MANAGEMENT OF SPONTANEOUS INTRACRANIAL HYPOTENSION IN PREGNANCY: A CASE SERIES

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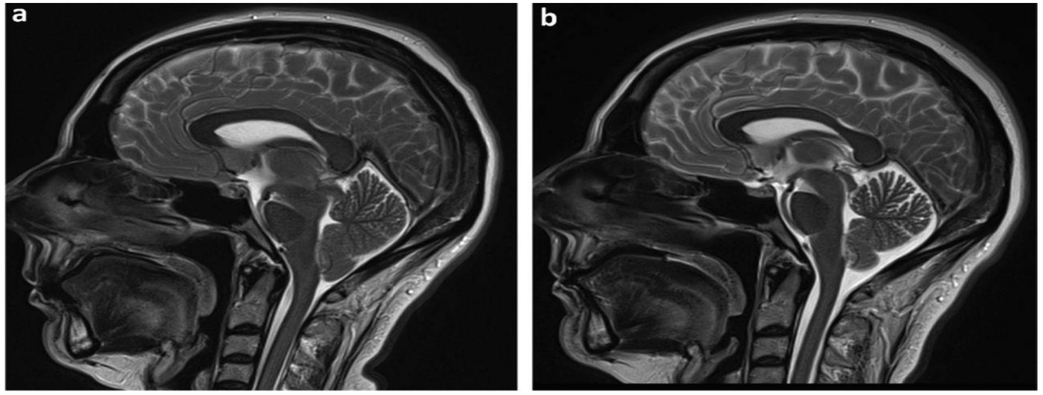
Spontaneous Intracranial Hypotension (SIH)

- Spontaneous Intracranial Hypotension (SIH) is a rare condition associated with a **spontaneous dural tear** and subsequent CSF leak. It is more common in females of child-bearing age. **Overall annual incidence is 4-5 cases per 100,000 population**[1]. There is no consensus opinion on management of these patients during pregnancy or delivery.
- **Orthostatic headache** (similar to a PDPH) is the predominant symptom, likely due to downward displacement of cerebral structures following CSF leakage, followed by **nausea** and **neck pain** in terms of incidence[2]. Other symptoms include dizziness or vertigo, tinnitus, change in hearing, and cognitive impairment .
- Investigation of suspected SIH includes CT myelography, MRI and lumbar puncture.

Case Series

Over the past 10 years our institution has encountered five women who have presented with SIH:

- A multiparous woman (2xCS) with previously diagnosed SIH experienced a recurrence of symptoms in her third pregnancy at 15 weeks. Epidural Blood Patch (EBP) was performed at 21/40 with 8 weeks symptom relief, before further recurrence. After MDT review, the patient had a Caesarean section (CS) under GA at term, with no recurrence of headache postnatally.
- A multiparous woman (P2 SVDs) with a history of SIH was induced at 39 weeks and had epidural analgesia for labour and forceps delivery. She subsequently had recurrence of her headaches and is awaiting an EBP.
- A primiparous woman with a history of SIH 11 years previously had an uncomplicated pregnancy and vaginal delivery. She received epidural analgesia with no recurrence of symptoms.
- A primiparous woman with an 18 month history of SIH and ongoing symptoms declined EBP antenatally and requested an elective CS under GA. Postpartum she underwent MRI and EBP.
- A primiparous woman with a history of SIH 10 years previously and full recovery declined neuraxial analgesia for labour and had an uncomplicated vaginal delivery. She remains asymptomatic.



MRI brain images pre- and post-treatment for SIH (taken from article by Perthen et al.).
Image A shows classic imaging signs such as descent of the brainstem and cerebellar tonsils, pituitary and venous sinus engorgement. These signs resolve following treatment (image B).

Discussion

- **Findings:** Women who had SIH>10 yrs previously did not have symptom recurrence after delivery. There was no association between MOD or RA and recurrence but 3 women declined RA.
- **Anaesthetic considerations:** The effects of potential iatrogenic dural puncture with RA must be considered, as it can exacerbate brainstem and cerebellar tonsillar descent (noted on MRI imaging in Case 1) and cause worsening headache. Also the potential of an existing dural tear leading to intrathecal spread of epidural-administered local anaesthetic.
- **Investigations:**
  - Opening pressures on LP may be low (<60 mm H20) in ~2/3 of patients, but normal or high in a 1/3, so cannot be used to rule out SIH[2].
  - Brain MRI is the most sensitive imaging modality with changes seen in ~3/4 of patients. However ~1/5 patients will have normal imaging, so again cannot be used to definitively rule out SIH[2].
  - DSA/MRI Myelography has a high sensitivity in identifying the exact leak site[2].
- **Treatment options:**
  - **Conservative** – only successful in 28% of cases[2] (noted to be only 7% in the smaller U.K.-based study[1])
  - **Epidural Blood Patch** – single patch successful in 2/3 of cases[1,2], with large volume (>20mls blood) more effective than lower volume patches[2]. This is true for non-targeted patches i.e. lumbar EBPs, even where the suspected leak is distant to the lumbar region. The relapse rate is around 10%, with repeat procedures proving effective[1].
  - **Myelography and targeted fibrin sealant** – if EBP is not successful, then targeted treatment is thought to be effective in ~60% of patients (for >6 months), with a relapse rate of 25%[1]. Repeated procedures have been shown to control symptoms in the majority of relapses.
  - **Neurosurgical repair** – definitive treatment, but rarely necessary in practice.
  - There is no robust evidence regarding the timing or interval for treatment
  - Our **preferred option is EBP** as it has slightly better initial symptom-control than targeted treatment, and significantly lower recurrence rates[1]. In addition, it can be performed outside of specialist neurosurgical centres and is a procedure that all Obstetric Anaesthetists regularly perform.

References

1. Perthen JE, Dorman PJ, Morland D et al. Treatment of spontaneous intracranial hypotension: experiences in a UK regional neurosciences Centre. Clinical Medicine. 2021, 21 (3) e247-e251.
2. D'Antona L, Merchan MAJ, Vassiliou A et al. Clinical Presentation, Investigation Findings and Treatment Outcomes of Spontaneous Intracranial Hypotension Syndrome: A Systematic Review and Meta-Analysis. JAMA Neurol. 2021 Mar 1;78(3):329-337.