

Guidelines for the Diagnosis, Treatment and Prevention of Post Dural Puncture Headache

Diagnosis of Headache

Headache is common in the post-partum period, affecting up to 40% of all parturients.

Carrie and Collins define a PDPH as “a headache occurring after dural puncture that has a significant effect on the patient’s post operative well being i.e. a headache which is not only postural but also continues for more than 24 hours at any level of intensity or so severe at any time that the patient is unable to maintain an upright position”.¹

Symptoms

PDPH is classically occipito-frontal and often radiates to the neck and shoulders. Pain is exacerbated by sitting and standing, and alleviated by lying flat. Other associated symptoms include nausea, vomiting, hearing loss, tinnitus, vertigo, dizziness and paraesthesia of the scalp. Visual disturbances such as diplopia and cortical blindness have been described.⁴

Neurological symptoms may precede the onset of grand mal seizures. Subdural haematomas can occur as a result of dural puncture. **Unless the headache is associated with postural features, other serious intracranial causes must be excluded.**

Onset

Ninety per cent of headaches will occur within 3 days of the procedure² and two thirds within the first 48 hours³. The headache can develop up to 14 days after the procedure, or very rarely it can occur immediately.

Diagnosis

Symptoms of a postural headache with a history of dural puncture are usually sufficient to make a diagnosis. Where doubt exists additional investigations may confirm the clinical findings. Lumbar puncture or MRI scanning of the brain may demonstrate evidence of reduced CSF pressure. Myelography or thin-section MRI can be used to locate the source of the CSF leak¹².

Differential diagnoses of PDPH include: intracranial tumours, intracranial haematomas, pituitary apoplexy, cerebral venous thrombosis, migraine, chemical or infective meningitis, and non-specific headache.

Duration

72% of PDPH will resolve spontaneously within seven days^{4,5}. In a minority of patients the headache can persist, occasionally for months or years.

Treatment of PDPH

It is important to note that a large proportion of the literature regarding the treatment of PDPH is of poor quality, either due to small numbers of patients or inappropriate statistical analysis. The psychological impact of severe headache on a mother coping with a new baby cannot be

underestimated. It is therefore of great importance to give the mother a thorough explanation of the reason for the headache, expected time course, and therapeutic options available. Regular review is essential. Consultant Anaesthetic input into the patient's care should be sought at the earliest available opportunity.

Simple treatments and posture

There is no evidence to support bed rest, specific postures, or additional fluids above those required for maintenance, following PDPH⁶. The patient should be encouraged to adopt the position which they find most comfortable.

Analgesics including paracetamol and NSAIDs, in conjunction with antiemetics, may control the symptoms and so reduce the need for interventional therapy¹³. Opioids are controversial and probably do not provide any extra benefit. We recommend a regime of regular codydramol, six hourly, and diclofenac eight hourly, if not contraindicated.

Other pharmacological treatments

Many therapeutic agents have been tried, but all suffer from a lack of large, randomized, controlled clinical trials. Desmopressin (DDAVP) has no effect on PDPH following lumbar puncture¹⁴, and the evidence for ACTH is inconclusive¹⁵. Sumatriptan, the 5-HT_{1D} receptor agonist and migraine treatment, has been used for PDPH but a controlled trial found no evidence of benefit¹⁶.

Epidural saline and more recently, epidural dextran 40 have been used in the treatment of PDPH. Comparative trials with epidural blood patching are unable to demonstrate any long term efficacy of either of these two solutions¹⁷.

It has been concluded that caffeine is an effective therapy for PDPH^{18,19}. The dose recommended for PDPH is 300-500 mg of oral or i.v. caffeine once or twice daily. However, therapeutic doses have been associated with CNS toxicity and atrial fibrillation. It can be considered for the treatment of PDPH where simple treatments are ineffective, and blood patching contraindicated. It should only be administered in an HDU setting. Similarly oral theophylline preparations have also found limited success¹¹.

Epidural blood patch

Despite the fact that a Cochrane systematic review of epidural blood patching concluded that 'too few patients have been included in randomized trials to allow a reliable assessment of the potential benefits and harms of the technique'⁷, the high success rate and low incidence of complications have established it as the definitive treatment for PDPH.

The technique has a success rate of 70-98% if carried out more than 24 h after the dural puncture.⁸ If a blood patch fails to resolve the headache, repeating the blood patch has a similar success rate.

Complications of the technique include immediate exacerbation of the symptoms and radicular pain. These symptoms do not persist and resolve with the administration of simple painkillers. Long term complications are very rare, but include back pain. There is no evidence that epidural blood patching reduces the efficacy of future epidural analgesia.

At present the evidence for prophylactic blood patching, i.e. blood patching prior to the onset of symptoms, is contradictory. For this reason it cannot be recommended at the present time.

Guidelines for placement of epidural blood patch

Epidural blood patch is used to manage a persistent, incapacitating dural puncture headache. Blood patching should normally be performed only after the first 24 h, as prior to this it is associated with lower success rates. Systemic infection and fever, infection on the back, coagulopathy and patient refusal are all contraindications to blood patching. **The case must always be discussed with the appropriate anaesthetic consultant.**

The procedure must be carried out in theatre. Two anaesthetists are required, one of whom should be a consultant.

1. Written, informed consent should be obtained from the woman following a careful explanation of the procedure. The discussion should also include the chances of success, significant side effects and the possibility of requiring a second blood patch (approximately 1 in 5).
2. The epidural space is located with a Tuohy needle, by the first anaesthetist, at the level of the supposed dural puncture, or an intervertebral space above or below. CSF may be present in the epidural space. 20 – 30 ml of the patient's blood (provided by the second anaesthetist) is then injected into the epidural space over 30 – 60 seconds. Dull, lower back pain may limit the volume injected, although pausing for a few seconds or slowing the rate of injection may allow the full amount to be injected.
3. The second anaesthetist is responsible for drawing blood from the patient. As with the epidural, venepuncture must also be carried out using a full aseptic technique. After cleaning and draping the skin of the antecubital fossa, the skin should be anaesthetized with local anaesthetic prior to the insertion of a 14 or 16 gauge cannula. This should be done when the epidural needle is sited.
4. It has previously been taught that samples of the blood should routinely be sent for culture. This is an area of much controversy, and is backed up by little evidence, however until we have a definitive answer to this question it would seem prudent to continue to send blood for screening purposes. There is no evidence for the routine use of prophylactic antibiotics following blood patch.
5. The epidural blood patch should be carried out in the Obstetric theatre. Immediately following the procedure the patient should be taken to the recovery area for close observation. The patient is encouraged to lie still for one to two hours. After this time she can be transferred to the ward where she should be encouraged to walk.
6. It is important that the patient has repeated clinical assessment while an inpatient, although she may well go home the same day. Prior to going home, advice must be given regarding the need to contact labour ward or present to an Accident and Emergency department in the case of any complications. Specifically patients should be told about presenting features of cauda equina syndrome and epidural abscess. Where possible written information should also be given.

Follow up for patients with PDPH

It is important that all patients with significant PDPH, from whatever cause or whether having received an epidural blood patch or not, should be referred for postnatal review. This will be at six weeks in the high risk obstetric clinic, with either Dr Renate Wendler or Dr Frank Schroeder. In this way long term complications should be picked up at an early stage and can be treated, or monitored.

References

1. Carrie Less, Collins PD. 29 gauge spinal needle. *Br J Anaesth* 1991; **66**: 145-6
2. Reynolds F. Dural puncture and headache. *Br Med J* 1993; **306**: 874-6
3. Leibold RA, Yealy DM, Coppola M, Cantees KK. Post-dural puncture headache: characteristics, management, and prevention. *Ann Emerg Med* 1993; **22**: 1863-70
4. Vandam LD, Dripps RD. Long-term follow up of patients who received 10 098 spinal anaesthetics. *JAMA* 1956; **161**: 586-91
5. Costigan SN, Sprigge JS. Dural Puncture: the patients' perspective. A patient survey of cases at a DGH maternity unit 1983-1993. *Acta Anaesthesiol Scand* 1996; **40**: 710-714
6. Sudlow C, Warlow C. Posture and fluids for preventing post dural puncture headache. *The Cochrane Database of Systematic Reviews* 2001, issue 2.
7. Sudlow C, Warlow C. Epidural blood patching for preventing and treating post-dural puncture headache. *Cochrane Database of Systematic reviews* 2001, Issue 2.
8. Abouleish E, Vega S, Blendinger I, Tio TO. Long term follow-up of epidural blood patch. *Anesth Analg* 1975; **54**: 459-63
9. Turnbull DK, Shepherd DB. Post-dural puncture headache: pathogenesis, prevention and treatment. *Br J Anaesth* 2003; **91**: 718-29
10. Paech M. Epidural blood patch – myths and legends. *Can J Anesth* 2005; **52**: 1-5
11. Schwalbe, Schifmiller, Marx. Theophylline for PDPH. *Anesthesiology* 1991; **75**.
12. Vakharia SB, Thomas PS, Rosenbaum AE, Wasenko JJ, Fellows DG. Magnetic Resonance Imaging of cerebrospinal fluid leak and tamponade effect of blood patch in postdural puncture headache. *Anesth Analg* 1997; **84**: 585-90
13. Ostheimer GW, Palahniuk RJ, Shnider SM. Epidural blood patch for post-lumbar-puncture headache. *Anesthesiology* 1974; **41**: 307-8
14. Hansen PE, Hansen JH. DDAVP, a synthetic analogue of vasopressin, in prevention of headache after lumbar puncture and lumbar pneumoencephalography. *Acta Neurol Scand* 1979; **60**: 183-8
15. Collier BB. Treatment for post-dural puncture headache. *Br J Anaesth* 1994; **72**: 366-7
16. Connelly NR, Parker RK, Rahimi A, Gibson CS. Sumatriptan in patients with postdural puncture headache. *Headache* 2000; **40**: 316-9
17. Bart AJ, Wheeler AS. Comparison of epidural saline placement in the treatment of post-lumbar-puncture headache. *Anesthesiology* 1978; **48**: 221-3
18. Sechzer PH. Post-spinal anesthesia headache treated with caffeine. Evaluation with demand method. Part 2. *Curr Ther Res* 1979; **26**: 440-8
19. Sechzer PH, Abel L. Post-spinal anesthesia headache treated with caffeine. Evaluation with demand method. Par 1. *Curr Ther Res* 1978; **24**: 307-12