Delayed Recognition of Long-Segment Spinal Extradural Collection With Adhesive Arachnoiditis and Syringomyelia After Failed Neuraxial Anesthesia: A Case Report

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Introduction

Neuraxial anesthesia is generally safe but may rarely cause complications including epidural hematoma, neurologic injury, and cerebrospinal fluid (CSF) leak. Spinal epidural hematomas can produce severe pain, neurologic compromise, or remain clinically subtle, making delayed recognition possible.

Syringomyelia is a fluid-filled cavity within the spinal cord that may occur with disturbed CSF flow. Adhesive arachnoiditis, caused by chronic inflammation and scarring of the arachnoid, can obstruct CSF circulation and contribute to syrinx formation.

Intracranial hypotension may also cause cerebellar tonsillar descent and mimic Chiari I malformation on MRI. We present a rare case of delayed identification of a long-segment thoracolumbar extradural collection with adhesive arachnoiditis, syringomyelia, and cerebellar tonsillar descent following failed neuraxial anesthesia.

Case Presentation

A 77-year-old man presented with chronic localized low back pain for evaluation of possible epidural steroid injection. He denied radicular pain, lower-extremity weakness or numbness, bowel or bladder dysfunction, and gait disturbance. His pain had been managed conservatively with physical therapy and non-narcotic analgesics.

Eight years earlier, he underwent revision knee arthroplasty. A spinal anesthetic and subsequent epidural catheter placement were unsuccessful, requiring conversion to general anesthesia. Three days postoperatively, he developed severe 10/10 sharp, burning low back pain radiating to both buttocks, with lumbar tenderness and ecchymosis but no major neurologic deficit. MRI demonstrated a long ventral thoracolumbar collection concerning for epidural hematoma. Because he remained neurologically stable, he was treated conservatively and discharged.

At his current evaluation, MRI demonstrated a chronic long-segment extradural collection extending approximately T2-L2, with associated adhesive arachnoiditis, syringomyelia, and cerebellar tonsillar descent. The latter raised consideration of intracranial hypotension versus Chiari malformation.

Neurosurgery advised against thoracic epidural injection; lumbar injection was considered acceptable. The patient elected to continue conservative management with physical therapy and non-narcotic analgesics rather than undergo injection.

Discussion

This case demonstrates the potential for delayed recognition of complex neuraxial pathology after an initially uncomplicated postoperative course. The temporal relationship between failed neuraxial anesthesia, severe postoperative back pain, and early imaging concerning for epidural hematoma raises the possibility of procedure-related injury; however, the absence of pre-procedural imaging prevents definitive attribution.

Spinal epidural hematoma commonly presents with acute back pain and may progress to neurologic deficit, but neurologically intact patients may occasionally be managed conservatively with close observation. In this patient, clinical stability supported nonoperative management during the acute episode.

Years later, MRI demonstrated a persistent long-segment extradural collection together with adhesive arachnoiditis and syringomyelia. Arachnoid scarring can disrupt normal CSF circulation, creating pressure gradients that contribute to syrinx formation. Cerebellar tonsillar descent further complicated interpretation because both Chiari I malformation and intracranial hypotension may produce this finding. Despite significant radiographic abnormalities, the patient remained neurologically intact with predominantly localized pain. This illustrates the importance of correlating MRI findings with the clinical examination rather than treating imaging abnormalities alone.

For patients with a history of neuraxial procedures and unexplained postoperative back pain, careful review of prior anesthetic records, neurologic examination, and appropriate spinal imaging may help identify uncommon delayed complications and guide decisions regarding future neuraxial interventions.



Figure 1: Sagittal short tau inversion recovery (STIR) image of the thoracic spine with a long segment of hyperintensity throughout the central cord (arrow), compatible with a syrinx.

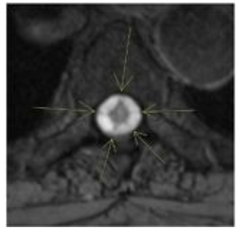


Figure 2: Axial gradient recall echo (GRE) image of the thoracic canal demonstrating thin hypointense linear structures reflecting arachnoid septations (arrows), which can be seen with chronic adhesive arachnoiditis.



Figure 3: Sagittal short tau inversion recovery (STIR) image demonstrating focal mass effect of the hyperintense extramedullary collection (star).

Conclusion

This case describes a 77-year-old male with a history of failed neuraxial anesthesia during knee surgery, severe postoperative back pain with possible thoracolumbar epidural hematoma, and extremely delayed identification of rare findings of adhesive arachnoiditis, syrinx, with cerebellar sagging adding differential of intracranial hypotension versus Chiari malformation.

The case emphasizes the possibility of delayed onset of spinal pathology following failed neuraxial anesthesia even with active conservative management with physical therapy as well as careful pre-procedural evaluation before epidural steroid injection in patients with prior neuraxial anesthesia complications or unexplained postoperative back pain.

Review of prior anesthesia records, outside hospital encounters or trauma, anticoagulation history, neurologic examinations, and formal spinal MRI findings is essential before attributing causality to failed neuraxial anesthesia.

References

