Targeted Thoracic Epidural Blood Patch In Treating Positional Headache From Spontaneous Cerebrospinal Fluid Leak

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Introduction

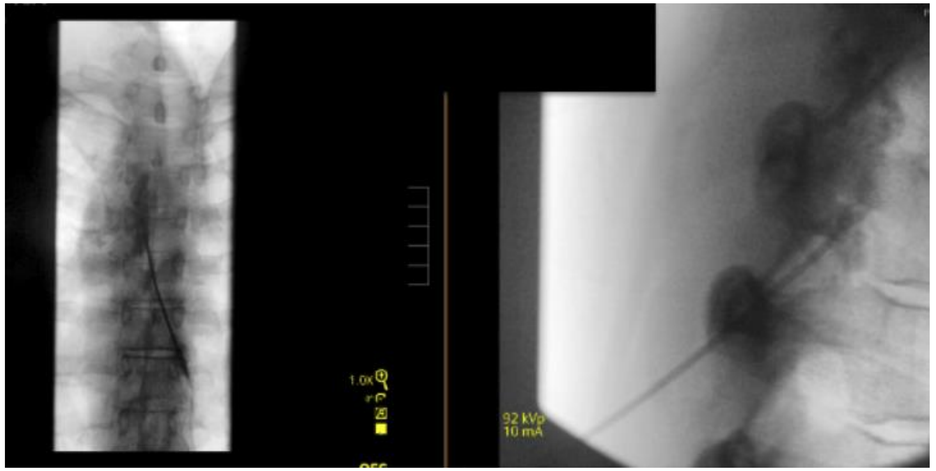
Spontaneous intracranial hypotension commonly presents with orthostatic headache and may result from a spinal dural tear. Targeted epidural blood patching and delivering autologous blood near the suspected leak site may provide more effective and durable closure than a nontargeted approach, particularly in patients with refractory and debilitating symptoms.

Case Description

- A 47-year-old woman developed acute neck tightness and headache after a Peloton ride. Over approximately 36 hours, the headache became severe and was accompanied by uncontrollable vomiting. The pain was relieved only by lying supine and worsened with sitting, standing, or strenuous activity.
- She subsequently developed persistent diplopia, left-sided tinnitus, profound fatigue, and significant functional limitation.
- Brain MRI demonstrated bilateral convexity extra-axial FLAIR hyperintensity and pachymeningeal enhancement.
- Spine MRI showed findings consistent with low cerebrospinal fluid pressure and a longitudinal dorsal epidural collection from T1 to T9, representing an epidural hematoma.
- CT myelography later demonstrated a contrast-opacifying dorsal epidural collection from T2 to T10, although the exact leak site was not discretely identified. A calcified T6-T7 disc/osteophyte complex abutting the thecal sac was considered the likely source of a dural tear.

Intervention

- A lumbar epidural blood patch was initially considered but deferred because of the extensive thoracic epidural hematoma and concerns about worsening spinal cord compression.
- After interval resolution of the hematoma 3 months later, a fluoroscopically guided thoracic epidural blood patch was performed. Because the T6-T7 interlaminar space was notably tight, epidural access was ultimately obtained through the T5-T6 interlaminar window. Correct epidural placement was confirmed with contrast, and 25 mL of autologous venous blood was injected in 5-mL aliquots until the back pain/tightness reached a nearly unbearable level. However, the patient reported significant relief of the headache immediately at the conclusion of the procedure.



1. *JAMA Neurol*. 2021;78(3):329-337.
2. *Neurosurg Rev*. 2021;44(6):3079-3085.
3. *J Am Coll Radiol*. 2024;21(11S):S396-S412.
4. *Reg Anesth Pain Med*. 2024;49(7):471-501.
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6. *Pain Physician*. 2015;18(4):343-348.

Discussion

- This case demonstrates a classic clinical presentation of intracranial hypotension despite incomplete radiologic localization of the spinal cerebrospinal fluid (CSF) leak.[1]
- Contrast-enhanced brain MRI is a key diagnostic modality for intracranial hypotension.[2] Identification of extradural CSF on spinal imaging provides additional diagnostic evidence and guides targeted intervention.[3]
- A concomitant spinal epidural hematoma complicated management. Epidural blood patching was deferred during the acute evaluation because of concerns regarding additional mass effect and potential interference with diagnostic assessment. The mid-thoracic spinal cord (T3-T9) may be particularly susceptible to ischemic injury owing to its watershed vascular supply, and thoracic spinal epidural hematomas have been associated with poorer outcomes than hematomas at other spinal levels.[4]
- Following interval resolution of the hematoma, a fluoroscopically guided thoracic epidural blood patch was performed based on its reported therapeutic efficacy.[5] A study reported a 90% long-term success rate after administration of 25 mL of autologous blood at the lower thoracic level.[6]

Summary

This case illustrates the diagnostic and therapeutic complexity of a spontaneous thoracic spinal cerebrospinal fluid leak, the importance of prioritizing the stability of thoracic epidural hematoma over the additional epidural blood patch therapy, the feasibility of high-volume thoracic epidural blood patch targeting the potential location of the leak and the therapeutic outcomes of immediate improvement in positional headache.