Postpartum headache after epidural blood patch: investigation and diagnosis

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Use of an epidural blood patch to treat spinal headache after accidental dural puncture is well recognized. The high success rate associated with this practice has been questioned and it is not uncommon for patients to suffer recurring headaches after a supposedly successful blood patch. We describe a patient in labour who suffered accidental dural puncture, and whose headache was treated twice with an epidural blood patch. Despite this, the headache persisted. The case highlights the difficulty in the diagnosis of headache in the postnatal period in patients who have had regional analgesia and the importance of considering an alternative pathology, even if epidural blood patching has been successful. In this case, a diagnosis of cortical vein thrombosis was made. The incidence, presentation, aetiology and treatment of this rare condition is described.

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Use of an epidural blood patch to treat spinal headache after accidental dural puncture is well recognized,¹ and although the success rate is generally quoted to be as high as 90%,² there is evidence to suggest that this may be over optimistic.³⁻⁵ Certainly, it is not uncommon for a patient to complain of recurrence, having had their initial spinal headache treated with an epidural blood patch. There are no clear guidelines in the literature regarding the number of times an epidural blood patch should be performed in the same patient, but each time the procedure is repeated the patient is at risk of complications.

This case report describes such a clinical dilemma. The differential diagnosis of postpartum headache is discussed and consideration of other pathologies as a cause of persistent headache after epidural blood patch is emphasized.

Case report

A previously healthy 20-yr-old, gravida 1, para 0 woman was admitted to the delivery suite at term in active labour. Apart from one migraine attack some years ago, she had little significant medical history and her pregnancy had been normal. Two hours later, she requested epidural analgesia. I.v. access was obtained and, under sterile conditions using the loss of resistance to saline technique, a 16-gauge Tuohy needle was inserted into the L2–3 interspace. Unfortunately, accidental dural puncture occurred. The needle was removed and resited in the L3–4 interspace where the epidural catheter was placed successfully. A test dose of 0.5% bupivacaine 2.5 ml was administered with no untoward effects, but shortly after she progressed to the second stage of labour and had a spontaneous vaginal delivery of a healthy infant.

She remained well after delivery and continued to do so for the next 24 h. However, on the second day postpartum, she developed an occipital headache and neck pain, which were both relieved by lying down. She was afebrile, with no focal neurology, and arterial pressure was normal. As a spinal headache was the obvious diagnosis, an epidural blood patch was performed under aseptic conditions using 18 ml of autologous blood placed at L2–3. Within 2 h, all symptoms had resolved, she was mobilizing well and was discharged from hospital that evening.

On day 3 postpartum, the headache returned with similar intensity and again with a definite postural element. She was readmitted to hospital and underwent a second epidural
Differential diagnoses of persistent headache in the puerperium

- Spinal headache after regional anaesthesia
- Non-specific
- Migraine
- Pregnancy-induced hypertension
- Meningitis
- Cerebral tumour
- Subarachnoid haemorrhage
- Subdural haematoma
- Cerebral vein thrombosis

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Discussion

The success rate of epidural blood patch to treat spinal headache is commonly quoted to be as high as 90%. However, other studies have shown success rates of only 60–70%. In the light of a possible overestimate of the effectiveness of epidural blood patch, how should the anaesthetist manage a patient who has returned with recurring headache after successful treatment with epidural blood patch? Should another epidural blood patch be performed with the risks of infection, repeat dural puncture and repeat failure, or should a conservative approach be adopted, the headache investigated further and other causes excluded?

The common and serious causes of persistent headache in the puerperium after regional anaesthesia are shown in Table 1. A thorough history is important to exclude other possible diagnoses before assuming that the headache is of spinal origin. In our patient, because the nature of her headache had changed, we felt that a third epidural blood patch was inappropriate and obtained a neurological opinion.

Spinal headache

Spinal headache typically presents 24–48 h postpartum with throbbing fronto-occipital pain which is relieved by lying flat. Associated symptoms include dizziness, tinnitus, hearing impairment, blurred or double vision, photophobia and neck stiffness. Physical examination is usually unremarkable. However, a discriminatory test described by Gutsche, which involves application of firm manual pressure around the abdomen of the seated patient, can produce transient relief.
Non-specific headache and migraine
Non-specific headache is common after childbirth, occurring in 39% of mothers in the first week postpartum.8 Migraine tends to improve in pregnancy but it can recur early after delivery. Headache typically is severe, throbbing in nature and often unilateral. It can be associated with nausea, vomiting and photophobia, and can even present with focal neurology.

Pregnancy-induced hypertension
Headache is usually associated with high blood pressure and in patients with pregnancy-induced hypertension, other symptoms may also be present, such as visual disturbances, nausea, vomiting or epigastric tenderness. Clinical examination may demonstrate hypertension, peripheral oedema and brisk reflexes. Investigations may reveal proteinuria, deteriorating renal function, increased liver enzymes and urate, and a coagulopathy.

Meningitis
Bacterial and aseptic meningitis have been reported after epidural,9 spinal10 and combined spinal–epidural11 techniques and also after epidural blood patching.12 Typical symptoms include headache, fever, nausea and vomiting, neck stiffness and an increased white cell count. CSF examination may distinguish between the two causes. With bacterial meningitis, CSF glucose is reduced and microscopy and culture of micro-organisms may be positive, whereas in aseptic meningitis, CSF glucose is normal with no organisms seen on microscopy or culture.

Much of the symptomatology associated with these conditions is very similar and it is often necessary to use CT and MRI scanning to exclude some of the rarer causes of postpartum headache listed in Table 1.

Cerebral tumour
Although rare, headache in the postpartum period caused by a cerebral tumour has been reported.13 The headache is typically dull in nature and can be accompanied by signs of increased intracranial pressure such as nausea, vomiting and seizures.

Subarachnoid haemorrhage
This occurs in one to five cases per 10 000 pregnancies and presents typically with severe occipital headache, nausea, vomiting and depressed consciousness. The condition can be similar to that of pre-eclampsia because both are associated with hypertension. However, CT scanning can be diagnostic, the hallmark being an increased density of the CSF spaces caused by blood.

Subdural haematoma
Intracranial subdural haematoma may occur acutely or over a more chronic period after dural puncture.14 CT is the investigation of choice in the acute situation, often revealing a high density crescent of fresh blood, concave on the deeper surface. As the haematoma ages it becomes ‘isodense’ on CT, and MRI is then the more sensitive investigation for detection and optimal delineation.15

In our case, when the patient suffered four generalized seizures, a CT scan was performed first to exclude a subarachnoid haemorrhage or subdural haematoma; an MRI scan was performed which revealed changes of a cerebral vein thrombosis limited to the cortical veins (Fig. 1).

Cerebral vein thrombosis
This condition is very rare, with an incidence of 8.9 cases per 100 000 deliveries.16 In the most recent report on Confidential Enquiries into Maternal Deaths, there were only two deaths from cerebral vein thrombosis, both associated with deep vein thrombosis.17 Cerebral vein thrombosis has a variable presentation but typically includes headache which may be gradual in onset or sudden, similar to a subarachnoid haemorrhage.18 Headache can be accompanied by other neurological symptoms such as focal, multi-focal or generalized seizures, coma, hemiparesis or bilateral papilloedema.19 In up to 26% of cases, CT scan is normal20 but MRI is a more sensitive test, achieving a diagnosis in 90% of cases. However, if this is unsuccessful, MR venography, together with MRI, is sufficient to allow diagnosis in almost all cases and can be used for follow-up after treatment has been instigated.21

The aetiology of cerebral vein thrombosis is uncertain but the procoagulable state of pregnancy is a predisposing factor. Also, many patients have an inherited thrombophilia22 and should undergo a thrombophilia screen. In our case, we believe that the cerebral vein thrombosis occurred after the second epidural blood patch, when the nature of the headache changed, and although it is not a recognized complication of epidural blood patch, this is the second such case to be reported.23

Cerebral vein thrombosis can be treated with anticoagulation therapy for 2–3 months, although this is controversial because of the risk of promoting further bleeding into an area of haemorrhagic infarct. In our case, anticoagulation was avoided because lumbar puncture revealed the presence of red blood cells. However, this could have occurred as a result of the two epidural blood patches.

In summary, this case serves to highlight the difficulty of diagnosis of persistent postpartum headache after epidural blood patch, and the importance of considering other possible pathologies.

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