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Epidural Blood Patch as a Therapeutic Modality in the Management of Sagging Brain Syndrome

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INTRODUCTION

- Frontotemporal Brain Sagging Syndrome (FBSS) is an exceptionally rare disorder caused by spontaneous intracranial hypotension leading to frontotemporal and brainstem descent.

- MRI findings typically include pachymeningeal enhancement, CSF–venous fistulas, brain sagging, and reduced CSF volume (1).

- Clinically, FBSS mimics behavioral-variant frontotemporal dementia (bvFTD) with symptoms such as personality changes, cognitive decline, executive dysfunction, headache, apathy, and dietary changes (2).

- These symptoms correlate with dysfunction of frontotemporal regions responsible for behavior, decision-making, and executive function.

- Unlike degenerative dementias, FBSS is potentially reversible when the underlying CSF leak is treated.

- Although rarely encountered by anesthesiologists, their procedural expertise and understanding of CSF dynamics uniquely position them to assist in diagnosis and management.

- Epidural blood patch (EBP) therapy, traditionally used for post-dural puncture headache, is considered first-line treatment for FBSS (3).

- This case highlights EBP therapy as a viable interventional approach in a patient with FBSS refractory to medical management.

CASE REPORT

-A 52-year-old male presented to the emergency department with progressive memory loss, positional headache, neck pain, hyperphagia, worsening short term memory, hypomanic behavior and gait instability.

- Early brain MRI suggested reduced sulcal cerebrospinal fluid (CSF) fullness, and follow-up MRI on March 2025 demonstrated diffuse pachymeningeal enhancement consistent with intracranial hypotension.

- Repeat MRI at the time of evaluation in May 2025 again showed pachymeningeal enhancement. A CT myelogram identified a CSF–venous fistula spanning T7–T11, at which point the patient was diagnosed with frontotemporal brain sagging syndrome (FBSS) secondary to spontaneous intracranial hypotension.

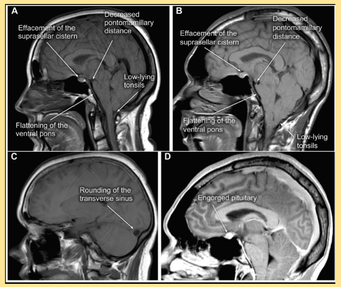
-A multidisciplinary team of the hospital's neurosurgery, neurology and anesthesiology acute pain service jointly recommended a trial of epidural blood patch (EBP) therapy to treat this patient.

METHODS

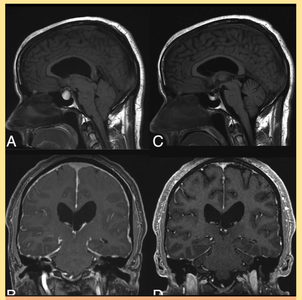
Intervention 1:

- Procedure: Epidural blood patch (EBP) at the T10 level.
- Patient positioned sitting on hospital bed.
- Skin infiltration with 3 mL of 1% lidocaine under sterile conditions.
- 19-gauge Tuohy needle advanced using loss-of-resistance to saline technique (6 mL loss achieved).
- 20 mL autologous blood drawn under sterile technique and slowly injected into the epidural space.

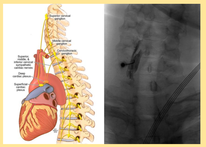
Intervention 2:
- Performed after recurrence of symptoms and identification of a new C5–C6 CSF leak on repeat imaging.
- EBP administered at C4–C5 level under fluoroscopic guidance.
- 15 mL autologous blood injected slowly without complication.



Example of classic MRI brain findings in spontaneous intracranial hypotension (SIH). (A) Sagittal T1-weighted and (B) T2-weighted images demonstrating low-lying tonsils, decreased pontomedullary distance, flattening of the ventral pons, and effacement of the suprasellar cistern; (C) rounding of the transverse sinus; and (D) engorgement of the pituitary.



Before and after radiographic images of a patient with FBSS after clinical resolution of symptoms correlated with imaging findings on MRI.



Fluoroscopic view of cervical spine target from an anterior perspective with a needle trajectory aimed slightly medial to avoid the carotid artery and trachea.

RESULTS

- The patient underwent an epidural blood patch at T10, resulting in immediate improvement in headache, cognition, and gait stability.

- Symptoms recurred within one week, prompting repeat imaging, which revealed a new CSF leak at C5–C6.

- A second epidural blood patch at C4–C5 led to sustained resolution of headache and improved cognitive and motor function.

- At two-month follow-up, the patient continued to demonstrate stable neurological recovery with residual but improving behavioral symptoms.

- No complications were reported following either intervention.

- Overall, treatment resulted in significant functional recovery and supports the role of epidural blood patching as an effective, minimally invasive therapy for FBSS, with the potential for gradual behavioral improvement over time.

DISCUSSION

- FBSS is a rare, under-recognized but reversible cause of dementia that mimics bvFTD.

- Diagnosis requires combined radiographic and clinical evidence showing frontotemporal and brainstem descent secondary to CSF volume loss, typically with pachymeningeal enhancement and venous fistulas.

- Approximately 5% of dementia cases have a treatable etiology, many arising from spinal-level CSF leaks or fistulas (4).

- Identification and repair of the leak can lead to significant cognitive and symptomatic recovery, highlighting the importance of spinal imaging in unexplained cognitive decline.

- Neuroimaging evidence suggests that behavioral disturbances in FBSS result from disrupted white-matter connectivity in frontal networks due to mechanical traction, rather than irreversible cortical atrophy (5).

- This may explain persistent behavioral changes even after restoration of CSF dynamics.

- In this case, EBP therapy improved headache, gait, and cognition, indicating effective CSF restoration, while persistent behavioral symptoms may reflect gradual white-matter recovery.

- Long-term follow-up is essential to evaluate delayed neurobehavioral improvement.

- Anesthesiologists play a pivotal role in diagnosing and delivering interventional treatments for rare yet treatable neurologic syndromes like FBSS.

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