Unintentional Dural Puncture and Post Dural Puncture Headache: Diagnosis & Management in Obstetric Practice

Background Information:

When loss of CSF is greater than production, as might occur through a dural tear, CSF pressure falls and the brain sinks, stretching the meninges. This stretching is thought to cause headache. Compensatory vasodilation of intracranial vessels may further worsen symptoms.

The incidence of dural puncture should be less than 1% of epidurals. Following a dural puncture with a 16G Tuohy needle, the incidence of post dural puncture headache is approximately 90%. However, in only approximately 40% of dural punctures is CSF recognized flowing from the Tuohy needle. In a further 10%, CSF is recognized in the “epidural” catheter. 6% are only recognized following a test dose and 3% are recognized when a very high block occurs following an epidural top-up.

Importantly, in more than 30% of individuals who develop a postdural puncture headache, a dural puncture was not recognized at the time of insertion.

It is therefore crucial that all midwives, as well as obstetric and anaesthetic staff, should be alert to the signs of post dural puncture headaches (see “Late Management”). If untreated, headaches are not only unpleasant, but on rare occasions can be life threatening, usually as a result of intracranial haemorrhage or coning of the brain stem.

Management of accidental dural puncture can be divided into immediate and late

Immediate Management
The aim is to achieve effective analgesia without causing further complications.

Either

- Remove the epidural catheter

- Re-insert the epidural at a different interspace – usually one interspace higher. If the reason for the tap was difficult anatomy, a senior colleague should be informed.

- Label the catheter as “Epidural Catheter, but known DURAL PUNCTURE” (Labels in folder)

- Run the epidural as normal but beware of intrathecal spread of local anaesthetic.

- PCEA may be used providing the test dose and initial bolus behaved in a normal fashion.
• If extra doses of local anaesthetic are required, the anaesthetist must be aware of the potential for greater than normal effect due to spread of local anaesthetic into the subarachnoid space. All extra top-ups must be performed by the anaesthetist.

• Be very cautious with large top-ups of local anaesthetic for operative procedures, as high blocks may occur due to subarachnoid spread of solution.

Or

• Pass the “epidural” catheter 2-3 cm into the subarachnoid space.

• **Label the catheter clearly as an “INTRATHECAL CATHETER” and “Only anaesthetists may give top-ups”** (labels in folder).

• Give intermittent top-ups through the catheter (1ml of 0.25% bupivacaine +/- 5-25 μg fentanyl. Flush with 1 ml 0.9% saline (deadspace =1ml). Tachyphylaxis often occurs and the dose may need to be increased)

• Remove the catheter at the end of labour.

With either technique the patient should be informed at the earliest opportunity that a dural puncture has occurred and of the likely sequelae.

 Labour itself may be allowed to continue normally. Dural puncture is not an indication for an instrumental delivery.

• **Arrangement must be made for daily postnatal follow-up. Complete Section 1 of the Dural Puncture Follow-up Form and place it in one of the yellow follow-up folders.** As the forms are not kept in the notes, do not forget to document your opinions and actions in the notes as well.

• Give the woman a copy of the “Dural Puncture Headache Information Leaflet” (which is part of the Dural Puncture Follow-up Form)
Late management

Background
Headaches in the postnatal period are common. The key-differentiating factor between a “normal” post-natal headache and a post dural puncture headache is the positional nature of the latter.

Common features of post dural puncture headache include:

• typically onset is 24-48 hours post dural puncture. Untreated they are said to last 7-10 days but may last longer.

• characteristically worse on standing. Headache is often absent after overnight bed rest, but returns after mobilising.

• usually in the fronto-occipital regions and radiates to the neck, with associated neck stiffness.

• photophobia, diplopia and difficulty in accommodation common. Hearing loss, tinnitus and VIth nerve palsy possible.

• nausea in up to 60%

• If a headache was originally worse on standing, and then becomes worse on lying (particularly after prolonged severe dural puncture), it may be an indication of subdural haematoma. Urgent neurological opinion and CT scan should be sought

Treatment is either to alleviate symptoms while waiting for the dural tear to heal itself, or to seal the puncture. Epidural blood patching is the only commonly used method of sealing dural tears. (Neurosurgical closure has been reported).

Prophylactic treatment

• Although the most effective prophylactic treatment is blood patching, early blood patching has a lower success rate than blood patching after 24 hours and bacteraemia is common immediately post delivery (7% rising to 80% with uterine manipulation). Therefore routine early prophylactic blood patching is not recommended.

• Similarly, even if a spinal catheter has been sited, the evidence that the incidence of headache is reduced if the catheter is left in for more than 24 hours is relatively weak and the risk of infection increases, so leaving the catheter in-situ after delivery is not recommended.

• Infusions of saline into the epidural space reduces the incidence of headache while the infusion is maintained, but the evidence that it reduces the incidence of headache after 24 hours is again weak and so is not recommended.
Symptomatic treatment

- Simple analgesics are the mainstays of symptomatic treatment. Prescribe regular diclofenac and cocodamol (30/500), even though they are unlikely to completely relieve severe post dural puncture headache.
- Bed rest alleviates symptoms, but the incidence of post dural puncture headache after 48 hours is the same for those that mobilised throughout. Because of the risk of thromboembolism, bed rest should not be routinely encouraged in asymptomatic women.
- Adequate fluid intake is to be encouraged although there is no evidence that hydration reduces the incidence of post dural puncture headache.
- Caffeine / theophyllines. These act by reducing intracranial vasodilation, which is partially responsible for the headache. The evidence of benefit is very weak and there is some evidence for potential association with seizures so enhanced caffeine intake is not recommended.
- Sumatriptan (6mg s/c), ACTH (1-5mcg/kg in 1L saline over 1-2 hours) have been advocated for dural puncture headache, but clinically appear relatively ineffective.
- Abdominal binders or squeezing the abdomen from behind, while not effective for treatment, can be a useful diagnostic test. (The headache goes away as the abdomen is squeezed)
- If patient is on bed rest, remember to prescribe clexane and elasticated stockings
- Arrange follow up in Obstetric Anaesthetic Clinic in 4-6 weeks

Epidural Blood Patch

Blood patches are best performed in the recovery area or theatre, at a time to suit all concerned. (Overnight bed rest after patching may be ideal)

Epidural blood patch performed around 48 hours post partum has a 60-90% cure rate at the first attempt. The mechanism of action is two fold: 1) Blood injected into the epidural space compresses the dural sac and raises the intracranial pressure. This may produce an almost instantaneous improvement in pain 2) The injected blood forms a clot over the site of the dural tear and seals the CSF leak.

Blood injected into the epidural space predominantly spreads cephalad, so blood patches should be performed at the same or lower interspace as the dural puncture. Suggestions that labour epidurals after blood patching may be less effective, have not been confirmed.
- Consent must be obtained.
- Risks of epidural blood patching include: failure, repeat dural puncture, infection, radicular pain, neurological damage, backache (commonly lasting a few days, 16% lasting weeks to months (mean 27 days)).
- The patient should be apyrexial and not have a raised white cell count.
- 2 operators are required. One should be an experienced “epiduralist”, the other is required to take blood in a sterile manner.
- The patient should have a period of bed rest before performing the patch to reduce the CSF volume in the epidural space.
- Aseptic technique must be meticulous both at the epidural site and the site of blood letting – usually the antecubital fossa.
- An epidural should be performed at the same or a lower vertebral interspace as the dural puncture with the woman in the lateral position to minimise CSF pressure in the lumbar dural sac.
- Once the epidural space has been identified, 20 ml blood is obtained.
Inject the blood slowly through the epidural needle until pain occurs (commonly in the back or legs) or to a maximum of 20 ml. If pain occurs, pause and if the pain resolves, try continuing a slow injection. If the pain does not resolve or recurs then stop.

To allow the clot to form, maintain bed rest for at least 2 hours and then allow slow mobilisation.

As far as possible the patient should avoid straining, lifting or excessive bending for 48 hours, although there are obvious limitations when a woman has a new born infant to care for.

Follow-up is still required. Every woman should have clear instructions to contact the anaesthetists again if symptoms recur even after discharge home.

Every woman should be given an appointment to attend the Anaesthetic Obstetric anaesthetic clinic 4-6 weeks after discharge

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References


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