

Anatomy-based laparoscopic sleeve gastrectomy reduces gastroesophageal reflux disease compared to laparoscopic sleeve gastrectomy with bougie

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Background: Sleeve gastrectomy pouches with narrowing at the incisura angularis, twists along the staple line, retained fundus or resection compromising the lower esophageal sphincter have been implicated in increased gastroesophageal reflux disease (GERD) rates following laparoscopic sleeve gastrectomy (LSG). Basing creation of sleeve gastrectomy pouches on anatomic landmarks may help produce more consistent sleeve anatomy and improve outcomes. The goal of this study was to evaluate rates of GERD for patients undergoing anatomy-based sleeve gastrectomy (ABS) compared to those undergoing traditional LSG with a bougie.

Methods: A retrospective review of all patients undergoing LSG from January 2016 to November 2016 at a single institution specializing in bariatric surgery was performed. Patients underwent either traditional LSG with use of a 40F suction bougie to guide creation of the sleeve or ABS. ABS was performed using a gastric clamp to maintain predetermined distances from key landmarks. Data regarding GERD was collected prospectively as a part of an ongoing quality improvement program (MBSAQIP). Patient demographics, perioperative characteristics, and post-operative outcomes were compared using Chi-square and Student's t-tests as required.

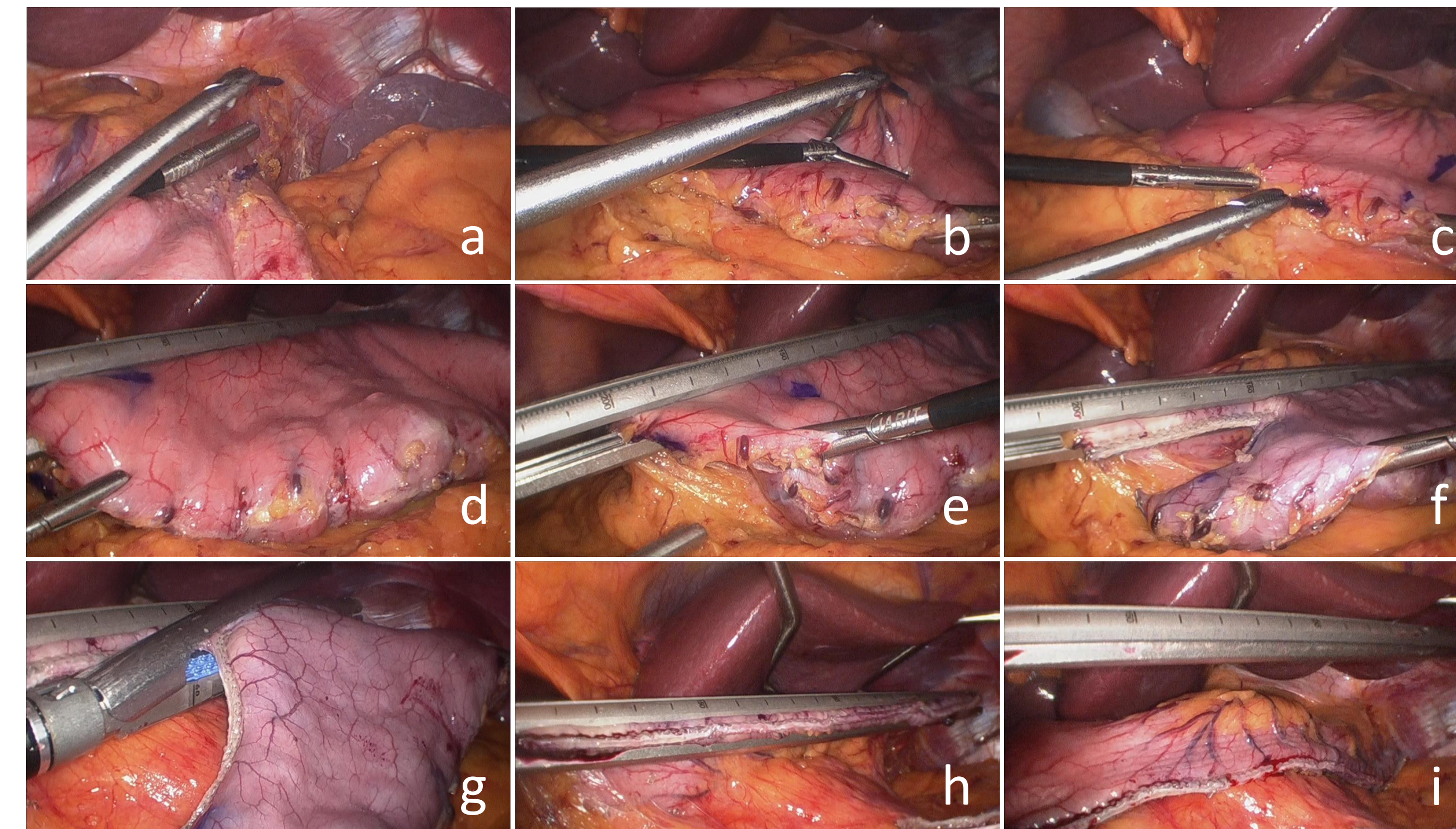


Figure 1: Anatomy-based laparoscopic sleeve gastrectomy. Staple line is planned by marking stomach 1cm from GE junction, 3cm from incisura angularis and 6cm from pylorus (a-c). Clamp is placed and three points are aligned to the anatomic left of the clamp (d-e). Staple line is then created along the clamp (f-h), resulting in a continuous staple line (h-i).

Table 1: Early results of anatomy-based sleeve vs suction bougie.

	BOUGIE (N = 156)	ABS (N = 115)	P VALUE
AGE	42	42	0.75
PREOP BMI	51	51	0.94
GENDER (FEMALE)	81%	83%	0.93
PROCEDURE TIME (MIN)	113	109	0.3
PRE-OP GERD RATE	33%	37%	0.51
POST-OP GERD RATE	34%	19%	<0.01
RESOLVED GERD RATE	32%	67%	<0.01
NEW ONSET GERD RATE	18%	11%	0.27

Results: Of 271 patients included during the study period, 156 (58%) underwent traditional LSG with use of a bougie and 115 (42%) underwent ABLSG. No significant difference in operative time was identified between groups (113 minutes vs. 109 minutes, $p = 0.30$). Additionally, there were no intraoperative complications, reoperations, leaks, bleeds, or strictures in either cohort. While prevalence of pre-operative GERD was similar between groups (37% vs. 33%, $p = 0.51$), patients undergoing ABS had a significantly lower rate of GERD post-operatively compared to the bougie group (19% vs. 34%, $p < 0.01$). In patients without pre-operative GERD, there was no significant difference in the rates of new-onset GERD following LSG (11% vs. 18%, $p = 0.27$). At a median follow-up of 2.3 months, a significantly larger proportion of patients undergoing ABLSG achieved resolution of their GERD compared to the bougie group (67% vs. 32%, $p < 0.01$).

Conclusion: When compared to traditional LSG with use of a bougie, ABS was shown to result in a significantly lower rate of post-operative GERD and a more than 100% improvement in early GERD resolution. These findings suggest that ABS may provide a substantial clinical benefit with regard to GERD following sleeve gastrectomy.