Long term results after conversion of sleeve gastrectomy to Roux-en-Y gastric bypass – The Mayo Clinic Experience

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Abstract

Introduction:

- Although 10-15% of patients undergoing sleeve gastrectomy (SG) require conversion to secondary bariatric procedures, mainly for weight related reasons and GERD, little is known about the long-term efficacy of SG conversion on secondary weight loss and resolution of GERD.
- We designed a study aimed at investigating the long-term success of weight loss and GERD resolution in patients undergoing conversion from SG to Roux-en-Y gastric bypass (RYBG).

Methods:

- Retrospective review of patients at our institution who underwent conversion from sleeve gastrectomy (SG) to Roux-en-Y gastric bypass (RYGB) between 2009 and 2019.
- Preop: In addition to demographic information, we obtained information on timing and indication for conversion and the presence of major obesity related co-morbidities
- Post-operatively, we measured short- and long-term complications, and percent changes in total body weight at 6 months, 12 months and 24 months post-op.
- Statistical analyses performed using univariate models, Fisher's test and Wilcoxon Rank sum tests.

Results:

- 42 eligible patients underwent SG to RYGB conversion during the study
- GERD (57.1%), followed by weight related reasons (inadequate weight loss or weight regain; IWL/WR) (35.7%) and then anatomic complications including stenosis and stricture (7.1%) were the most common conversion reasons
- Mean pre-conversion BMI was 31.1kg/m² in the GERD subgroup vs. 42kg/m² in the IWL/WR subgroup
- Percent total weight loss (%TWL) was 17.1% at six months, 20.7% at one year and 18.8% at two years for IWL/WR patients
- In GERD subgroup, complete resolution rate of GERD symptoms occurred in 42.3% at six months, 56.3% at one year and 75% at two years.
- Short term major complication rate was 9.5% (Grade III-V) at 30 days. Long term complication rate (major and minor) was 31% at two years.

Pre-operative and Demographic Characteristics

	n= 42 patients
Age (IQR), years	48 (37-57)
Sex, Female	34 (81%)
Race, White	32 (80%)
Peak BMI pre SG (+/-SD), kg/m²	45.5 kg/m² (+/- SD: 7.8)
Nadir BMI post SG (+/-SD), kg/m²	33.7 kg/m² (+/- SD: 7.5)
Peak BMI pre RYGB (+/-SD), kg/m²	36.7 kg/m² (+/- SD: 8.4)
Time to conversion, months	52.9 months (+/- SD: 29.3)
Indication for conversion: GERD, n	24 (57.1%)
Indication for conversion: IWL/WR, n	15 (35.7%)
Indication for conversion: Anatomic complication, n	3 (7.1%)

Table 1: Preoperative and demographic characteristics of study patients

Subgroup characteristics

Subgroup	GERD (n=24)	IWL/WR (n =15)	*p* value
Age, years	48.4 (IQR:36-57.5)	47.9 (IQR: 42-55)	0.90
Sex, female	20 (83.3%)	11 (73.3%)	0.45
Race			0.77
Black	3 (13%)	1 (7.1%)	
Hispanic	2 (8.7%)	2 (14.3%)	
White	18 (78.3%)	11 (78.6%)	
Unspecified	1	1	
Pre SG BMI	47.3kg/m²(+/- SD: 7.2)	45.3kg/m² (+/- SD: 5.9)	0.61
Pre conversion BMI	32.6 kg/m² (+/- SD: 6.4)	43.8kg/m²(+/- SD: 7.1)	<0.0001
Time to conversion, months	51.3 (IQR: 30-66)	59.3 (IQR: 30-71)	0.35
Presence of hiatal hernia intraoperatively	54.2%	20%	0.035

Table 2: Subgroup characteristics based on two major conversion indications

Results

Rate of GERD Resolution in GERD patients	6 months	12 months	24 months
Complete resolution /Incidence (%)	8/19 (42.3%)	9/16 (56.3%)	9/12 (75%)
Weight Loss Outcomes in IWL/WR patients			
ΔBMI (SD)	7.6 (3.7)	9.3 (5.4)	8.4 (5.0)
%TWL (SD)	17.1 (7.5)	20.7 (11.1)	18.4 (9.4)

Table 3: GERD resolution frequency and weight loss outcomes per major conversion subgroup

Weight Loss Outcomes

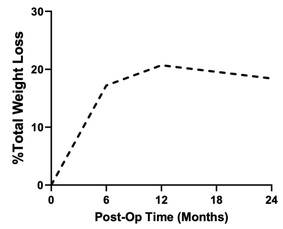
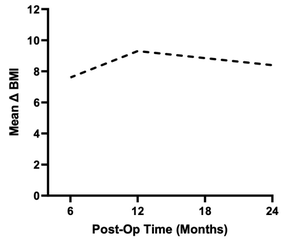


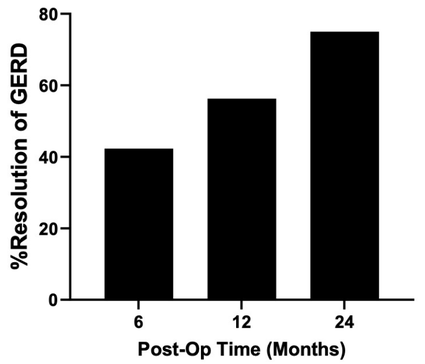
Fig 1a

Fig 1b



Figures 1a-b: Weight loss outcomes for patients converted for IWL/WR, reported in %TWL and delta BMI

GERD Resolution Outcomes



Figures 2: Complete GERD resolution for patients converted for GERD, presented as bar graph

Complications

Complication	Frequency	Clavien-Dindo Grade
Early Complications (<30days)		
Cerebrovascular accident/stroke	1 (2.4%)	II
Surgical site infection	1 (2.4%)	II
Anastomotic leak	1 (2.4%)	III
Pneumonia	1 (2.4%)	II
Gall stone pancreatitis	1 (2.4%)	III
Late Complications (> 30 days)		
Marginal ulcers	5 (11.9%)	III
Anastomotic stricture (gastrojejunostomy)	2 (4.8%)	III
Symptomatic cholelithiasis	1 (2.4%)	III
Small bowel obstruction (jejunojejunostomy)	1 (2.4%)	III
Incisional hernias	2 (4.8%)	III
Hiatal hernia recurrence	1 (2.4%)	II
Failure to thrive requiring enteral access	2 (4.8%)	III
Acute cholecystitis	1 (2.4%)	III

Table 4: Early and Late Complications

Conclusions

Follow-up: Study follow-up rates were 100% at thirty days, 92.9% at six months, 71.4 % at one year and 40.5% at two years.

Limitations:

- Retrospective study design
- Small sample size
- GERD/dysphagia resolution reported subjectively and did not include partial resolution.
- Low long-term follow-up rate

Conclusions: Most patients undergo conversion from SG to RYGB primarily because of symptomatic GERD, followed by IWL/WR. Patients converted for IWL/WR achieved a greater %TWL than those converted for GERD. There was a significantly higher incidence of hiatal hernia in patients converted for GERD compared to the IWL/WR subgroup. Complete resolution of GERD symptoms occurred in the majority of affected patients at two years. The thirty-day complication overall rate was lower than expected for revision bariatric surgery

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