

# Deep Venous Thrombosis In The Early Postoperative Period Of Major Spine Surgery: A Case Report

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## Abstract

Here, we report a case of deep venous thrombosis in a 45-years-old female patient that had become clinically symptomatic in the very early postoperative period of major spine surgery, at the postoperative hour 12. In addition, the factors that promote the formation of DVT so quickly have been discussed.

## INTRODUCTION

Deep venous thrombosis (DVT) formation is a serious postoperative complication after major surgery. <sup>2</sup> Virchow's triad of reduced blood flow, abnormal clot formation, and loss of vascular integrity describes the conditions that promote thrombus formation. Likewise, similar conditions common and unavoidable in the postoperative state include venous stasis, hypercoagulability and the presence of vessel injury. <sup>3</sup>

Here, we report a case of DVT that had become clinically symptomatic in the very early postoperative period of major spine surgery, at the postoperative hour 12. In addition, the factors that promote the formation of DVT so quickly have been discussed.

## CASE REPORT

A 45-years-old woman (1.65 cm in height, 65 kg in weight) was referred to the Neurosurgery Clinic with the diagnosis of epidural abscess after lumbar discectomy performed two months ago. The medical history revealed that the patient was diabetic and was using glimepiride 1 mg bid medication. Laboratory studies on the admission revealed peripheral blood cell count of  $14,200/\text{mm}^3$ , erythrocyte sedimentation rate of 124 mm/h, and serum C-reactive protein of 80 mg/dl. Magnetic resonance imaging of the lumbar spine demonstrated a cystic mass that extended from L3 to L5.

Major spine surgery was scheduled. Gradual compression stocking was applied on the legs in the perioperative period. After endotracheal intubation, the patient was placed in

prone position. Silicone pads were used for positioning. After the surgical field was disinfected with povidone-iodine and draped with sterile towels, a dorsal midline incision was performed between L1-S1 levels. The dissection of subperiosteal paravertebral muscles revealed the entire structure of L2-5 vertebrae. Laminectomy on L5 vertebra exposed abscess accumulation. The infected tissue was totally excised. Pathological and microbiological analyses of the sample were conducted. The surgical area was washed by wound debridement (Pulsavac, Zimmer, USA) with 3L of 0.9 % NaCl to clean all the debris and prevent infection. In order to prevent the instability of the spine, transpedicular fixation and posterolateral fusion were performed. The surgical area was washed and the debris was removed via Pulsavac again. After homeostasis, all the tissue was closed up. The duration of the operation was 255 min. Throughout the operation, total bleeding was 1200ml. Two packs of erythrocyte suspension, gelatin polysuccinate (Gelifusine, B. Braun, Germany) 500-cc, and 2000-ml of 0.9% NaCl were infused. The patient was hemodynamically stable during surgery. There was no complication.

Then, the patient was transferred to the Neurointensive Care Unit for postoperative follow up of 24 hours. In our clinic, low molecular weight heparine 0.3 cc bid, a routine postoperative medication, was started.

At the 12<sup>th</sup> postoperative hour, the patient's left leg was pinkish, edematous, tense, and sensitive to touch (Fig. 1).

### Figure 1

Figure 1: The patient's left leg was pinkish, edematous, tense, and sensitive to touch. Also, the temperature of the leg had increased.



Also, the temperature of the leg had increased. The history revealed that 4 hr ago, one pack of erythrocyte suspension was transfused via a catheter in this leg. The catheter was removed, and the leg was elevated. The patient's peripheral pulses were palpable. Differential diagnosis involved DVT, cellulites, edema, lymph edema, and venous insufficiency. The patient was consulted with a cardiothoracic and vascular surgeon. Meanwhile, within the next half hour, the condition of the patient's leg deteriorated. Lower extremity venous Doppler revealed that left major saphena vein and both major and superficial femoral veins were not compressible and did not respond to augmentation as a sign of acute DVT. Leg elevation, cold application, minimal mobilization, increased dosage of low molecular weight heparin to 0.6 cc bid, and coumadin medication (it was not started immediately in order not to cause bleeding at the surgical field) were recommended. The analgesia was achieved by using gabapentine 300 mg tid, tramadol retard tablet bid, and amitriptyline. Pathology of the lesion was chronic granulomatous changes. Sample culture was negative.

The patient's physical status gradually improved, and her leg was normal on the postoperative day 12.

### DISCUSSION

Major spine surgery patients have a number of risk factors for developing DVT after surgery: lengthy operative procedures, prolonged decubence stay postoperatively, manipulation of the great vessels during anterior approaches, and positioning the patients prone on certain frames that may compress the femoral venous system.<sup>1,2,4</sup> In our institution,

400 spine cases were performed annually and more than 60% of these cases were major spine surgery. Besides being the first case of DVT in the last 14 years in our clinic, this case is the only DVT case in literature with postoperative clinically presentation within the first 24 hours. The operation of our case lasted 255 min which could be considered long. In order to prevent compression of the femoral system, silicone pads were used for the positioning. Although peripheral pulses were checked after positioning, venous compression could not be checked. The patient did not experience hypotension throughout the surgery. At the perioperative period, the hemoglobin level was maintained between 9-10 mg/dl.

An appropriate and safe prophylaxis for DVT is not yet known. Pharmacologic methods such as heparin or warfarin are known to cause bleeding. In the face of exposed neural elements and a wide surface area of decorticated bone, increased or uncontrolled bleeding can lead to disastrous complications in the spine, including hematoma, paralysis, or infection.<sup>4,5,7</sup> In our daily routine, graduated compression stocking and low molecular weight heparin are used. Thus, the patients are mobilized as early as postoperative day 2. Graduated compression stocking reduces venous stasis by applying a gradient pressure pattern on the limb and prevents vein wall distention. Low molecular weight heparin binds to anti-thrombin III as a catalyst for anti-Factor X-a; therefore, there is no need to monitor partial thromboplastin time. It was shown that even standard prophylactic measures without anticoagulation were effective in the prevention of DVT.<sup>6</sup>

It must be kept in mind that the patient was diabetic; thus, vascular integrity might have been lost because of the disease progression. Also, erythrocyte sedimentation rate was high due to epidural abscess. Abnormal vascular lumen and sedimentation tendency of the erythrocyte were the predisposing factors.

Previous spine surgery could also be another factor, it is possible deep venous thrombosis was present, albeit subclinically, at the time of the second operation. Additive risk factors during second surgery may cause clinical presentation.

In conclusion, medical staff should be more vigilant in the follow up of patients with accompanying pathologies such as diabetes and infection and a history of previous surgery for the development of DVT; whenever possible, veins at the dorsum of the foot should be avoided for intravenous catheterization.

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