Filters and Heparins in Bariatric Surgery: What’s the Verdict?

by AMIR MEHRAN, MD, and TAYLOR RUGGIERO

INTRODUCTION

Venous thromboembolism (VTE) remains one of the most feared complications of bariatric surgery. The incidence of VTE ranges between 0.3 and 2.0 percent with up to 30 percent of incidences resulting in a fatal outcome. Whereas some general agreement exists regarding the benefits of VTE prophylaxis in patients with morbid obesity through early ambulation and the use of sequential compressive devices, little agreement exists regarding other prophylactic measures, such as chemoprophylaxis and inferior vena cava (IVC) filters.

The 2007 American Society for Metabolic and Bariatric Surgery (ASMBS) position statement provided an overview of this topic but did not delve into concrete guidelines. Furthermore, most bariatric surgeons follow their own established patterns and are unlikely to change their current practices in the absence of any demonstrable benefit to doing so. Cognizant that a thorough discussion would possibly require a dedicated consensus conference, we limit our article to the use of low molecular weight heparin (LMWH) versus unfractionated heparin (UFH) and the utility of IVC filters. Since the term venous thromboembolism has been liberally applied to both deep venous thrombosis (DVT) and/or pulmonary embolus (PE), our focus will be primarily on the latter more serious complication. The bariatric literature will be reviewed and our program’s approach will be described.

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by JENNIFER TRAUB, RD, CNSC

INTRODUCTION

While there are many challenges in maintaining optimum health status in patients who have undergone bariatric surgery, one issue that remains puzzling for many healthcare professionals is accurately diagnosing and treating iron deficiency. Iron deficiency can present with or without anemia, and its overall incidence is high in the bariatric surgery patient population. Proper diagnosis and management is essential in relieving patient symptoms and preventing long-term consequences associated with iron deficiency, such as impaired memory, physical ability, and mental function.

Bariatric surgery patients are at an increased risk of iron deficiency. The incidence of anemia following bariatric surgery has been reported to be as high as 74 percent and has been mostly ascribed to iron deficiency. There are three major factors that contribute to the increased risk in this patient population. First, surgical bypass procedures reduce absorptive surface area by the exclusion of the duodenum and proximal jejunum, which are the physiological sites of iron absorption. Continued on Page xx
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WHICH HEPARIN, IF ANY AT ALL?

The 2007 ASMBS position statement and the 2008 American College of Chest Physicians (ACCP) guidelines support the use of chemoprophylaxis during bariatric surgery should no medical contraindications to its use exist. In a recent survey of the ASMBS membership, some form of heparin was indeed utilized by 95 percent of bariatric surgeons with the majority preferring LMWH over UFH. In theory, LMWH provides VTE prophylaxis with a reduced incidence of bleeding and heparin-induced thrombocytopenia (HIT). The chief action of LMWH is through its inhibitory activity against both factor Xa (FXa) and thrombin. This is in contrast to UFH. UFH has to bind to an inhibitory activity with zero incidence; however, the incidence of bleeding and transfusion requirement was higher in the enoxaparin group (5.9% vs. 1.3%), with 1.7 percent of patients requiring a reoperation for bleeding complications. Therefore, enoxaparin use was not recommended.

In a prospective, randomized trial, Kalafentzos et al22 subjected 60 gastric bypass patients to a daily subcutaneous dose of either 5700 IU or 9500 IU of nadroparin, a LMWH available in Europe. All patients had Doppler studies of their lower extremities preoperatively and at several points postoperatively. No VTE episodes or differences in coagulation parameters were observed in either group. Hemorrhagic complications, however, were observed in two patients in the 9500 IU group versus zero in the 5700 IU group, supporting the use of the lower dose LMWH.

In contrast, Scholten et al23 came to an opposite conclusion in their nonrandomized study of 481 patients. Enoxaparin 30mg BID was prescribed to the first 92 patients versus 40mg BID in the later group. The two groups were matched except for longer operating room times in the 30mg group. With similar bleeding rates, the incidence of VTE was higher in the former group, which led the authors to recommend the higher dose regimen.

Using a fixed dose LMWH approach, Borkgren et al17 prospectively studied 223 Roux-en-Y gastric bypass (RYGB) patients who received either 40 or 60mg of enoxaparin BID and continued for 10 days after discharge. Patients with BMI greater than 50kg/m2 were assigned to the latter group. Anti-factor Xa levels were measured serially, and dosing adjustments were made if levels exceeded established parameters. Clinical suspicion of VTE was entertained in 7.6 percent of the subjects but only one patient in the 40mg cohort was diagnosed with this complication. Five patients (2.2%) developed significant bleeding, all but one patient in the 40mg group. Similar to the findings in the Paige study, the authors found that higher aFXa levels did not correlate with postoperative hemorrhage.

Extended post discharge VTE prophylaxis using warfarin or LMWH has been promoted by some authors. Steinberg et al16 reviewed 308 consecutive RYGB patients and their experience with the use of enoxaparin. 118 patients received enoxaparin 30mg BID as an inpatient-only regimen versus extended use of the same dosage in 159 patients. All patients underwent lower-extremity venous
ultrasounds prior to discharge. The groups were matched except for a higher bleeding and open conversion rate in the inpatient-only cohort. Defining VTE as either DVT or PE, six VTEs were discovered with four in the inpatient low risk and two in the higher risk group. A total of 957 patients had negative lower-extremity ultrasounds previously. Extended LMWH use was therefore advocated; however, the two groups were not matched for VTE risk. Both groups had a higher than average rate of smokers, and the operative times were longer than the other studies reviewed in this article. Although the significance of these findings is unknown, the authors did question the reliability of deep venous duplex ultrasounds in the setting of morbid obesity, a concern brought up by others as well.

Magee et al.20 support the use of extended-term chemoprophylaxis as well. In 735 bariatric patients, dalteparin was utilized perioperatively and persisted for six to 12 months after surgery depending on the procedure performed. The daily dosing was adjusted from 2500 IU before surgery to 5000 IU afterwards. In contrast to most programs, however, pneumatic compression devices were not used. With a minimum of six months follow up, symptomatic VTEs were absent and bleeding was recognized in only three patients. The authors, however, did not provide a comparative group of patients in whom LMWH was only used in the immediate perioperative period.

Finally, for patients with HIT, the use of alternative nonheparin anticoagulants, such as fondaparinux, hirudin, or argatroban, have been discussed in the surgical literature. However, there are currently no data related to their use in bariatric surgery, let alone any discussions regarding dosing and BMI adjustment beyond those provided in the ASBMS position statement.1

Bariatric surgeons have therefore relied on individual solutions based on clinical observations or interpretation of underpowered, small studies. In the absence of randomized trials other than Kohtarhi’s,21 the preferential use of LMWHs versus UFH may be advantageous only in terms of dosing convenience and continuity should patients be discharged on the same regimen. The cost effectiveness of this approach is unknown. At the authors’ institution, depending on the dosing regimen, the cost difference between LMWH and UFH is 5 to 6 fold. This review found no strong support for the weight or BMI-based use of LMWHs as there appears to be no consistently reproducible correlation to the incidence of VTE or postoperative bleeding. Similarly, routine use of aFXa activity may be more of scientific interest than of clinical relevance. Its continuous monitoring during typically short hospital stays has to be carefully balanced against its associated costs and whether a meaningful alteration of chemoprophylactic measures can be carried through a time period defined on the results. And finally, the efficacy, cost effectiveness, or even type of extended chemoprophylaxis beyond discharge remains unknown in the absence of larger, randomized studies.

IVC FILTERS: TRUE SAVIORS OR JUST PEACE OF MIND?

Similar to VTE chemoprophylaxis, there is no consensus or solid evidence-based guidelines regarding the use of IVC filters in high-risk bariatric patients.22 The recently quoted ACCP guidelines recommend against IVC filter use in trauma patients which, by proxy, has often been extrapolated to bariatric surgery and used for denial purposes by payers and referring managed-care groups. The validity of this comparison remains beyond the scope of this article especially since most of the evidence is based on older data and before the age of retrievable filters. Most bariatric surgery authorities define an individual patient’s history of VTE and known history of hypercoagulopathy as a higher risk cohort who should have IVC filters placed preoperatively. Other possible “softer” criteria include evidence of significant venous stasis disease, such as severe lower-extremity edema with brawny skin changes and large varicose veins, super morbid obesity, especially with central distribution, pulmonary insufficiency, and contraindications to chemophrophylaxis, and relative immobility. Using these criteria, up to five percent of bariatric surgery patients may fall into this category.23,24 Similar findings have been reported by others as well.25 Rare VTEs were only seen after the removal of retrievable filters when they were not deployed at all. Furthermore, up to 21 percent of patients were found to have some form of venous thrombosis despite of chemophrophylactic measures and the use of compression devices.26–28 Retrievable IVC filters, however, are not complication free. Filter breakage, caval perforation, and retroperitoneal hematoma have been reported with their removal, albeit rarely.29 Additionally, to 17 percent of these devices are not explanted; and so, long-term outcomes as well as the need for chronic anticoagulation remain uncharted territory.30,31
surgery patients, furthermore, the benefits of retrievable IVC filters appear to outweigh the risks. IVC filter use should be routinely considered in this particular group. Large prospective studies are necessary in order to provide solid recommendations. That is very unlikely to occur as by one account, 128,000 patients are required to discern a statistical difference. 11

Whether centralized databases, such as BOLDP, may provide some type of consensus, however, remains to be seen.

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REFERENCES


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