

Utility of neuroimaging in postpartum headache work-up: case report and diagnostic considerations

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Abstract

A postpartum headache is commonly seen in clinical practice, especially after a subarachnoid block. Generally, it is treated as a postdural puncture headache. We report on a case of a 24-year-old primigravida who underwent emergency Caesarean delivery under spinal anaesthesia. She developed a headache on the third postoperative day, which responded to conservative management. On the sixth day, she developed a severe headache which did not respond to analgesics and bed rest. Magnetic resonance imaging of the brain revealed a subdural haematoma. In such situation, there is a need to consider other differential diagnoses other than that of a postpartum headache and to conduct early neuroimaging, since the headache may be the first indication of an unsuspected, potentially fatal lesion.

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Introduction

A 24-year-old primigravida, with no other co-morbidities, was admitted at 38 weeks of gestation with complaints of absent foetal movement. She was scheduled for an emergency Caesarean delivery. Subarachnoid block was administered using a 25 G Quincke Babcock needle with 1.8 ml, 0.5% heavy bupivacaine and 15 µg of fentanyl as an additive. The subarachnoid space was successfully identified on the first attempt and an adequate block was achieved. There were no intraoperative complications and a healthy baby was delivered. However, on the third postoperative day, the patient complained of a moderate frontal headache which was throbbing in nature and relieved when the supine position was adopted. There were no neurological deficits or neck rigidity. It was treated as a postdural puncture headache (PDPH) with analgesics, bed rest and hydration. The headache subsided by the next day. However, on the sixth postoperative day, the patient complained of a severe headache which extended to the occipital region and the neck. It was neither relieved by adopting the supine position, nor did it respond to analgesics. There were no neurological deficits. However, the headache was associated with hypertension and bradycardia. To rule out any intracranial pathology, a computed tomography scan was performed. A neurosurgery

consultation was made and magnetic resonance imaging (MRI) was performed as it was considered to be of better discriminative value in diagnosing other secondary causes of postpartum headaches, including coexistent cerebral venous thrombosis. The MRI scan showed a subdural haematoma (Figure 1). It was managed conservatively

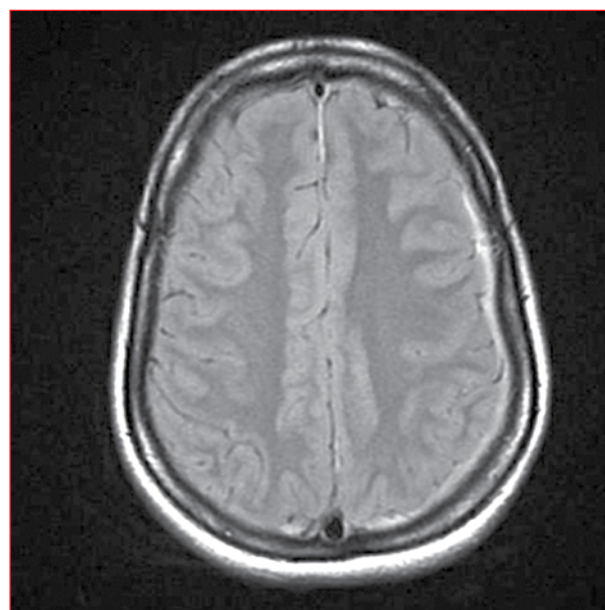


Figure 1: A subdural haematoma

because of the small size of the subdural hematoma and the absence of significant symptoms in the patient. Her headache subsided by the next day. Her remaining stay in hospital was unremarkable. She was symptom-free at the three-month follow-up visit.

Discussion

A postpartum headache is commonly encountered in clinical practice.¹ The aetiologies are broadly classified as primary and secondary. Primary headaches generally include migraines and tension headaches. The hormonal changes characterised by sustained elevated estrogen levels during pregnancy, followed by estrogen withdrawal after delivery, can explain the recurrence of migraine headaches in the postpartum period.² Ovarian steroids play a critical role in serotonin metabolism, which accounts for the relief of migraines in pregnancy and their recurrence after delivery.³

Secondary headaches include PDPHs, pre-eclampsia and eclampsia, cerebral venous thrombosis, bleeds from vascular malformations, posterior reversible encephalopathy, tumours and infection.^{3,4} Conditions like pituitary apoplexy, reversible cerebral vasoconstriction syndromes, aneurysmal bleeds and cerebral venous thrombosis can have catastrophic presentations. Early neuroimaging is indicated in individuals who show signs of raised intracranial pressure and focal neurological deficits or seizures. Imaging becomes mandatory when a headache that is presumed to be due to a migraine, tension, eclampsia or PDPH, becomes refractory to standard medical management. In a case series of 95 subjects with postpartum headaches, neuroimaging was indicated in 22 subjects. Of these, 15 (68.3%) showed abnormalities which included pituitary haemorrhage, cerebral venous thrombosis, posterior reversible encephalopathy, inflammatory lesions and subarachnoid haemorrhage.³

PDPHs are a commonly reported complication of spinal anaesthesia.⁵ Severe headaches have been reported which classically worsen when the patient is in an upright position, and improve when he or she is in the supine position. These usually occur within 48-72 hours of spinal anaesthesia, and can persist for up to two weeks. PDPHs are often associated with accidental dural puncture during epidural anaesthesia. Higher frequency of PDPHs has been noted with Quincke, compared to pencil-point, needles.⁶ A postulated mechanism is that persistent cerebrospinal fluid leakage through the dural puncture site leads to caudal displacement of the brain, with traction on pain-sensitive structures.⁷ In addition, the reduced cerebrospinal fluid (CSF) volume results in compensatory vasodilatation and increased intracranial blood volume according to the Munro Kellie doctrine.⁸ PDPHs are mostly benign and self-limiting. They usually respond to adequate hydration and analgesics. Neuroimaging is not routinely indicated, unless the headache is refractory. Use of a therapeutic epidural blood patch has shown benefit over conservative treatment

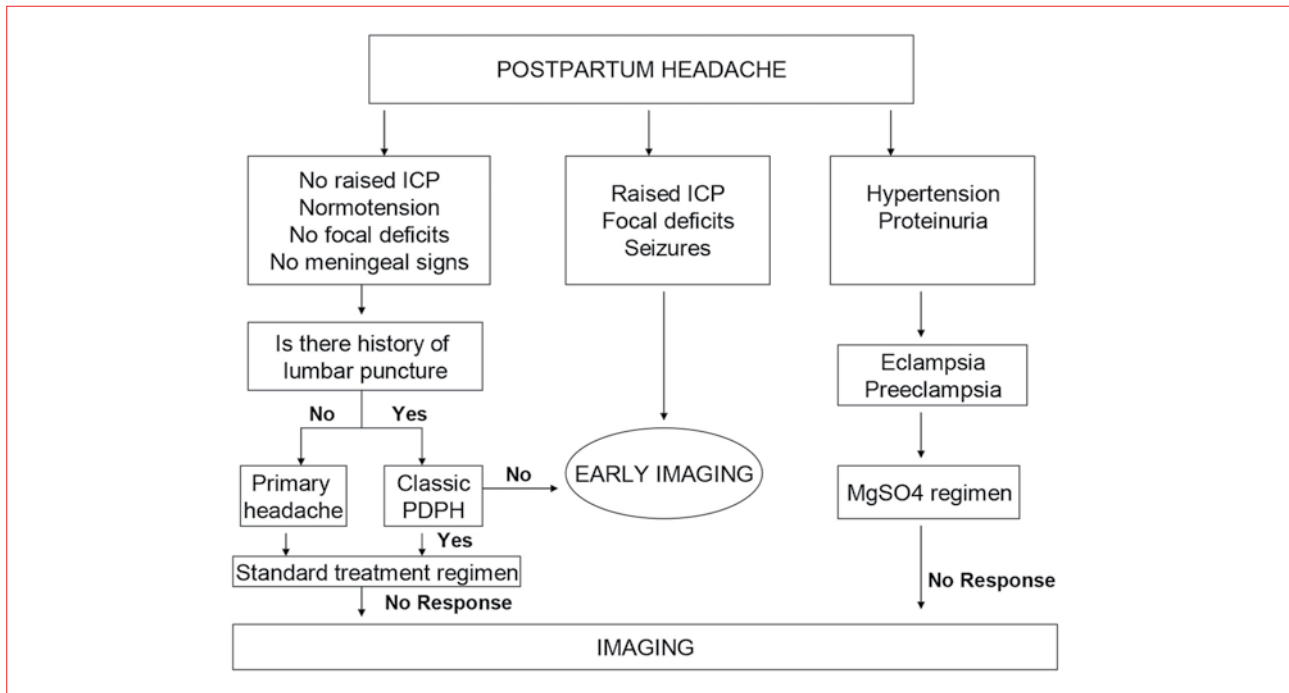
strategies.^{9,10} It is important to note that 15% of patients have a persistent headache (chronic PDPH), even after six weeks, if only treated with conservative management.¹¹

Subdural haematomas and cerebral venous thrombosis (CVT) relate to decreased intracranial pressure. Though rarely reported, they need to be ruled out, especially if there is a change in the character or severity of the PDPH. Subdural haematomas can occur owing to traction on the bridging veins which can cause a gradual constant leakage of blood.¹² The steady extravasation that leads to subsequent accumulation can explain the initial mild presentation and late appearance of signs of raised intracranial pressure.^{7,12} Venous stasis, traction on venous sinuses and increased venous viscosity with impaired CSF reabsorption, can predispose to cerebral venous thrombosis.¹³ Contributing factors to subdural haematomas include trauma, bleeding diathesis, cerebral atrophy and use of anticoagulants.⁷ Haemostatic imbalances and differences in elasticity of dura can explain the higher occurrence of subdural haematomas in pregnant women.¹⁴ The simultaneous occurrence of both CVT and subdural haematomas in the same patient has also been reported in the literature.¹⁵ Large haematomas requiring craniotomy and evacuation have also been reported in literature.^{16,17} Epidural blood patches, as a therapeutic option, can cease the CSF leak which is the primary cause of the decreased intracranial pressure and subsequent development of subdural haematomas.¹⁸ However, it may not be safe in the presence of large space-occupying lesions, signs of raised intracranial pressure, or lateralising focal neurological deficits.¹⁸ It has been described that an epidural blood patch may not reliably prevent the subsequent development of subdural haematomas in cases of PDPH.¹⁹

Our patient had symptoms that were suggestive of a PDPH, which initially responded well to conservative treatment. However, there was a reappearance of the headache with a definite change in character and severity. There were also signs that were indicative of raised intracranial pressure. Because of these warning signs, MRI was carried out which revealed a subdural haematoma. Fortunately, the size of the haematoma was small and only conservative treatment was required. At the three-month follow-up visit, the patient was symptom-free.

An atypical PDPH, accompanied by changes in character, with the disappearance of the postural aspect to it, warrants investigations to rule out potentially catastrophic causes, such as a subdural haematoma. It is possible that, following lumbar puncture and spinal anaesthesia, subdural haematomas are under-reported.

Taking a comprehensive history, making an early diagnosis and management intervention are mandatory for a good prognosis. In atypical cases, the need for early neuroimaging must be integrated. Figure 2 features an algorithm for the initial assessment and management of postpartum headaches.



ICP: intracranial pressure, MgSO4: magnesium sulphate, PDPH: postdural puncture headache

Figure 2: Suggested algorithm for the workup of a postpartum headache

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