Comparative analysis of postoperative outcomes of revision or conversion metabolic and bariatric surgery after primary sleeve gastrectomy: an analysis of the MBSAQIP database

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INTRODUCTION

- A growing proportion of patients who undergo primary sleeve gastrectomy (SG) require revision/conversion surgery, but there is limited data on the ideal surgical procedure for these patients in terms of safety and efficacy outcomes

METHODS

- We conducted a retrospective cohort study using the 2020-2022 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database
- We compared outcomes between the following revision/conversion procedures after primary SG:
  - Roux-en-Y gastric bypass (SG-RYGB)
  - Revision SG (re-SG)
  - Biliopancreatic diversion/duodenal switch (SG-BPD/DS)
  - Single-anastomosis duodenoileal bypass (SADI)
  - One-anastomosis gastric bypass (OAGB)
- We examined the following 30-day outcomes of interest:
  - Major complications (Clavien-Dindo Grade ≥2)
  - Anastomotic or staple line leak
  - Reoperation, readmission, or re-intervention
  - Operative length and length of stay

RESULTS

DATA SUMMARY

- From 33,348 total revision/conversion MBS for SG, the most common was SG-RYGB (82.1%), followed by re-SG (7.2%), SG-BPD/DS (5.7%), SADI (4.04%), and OAGB (0.93%)
- The most common indication for revision/conversion was GERD (n=16297, 48.9%), followed by weight gain/inadequate weight loss (n=14580, 43.7%)
- **Figure 1** shows results of adjusted multivariate analysis of outcomes between procedures, with RYGB used as the reference group

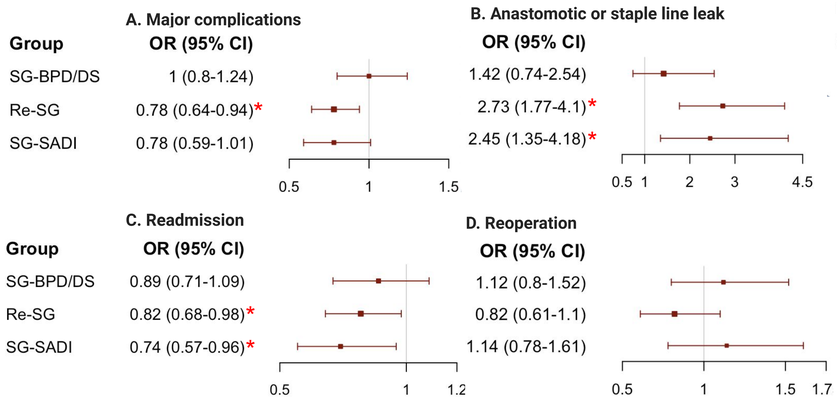
Table 1: Baseline patient characteristics between groups

	SG to RYGB	Re-SG	SG to BPD/DS	SG to SADI	SG to OAGB	Total	P-value
N (%)	27393 (82.1%)	2406 (7.2%)	1891 (5.67%)	1348 (4.04 %)	310 (0.93%)	33348	N/A
Age, mean (SD)	46.1 (10.6)	45.6 (10.6)	44.8 (10.2)	44.7 (10.2)	45.3 (10.4)	45.9 (10.5)	<0.001*
BMI, mean (SD)	39.7 (7.8)	40.5 (7.3)	46.8 (8.9)	45.3 (8.1)	40.9 (9.2)	40.4 (8.1)	<0.001*
Female, n (%)	24918 (91.0%)	2088 (86.8%)	1561 (82.6%)	1139 (84.6%)	278 (89.7%)	29984 (89.9%)	<0.001*
Smoker	1280 (4.7%)	144 (6.0%)	81 (4.3%)	65 (4.8%)	13 (4.2%)	1583 (4.7%)	0.047*
Diabetes Insulin No Insulin	 740 (2.7%) 2368 (8.6%)	 62 (8.6%) 215 (8.9%)	 79 (4.2%) 230 (12.2%)	 60 (4.5%) 183 (13.6%)	 9 (2.9%) 30 (9.7%)	 950 (2.8%) 3026 (9.1%)	<0.001*
OSA	6373 (23.3%)	502 (20.9%)	647 (34.2%)	435 (32.3%)	77 (24.8%)	8034 (24.1%)	<0.001*
GERD	20189 (73.7%)	967 (40.2%)	728 (38.5%)	520 (38.6%)	220 (71%)	22624 (67.8%)	<0.001*
Hypertension	9529 (34.8%)	775 (32.2%)	766 (40.5%)	523 (38.8%)	111 (35.8%)	11704 (35.1%)	<0.001*
COPD	317 (1.2%)	15 (0.6%)	23 (1.2%)	9 (0.7%)	7 (2.3%)	371 (1.1%)	0.017*
Hyperlipidemia	4825 (17.6%)	361 (15.0%)	342 (18.1%)	272 (20.2%)	54 (17.4%)	5854 (17.6%)	0.001*
Renal insufficiency	94 (0.3%)	12 (0.5%)	6 (0.3%)	8 (0.6%)	2 (0.6%)	122 (0.4%)	0.373
ASA class I II III ≥IV	 51 (0.2%) 7417 (27.1%) 19370(70.7%) 525 (1.9%)	 7 (0.3%) 740 (30.9%) 1604(66.7%) 41 (1.7%)	 3 (0.2%) 260(13.7%) 1496(79.1%) 131 (6.9%)	 2 (0.2%) 232 (17.2%) 1056 (78.3%) 57 (4.2%)	 1 (0.3%) 78 (25.2%) 224 (72.3%) 7 (2.3%)	 64 (0.19%) 8727 (26.2%) 23750 (71.2%) 761 (2.3%)	<0.001*

OUTCOMES

Table 2: Univariate outcomes between groups

	SG to RYGB	Re-SG	SG to BPD/DS	SG to SADI	SG to OAGB	Total	P-value
Major complications, n (%)	1981 (7.2%)	119 (4.9%)	102 (5.4%)	59 (4.4%)	29 (9.4%)	2290 (6.9%)	<0.001*
Anastomotic or staple line leak	130 (0.5%)	32 (1.3%)	13 (0.7%)	16 (1.2%)	2 (0.6%)	193 (0.6%)	<0.001*
Reoperation	790 (2.9%)	51 (2.1%)	45 (2.4%)	34 (2.5%)	10 (3.2%)	930 (2.8%)	0.157
Readmission	2010 (7.3%)	132 (5.5%)	102 (5.4%)	63 (4.7%)	20 (6.5%)	2327 (7.0%)	<0.001*
Reintervention	629 (2.3%)	59 (2.5%)	29 (1.5%)	17 (1.3%)	6 (1.9%)	740 (1.9%)	0.024*
Operative length (min), mean (SD)	144.5 (66.9)	89.6 (51.9)	143.8 (65.3)	144.1 (64.3)	129.9 (60.7)	140.4 (67.2)	<0.001*
Length of stay (days), mean (SD)	1.71 (1.84)	1.30 (1.89)	1.69 (1.48)	1.58 (1.61)	2.15 (5.49)	1.7 (1.9)	<0.001*



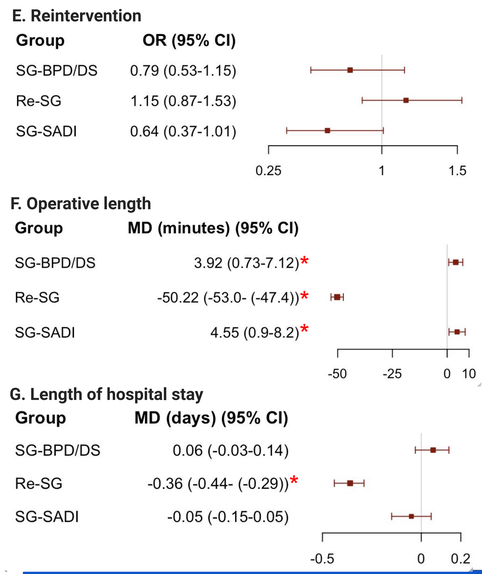


Figure 1: A-G above and top right; results of adjusted multivariable regression analysis for each outcome. RYGB was used as the reference group. Odds ratios (OR) or mean difference (MD) are provided with 95% CI for each outcome. Red asterisk indicates significance (p<0.05.)

KEY POINTS

- Compared to SG-RYGB, SG-SADI and re-SG had a lower odds of readmission, and re-SG had lower odds of major complications
- **Compared to RYGB, re-SG and SADI had a significantly higher odds of anastomotic and staple line leak**
- Our results suggest that these procedures should be chosen with caution in patients undergoing revision/conversion surgery after SG