

Case Report

Penetrating injury of the common femoral vein followed by local deep vein thrombosis: A case report

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ABSTRACT

This case report discusses a unique scenario in which a 19-year-old patient with a penetrating wound in the common femoral vein developed deep vein thrombosis in response to life-threatening bleeding. The report highlights our thoughts on managing an isolated truncal venous injury leading to deep vein thrombosis, emphasizing the significance of surgical exploration in vascular trauma and the feasibility of employing non-invasive imaging diagnosis in preoperative planning.

Introduction

Studies suggest that the incidence of lower extremity deep vein thrombosis in admitted trauma patients ranges from 27.7 % to 58 % [1,2]. However, our brief review indicates that most existing research in this field focuses on the risk of developing venous thromboembolism after various initial clinical presentations. In our case report, we present a unique scenario where a patient with a venous penetrating wound was admitted to our service with deep vein thrombosis as a physiological response to life-threatening bleeding.

Case report

We present a case report of a 19-year-old man with a penetrating wound in a common femoral vein, victim of a stab wound in the right inguinal region. The patient was first admitted to a minor medical facility with massive bleeding and lowered level of consciousness. The patient returned to wakefulness through infusion of crystalloids and cessation of inguinal bleeding by inguinal manual compression. The patient was referred to our institution the next day for vascular surgery assessment.

By the admission in our institution, the patient was alert, with normal blood pressure, normal and symmetric inferior limbs pulses, no ischemic or neurological limb complaints and without active bleeding (Fig. 1). Blood transfusion was necessary due to low hemoglobin levels (6,9 g/dL). We performed a duplex ultrasound of the right lower limb and found a local-restricted common femoral vein thrombosis as well as thrombosis of the saphenofemoral junction (Fig. 2). No iliac vein thrombosis was found.

The patient underwent inguinal exploration. The entire common femoral vein was gently skeletonized from the femoral arteries to avoid the risk of embolization. The surgical findings were as follows: biparietal common femoral vein injury and local vein thrombosis,

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saphenofemoral junction thrombosis, and minor vessel injuries (subcutaneous arteries and veins). No major artery injury was found (common femoral artery, superficial femoral artery, and profunda femoral artery were evaluated). We performed ligation of the saphenofemoral junction and its tributaries, followed by systemic heparinization (Fig. 3). Clamps were then placed in the common femoral vein proximal and distal to the palpable venous thrombus, and venous thrombectomy of the common femoral vein and resection of the non-viable double-wounded vein wall were performed. An oblique end-to-end anastomosis was performed, not requiring the use of a patch.

After the surgery, the patient received full anticoagulation with low-molecular-weight heparin during hospitalization and evolved with no signs or symptoms of pulmonary embolization or inguinal bleeding. A follow-up whole-leg duplex ultrasound was performed on the second postoperative day, and no venous thrombosis or arteriovenous fistula was found. The patient was discharged home without immobility, and no full or prophylactic anticoagulation was prescribed. A whole-leg duplex ultrasound was performed after 30 days, and no signs of thrombosis or arteriovenous fistula were found (Fig. 4). The patient maintained an absence of clinical complaints during the 90-day follow-up.

Discussion

It has been reported that venous trauma cases occur in conjunction with arterial injuries in 47.3 % to 79.4 % of cases, while they manifest alone in 3.6 % to 20.6% [3,4]. The presented case illustrates an isolated truncal venous injury that subsequently developed into localized deep vein thrombosis. We believe that local deep vein thrombosis was a physiological response of the patient to life-threatening massive bleeding, and we did not find any similar case report in the literature.

We would like to elucidate our clinical rationale: while some surgeons may contemplate non-invasive treatment involving full anticoagulation, our medical team opted against this approach due to the substantial risk of recurrent bleeding. Prior to the Korean War, the conventional historical approach for managing venous injuries involved simple ligation [5]. Even in contemporary practice, there remains a lack of consensus regarding the comparative outcomes of venous repairs versus venous ligation [6]. While some authors recommend considering the patient's clinical and hemodynamic status when deciding between reconstruction and venous ligation in limb injuries [7], others discourage venous repair when involving infrapopliteal veins [8]. Our patient was clinically and hemodynamically stable and, therefore, it was possible to carry out good preoperative preparation with blood transfusion and surgical planning based on imaging examination. This planning aimed at venous reconstruction and thrombectomy, due to proximity and importance of the common femoral vein.

Although it may be rational to use vena cava filters and proximal balloon occlusion of the cava during venous thrombectomy [9], they were unnecessary in our case due to the use of vascular clamps. In this instance, Doppler ultrasound proved to be an effective exam to ensure the extent of thrombosis and support our preoperative planning.

Patients undergoing venous repair are at risk of venous thromboembolism, however, some studies suggest that anticoagulation



Fig. 1. Patient's wound upon admission to our service.

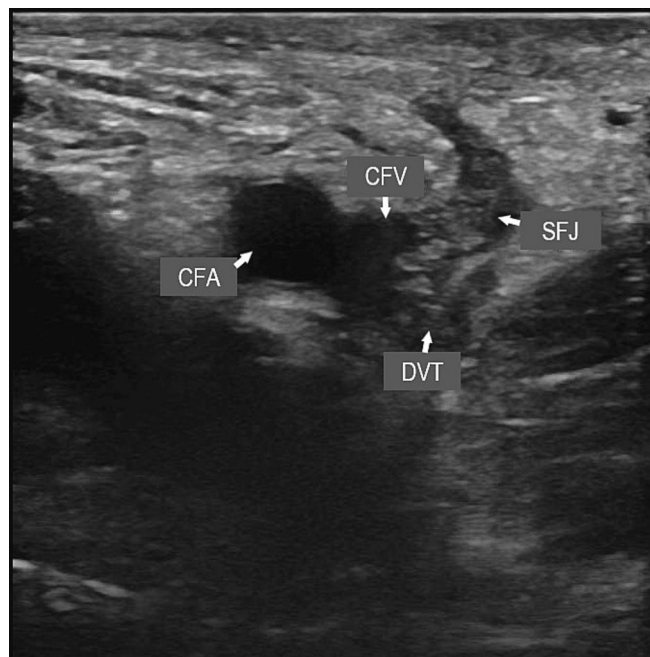


Fig. 2. Preoperative duplex ultrasound. Thrombosis of the common femoral vein and saphenofemoral junction. CFV: common femoral vein. SFJ: saphenofemoral junction. DVT: deep vein thrombosis. CFA: common femoral artery.

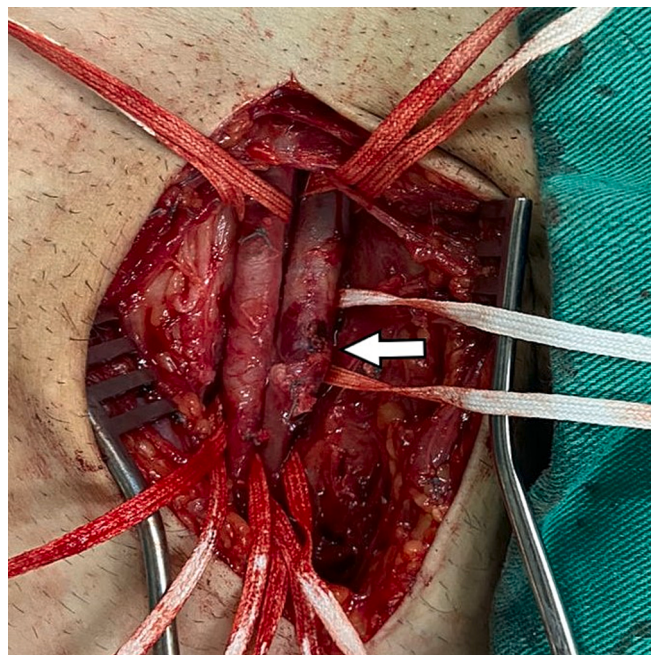


Fig. 3. Aspect of the common femoral vein (arrow) injury after ligation of the saphenofemoral junction and its tributaries, prior to thrombectomy and venoplasty. Note that local thrombosis prevented massive vein rebleeding.

beyond three days is not necessary to prevent venous thromboembolism in these cases [7]. In our report, the patient remained on full anticoagulation postoperatively for two days and after confirming the absence of venous thrombosis with a control ultrasound, the patient was discharged without chemical prophylaxis or full anticoagulation.

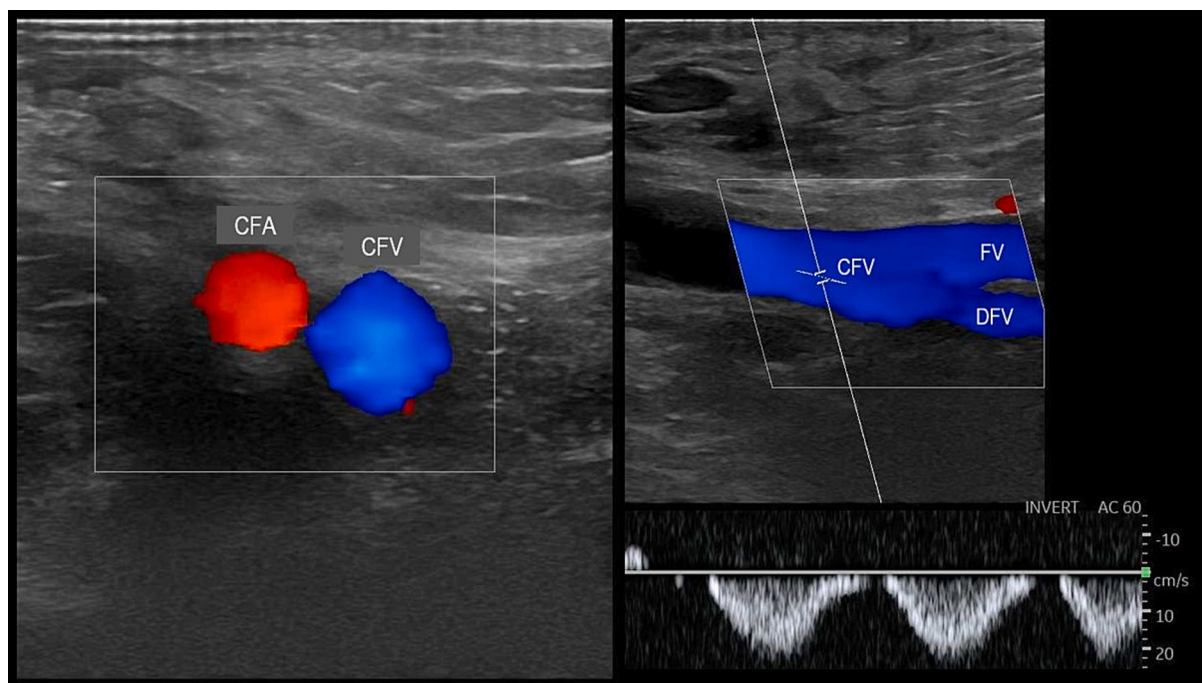


Fig. 4. Postoperative duplex ultrasound. Left: absence of venous thrombosis in common femoral vein. Right: normal common femoral vein flow pattern. CFV: common femoral vein. CFA: common femoral artery. DFV: deep femoral vein. FV: femoral vein.

Conclusions

In conclusion, despite the availability of new diagnostic technologies and the growing trend in many centers toward expectant or minimally invasive treatments, our case highlights the feasibility of employing a non-invasive and cost-effective diagnostic method for therapeutic planning and management. It remains crucial for vascular surgeons not to neglect standard principles of vascular trauma, such as surgical exploration in penetrating trauma along the course of major vessels. As demonstrated in our case, favorable outcomes can still be achieved through conventional surgical exploration, reaffirming its relevance in contemporary practice.

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Consent for publication

Written informed consent was obtained from the patient for the publication of the anonymized case report and any accompanying anonymized medical images.

Ethical approval

This study was approved by the State University of Londrina ethics committee. An official statement is available upon request.

Declaration of competing interest

The authors declare no conflict of interest.

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