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Epidural Hematoma in an Elderly Patient With Multiple Comorbidities on Aspirin Following Spinal Cord Stimulator Trial: A Case Report

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Background: Spinal cord stimulators (SCSs) are generally a safe and effective treatment for chronic pain conditions. Spinal epidural hematomas (SEHs) after SCS placement or removal, while rare, can be devastating. Aspirin use is not contraindicated in patients undergoing SCS procedures, but it increases bleeding risk. The American Society of Regional Anesthesia and Pain Medicine (ASRA) states that physicians must weigh the risks and benefits of aspirin use in each patient undergoing high-risk procedures, such as SCS trials. Thus, aspirin use, in conjunction with other risk factors for bleeding, must be recognized and assessed before neuraxial procedures.

Case Report: An 80-year-old woman who developed an SEH with neurological deficits after an SCS trial. Adding to the increased risk of bleeding due to her comorbidities, the patient did not disclose aspirin use. She therefore went for emergent neurosurgical intervention for the removal of SCS leads and epidural hematoma evacuation. Postoperatively, the patient regained bilateral lower extremity strength but remained with a mild deficit in sensation to light touch.

Conclusions: Aspirin use, in conjunction with other risk factors associated with platelet dysfunction, can put patients at high risk for the development of epidural hematomas after neuraxial procedures, such as SCS trials. Physicians must continue to adhere to the ASRA guidelines.

Key words: Epidural hematoma, antiplatelets, spinal cord stimulator trial, chronic kidney disease, cirrhosis

BACKGROUND

Epidural hematoma is a medical emergency characterized by the accumulation of blood in the epidural space within the spinal canal. This build-up of blood places significant pressure on critical structures, such as the thecal sac, cauda equina, or spinal cord, leading to ischemia and potentially permanent neurological deficits. Furthermore, inadvertent puncture of an arterialized posterior internal venous plexus during the administration of an epidural injection can also lead to the development of an epidural hematoma (1). The gold standard for diagnosis of spinal epidural hematoma (SEH) currently is magnetic resonance imaging (MRI) and the primary treatment is surgical evacuation (2).

Spinal cord stimulators (SCSs) are a safe, effective, and minimally invasive procedure for the management of chronic painful conditions (3). Complications of this procedure are not uncommon and are estimated to occur in 30% to 40% of the cases (4). Complications can be divided into 2 general categories based on cause:

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device-related complications and biologic-related complications. Device-related complications include device migrations, hardware failure, or damage (5,6). Biological complications include infections, fluid accumulation, trauma, and SEH (7). Although rare, the incidence of SEH associated with SCS is reported to be 0.71% (8).

It is well understood that the risk of bleeding and epidural hematoma formation is increased in patients with anticoagulant and antiplatelet use along with inherent or other-acquired causes of platelet dysfunction and coagulopathies. Aspirin, a commonly used antiplatelet agent that irreversibly inhibits platelet function by cyclooxygenase inhibition, poses bleeding risks to patients undergoing high-risk neuraxial procedures (9). These guidelines advocate for a tailored approach, particularly when it comes to the use of aspirin. The American Society of Regional Anesthesia and Pain Medicine (ASRA) guidelines advise health care providers to determine whether a patient is using aspirin for primary or secondary prophylaxis and to evaluate the risk level of the intended procedure in terms of perioperative bleeding. For patients undergoing high-risk procedures like SCS trials, usage of aspirin for primary prophylaxis should be discontinued. As for patients using aspirin for secondary prophylaxis, a thorough discussion between the patient and physician is essential, requiring carefully weighing the risks and benefits of continuing or discontinuing aspirin therapy before proceeding with any interventions.

There have been case reports discussing the occurrence of SEH in the context of SCS implantation and trial procedures. Noori et al (10) reported acute epidural hematoma occurring after removal of SCS trial leads in a cancer patient with chronic thrombocytopenia. Another case report (11) describes epidural hematoma occurring after the removal of percutaneous SCS trial leads in 2 patients taking aspirin. Buvanendran et al (12) describe an SEH formation in a patient on aspirin therapy undergoing an SCS trial. However, this case report describes the formation of epidural hematoma following an SCS trial in a patient with inherent risks of platelet dysfunction, such as liver cirrhosis, and chronic kidney disease (CKD), along with undisclosed aspirin use.

CASE PRESENTATION

Our case involves an 80-year-old woman with a history significant for hypertension, CKD (glomerular filtration rate < 50), cirrhosis without ascites, chronic low back pain with bilateral lower extremity radiculopathy, and postlaminectomy syndrome who presented for an SCS trial at an outpatient chronic pain center. Her pain medication regimen was significant for low-dose pregabalin, and she was contraindicated from nonsteroidal anti-inflammatory drug use given her history of CKD. In the past, the patient underwent L5/S1 spinal fusion with L5 laminectomy, multiple transforaminal epidural steroid injections, and sacroiliac joint injections all of which provided minimal to no relief. An MRI of her lumbar spine confirmed degenerative disc disease with L3/L4 and L4/L5 showing moderate-to-severe levels of stenosis. In order to avoid another spinal surgery, she decided to participate in an SCS trial. Under minimal sedation with 1 mg versed (midazolam)and 50 mcg of fentanyl, the patient's SCS leads were successfully inserted bilaterally at the level of L1 and advanced to the superior aspect of T8 without complications or difficulty.

Postoperatively, the patient reported a new onset of mild abdominal pain and nausea. Prior to discharge, she was monitored for any changes in abdominal pain and showed no neurological deficits upon examination. She was instructed to visit the nearest emergency room if she experienced any neurological changes or persistent abdominal pain. The patient presented to a nearby emergency room roughly 6 hours after discharge from the pain center with ongoing mild abdominal pain with nausea and emesis along with new-onset bilateral lower extremity weakness. On physical examination, she had mild epigastric tenderness and bloating along with the inability to move both lower extremities on command, mild loss of sensation from the level of the umbilicus to the soles of both feet, and mild loss of proprioception. Upon further history taking and questioning from hospital staff, the patient disclosed that she had been taking low-dose aspirin for primary prophylaxis for coronary artery disease, a fact never disclosed to her pain doctor.

Neurosurgical consultation recommended a stat imaging of the thoracic and lumbar spine and intravenous dexamethasone. An MRI was not obtained because the newly placed SCS was not tested for MRI compatibility. A thoracic spine computed tomography scan revealed postoperative alterations consistent with the correct placement of an SCS. The device leads were within the dorsal epidural space, with its entry point at the T12/L1 level. Notably, there was the presence of gas within the epidural space, extending cephalad along the stimulator leads up to the superior aspect of the T9 vertebral body. Given these findings and the patient's clinical presentation, a collaborative decision for urgent removal of the

SCS was made by the pain management specialist and the neurosurgical team. In the operating room, upon removal of the inferior aspect of the spinous process and lamina of T9, the neurosurgeon encountered an epidural hematoma from the midpoint of T9 extending to the inferior aspect of T12. Evacuation of the hematoma and decompressive laminectomies from T9/T12 were performed without complications. After a short postoperative stay, the patient was discharged to a rehabilitation facility, where she regained strength but remained with a persistent mild deficit in sensation to light touch in her bilateral lower extremities.

DISCUSSION

The discussion of this case highlights the association between antiplatelet therapy in patients with comorbidities, and the development of epidural hematomas. According to the guidelines provided by the American Society of Interventional Pain Physicians (ASIPP) (13), conducting an SCS trial is classified as a high-risk procedure. ASIPP recommends discontinuing low-dose aspirin for a minimum of 3 days before the procedure. However, there remains a lack of substantial evidence regarding the discontinuation of antiplatelet therapy, such as clopidogrel to mitigate the risk of complications such as significant bleeding and epidural hematomas (13). Previous studies (9,14) have shed light on the role of dual antiplatelet therapy in spinal complications. Although research indicates that anticoagulation therapy may have been a contributing factor in approximately 17% of all reported epidural hematoma cases (14), there is still limited statistical data about the use of aspirin specifically and the risk of SEH development. This statistic shows the need for careful patient management strategies and a detailed preoperative assessment, especially in situations where patients are at an increased risk because of their medical history.

In the context of high-risk procedures, specifically SCS lead placement, it is important to consider the challenges posed by this technique. SCS lead placement requires the use of large-gauge needles and lead insertions, which expose the epidural space to significant trauma. Such trauma can be exacerbated in patients who have not discontinued the use of aspirin for primary prophylaxis, as per the guidelines of the ASRA (9). Therefore, careful consideration and planning are important to minimize complications associated with these procedures. In low-risk procedures, such as peripheral nerve blocks, recognizing certain patient-specific factors can impact the risk profile. For elderly patients, physiological changes associated with aging can affect drug metabolism thus increasing the risk of postoperative complications. Specifically, patients with liver cirrhosis or advanced renal disease have altered drug metabolism and excretion rates leading to an increased risk of bleeding. Therefore, it is important to treat such patients as if they are undergoing intermediate- or high-risk procedures, in line with the guidelines of the ASRA. This approach ensures that these risks associated with their specific health conditions are adequately addressed, thereby optimizing patient safety and outcomes.

In the case of our elderly patient, with risk factors, including advanced age, liver cirrhosis, and renal disease, a key piece of information was not reported; her use of aspirin. The patient's undisclosed use of aspirin, combined with her age and existing medical conditions, placed her at a higher risk for bleeding. This scenario shows the importance of a comprehensive medical history taking, including over-the-counter medications and supplements, in patients with complex medical histories undergoing spinal procedures. It highlights the need for careful consideration and thorough preprocedural assessments to identify and mitigate potential risks, ensuring patient safety, and optimal outcomes.

CONCLUSIONS

This case report discusses a postoperative complication of an 80-year-old woman with a history of CKD, hypertension, cirrhosis, and undisclosed aspirin use, who underwent an SCS trial at an outpatient chronic pain center. Postoperatively, she developed nausea, abdominal pain, bilateral lower extremity weakness, and loss of sensation to light touch below the umbilicus. Given her clinical presentation and inconclusive imaging, the patient was emergently taken to surgery where her SCS leads were removed, and an epidural hematoma was identified and evacuated. This case discusses the risks associated with patients underreporting their medication use, particularly in those with complex medical histories. With our patient's inherent risks of platelet dysfunction secondary to her CKD, cirrhosis, and aspirin use, she developed an epidural hematoma and a persistent mild deficit in sensation to light touch in her bilateral lower extremities.

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