

Measure twice, cut once: anatomy-based sleeve gastrectomy associated with dramatic benefits versus suction bougie in sleeve gastrectomy pouch creation

Jonathan R. Thompson MD^{1,2}, Vikrom K. Dhar MD², Dennis J. Hanseman PhD², Brad M. Watkins MD², Tayyab S. Diwan MD², Thomas Inge MD, PhD³, John Morton MD, MPH⁴

¹University of Cincinnati Research Institute; ²University of Cincinnati Department of Surgery

³Children's Hospital of Colorado, University of Colorado, Denver

⁴Department of Surgery, Stanford University

Introduction: Anatomy-based sleeve gastrectomy (ABS) has been developed to improve the shape, volume and anatomic consistency of the laparoscopic sleeve gastrectomy (LSG) pouch. Anatomic imperfections in the sleeve gastrectomy pouch have been implicated in increased gastroesophageal reflux disease (GERD) following LSG. We report our one-year results using an ABS technique.

Methods: A quality improvement data collaborative was initiated with custom fields added to the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database. Determination of "not human subjects research" was obtained from our IRB. ABS was implemented beginning in 6/2016. ABS consists of planning a sleeve gastrectomy pouch by marking the stomach 1cm from the gastroesophageal junction, 3cm from the IA, and 6cm from the pylorus. The marks are lined up to the beside a 25cm clamp and a 60mm endocutter is used to resect the stomach. 641 ABS cases were compared to 737 cases where a 40F bougie was used for pouch creation (1/2014-5/2016). No programmatic changes were made during this time. 30-day safety, 6-month and 1-year GERD and weight loss outcomes were compared. Student's t test and Chi square tests were used as appropriate.

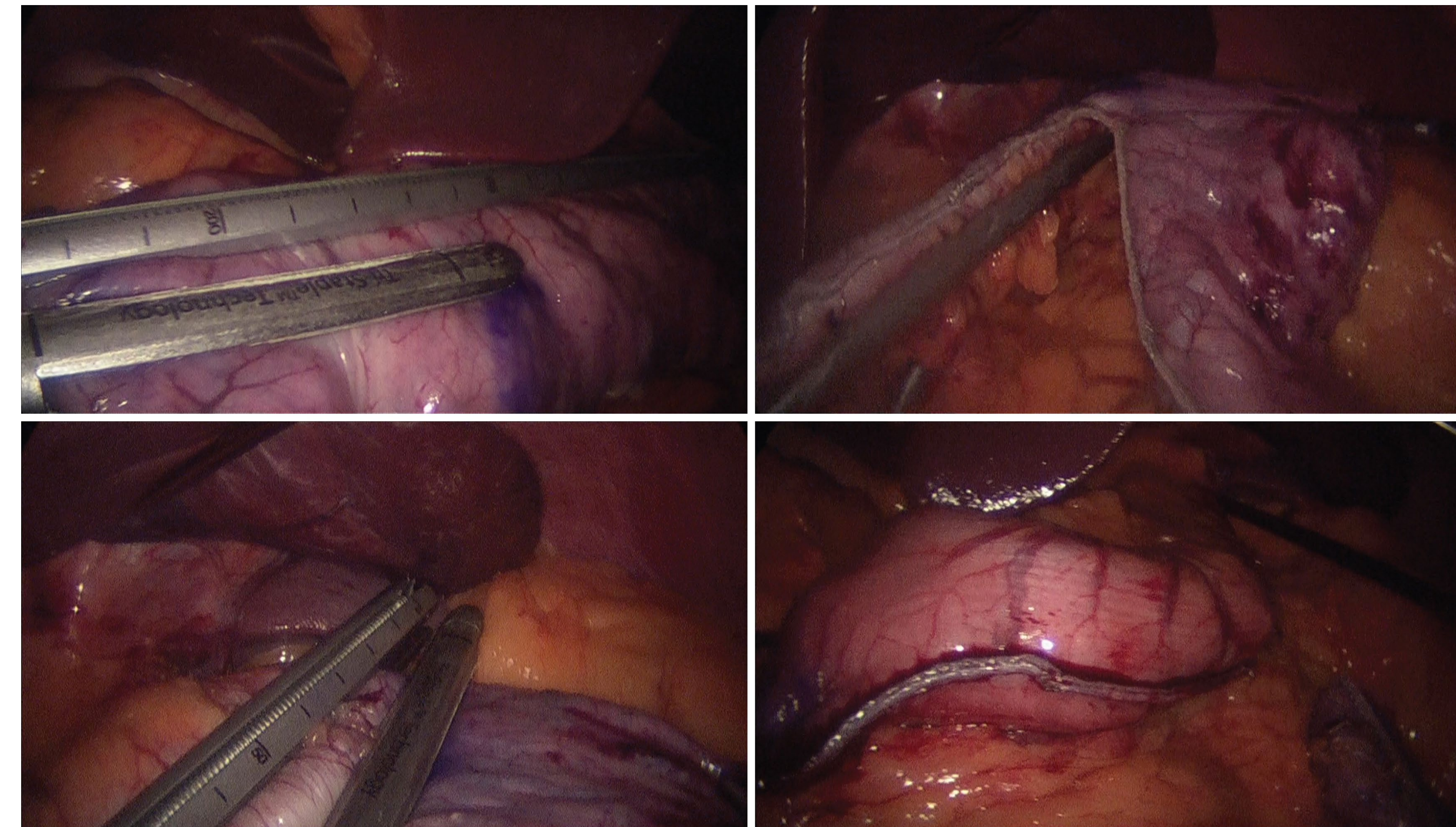


Figure 1: Anatomy-based sleeve gastrectomy pouch created with 25cm clamp. The resultant staple line is shown insufflated with 60ml of air.

Results: No significant differences in gender, preoperative BMI, or operative time were identified between groups (all $p > 0.05$). Average age was 45 in the bougie group and 43.5 in ABS ($p = 0.02$). ABS was associated with shorter length of stay (1.2 vs 1.7, $p < 0.01$), 42% fewer readmissions (3.3% vs 5.7%, $p = 0.03$), 61% fewer readmissions due to nausea/vomiting (1.1% vs 2.9%, $p = 0.02$). ABS patients had a 48% lower 6-month GERD rate (21% vs 40%, $p < 0.01$), 86% higher 6-month GERD resolution rate (54% vs 29%, $p < 0.01$), 49% lower 1-year GERD rate (20% vs 39%, $p < 0.01$), 106% higher 1-year GERD resolution rate (72% vs 35%, $p < 0.01$). Both groups had similar total 1-year weight loss (26.3% vs 27.3%, $p = 0.41$).

Table 1: MBSAQIP outcomes with bougie or anatomy-based sleeve gastrectomy

	Bougie (n = 737) % or mean (sd)	ABS (n = 641) % or mean (sd)	p value
Age at surgery	45.0 (11.3)	43.5 (11.8)	0.02
Female %	81%	83%	0.23
Baseline BMI	49.9 (9.6)	50.3 (9.2)	0.38
Operative time	112 (42)	109 (69)	0.32
Length of stay	1.7 (4.0)	1.2 (0.6)	<0.01
Reoperation	0.70%	0.30%	0.46
Bleed	0.10%	0.30%	0.6
Leak	0	0	-
Stricture	0	0	-
Readmission	5.70%	3.30%	0.03
Nausea/vomiting readmission	2.80%	1.10%	0.02
	Bougie (n = 490)	ABS (n = 301)	
Preop GERD (6-month cohort)	34%	34%	0.94
6-month GERD	40%	21%	<0.01
6-month resolved GERD	29%	54%	<0.01
6-month %TWL	21.4 (7.7)	21.2 (6.7)	0.64
	Bougie (n = 253)	ABS (n = 56)	
Preop GERD (1-year cohort)	32%	45%	0.09
1-year GERD	39%	20%	<0.01
1-year resolved GERD	35%	72%	<0.01
1-year %TWL	27.3 (9.8)	26.3 (8.7)	0.41

Conclusion: Anatomy-based sleeve gastrectomy offers benefits over sleeve gastrectomy with bougie with regard to 30-day safety and dramatic improvement of GERD rates at 6-months and 1-year.