Successful treatment of a recurrent post-dural puncture headache with an epidural blood patch 18 months after the initial dural puncture

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ABSTRACT
Inadvertent dural puncture is a recognised complication of epidural insertion. Parturients are at increased risk of developing a post-dural puncture headache, which can be debilitating for a mother caring for a newborn infant. Epidural blood patch is an effective treatment in patients presenting acutely with post-dural puncture headaches but its efficacy in those with delayed presentation or with late recurrent post-dural puncture headache is less clear. We present the case of a woman with a recurrent post-dural puncture headache who was successfully treated with an epidural blood patch 18 months after the initial dural puncture. Patients who develop post-dural puncture headaches may remain symptomatic for some time and an epidural blood patch may be beneficial, following appropriate investigation.

Keywords: Headache; Post-dural puncture; Epidural blood patch

Case report

A 39-year-old nulliparous woman underwent the uneventful insertion of an epidural catheter for labour analgesia at the L3-4 interspace. She underwent caesarean delivery for labour dystocia several hours later under epidural anaesthesia. Although she had developed a mild intermittent headache at the time of discharge from hospital three days later, her postoperative recovery was otherwise uneventful.

She was re-admitted several days later with a severe bilateral fronto-temporal headache, associated with photophobia, tinnitus and neck stiffness. She experienced little relief from simple analgesia and her symptoms severely affected her ability to care for her baby. A post-dural puncture headache (PDPH) secondary to an unrecognised dural puncture at the time of epidural placement was diagnosed. An epidural blood patch (EBP) at the L4-5 interspace using 17 mL of autologous blood produced immediate relief.

She was subsequently lost to follow-up but 10 months later represented to the anaesthetic clinic for management of a suspected recurrent PDPH. The headaches had resumed six weeks after the EBP. She described a postural headache that occurred intermittently, typically with two episodes per month lasting several hours each. She reported relief from caffeine-containing beverages but the headache impacted her ability to work or stand for long periods. She was otherwise well.

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Management options of conservative treatment or a repeat EBP were discussed. She was advised that there is limited evidence, particularly in the obstetric anaesthetic literature, about the benefit of performing an EBP so long after the original dural puncture, including because she had already had an EBP. While she considered the options, an MRI brain was performed to exclude other causes of headache and the findings were reassuring.

Nearly 18 months after her initial dural puncture she agreed to receive a repeat EBP, performed with her in the left lateral position at the L3-4 interspace and using 19 mL of autologous blood, with typical volumes used in our institution being 20–25 mL. The blood was injected continuously until she complained of back pressure and she experienced immediate and complete resolution of her symptoms. She remained free from headache six months later.

Discussion

Inadvertent dural puncture is a known risk of epidural placement. Approximately 1 in 70 parturients suffer a dural puncture during insertion, half of whom develop a PDPH.[1] Rarer causes of headache after dural puncture in the postpartum mother have been described and including pneumocephalus, reversible encephalopathy syndrome and subdural haematoma.[2] Headache is the predominant feature of PDPH; it is typically intensified by standing and relieved when lying supine, and other symptoms include neck pain, nausea and vomiting, hearing loss, tinnitus and visual disturbance. Post-

dural puncture headache is defined as a specific entity by the International Headache Society.[3] It can be extremely debilitating for the new mother as it affects her ability to bond and care for her newborn infant. While PDPH is relatively common, a high index of suspicion for more sinister causes of headache in the parturient remains necessary, especially in the context of atypical or associated features such as those associated with pre-eclampsia, intracerebral bleeding or cerebral sinus thrombosis.[4] A recent guideline released by the Obstetric Anaesthetists' Association recommends that alternative diagnoses be considered and investigated if the nature of the headache changes, the headache is atypical, there is a change in neurological status of the patient or two unsuccessful EBPs have been performed.[3]

The pathophysiology of the headache in PDPH is unclear but it is thought that dural puncture causes loss of cerebrospinal fluid (CSF) leading to intracranial hypotension and traction on sensitive intracranial structures.[4] Compensatory vasodilatation to maintain intracranial volume is also believed to contribute. Most PDPHs resolve spontaneously within seven days, but some may persist for months or even years.[3,4]

Conservative symptomatic treatment strategies such as bed rest, caffeine and simple analgesia are typically adopted in the first 48 h in the knowledge that many PDPHs will resolve spontaneously.[3,4] An EBP performed during the first 48 h may be less efficacious[3] but remains the gold standard treatment of persistent headache and typically achieves complete improvement in PDPH symptoms in over 50% of patients.[3] The procedure is generally well tolerated but rarely has been associated with chronic adhesive arachnoiditis.[4,5] The epidural space is accessed through the same or adjacent intervertebral space that resulted in the initial dural puncture and autologous blood is injected into the epidural space: the optimum volume has yet to be determined but 20 mL has been recommended.[6] Acutely, the autologous blood injected into the epidural space increases lumbar CSF pressure with relief of intracranial hypotension,[4] while the sustained therapeutic effect is believed to be due to clot formation over the dural puncture site preventing further CSF leakage and facilitating dural healing.[3]

Evidence for repeating an EBP after a significant delay from the initial dural puncture is sparse and restricted to case reports.[7,8] A 2005 case report published in French described the successful treatment of a PDPH seven years after the initial dural puncture.[9] A 14-gauge Tuohy needle had breached the dura during a difficult epidural insertion for an emergency caesarean delivery and the patient had immediately developed a typical PDPH that persisted for seven years. Traumatised by her earlier experience, she initially refused the offer of an EBP but when finally performed it provided complete remission of her headache. There are no reports of a late EBP proving successful after earlier treatment with an EBP.

This case demonstrates that an EBP may be used to treat a PDPH 18 months after the initial dural puncture, even if an EBP had been performed at the time of the initial event. Clinicians should not discount the therapeutic role of an EBP if a patient presents with a typical headache and has been appropriately investigated.

References

1. Choi PT, Galinski SE, Takeuchi L, Lucas S, Tamayo C, Jadad AR. PDPH is a common complication of neuraxial blockade in parturients: a meta-analysis of obstetrical studies. *Can J Anaesth* 2003;**50**:460–9.
2. Kwak KH. Postdural puncture headache. *Korean J Anesthesiol* 2017;**70**:136–43.
3. Russell R, Laxton C, Lucas DN, Niewiarowski J, Scrutton M, Stocks G. Treatment of obstetric post-dural puncture headache. Part 2: epidural blood patch. *Int J Obstet Anesth* 2019;**38**:104–18.
4. Turnbull DK, Shepherd DB. Post-dural puncture headache: pathogenesis, prevention and treatment. *Br J Anaesth* 2003;**91**:718–29.
5. Carlswärd C, Darvish B, Tunelli J, Irestedt L. Chronic adhesive arachnoiditis after repeat epidural blood patch. *Int J Obstet Anesth* 2015;**24**:280–3.
6. Paech MJ, Doherty DA, Christmas T, Wong CA. Epidural Blood Patch Trial Group. The volume of blood for epidural blood patch in obstetrics: a randomized, blinded clinical trial. *Anesth Analg* 2011;**113**:126–33.
7. Ferre JP, Gentili ME. Seven months' delay for epidural blood patch in post-dural puncture headache. *Eur J Anaesthesiol* 1999;**16**:257–8.
8. Wilton NC, Globerson JH, de Rosayro AM. Epidural blood patch for postdural puncture headache: it's never too late. *Anesth Analg* 1986;**65**:895–6.
9. Raffin L, Batiste C, Noël D, Serbouh A. Blood patch, il n'est jamais trop tard (Epidural blood patch, never too late). *Ann Fr Anesth Réanim* 2006;**25**:201–5.

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