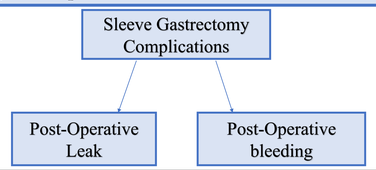
POSTOPERATIVE BLEEDING AND LEAKS IN SLEEVE GASTRECTOMY ARE INDEPENDENT OF BOTH STAPLE HEIGHT AND STAPLE LINE OVERSEWING

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INTRODUCTION

- Over 100,000 sleeve gastrectomy procedure annually in the U.S.A.
- Post operative bleeding and staple line leaks are devastating complications
- Our aim is to study how staple height and staple line oversewing effect post operative bleeding and staple line leaks.



METHODOLOGY:

- Single institution retrospective cohort analysis patient who had sleeve gastrectomy between 2005-2009
- Pre-operative and Post operative data collected (Table 1)
- Statistical analysis was performed using multiple logistic regression for combined postoperative complications (bleeding and staple line leak)
- Bleeding was defined as requiring blood transfusion and/or re-operative surgical hemostasis
- Staple line leaks was confirmed radiographically

Patient Demographics, Comorbidities, & Procedure Details		
Patient Demographics	Patient Comorbidities	Procedure details
• Age • Gender • BMI	• Recent anticoagulant use • History of Cirrhosis • Prior liver transplantation • LVAD placement • End stage renal disease with dialysis	• Surgeon's name • Date of surgery • Surgical approach • Type of energy device • Bougie size • Staple height (range 1.5mm to 5.0mm) • Number of staples used • Staple distance from antrum • Staple line oversewing • Staple line clipping • Thromboprophylaxis

Table 1: Preoperative and intraoperative data points

Exclusion Criteria
· **Liver Transplantation**
· **Cirrhosis**
· **End-Stage Renal Disease**
· **Anticoagulation for LVAD**

RESULTS

		By bleeding occurrence			By transfusion of packed red blood cells (PRBC)			By leak complication			By composite event of bleeding, PRBC or leak		
	Total	No bleeding	Bleeding	p-value	No PRBC	PRBC	p-value	No leak	Leak	p-value	No event	Event	p-value
	(n=1213)	(n=1203)	(n=10)		(n=1177)	(n=36)		(n=1211)	(n=2)		(n=1174)	(n=39)	
Staple type				0.33			0.19			1.00			0.26
Ethicon	835 (68.8)	830 (69.0)	5 (50.0)		813 (69.1)	22 (61.1)		833 (68.8)	2 (100.0)		810 (69.0)	25 (64.1)	
Covidien	353 (29.1)	348 (28.9)	5 (50.0)		340 (28.9)	13 (36.1)		353 (29.1)	0 (0.0)		340 (29.0)	13 (33.3)	
Sureform	11 (0.9)	11 (0.9)	0 (0.0)		11 (0.9)	0 (0.0)		11 (0.9)	0 (0.0)		11 (0.9)	0 (0.0)	
Seamguard	4 (0.3)	4 (0.3)	0 (0.0)		3 (0.3)	1 (2.8)		4 (0.3)	0 (0.0)		3 (0.3)	1 (2.6)	
Unknown	10 (0.8)	10 (0.8)	0 (0.0)		10 (0.8)	0 (0.0)		10 (0.8)	0 (0.0)		10 (0.9)	0 (0.0)	
First firing				0.70			0.23			0.82			0.40
Blue Ethicon	33 (2.8)	33 (2.8)	0 (0.0)		33 (2.9)	0 (0.0)		33 (2.8)	0 (0.0)		33 (2.9)	0 (0.0)	
Gold Ethicon	253 (21.2)	251 (21.2)	2 (20.0)		249 (21.5)	4 (11.1)		252 (21.2)	1 (50.0)		247 (21.4)	6 (15.4)	
Green Ethicon	510 (42.7)	507 (42.9)	3 (30.0)		494 (42.7)	16 (44.4)		509 (42.7)	1 (50.0)		493 (42.7)	17 (43.6)	
Black Ethicon	37 (3.1)	37 (3.1)	0 (0.0)		35 (3.0)	2 (5.6)		37 (3.1)	0 (0.0)		35 (3.0)	2 (5.1)	
Gold Covidien	3 (0.3)	3 (0.3)	0 (0.0)		3 (0.3)	0 (0.0)		3 (0.3)	0 (0.0)		3 (0.3)	0 (0.0)	
Purple Covidien	113 (9.5)	111 (9.4)	2 (20.0)		110 (9.5)	3 (8.3)		113 (9.5)	0 (0.0)		110 (9.5)	3 (7.7)	
Black Covidien	234 (19.6)	231 (19.5)	3 (30.0)		224 (19.4)	10 (27.8)		234 (19.6)	0 (0.0)		224 (19.4)	10 (25.6)	
Green Sureform (robotic)	5 (0.4)	5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)	
Blue Gore Seamguard	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
Black Seamguard	4 (0.3)	4 (0.3)	0 (0.0)		3 (0.3)	1 (2.8)		4 (0.3)	0 (0.0)		3 (0.3)	1 (2.6)	
Green Sureform (robotic)	5 (0.4)	5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)		5 (0.4)	0 (0.0)	
Blue Gore Seamguard	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
Black Seamguard	2 (0.2)	2 (0.2)	0 (0.0)		1 (0.1)	1 (2.8)		2 (0.2)	0 (0.0)		1 (0.1)	1 (2.6)	
Tan Covidien	54 (4.6)	54 (4.6)	0 (0.0)		54 (4.7)	0 (0.0)		54 (4.6)	0 (0.0)		54 (4.7)	0 (0.0)	
Green Seamguard	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
Gold Seamguard	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
Green Seamguard	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
White Ethicon	--	1 (2.0)	--	--	1 (2.1)	0 (0.0)		1 (2.1)	0 (0.0)		1 (2.1)	0 (0.0)	
Suture				0.59			0.34			1.00			0.43
Nothing	274 (22.6)	271 (22.5)	3 (30.0)		268 (22.8)	6 (16.7)		274 (22.6)	0 (0.0)		267 (22.7)	7 (17.9)	
Selective suturing	100 (8.2)	99 (8.2)	1 (10.0)		97 (8.2)	3 (8.3)		100 (8.3)	0 (0.0)		97 (8.3)	3 (7.7)	
Entire suturing	746 (61.5)	741 (61.6)	5 (50.0)		724 (61.5)	22 (61.1)		744 (61.4)	2 (100.0)		722 (61.5)	24 (61.5)	
Clip placement	71 (5.9)	70 (5.8)	1 (10.0)		67 (5.7)	4 (11.1)		71 (5.9)	0 (0.0)		67 (5.7)	4 (10.3)	
Selective suturing+clip placement	1 (0.1)	1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)		1 (0.1)	0 (0.0)	
Entire suturing+clip placement	13 (1.1)	13 (1.1)	0 (0.0)		13 (1.1)	0 (0.0)		13 (1.1)	0 (0.0)		13 (1.1)	0 (0.0)	
Unknown	8 (0.7)	8 (0.7)	0 (0.0)		7 (0.6)	1 (2.8)		8 (0.7)	0 (0.0)		7 (0.6)	1 (2.6)	

CONCLUSION:

Sleeve gastrectomy procedure has tremendous variability in technique and devices used. We observed no difference in the combined postoperative complications of staple line bleeding or leak with respect to different energy devices, staple height, or over-sewing of the gastric staple line. Patient selection is crucial, as patient age and coagulopathic comorbidities were found to lead to higher combined postoperative complications.

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