease but not for Further Weight Loss

Table 2 Weight loss in patients converted for GERD

Parameters	Weight before SG	Weight at conversion to RYGB	6 months after RYGB ($N = 10$)	12 months after RYGB ($N = 10$)	24 months after RYGB ($N = 7$)
Mean weight (kg)	130.8 (95.8–199.6)	87.5 (56.8–125.7)	82.1 (53.6–113)	85.9 (59.8–102)	79.1 (51–105)
Mean BMI (kg/m^2)	45.8 (37.6–66.7)	30.5 (23.7–42)	28.6 (21.4–37.7)	29.5 (24.2–33.7)	28.5 (18.8–34.3)
EWL (%)	-	75.8 (51.8–109.5)	83.5 (48.8–114)	77.8 (38.7–105.8)	82.1 (48.5–124)

GERD gastro-esophageal reflux disease, *SG* sleeve gastrectomy, *RYGB* Roux-en-Y gastric bypass, *BMI* body mass index, *EWL* excess weight loss

Conversion from SG to RYGB due to GERD leads to excellent WL

- **Parmar CD et al. Obes Surg. 2017 Jul;27(7):1651-1658.**

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass is Effective for Gastro-Oesophageal Reflux Disease but not for Further Weight Loss

Table 3 Weight loss in patients converted for IWL/WR

Parameters	Weight before SG	Weight at conversion to RYGB	6 months post RYGB ($N = 8$)	12 months after RYGB ($N = 11$)	24 months after RYGB ($N = 7$)
Mean weight (kg)	152.1 (115.2–224)	123.8 (82.8–173.1)	109.9 (72.2–163)	114.6 (70.6–167)	116.1 (88–162)
Mean BMI (kg/m^2)	53.1 (42.3–66.2)	43.3 (34.6–54.4)	38.2 (31–46.1)	39.9 (30.4–47.6)	40.8 (32.3–48.1)
EWL (%)	–	36.1 (24.4–45.5)	49.9 (32.8–68.9)	49.5 (33.7–72.5)	46 (32.3–57.7)

IWL inadequate weight loss, *WR* weight regain, *SG* sleeve gastrectomy, *RYGB* Roux-en-Y gastric bypass, *BMI* body mass index, *EWL* excess weight loss

Conversion from SG to RYGB due to IWL/WR has more limited WL

- Parmar CD et al. Obes Surg. 2017 Jul;27(7):1651-1658.

Table 5 Weight loss outcomes in studies reporting on conversion of SG to RYGB for IWL/WR

Study characteristics	Year of publication Evidence of level Mean Time to Conversion	Pre-conversion characteristics	Bypass limbs Mortality Early complication Late complication	Weight loss outcomes After conversion
Abdemur et al. [9] Jan. 2004–Aug 2014 N: 7 Sex: NA Mean age: NA	2016 Level IV NA	BMI at SG: NA BMI at conversion: NA EWL at conversion: 17.8.8 (10.0–28.2) %	Limb lengths: NA Mortality: 0 Early complication: 0 Late complication: 1 perforated MU	Final EWL: 47.0 (19.7–82.4) % Mean FU: 9.8 months
Alsabah et al. [4] 2009–2012 *N* = 12 Sex: 10 females Mean age: 34 years	2016 Level IV NA	BMI at SG: 52.0 kg/m^2 BMI at conversion: 41.0 kg/m^2 EWL at conversion: 37.9%	BPL 70 cm; AL 150 cm Mortality: 0 Early complications: 0 Late complications: 0	Final EWL: 61.3% at 1 year. BMI came down to 36.0 Authors found no significant difference in weight loss between re-sleeve and RYGB at 1 year after revision
Carmeli et al. [16] Dec 2006–Nov 2012 *N* = 10 Sex: NA Mean age: NA	2015 Level IV 36.0 months	BMI at SG: 44.5 kg/m^2 BMI at conversion: 39.8 kg/m^2 EWL at conversion: 25.0%	NA Mortality: 0 Early complication: 0 Late complication: 1 MU related to aspirin	Final EWL: 66.6% after 36 months BMI down to 30.2% Weight loss superior with DS.
Gautier et al. [2] Jun 2005–Dec 2010 *N* = 9 Sex: NA Age: 36.8	2013 Level IV 24.3 months	BMI at SG: 58.2 kg/m^2 BMI at conversion: 43.7 kg/m^2 EWL at conversion: 41.0%	BPL 70 cm, AL 120–150 cm. Mortality: 0 Early complication: NA Late complication: NA	Final EWL: 59.0%. BMI came down to 38.1 kg/m^2
Langer et al. [5] Dec 2002 to Sept 2009 *N* = 5 Sex: 1/5 (20.0% female) Mean Age: 36.2 yeas	2010 Level IV 35.4 months	BMI at SG: 49.0 kg/m^2 BMI at conversion: 45.6 EWL at conversion: 15.0%	BPL 80 cm, AL 150 cm. One was banded bypass Mortality: NA Early complication: NA Late complication: NA	Final EWL: 35% after a mean FU of 25.2 (1–52) months BMI came down to 40.6 kg/m^2

SG sleeve gastrectomy, *RYGB* Roux-en-Y gastric bypass, *IWL* inadequate weight loss, *WR* weight regain, *N* number, *BMI* body mass index, *EWL* excess weight loss, *NA* not available, *MU* marginal ulcer, *FU* follow up, *BPL*, bilio-pancreatic limb, *AL* alimentary limb

Parmar CD et al. Obes Surg. 201 Jul;27(7):1651-1658.

Conversion from SG to RYGB with incomplete resolution of GERD

Table 6 GERD outcomes in studies reporting on conversion of SG to RYGB for GERD

Study characteristics	Year of publication Evidence of level Mean time to conversion	Complete resolution of GERD symptoms	Partial resolution of GERD symptoms (needing PPI)
Abdemur et al. [9] Jan 2004–Aug 2014 N: 9 Sex: NA Mean age: NA	2016 Level IV NA	7	2
Gautier et al. [2] Jun 2005–2010 N: 6 Sex: NA Mean age: 44	2013 Level IV 28.1 months	6	0
Langer et al. [5] Dec 2002–Sept 2009 N: 3 Sex: 3 females Mean age: 35 years	2010 Level IV 39.3 months	3	0
Van Rutte et al. [13] Aug 2006–July 2010 N: 5 Sex: NA Mean Age: NA	2012 Level IV NA	3	2
Hendricks [19] 2005–2013 N: 4 Sex: NA Mean age: NA	2015 Level IV 30 months (9–56)	3	1
Cumulative results		22 (81. 5%)	5 (18.5%)

SG sleeve gastrectomy, *RYGB* Roux-en-Y gastric bypass, *N* number, *GERD* gastro-esophageal reflux disease, *PPI* proton pump inhibitor, *NA* not available

Improvement of GERD

Is not 100% - 80%

Parmar CD et al. Obes Surg. 2017 Jul;27(7):1651-1658.

Elias Ortiz & Company
MEXICO WEIGHT LOSS SPECIALISTS

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass is Effective for Gastro-Oesophageal Reflux Disease but not for Further Weight Loss

Table 1 Early and late complications after conversion of SG to RYGB

Serial No	Age/sex	Early (≤30-day) or late (>30-day)	Diagnosis	Management
1[a] Conversion for IWL	70/F	Early	Bowel obstruction	Laparotomy for internal hernia
2 Conversion for GERD	46/F	Late	Marginal ulcer	Managed conservatively
3 Conversion for GERD	46/F	Late	Abdominal pain and persistent GERD	Normal CT scan and endoscopy. Patient requested referral to a closer hospital unit to avoid frequent travel
4[a] Conversion for IWL	58/F	Late	Abdominal pain	Laparoscopy and adhesiolysis
5 Conversion for GERD	43/M	Late	Persistent GERD	Post conversion endoscopy normal. Symptoms controlled on PPI.

SG sleeve gastrectomy, *RYGB* Roux-en-Y gastric bypass, *IWL* inadequate weight loss, *GERD* gastro-esophageal reflux disease, *F* female, *M* male, *PPI* proton pump inhibitor

[a] Needed reoperation

- ✓ **Missed and not repaired HH**
- ✓ **Use of a large pouch**

- **Parmar CD et al. Obes Surg. 2017 Jul;27(7):1651-1658.**

Indications and Mid-Term Results of Conversion from Sleeve Gastrectomy to Roux-en-Y Gastric Bypass

Table 2 Results after conversion

	Total, mean (range)	IWL (mean)	Reflux (mean)	Diabetes (mean)
	55/41	58/44	51/37	55/41
BMI ac (kg/m^2)	35.8 (24–42.6)	38.1	32.7	34.9
%EBMILac	64.6 (36.9–104.6)	60.6	69.9	65.6
%EWLac	61.7 (34.2–103.2)	59	65.9	61.6

BMIac BMI after conversion, *%EBMILac* percentage of excess BMI loss after conversion, *%EWLac* percentage of excess weight loss after conversion

Gautier T et al. Obes Surg. 2013;23(2):212-5.

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass: An Audit of 34 Patients

And about other associated diseases?

Table 4: Evolution of comorbidities and medications use.

Variable	Before conversion	At end-point (mean follow – up -3 years)	*p*-value
Hypertension (n, %)	13 (38%)	13 (38%)	NS
No. of medications, mean ±SD	1.6 ±0.5	1.3 ±0.5	NS
Type 2 diabetes (n, %)	11 (33%)	4 (12%)	0,023
No. of medications, mean ±SD	1.5 ±1	0.5 ±0.5	0,004
Obstructive sleep apnea syndrome (n, %)	14 (41%)	11 (32%)	NS
Positive airway pressure therapy (n, %)	5 (15%)	5 (15%)	NS
GERD (n, %)	9 (26.5%)	0	0,002

SD= standard deviation; GERD= gastro esophageal reflux disease

Hypertension
Sleep Apnea
T2D
GERD

Poghosyan T et al. Surg Obes Relat Dis. 2016;12(9):1646-1651.

Revision of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass: a Canadian Experience

Effectiveness

Table 1. Weight loss trends before and after revision-RYGB (n = 18)

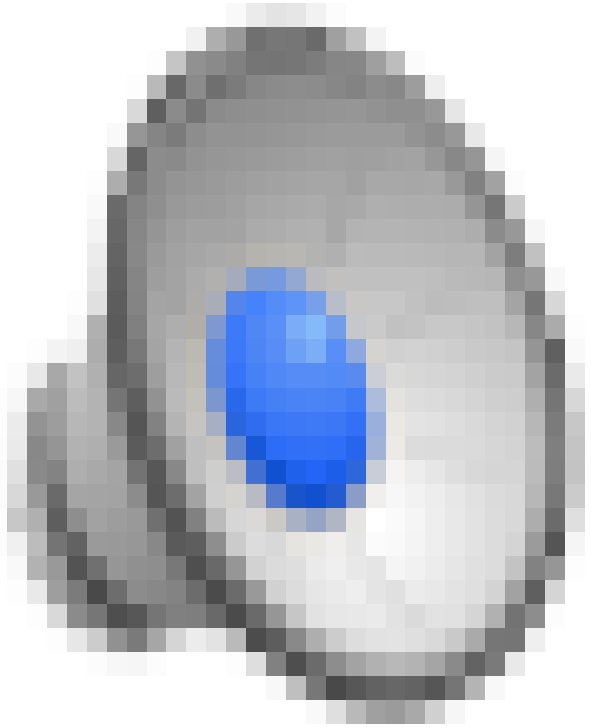
Variable	Mean	SD	Min	Max
Mean BMI pre-SG (kg/m^2) **BMI LSG**	50.5	12.0	35.1	77.5
Mean BMI post-SG (kg/m^2)	40.5	10.5	25.2	60.5
Maximum Weight loss after SG (kg)	28.3	12.5	8.8	63.0
Time to Maximum Weight Loss after SG (months)	20.9	7.8	10.0	35.0
Time between SG and RYGB Conversion (months)	41.8	12.5	22.0	61.0
BMI pre-RYGB **BMI RYGB**	43.1	9.0	31.1	60.5
Weight Change between lowest patient weight after SG and weight right before revisional-RYGB (kg)	7.4	8.7	-7.4	24.4
Maximum Weight Loss after RYGB Conversion (kg)	19.3	9.4	8.1	39.6
Lowest BMI post-RYGB (kg/m^2) **BMI RYGB**	36.4	9.0	18.3	49.0

*SD = Standard Deviation, Max = Maximum, Min = Minimum, BMI = Body Mass Index

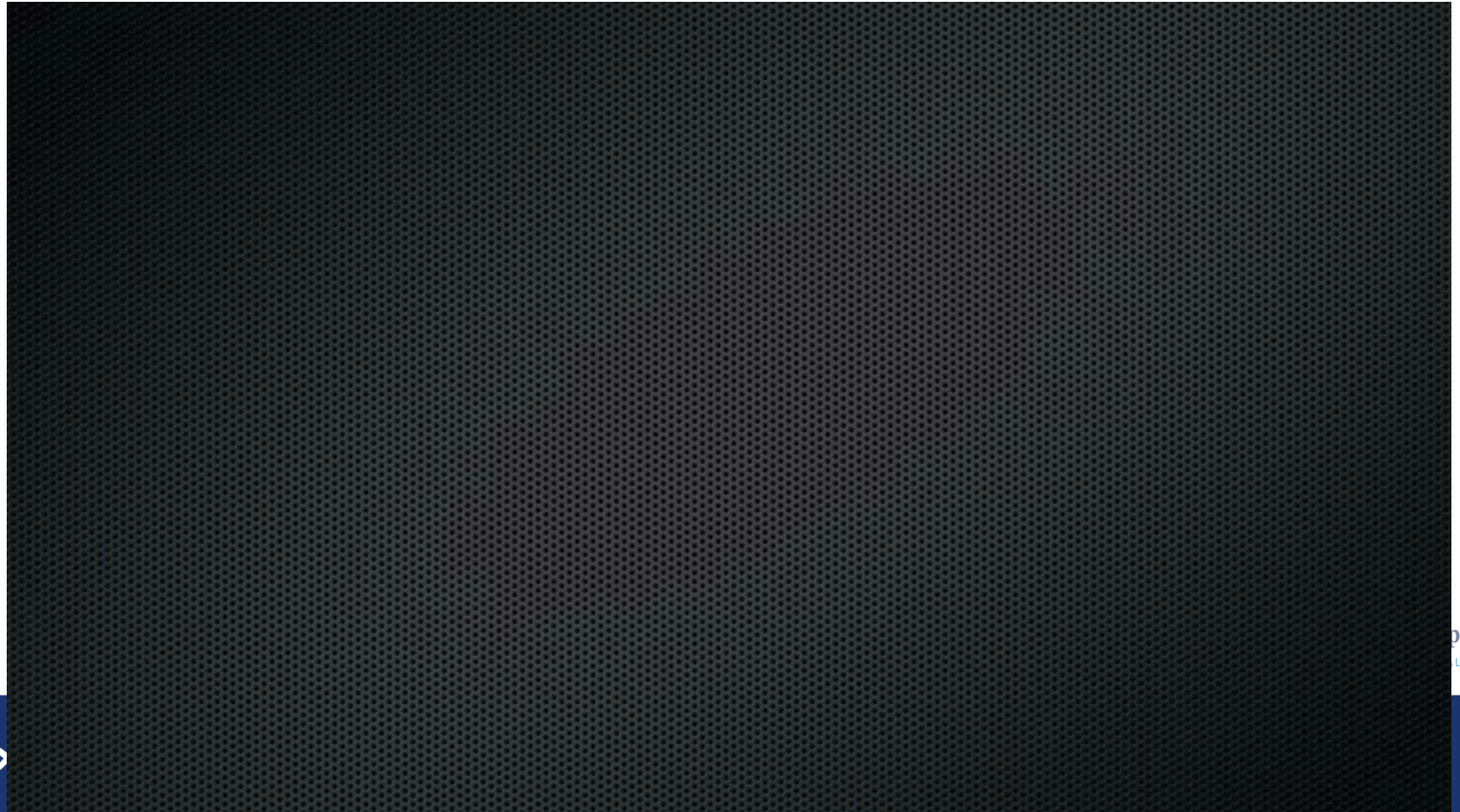
Yorke E et al. Am J Surg. 2017;213(5):970-974.

Sleeve Gastrectomy to Gastric Bypass

Sleeve to Bypass for Weight Regain



SLEEVE GASTRECTOMY CONVERTION TO GB



Conclusions

- ✓ Safe
- ✓ Effective
  - ✓ Adding some more weight loss
  - ✓ Improving GERD
  - ✓ Controlling other associated diseases
- ✓ Additional weight loss is limited
- ✓ Improving of GERD is not 100%

Thank you!

Gracias!

Obrigado!

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