Effects of Gastric Bypass and Sleeve Gastrectomy on Reflux and Barrett's Esophagus

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INTRODUCTION

- Roux-en-Y Gastric Bypass (RYGB) and Sleeve Gastrectomy (SG) are the most common bariatric procedures performed world-wide.
- **However**, SG is a potentially refluxogenic operation [1] with a theoretical increased risk of developing Barrett's Esophagus (BE).
  - Recent position statement by The International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) states a de novo postoperative BE incidence of 4.6% within 5 years following SG [3].
- RYGB, on the other hand, is regarded as an effective anti-reflux procedure and may have a lower risk of developing BE [2].
- BE is associated with a higher risk of developing esophageal adenocarcinoma, with this risk increasing with time, cellular dysplasia and length of Barrett's change
  - A German study published an annual cancer transition rate of 0.22% for long (≥3cm), 0.03% for short (≥1 to <3cm), and 0.01% for ultra-short-segment (<1 cm) BE [4].
- Intestinal Metaplasia (IM) is the histological diagnosis of BE.

AIM

To assess the incidence of intestinal metaplasia, Barrett's Esophagus, and reflux following SG or RYGB with a minimum follow-up interval of 6 years.

(*) Prague Classification

The key steps in Prague C & M Criteria are:

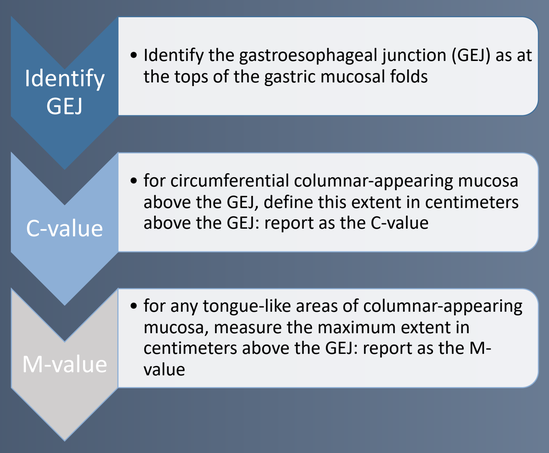

Figure 1 – Prague Classification

METHODS

- 109 of 114 participants of a double-blinded RCT [5] were contacted to take part in the study through email, phone call, and text message.
- Recruited patients were consented and asked to fill out a GERD Quality-Of-Life Scale questionnaire.
- A gastroscopy was performed with routine biopsies taken from the gastroesophageal junction (4-quadrant)
- Endoscopic and histologic evidence of IM/BE were identified as the **primary outcome** and recorded using the Prague Classification (*).
- **Secondary outcomes** included reflux scores, proton-pump inhibitor (PPI) usage (pre- and post-surgery) and surgical revisions for reflux.

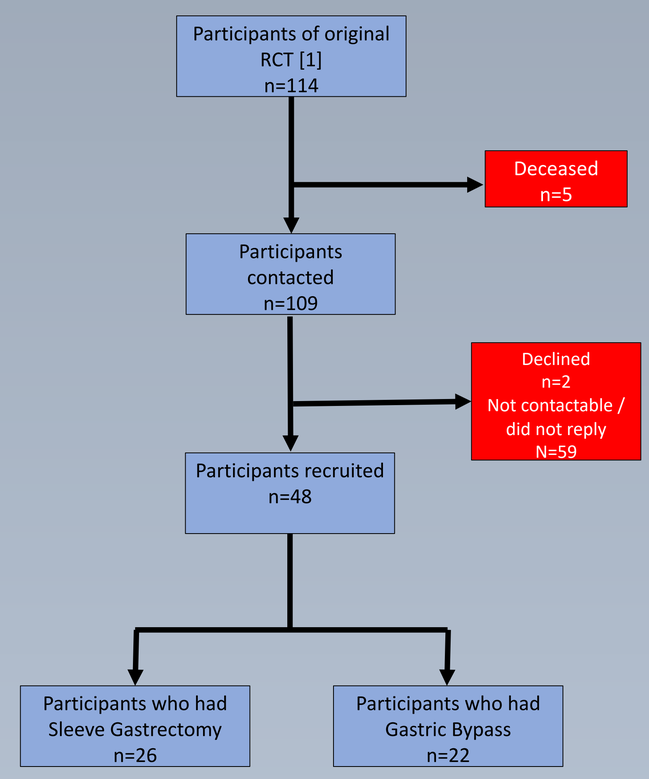

Figure 2 – Recruitment process

8 SG patients had IM (6) or focal metaplasia (FM) (2) while 3 RYGB patients had IM (30.8% vs 13.6%, **p=0.094**). 1 patient who had a RYGB was found to have focal dysplasia. There was no dysplasia in the SG group.

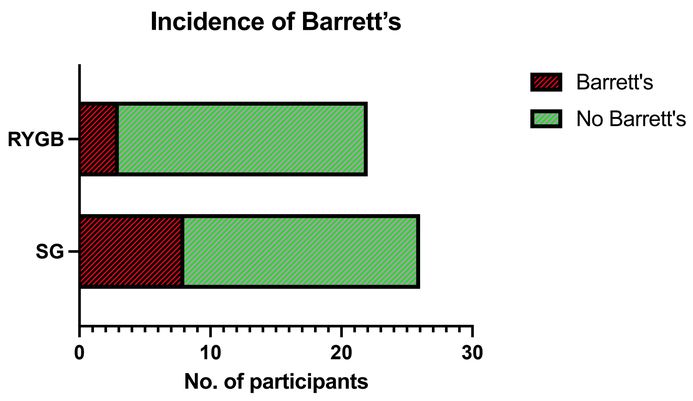

Figure 3 – Histologically confirmed incidence of Barrett's between the two groups showed no statistical significance.

There was no significant difference between the two groups when higher risk BE (long- and short-segment) was taken into account [GB 13.6% vs SG 19.2%; p=0.710)

Results

48 patients were enrolled

(SG 26/48 [54.2%] vs RYGB 22/48 [45.8%])

Mean follow-up was 7.4 years (6.9–9.3)

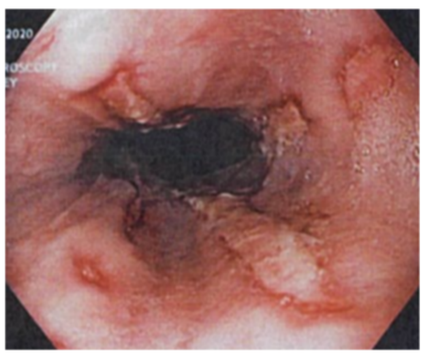

Photo 1 – This participant had undergone a laparoscopic SG. Endoscopy revealed C3M4 Barrett's Esophagus. Histology confirmed intestinal metaplasia with presence of goblet cells.

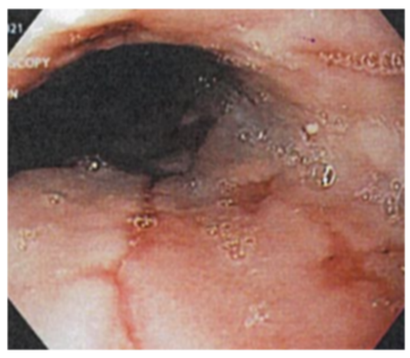

Photo 2 – This participant had undergone a laparoscopic RYGB. Endoscopy revealed C1M1 Barrett's Esophagus. Histology confirmed intestinal metaplasia with focal dysplasia.

	Long-segment (≥3cm)	Short-segment (≥1 to <3cm)	Ultra-short-segment (<1 cm)	TOTAL
GB	0	3	0	3
SG	1	4	3	8

Figure 4 – higher risk BE (long- and short-segment) was not statistically different between the two groups.

	SG n (%) (N=26)	GB n (%) (N=22)	P-value
Age			
Median	54	57	
Range	39-64	40-63	
Gender			
Male	12 (46.2)	6 (27.3)	0.237
Female	14 (53.8)	16 (72.7)	
Follow-up duration (years)	7.5	7.4	
Seminar BMI			
Mean	42.6	42.8	
BMI at gastroscopy			
Mean	34.0	30.5	0.046
HbA1c levels			
Mean	48.6	43.0	0.083

Figure 5 – demographics

Mean regurgitation score was 7.72/45 for SG patients (range 0–22) and 11.45/45 for RYGB patients (range 0–44), p=0.152. Mean Heartburn score was 8.35/45 for SG patients (range 0-36) and 9.10/45 for RYGB patients (range 0-34), p=0.783

PPI usage pre-SG was 6/26 (23.1%), compared to 13/26 (50.0%) post-surgery. PPI usage pre-RYGB was 8/22 (36.4%) compared to 12/22 (54.5%) post-surgery (p=0.780).

1 SG patient required revision to RYGB for sleeve stricture and significant reflux.

Conclusion

- Despite not showing a statistical significance, it appears that the incidence of reflux and BE is higher following a SG.
  - A larger sample size is required to adequately power this study (182 patients). We are currently in the process of recruiting more patients.
- The incidence of BE in this study was higher than those stated in other studies. This could represent a temporal relationship between reflux and development of BE, as this study had a longer follow-up period than others.
- The higher regurgitation scores in the RYGB group may be related to the silastic ring size of 6.5cm
- High rates of PPI usage post-surgery may be due to patients continuing their PPI which is routinely prescribed for 1 year post surgery

References

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[5] Murphy, R., et al., *Sleeve gastrectomy versus Roux-en-Y gastric-bypass for type 2 diabetes mellitus and morbid obesity: double-blind randomised clinical trial protocol.* BMJ open, 2016. 6(7).