Comparative Study Between DVT Incidence Among Anticoagulated Patients And Non Anticoagulated Patients After Laparoscpic Sleeve Gastrectomy

A Thesis

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List of Abbreviations

Abb.	Full term
ACCP	*American College of Chest Physicians*
AF	*Atrial fibrillation*
AIS	*Acute ischemic stroke*
APSAC	*Anisoylated plasminogen streptokinase activator complex*
aPTT	*Activated partial thromboplastin time*
ASMBS	*American Society for Metabolic and Bariatric Surgery*
BMI	*Body mass index*
BPD-DS	*Biliopancreatic diversion with duodenal switch*
CHF	*Congestive heart failure*
CI	*Confidence interval*
COPD	*Chroinc obstructive pulmonary disease*
CT	*Computed tomography*
CTPA	*Computed tomography pulmonary angiography*
CTPH	*Chronic thromboembolic pulmonary hypertension*
CTV	*Computed tomography venography*
CVC	*Central venous catheter*
DS	*Duodenal switch*
DUS	*Duplex ultrasonography*
DVT	*Deep vein thrombosis*
ECG	*Electrocardiography*
HCSE	*Horse chestnut seed extract*
HIT	*Heparin-induced thrombocytopenia*
HRT	*Hormone replacement therapy*
IPC	*Intermittent pneumatic compression*
LGB	*Laparoscopic gastric banding*

List of Abbreviations Cont...

Abb.	Full term
LMWH	*Low molecular weight heparin*
LSG	*Laparoscopic Sleeve Gastrectomy*
MPFF	*Micronized purified flavonoid fraction*
MRI	*Magnetic resonance imaging*
NOAC	*Non-Vitamin K antagonist oral anticoagulants*
NPO	*Nothing by mouth*
PAI-1	*Plasminogen activator inhibitor-1*
PCD	*Pneumatic compression devices*
PE	*Pulmonary embolism*
PESI	*Pulmonary embolism severity index*
PIOPED	*Prospective Investigation of Pulmonary Embolism Diagnosis*
PPV	*Positive predictive value*
PTS	*Post-thrombotic syndrome*
PTS	*Post-thrombotic syndrome*
r-PA	*Recombinant plasminogen activator*
RYGB	*Roux-en-Y gastric bypass*
SAGES	*Suggested VTE prophylaxis*
SC	*Subcutaneous*
SD	*Standard deviations*
SG	*Sleeve gastrectomy*
SPSS	*Statistical Package for Social Science*
TF	*Tissue factor*
TFPI	*Tissue factor pathway inhibitor*
TGF-β	*Transforming growth factor-β*
TNF-α	*tumor necrosis factor- α*
TOS	*The Obesity Society*
tPA	*Tissue plasminogen activator*

List of Abbreviations Cont...

Abb.	Full term
UFH	*Unfractionated heparin*
UH	*Unfractionated heparin*
V/Q scan	*Ventilation/Perfusion scan*
VBG	*Vertical banded gastroplasty*
VKAs	*Vitamin K antagonists*
VPX	*VTE prophylaxis*
VTE	*Venous thromboembolism*

INTRODUCTION

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems ***(Haslam and James, 2005).***

Surgical approaches to weight loss, bariatric surgeries, are commonly performed procedures for morbidly obese individuals; the estimated number of bariatric procedures in the USA alone was close to 180,000 in 2013. Bariatric surgery is effective in achieving weight loss and improving obesity-related complications ***(Matthew et al., 2015).***

Laparoscopic Sleeve Gastrectomy (LSG) has increased in popularity and is currently very popular among laparoscopic surgeons involved in bariatric surgery. As LSG proved to be effective in achieving considerable weight loss in the short-term, it has been proposed by some as a sole bariatric procedure ***(Iannelli et al., 2008).***

As a result of new technologies with lower risks and better long-term results, bariatric and metabolic surgeries have grown in popularity in recent years. The number of operations performed is rapidly increasing. However, bariatric surgery is associated with numerous peri- and postoperative complications ***(Stroh et al., 2012)***.

Venous thromboembolism is the most common postoperative complication. Obesity needs to be considered as one of the most serious factors predisposing patients to the development of thrombosis and pulmonary embolism ***(Stroh et al., 2012).***

Deep venous thrombosis may occur in up to 1.3% of patients after open or laparoscopic bariatric surgery. Despite the early mobility after laparoscopic surgery, the incidence of DVT may not be reduced as much as expected because the benefit of early motility may be offset by the tendency of pneumoperitoneum to promote DVT ***(Becattini et al., 2012)***.

Despite universal agreement on the need for thromboprophylaxis, no clear consensus has been reached regarding the best regimen and treatment duration. Current modalities of thromboprophylaxis include subcutaneous injection of unfractionated or low molecular weight heparin, pneumatic compression devices, elastic stockings, and inferior vena cava filters ***(Magee et al., 2010)***.

Most series evaluating prophylactic strategies for bariatric patients include some form of mechanical prophylaxis. Because of concerns of bleeding complications associated with chemoprophylaxis (2% incidence of bleeding complications in a recent systematic review when a standardized definition of hemorrhage was used), several studies have examined the use of mechanical compression only in bariatric surgery patients ***(Becattini et al., 2012).***

AIM OF THE WORK

To compare between incidence of developing deep venous thrombosis in patients receiving anticoagulation prophylaxis to those not receiving anticoagulation prophylaxis in Laparoscopic sleeve gastrectomy operations for treatment of morbid obesity.

Chapter 1

OVERVIEW ON LAPAROSCOPIC SLEEVE GAASTRECTOMY

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems ***(Haslam and James, 2005).***

Body mass index (BMI) is a widely and simple used method to estimate body fat mass. BMI is calculated by dividing the subject's mass in kg by the square of his or her height. Any BMI ≥ 35 is severe obesity, BMI of ≥ 40 is morbid obesity and BMI of ≥ 45 is super obese ***(Sturm, 2007).***

Severe obesity is associated with a large number of comorbidities. These start at the head (stroke, diabetic retinopathy,pseudo tumor cerebri, tinnitus) and go to the toes (diabetic neuropathy, venous stasis disease, foot ulcers) and affect almost every organ in between: heart, lungs, liver, gall bladder, spleen, esophagus, intestines, colon, kidneys, bladder, ovaries, prostate, breast, legs, etc... ***(Sugerman et al., 2003).***

Bariatric surgery has demonstrated to be the most effective and sustainable method for the regulation of morbid obesity, superior to both pharmaceuticals and combinations of diet and lifestyle regimens.

Indications for Bariatric Surgery and Patient Selection:

In 1991 the National Institutes of Health published a consensus statement regarding bariatric surgery. Surgery was indicated in patients with a BMI $\geq$ 40 kg/m^2 and in patients with a BMI between 35 and 40 with other comorbidities **(Table 1)**. Severe sleep apnea, obesity related cardiomyopathy, Pickwickian syndrome, severe diabetes mellitus and lifestyle limitations were all considered comorbidities that would allow the patient to pursue surgery ***(National Institutes of Health, 2013).***

Table (1): Indications for bariatric surgery and patient selection ***(Schirmer and Schauer, 2010).***

Patient must:
1. Have BMI of ≥40 with or without other co-morbid medical conditions associated with obesity.
2. Have BMI of 35–40 with other co-morbid medical conditions.
In addition, patients:
1. Have failed attempt of other weight loss treatments
2. Must be psychologically stable
3. Must be cooperative, motivated and agree for lifelong follow up.
4. Must be fit for surgery.
5. Aged 18 to 60 years.

Sleeve gastrectomy (SG) was introduced as a promising bariatric operation. SG involves removing the fundus and greater curvature portion of the stomach, leaving only a lesser curvature tube ***(Deitel et al., 2007).***