

Anatomy-based sleeve gastrectomy superior to sleeve gastrectomy with bougie in a retrospective cohort analysis

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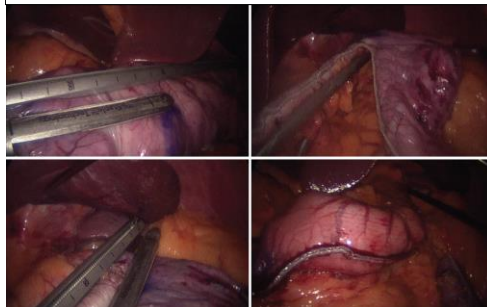
BACKGROUND

- Sleeve gastrectomy (SG) pouch imperfections have been implicated in postoperative gastroesophageal reflux disease (GERD) and other complications.
- Anatomy-based sleeve gastrectomy (ABS) has been developed to improve the shape, volume, and anatomic consistency of the laparoscopic SG (LSG) pouch.
- In ABS, a pouch is created by applying a clamp 1-cm from the gastroesophageal junction, 3-cm from the incisura, 6-cm from the pylorus, and stapling adjacent to the clamp.

METHODS

- Retrospective cohort analysis of MBSAQIP data from a single academic institution in the United States.
- LSG was performed in 1715 patients using either bougie (736 patients) or ABS (979 patients) technique.
- Comparisons were made with Student's t-test and Chi-square tests as appropriate.

Figure 1. Anatomy-based sleeve gastrectomy pouch created with 25-cm clamp. The resultant staple line is shown insufflated with 60-ml of air.



RESULTS

- One thousand seven hundred and fifteen patients were qualified for the study.
- There was no statistically significant difference in male/female ratio and preoperative mean body mass index (BMI) between both groups. The only category that was statistically significant was age (bougie group= 44.5 ± 11.3 yrs. vs. ABS= 43.1 ± 11.8 yrs., $p < 0.01$).
- In the ABS group compared to the bougie group, operative time (104 ± 44 vs. 112 ± 34 minutes, $p < 0.01$) and length of stay (1.2 ± 0.6 vs. 1.6 ± 4 days, $p < 0.01$) were significantly shorter.
- There were no statistically significant differences in 30-day complications, readmission, and reoperation rates between both groups.
- Preoperatively, the bougie group had 34.3% patients, and the ABG group had 33.7% patients with GERD ($p < .84$). However, at 6 months, GERD was noted in 40.2% patients (bougie group) and 27.9% (ABS group) ($p < 0.001$).
- The co-morbidity resolution rates were available for 66.9% (bougie group) and 61.8% patients (ABS group).
- At 6 months, the GERD resolution rate was superior in the ABS group (45.6 vs. 29.9%, $p < 0.01$).
- The bougie group had a higher 6-month induced GERD rates compared to the ABS group (24.1 vs. 14.4%, $p < 0.01$).
- At 12 months, GERD was noted in 10% fewer cases in the ABS group compared to the bougie group ($p = 0.03$).
- At 6 months, there were no statistically significant differences in type 2 diabetes (T2D), hypertension (HTN), hyperlipidemia (HLD), and obstructive sleep apnea (OSA) resolution rates between both groups.
- At 6 months, there was no significant difference in percentage total weight loss (%TWL) between groups (14.2 ± 7.3 vs. 14.7 ± 6.4, $p = 0.19$). However, at 12 months, there was a statistically significant difference in weight loss between both groups ($p = 0.03$).

Table 1. Outcomes with bougie and anatomy-based sleeve gastrectomy

Variable	Bougie (n = 736)	ABS (n = 979)	P-value
Age at surgery (yr.)*	44.5 ± 11.3	43.1 ± 11.8	<0.01
Female (%)	80.7	83.2	0.20
Baseline BMI (kg/m ²) *	46.7 ± 9.2	46.5 ± 9.2	0.86
Operative time (min.) *	112 ± 34	104 ± 44	<0.01
Length of stay (day) *	1.6 ± 4	1.2 ± 0.6	<0.01
30-Day Outcome			
30-day reoperation (%)	0.4	0.3	1.00
30-day bleed (%)	0.3	1	0.08
30-day leak (%)	0.1	0.0	0.43
30-day stricture (%)	0.0	0.0	---
30-day readmission (%)	5.3	3.7	0.12
30-day N/V readmission (%)	2.5	1.4	0.15
Co-Morbid Condition (6 Months)			
Preop GERD (6-m cohort) (%)	34.4	33.7	0.84
6-m GERD (%)	40.2	27.9	<0.01
6-m resolved GERD (%)	29.9	45.6	<0.01
6-m induced GERD (%)	24.1	14.4	<0.01
Co-Morbid Condition (12 Months)			
Preop GERD (12-months cohort) (%)	31.6	36.3	0.34
12-m GERD (%)	38.3	28.1	0.03
12-m resolved GERD (%)	35.8	53.5	0.06
12-m induced GERD (%)	29.3	17.7	0.11
Weight-Loss Outcome (6 Months)			
6-m %TWL *	14.2 ± 7.3	14.7 ± 6.4	0.19
Weight-Loss Outcome (12 Months)			
12-m %TWL*	22 ± 7.3	20.3 ± 9.3	0.03

*Values are expressed as mean ± standard deviation

Abbreviation: ABS= anatomy-based sleeve gastrectomy; SD=standard deviation; BMI= body mass index; N/V= nausea/vomiting; GERD= gastroesophageal reflux disease; %TWL= percentage total body weight loss.

CONCLUSIONS

- In a single-center experience of 1715 patients, ABS is superior to sleeve gastrectomy with bougie with regard to operative time, length of stay, and GERD at 6 months.
- Weight loss is slightly better with sleeve gastrectomy with bougie.

Variable	Bougie (n = 736)	Standard Clamp (n = 979)	P-value	Anticipated Titan	Comments
Age at surgery (yr.)*	44.5 ± 11.3	43.1 ± 11.8	<0.01	↓	Increased procedure demand
Female (%)	80.7	83.2	0.20	-	
Baseline BMI (kg/m ²) *	46.7 ± 9.2	46.5 ± 9.2	0.86	↓	Increased procedure demand
Operative time (min.) *	112 ± 34	104 ± 44	<0.01	↓	Decreased stapling time
Length of stay (day) *	1.6 ± 4	1.2 ± 0.6	<0.01	↓	More consistent pouch
30-Day Outcome					
30-day reoperation (%)	0.4	0.3	1.00	-	
30-day bleed (%)	0.3	1	0.08	↓	Better hemostasis in head-to-head testing vs Echelon
30-day leak (%)	0.1	0.0	0.43	↓	Higher burst pressure, no overlaps
30-day stricture (%)	0.0	0.0	---	-	
30-day readmission (%)	5.3	3.7	0.12	↓	More consistent pouch
30-day N/V readmission (%)	2.5	1.4	0.15	↓	More consistent pouch
Weight-Loss Outcome (6 Months)					
6-m %TWL *	Bougie (n = 493)	ABS (n = 606)			
	14.2 ± 7.3	14.7 ± 6.4	0.19	↑	More consistent pouch
Weight-Loss Outcome (12 Months)					
12-m %TWL*	Bougie (n = 256)	ABS (n = 110)			
	22 ± 7.3	20.3 ± 9.3	0.03	↑	More consistent pouch