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Clinical characteristics and outcomes after epidural blood patch for intracranial hypotension: a single-center cohort study

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Introduction
Intracranial hypotension (IH) is an underdiagnosed syndrome resulting from disruption of CSF dynamics, most commonly through dural breach. Its management relies on epidural blood patch (EBP) as the established first-line procedural intervention, yet response rates vary according to etiology, and the clinical trajectory of non-responders remains poorly characterized.

Objective
To characterize treatment response and the full management trajectory following EBP in a cohort of IH patients, and to perform an exploratory analysis of factors associated with primary treatment failure.

Methods
Retrospective cohort study conducted at a neurological tertiary referral center (January 2022–October 2025). Patients meeting ICHD-3 criteria for IH who underwent EBP after failure of conservative management were included. A standardized protocol of blind lumbar EBP (15–20 mL) was applied. The primary outcome was clinical response at 6 months. Treatment success was defined as sustained symptomatic improvement (VAS 0–4) without additional interventions. Predictors of first-EBP failure were evaluated using Fisher's exact test and exploratory bivariate logistic regression.

Results
A total of 47 patients were included (mean age 42.1±14.7 years; 40.4% male). After primary EBP, 78.7% (n=37) achieved sustained clinical improvement, with an overall long-term success rate of 91.5% across the full escalation pathway. Among 10 primary non-responders, repeat EBP achieved sustained improvement in 60% (3/5); all 5 patients who underwent surgical correction achieved sustained improvement (100%). Late relapsers (n=4) showed no sustained response to additional EBP but responded universally to surgery. Exploratory analyses identified three variables significantly associated with first-EBP failure: absence of a prior lumbar procedure (p=0.019), symptom duration exceeding two weeks before EBP (OR 12.6; p=0.011), and prior neoplastic disease (OR 15.4; p=0.026). Age, sex, and brain MRI findings did not reach statistical significance.

Conclusion
Most IH patients achieve sustained improvement following EBP, with further gains attained through structured escalation. Two clinically distinct failure trajectories were identified: primary non-responders, in whom repeat EBP may still be effective; and late relapsers, who appear to harbor more complex dural pathology and consistently responded to surgical repair. Iatrogenic etiology, early EBP, and absence of oncological history were associated with favorable outcomes. These findings support early empirical EBP, prompt escalation to advanced myelography in high-risk non-responders, and multicenter prospective studies to validate these predictors.

Keywords:
Intracranial hypotension
Secondary hedache
Cohort
Epidural blood patch

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