Atypical Presentation of an Epidural Hematoma in a Patient Receiving Rivaroxaban After Total Hip Arthroplasty

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abstract

The authors report a case of a 69-year-old woman who presented with a spontaneous spinal epidural hematoma (SSEH) 10 days after a total hip arthroplasty. The patient had been receiving 10 mg/d of rivaroxaban for 5 days for venous thromboembolism prophylaxis. She had a sudden onset of severe neck pain, followed by quadriplegia below C4. A dorsal SSEH was revealed by computed tomography. While preparing for the emergency evacuation of the SSEH, the neurological symptoms resolved spontaneously in 4 hours. The 1-month follow-up magnetic resonance imaging confirmed that the SSEH had completely resolved. The pathogenesis of SSEH is unclear, but anticoagulant therapy is a known risk factor. It is a relatively rare disorder. Only 1 case of SSEH has been reported, and that patient was receiving a nonsteroidal anti-inflammatory drug besides rivaroxaban, which is another known risk factor for bleeding disorders. [Orthopedics. 2016; 39(3):e558-e560.]

CASE REPORT

A 69-year-old woman with coxarthrosis was admitted to the hospital for an elective total hip arthroplasty. The patient had a history of hypertension, non–insulin-dependent diabetes mellitus, and pemphigus vulgaris, but no history of coagulopathy and bleeding disorders. The coagulation parameters were within normal levels, with an international normalized ratio of 0.91, a partial thromboplastin time of 26.3 seconds, and a platelet count of 315,000/µL. Moreover, no antiplatelet and anticoagulant therapies were given preoperatively.

Total hip arthroplasty was performed with combined spinal epidural anesthesia. There were no bleeding complications dur-
ing the operation. Thromboprophylaxis was started 12 hours following the epidural insertion with 40 mg/d of enoxaparin subcutaneously. Pain was well controlled with epidural anesthetics, no motor block was present, and sensation was normal in the lower limbs after the operation. The postoperative term was uneventful. The patient was discharged home on the fifth postoperative day with a prescription of 10 mg/d of rivaroxaban (Xarelto; Bayer HealthCare AG, Leverkusen, Germany) for deep venous thrombosis prophylaxis starting 22 hours after the last dose of enoxaparin. She was also taking 500 mg of paracetamol, 30 mg of caffeine, and 10 mg of codeine (Geralgine-K; Munir Sahin, Istanbul, Turkey) for pain control.

Five days after the discharge, the patient was admitted to the hospital with cervical pain and weakness of the lower limbs and arms, which began during defecation. The last dose of rivaroxaban was taken 14 hours before the onset of the symptoms. She was examined by a neurosurgeon and mild quadriparesis was revealed. Computed tomography showed a dorsal SSEH extending from C2 to C4 (Figure 1) without abnormal changes in the spinal cord. No arteriovenous malformations, tumors, or fractures were seen. The test for measuring the plasma concentration of rivaroxaban is not routinely used and conventional coagulation tests are relatively insensitive to measure the effect of rivaroxaban. Her platelet count and coagulation parameters were again within normal ranges, indicating that the patient did not have a bleeding disorder and that the plasma drug concentration was low. The rivaroxaban therapy was discontinued.

Four hours after the onset of symptoms, sensory and motor function improved on her second-look evaluation, and the surgery was cancelled. She was admitted for observation. She had no sensory and motor function deficit after 48 hours, although the SSEH could be seen on magnetic resonance imaging (Figure 2A and Figure 3A). Anticoagulation therapy was stopped and the patient was discharged on the second day. She was followed with no complaints for 30 days. The follow-up magnetic resonance imaging at 1 month revealed that the SSEH had completely resolved (Figure 2B and Figure 3B).

**Discussion**

Spontaneous spinal epidural hematoma is a rare but important neurological emergency. It occurs in all ages but is more common after the fourth and fifth decades. The male to female ratio is 1.4:1.4,6 Because of its rarity and atypical symptoms, diagnosis of SSEH is difficult. Its initial symptom is usually neck or back pain, which is ignored until the neurological deficits present.

Some cases of epidural hematomas are idiopathic and spontaneous.4 Although the etiopathogenesis is not clear, many predisposing factors, including advanced age, low body weight, hepatic and renal disease, coagulopathy, anticoagulant therapy, concomitant therapy with aspirin or other nonsteroidal anti-inflammatory drugs, hypertension, vascular malformation, pregnancy, and malignancy, are suggested.5,9,10 Most researchers agree that normal activities or maneuvers can cause fluctuations in the intrathoracic and intra-abdominal pressures, leading to an acute increase in venous pressure so that delicate and valveless epidural venous plexus rupture and bleed. Furthermore, the disruption of a tortuous arterial plexus by traction on nerve roots may cause an
arterial source of bleeding by small, disrupted epidural arteries. The majority of SSEHs are located posteriorly or posterolaterally in the vicinity of the internal venous plexus. The anterior hematomas are rare and are usually associated with several risk factors, including anticoagulants, anti-aggregants, vascular malformations, or hematologic disorders like Factor XI deficiency, hemophilia B, and leukemia. Rivaroxaban is a direct Factor Xa inhibitor with rapid onset and offset of action after oral administration. The bleeding risk of rivaroxaban use increases with age, uncontrolled hypertension, concomitant use of nonsteroidal anti-inflammatory drugs, anti-thrombotics, liver and renal impairment, bleeding disorders, and drug and alcohol use. Deep venous thrombosis prophylaxis with 10 mg/d of rivaroxaban has a bleeding risk of 0.7%. Currently, rivaroxaban has no antidote for the bleeding complications. The combination of normal activated partial thromboplastin time and prothrombin time indicates the rivaroxaban plasma concentration is less than 30 ng/mL. Unlike the first case in the literature, the current patient had no increased risk of bleeding due to concomitant nonsteroidal anti-inflammatory drug use with rivaroxaban. However, increased intra-abdominal pressure during defecation might trigger SSEH.

The principal treatment of SSEH is acute surgical decompression. However, patients with spontaneous resolution have been described. The outcome is improved if the surgery is performed within 24 hours, or ideally within 12 hours. The proposed underlying mechanisms of spontaneous resolution of SSEH are the leakage through the intervertebral foramen, or spreading of the hematoma within the spinal canal. Remission of neurologic deficits starts with the spontaneous resolution of SSEH. The current patient would have been treated surgically if the symptoms had not improved significantly within the 4 hours.

CONCLUSION
Venous thromboembolism prophylaxis after hip replacement surgery is a highly recommended practice. Although new agents with lesser side effects are being developed, there may still be complications. Spontaneous spinal epidural hematoma is a rare but serious condition. Although urgent surgical decompression is the recommended procedure, SSEH may resolve spontaneously. It is important to check the neurologic status of the patient frequently while preparing for surgical decompression without delay.

REFERENCES