

CASE REPORT

Epidural anesthesia and ultrasound-guided femoral nerve block in a patient with femur shaft fracture receiving combined anticoagulant treatment

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ABSTRACT

With an ever increasing ratio of advanced age and cardiovascular disease in the population the anesthesiologists often come across patients for elective and emergency surgery, who are on one or multiple anticoagulants. Although the use of regional techniques is a preferred choice of anesthesia in suitable patients, some anesthesiologists prefer combining regional with general anesthesia and/or peripheral nerve blocks. Traditionally patients on anticoagulants have been opted out of regional or nerve block analgesia for fear of hematoma formation, but the recent upsurge in the use of ultrasound has increased the precision in the procedures and the confidence in the performers. This report describes the case of an old lady for lower limb surgery, who was on multiple anticoagulants, and she was successfully anesthetized using combined techniques.

Key words: Anticoagulants; Hematoma, Epidural, Spinal; Hematoma, Subdural; Anesthesia, Conduction; Anesthesia and Analgesia; Anesthesia, Local; Nerve Block; Anesthesia, Spinal; Anesthesia, Epidural

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INTRODUCTION

Regional anesthesia is an efficient way to provide a perfect intraoperative surgical stability, neuromuscular paralysis, anesthesia, and analgesia. It also ensures an effective postoperative analgesia with continuous catheter applications.¹ However, the application of regional anesthesia techniques in patients using prophylactic anticoagulants is a situation to be decided by the anesthetist through a risk-benefit analysis depending on the anticoagulant drug used, usage duration, dosage of drug, current clinical condition of the patient, and the use of more than one anticoagulant drug combination.²⁻⁴

Peripheral nerve blocks are not recommended for patients who receive anticoagulants or have coagulopathy.⁵ In such cases, the most significant complication of peripheral techniques is said to be serious blood loss.⁶ However, today the use of ultrasound in peripheral blocks is considered reliable as the relevant area is visible and it minimizes vascular injury.⁷

Here we present ultrasound guided femoral block application and epidural anesthesia in an advanced aged patient receiving combined anticoagulant drug treatments

such as warfarin plus aspirin. We aimed to show that ultrasound guided peripheral nerve blocks can be applied safely, while continuing anticoagulant therapy in this case report.

CASE REPORT

A 78 year-old female patient fell down in her house and fractured her left femur shaft; a decision was made of an emergent operation for the open reduction and fixation of fracture. In anamnesis of the patient who was consulted by the anesthesia department, it was stated that she had a history of 3 vessel coronary artery bypass surgery 1 year back. She gave history of pulmonary venous thromboembolism 1 year ago, accompanied by hypertension and diabetes mellitus, and was suffering from coughing and throat pain for the last 1 week. The patient was taking warfarin 5 mg/day, aspirin 100 mg/day, captopril 50 mg/day, and metformin 1 Gm/day. She stated to receive the latest anticoagulant treatment 16 hours ago. The patient's blood pressure was measured as 180/110 mmHg, heart rate as 120 beats/min, peripheral oxygen saturation (SpO₂) as 92% with mask. Preoperative

comparative evaluation of interscalene and interscalene plus

laboratory analyses were as follows: hemoglobin 14.4 gm/dl, hematocrit 42%, leukocyte 18.500 / μ L, platelets 192 000 / μ L, prothrombin time (PT) 14.4 sec, International normalized ratio (INR) 1.22, active thromboplastin time (aPTT) 39.7 sec. Lung sounds were coarse; there were crackles in right lung base. Infiltration was ascertained in right lung lower lobe in chest radiography. Atrial fibrillation was found on electrocardiography. Ejection fraction in transthoracic echocardiography was 45%. Regional block was decided for surgery.

The patient was taken to operating room. While still on the stretcher, patient's preoperative blood pressure was 210/107 mmHg, heart rate was 117 beats/min and SpO₂ was 90%. Before removing the patient from the stretcher, peripheral vascular access was established; after administering 2 mg of intravenous midazolam (Dormicum™ 15 mg/3 ml, Deva, Turkey), ultrasound guided (SonoSite M-Turbo®, Sonosite, USA) left femoral nerve block was performed with 15 ml bupivacaine (0.5% Marcain® flakon, Astra Zeneca, Sweden) + 5 ml lidocaine (Aritmal 2%™, Osel, Turkey). Sensory block was evaluated with pinprick test [0: normal senses, 1: loss of prick feeling (analgesia), 2: loss of sense of touch (anesthesia)]. Motor block was evaluated with modified Bromage Scale (0: No block, 1: Hip flexion is blocked when knee is extended, 2: Knee flexion is blocked, 3: Full motor block). When pin prick test was 2 and Bromage score was 1; the patient was given a sitting position and epidural catheter was inserted from L3-L4 space in a single attempt without traumatising and was inserted 9 cm inside. At the beginning 10 ml bupivacaine + 50 μ g fentanyl (Fentanyl 0.05 mg/ml, Johnson & Johnson, Turkey) + 4 ml normal saline (total volume of 15 ml) were administered through epidural catheter. On the other side of the patient, sensory block and motor block were evaluated. When both scores were 2, the patient was taken from stretcher to operating table. Sensory block level was again evaluated before skin incision and it was L1. An additional dose of 10 ml bupivacaine 0.25% was administered in the catheter. At the end of 2.5 hours operation, the patient was taken to intensive care unit for follow-up.

Postoperative pain control was ensured with 5 ml bupivacaine + 200 μ g morphine (Morphine 10 mg/1 ml, Galen, Turkey) + 3 ml normal saline (total volume of 10 ml) through epidural catheter. As long as she remained in the intensive care unit, daily PT and INR follow-up and lower extremity neurological examinations were performed. At the end of the first 48 hours in which PT and INR values were normal (PT: 15.2 sec, INR: 1.35); epidural catheter was removed and the patient was taken to service department. During 1 week when the patient was in the service department; daily PT and INR follow-up and neurological examination were conducted to find any neuraxial hematoma. After having observed no

complications, anticoagulant drugs were started and the patient was discharged from hospital.

DISCUSSION

Regional neuraxial anesthesia provides a good intraoperative analgesia and this effective analgesia causes a good postoperative pulmonary function, shorter extubation time, and early mobilisation.¹ Spinal hematoma is the most significant hemorrhagic complication of regional anesthesia.¹

The use of anticoagulants leads to concerns especially because of its complication risk in neuraxial methods. The oral anticoagulant warfarin affects both intrinsic and extrinsic tracks of coagulation cascade. It inhibits vitamin K-dependent procoagulant factor II, VII, IX and protein C and S synthesis. An INR 1.5 is observed when factor VII activity is 40%, whereas it is increased when factor VII activity reduces to 55%. In this case, INR < 1.5 is related to normal hemostasis.⁵ Other risk factors for development of complications are being female, advanced age, history of bleeding disorders, hip surgery, continuous catheter anesthesia technique, use of large bore needles, multiple intervention attempts and difficult epidural placement.⁸ In our patient had increased risk of spinal hematoma because of her advanced age, female gender, and hip surgery operation.

Horlocker et al² analysed 182 patients who underwent epidural anesthesia while receiving low doses of warfarin. They determined that the low doses of warfarin increased PT to 15-17.2 sec. They reported when PT reached the value 13.4 ± 2 sec, the catheter was removed and spinal hematoma did not develop. In our patient, catheter was removed successfully when the PT was 15.2 sec.

In a retrospective study conducted by Horlocker et al⁹, among 805 patients undergoing 1013 epidural or spinal anesthesia interventions, none of the 391 patients who received antiplatelet treatment developed spinal hematoma or postoperative neurological deficits. The most commonly used antiplatelet agent in these cases was aspirin. In the combination of age and epidural anesthesia, the risk of minor hemorrhagic complications such as bloody cerebrospinal fluid flow or blood aspiration is 4.5%. In the review of Urwey and Rowlingson,⁴ spinal hematoma development risk did not seem to be increased with antiplatelet agents in epidural or spinal anesthesia, however the combination of antiplatelet agents with other anticoagulant drugs was thought to increase complication risks. No complications were observed in our patient using aspirin and warfarin.

Our patient was successfully applied ultrasound guided femoral nerve block. In the guideline,¹⁰ peripheral nerve block applications were connected to certain conditions. It is important to note that 26 cases with hemorrhagic

complications have been reported after plexus / peripheral block techniques,^{6,9,11,12} and 13 patients had hemostasis disorder. Major bleeding occurred after psoas block or lumbar sympathetic block and / or in case of anticoagulant or antiplatelet agents. Today, with the development of ultrasound devices and methods, it is possible to define vascular and nervous structures accurately. This makes the process more sensitive and reliable by visualizing the relevant anatomy and minimizes the risk of vascular injury.

CONCLUSION

In our patient receiving combined anticoagulant treatment; epidural anesthesia and ultrasound guided femoral nerve

block were performed successfully and without any complications. The technique may be considered as an option in patients with high risk of spinal hematoma or excessive bleeding.

Authors' Contribution:

IK: Concept, conduction of the study, literature search, writing manuscript, editing manuscript

SO: Conduct of study, literature search

ZB: Literature search, editing manuscript

COK: Concept, conduction of the study, literature search

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