



Effective use of Caprini model for assessing need for extended post-operative Deep Vein Thrombosis prophylaxis in Bariatric gastric sleeve population



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INTRODUCTION

Venous thromboembolism (VTE) is a known complication following bariatric surgery with significant associated morbidity and mortality. Despite this, no agreed upon protocol to reduce the risk of VTE in these patients exists. The Caprini scoring system has been validated as a VTE risk assessment tool and has been adopted by our institution to identify patients who should receive extended VTE prophylaxis. We hypothesized that applying the Caprini scoring system to patients undergoing laparoscopic sleeve gastrectomy (LSG) would minimize post-operative VTE rates, while not increasing bleeding risks. We chose to focus on LSG because of the relatively higher incidence of portal mesenteric vein thrombosis after this procedure.

METHODS

Retrospective chart review of patients who underwent Laparoscopic sleeve gastrectomy between 2010-2018 (n=647) was conducted and patients with postoperative VTE events were identified. Demographic characteristics as well as hospital course were analyzed using appropriate statistical comparisons.

RESULTS

638 patients underwent LSG during the study period. 521 (81.7%) were female and average pre-operative BMI of 44.4 (SD 6.8). 158 (24.8%) met Caprini threshold to be discharged on extended VTE prophylaxis. Four patients (0.6%) developed a deep venous thrombosis (DVT) and or a pulmonary embolism (PE) in the 180-day post-operative period. No patient developed mesenteric venous thrombosis (MVT). There were no bleeding complications observed in the patients discharged on extended VTE prophylaxis. Baseline patient characteristics divided for subgroup analysis based on Low (Caprini <5) and High (Caprini >5). Further analysis was based on patients divided based on whether or not they developed a VTE event.

RESULTS

Table 1: Characteristics and comorbidities of Low (Caprini <5) versus High (Caprini >5) score patients.

	Low Caprini (n = 480)	High Caprini (n = 158)	
Age, years (mean ± SD)	38.8 ± 9.9	48.9 ± 12.9	p < 0.0001
% Female	83.3	76.6	ns
Pre-operative BMI (mean ± SD)	44.0 ± 6.2	45.7 ± 8.1	p = 0.008
Post-operative BMI (mean ± SD)	35.2 ± 6.9	35.9 ± 8.4	ns
Caprini score (mean ± SD)	3.5 ± 0.5	6.0 ± 1.3	p < 0.0001
Hypertension	38.8	58.2	p < 0.0001
Gastroesophageal reflux disease	26.7	36.1	p = 0.026
Obstructive sleep apnea	22.7	38.6	p < 0.001
Diabetes	19.6	36.1	p < 0.0001
Asthma	18.1	19.0	ns
Hyperlipidemia	10.2	26.6	p < 0.0001
Thyroid disease	7.1	11.4	ns
Osteoarthritis	6.9	18.4	p < 0.0001
Hepatitis C	2.1	2.5	ns
Coronary artery disease	1.5	2.5	ns
HIV	1.3	0.6	ns
Non-alcoholic steatohepatitis	1.0	1.9	ns
Cancer	0.8	8.2	p < 0.0001
Seizure	0.8	1.3	ns
Cirrhosis	0.8	0.0	ns
Pseudotumor cerebri	0.6	3.2	p = 0.025
Myocardial infarction	0.4	2.5	p = 0.036
Lung Disease	0.4	8.2	p < 0.0001
Stroke	0.2	1.9	p = 0.049
Latent tuberculosis	0.2	0.0	ns

Comparing baseline patient characteristics among all patients, those patients within the High Caprini group were statically more likely to be of older age, have a higher pre-operative BMI, and have comorbidities such as: HTN, GERD, OSA, DM, HLD, OA, Pseudotumor cerebri, history of cancer, MI, lung disease, or stroke.

RESULTS

Table 2: Characteristics and comorbidities of No VTE versus VTE cohorts.

	No VTE (n = 634)	VTE (n = 4)	
Age, years (mean ± SD)	41.3 ± 11.6	43.0 ± 10.2	ns
% Female	81.5	100	ns
Pre-operative BMI (mean ± SD)	44.3 ± 6.7	56.7 ± 11.6	p < 0.001
Post-operative BMI (mean ± SD)	35.3 ± 7.2	45.6 ± 7.9	p = 0.005
Caprini score (mean ± SD)	4.1 ± 1.3	6.8 ± 0.5	p < 0.0001
Seizure	0.8	25.0	p = 0.037

Table 3: Comparison of Caprini score distribution of No VTE versus VTE cohorts.

Caprini Score	No VTE (n = 634)	VTE (n = 4)	
Obesity	100	100	ns
OCP use	6.6	25.0	ns
Family History of DVT/PE	6.2	75.0	p = 0.001
History of DVT/PE	3.3	25.0	ns
History of Factor V Leiden	0.5	0	ns
History of Major Surgery	0.2	0	ns
History of HIT	0	0	ns
History of Surgery >6 hours	0	0	ns

Comparing patient characteristics among those with and without VTE events, those patients with VTE events were statically more likely to have higher pre-operative and post-operative BMIs, and have family history of VTE/PE. Of note, two of the four patients who developed VTE events were initially erroneously misclassified, and were not discharged on VTE prophylaxis.

CONCLUSION

The Caprini scoring system can be used effectively in patients undergoing LSG to consistently identify need for post-operative VTE prophylaxis without increasing bleeding events, however correct classification is necessary.