Complications After Robotic Sleeve Gastrectomy: Does Staple Load Color Affect Outcome?

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BACKGROUND

Sleeve gastrectomy is the most common bariatric surgery performed in the United States with over 160,000 operations performed in 2022 [1]. To optimize tissue apposition and hemostasis, most surgeons use progressively narrower staples as the staple line progresses from the thick antrum toward the thinner fundus. Staple heights in the robotic system (Intuitive Surgical Inc, Sunnyvale, CA) range from 2.5mm in height (white load) to 3.5mm (blue load) to 4.3mm (green load) to 4.6mm (black load). We examine whether there is an association between staple load color and complications after robotic sleeve gastrectomy.

METHODS

We retrospectively reviewed all patients who underwent sleeve gastrectomy at Mount Sinai Hospital and Mount Sinai Morningside between 2015 and 2022. We identified the patients who had a complication following robotic sleeve gastrectomy and performed a detailed chart review to include their preoperative workup, operative details, and postoperative course. General staple selection data was retrieved from individual robotic profiles. A chi square analysis was used to determine significance.

RESULTS

Twenty-four patients had a major complication following robotic sleeve gastrectomy (Table 1). The mean age was 37 (range 19 to 61) and the mean BMI was 44 (range 34 to 64). Their comorbidities include diabetes (n=6), sleep apnea (n=6), hyperlipidemia (n=5), and hypertension (n=9). Major complications (Figure 1) included bleeding requiring transfusion or operative intervention (n=10), thrombosis requiring anticoagulation (n=4), and leak (n=3). For patients with complications, staple load colors used were blue only (n=7), blue-to-white (n=4), black-to-green (n=1), black-to-blue (n=5), and green-to-blue (n=7). Among our surgeons, the commonly used staple loads are green-to-blue (31%), blue only (25%), blue-to-white (22%), and black-to-blue (20%) (Figure 2). Chi square analysis shows no significant difference between staple load color and complication rates (p-value 0.96).

Demographics	
Age, average	36.8
Female, n	17
Male, n	7
Highest BMI, average	46.73
BMI closest to surgery, average	44.57
Comorbidities	
Smoking, n	3
Diabetes, n	6
Immunosuppression, n	1
Sleep apnea, n	6
GERD, n	2
Previous cardiac surgery, n	2
Hypertension, n	9
Hyperlipidemia, n	5
Therapeutic anticoagulation, n	2
Hospital course	
Duration of operation, mins	113
Days in hospital, average	2.75
Drain placement, n	1

Table 1. Baseline characteristics of Patients with Complications

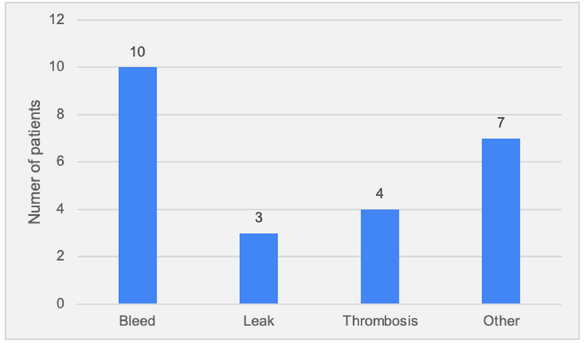


Figure 1. Complications after Robotic Sleeve gastrectomy

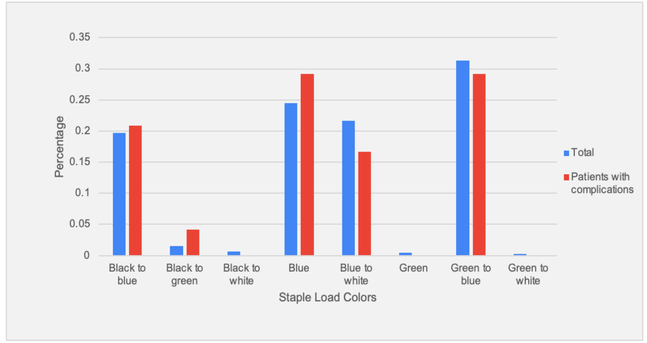


Figure 2. Staple Load Colors in Robotic Sleeve Gastrectomy

CONCLUSIONS

Although the use of continuous blue staple loads and green-to-blue staple loads are prevalent in our patients with complications, it is not statistically significantly different from patients who did not have complications. As a result, for patients undergoing robotic sleeve gastrectomy in our institution, staple load color is not associated with complications including bleeding, leak, and thrombosis.
However, further research is needed to understand the relationship between staple height and outcomes in bariatric surgery.

REFERENCE

[1] *Estimate of Bariatric Surgery Numbers, 2011-2022 - American Society for Metabolic and Bariatric Surgery*. (2024, March 13). American Society for Metabolic and Bariatric Surgery. https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers/

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