

Saddle Pulmonary Embolism and Deep Vein Thrombosis Following Foot and Ankle Surgery While On Prophylactic Lovenox, A Case Report

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PURPOSE

This case report highlights the importance of venothromboembolism (VTE) prophylaxis following foot and ankle surgery. Prophylaxis alone does not guarantee that a patient will not develop a VTE and if there is any suspicion, it is paramount to assess and refer your patient when necessary for appropriate care.

LITERATURE REVIEW

Venothromboembolic disorders include both pulmonary embolism (PE) and deep vein thrombosis (DVT). The three main mechanisms include damage to a vessel wall, circulatory stasis and hypercoagulability¹. Foot and ankle surgical patients are therefore at increased risk for the development of VTE secondary to the surgical insult itself, tourniquet use and prolonged immobilization. Other common risk factors include malignancy, advanced age, hormone replacement therapy, and obesity¹.

VTE events are rarely reported following foot and ankle surgery. Shibuya et al. reported an incidence of DVT and PE 0.28% and 0.21%, respectively following foot and ankle trauma². Compared to the orthopedic literature, rates of DVT in foot and ankle surgery is relatively low³. Jameson et al. retrospectively reviewed nearly 90,000 patients and reported the rate of symptomatic VTE after foot and ankle surgery was less than 0.3%⁴. On the contrary, Solis et al. reported a noticeably higher rate of postoperative DVT at 3.5%⁵. However, routine venous duplex ultrasound (US) exams were completed on each patient at their first postoperative visit. Therefore, this study captures a true rate of DVT incidence, with several being asymptomatic.

The decision to prophylactically anticoagulate patients following foot and ankle surgery is based on individualized risk/benefit stratification. Fleisher et al. published the clinical consensus statement of the American College of Foot and Ankle Surgeons which guides surgeons to address modifiable risk factors including the use of mechanical prophylaxis, early weightbearing and consideration of chemical prophylaxis⁶. The consensus also advises prompt evaluation for DVT if clinical suspicion exists. Expedient work up of VTE may be the difference between the life and death of a patient⁶.

CASE STUDY

A 40-year-old male presented with left foot pain after a ground level fall. Physical examination revealed tenderness to the midfoot and pain with manipulation of the tarsometatarsal region. Bilateral radiographs were obtained. Radiographs demonstrated diastasis within the left Lisfranc interval compared to the contralateral film. Magnetic resonance imaging (MRI) revealed acute full-thickness tear of the Lisfranc ligament.

The patient was consented for open reduction internal fixation of Lisfranc ligament disruption. Pertinent past medical history included obesity and male infertility for which he was being treated with a hormonal medication- Clomiphene, a selective estrogen receptor modulator. After risk/benefit discussion, the patient was provided VTE protocols. Intraoperatively, a sequential compressive device was applied to the opposite limb. At discharge the patient was given anti-embolic stockings and placed on prophylactic Lovenox.



Figure 1: Acute full-thickness tear of the Lisfranc ligament on MRI T2 STIR image. Post-operative radiograph with flexible fixation device across the Lisfranc complex

The patient was instructed to be nonweight-bearing for 4 weeks post-op. At first post-op visit the patient was transitioned to a CAM boot and instructed to begin passive ankle range of motion (ROM) exercises several times a day. At the second post-op visit, the patient's pain was controlled and the operative extremity did not exhibit any signs of calf tenderness, edema or erythema. The sutures were removed, the patient was permitted to bathe, and advised to continue passive ankle and hindfoot ROM.

CASE STUDY CONTINUED

Three weeks post-op the patient complained of dyspnea and went to the emergency department. Computed tomography (CT) revealed a large saddle PE that straddled the bifurcation of the pulmonary trunk extending into both left and right pulmonary arteries. US revealed multiple venous thrombi within the deep veins of the operative extremity. The patient was placed on a heparin drip and taken to the operating room for emergent thrombectomy. Following thrombectomy and resolution of symptoms the patient was discharged on therapeutic Eliquis for 6 months duration and was instructed to hold his Clomiphene.

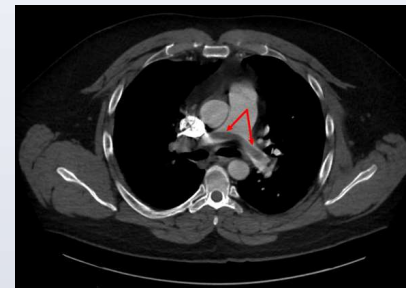


Figure 2: Axial CT demonstrating saddle pulmonary embolus extending into bilateral pulmonary arteries

One-month post-op the patient transitioned to partial weightbearing. At 6 weeks he made a full return to shoe gear. At one year follow-up the patient was doing well, without recurrence of VTE, and complete return to activity without limitations.

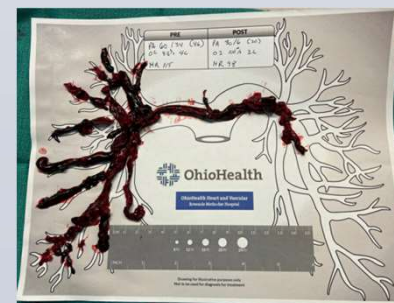


Figure 3: Intraoperative clinical photo demonstrating large gross saddle pulmonary thrombus specimen involving the pulmonary trunk and bilateral pulmonary arteries

DISCUSSION

Special considerations should be made for each patient to minimize the risk of VTE. Literature currently lacks a consensus for prophylactic treatment of VTE following foot and ankle surgery. Therefore, evaluation of risk factors, type of procedure and duration of immobilization must be discussed to determine the utility of chemical prophylaxis.

Our patient developed both DVT and PE post-operatively while on his third week of chemical prophylaxis, utilizing antiembolic stockings and completing ROM exercises. Fortunately, he sought medical attention and the appropriate work up was completed. Pre and postoperatively this patient was at an increased risk for DVT. The patient was obese with a BMI >30 at the time of surgery. Obesity is associated with higher risk of VTE⁷. Additionally, the patient was on Clomiphene for male infertility. This medication in combination with surgical intervention is suspected to have played part in the development of VTE in our patient. Kavoussi et al. reported the risk of DVT while on Clomiphene or testosterone replacement therapy is 0.8%⁸. Based on our experience, we suggest stopping this medication for a period of time post-op to reduce risk of VTE.

At our institution, we believe the incidence of VTE is higher. We have found that although peer-reviewed literature may provide statistics on VTE rates after foot and ankle surgery, often the true reported events are significantly higher. Several of these cases end up in hospitals or anticoagulation clinics and many times the diagnosis of foot and ankle injury or surgery is not listed as a secondary diagnosis and therefore would be under-reported. With this in mind, we stress the importance of completing a comprehensive evaluation to assess need for VTE prophylaxis. We also highlight the importance of educating patients on the risks, signs and symptoms of VTE to increase compliance and prevent complications.

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