



## Three cerebral venous sinus thromboses following inadvertent dural puncture: a case series over an eight-year period

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### To the Editor,

Accidental dural puncture is a recognized complication of epidural anesthesia. Cerebral venous sinus thrombosis (CVST) has previously been linked to accidental dural puncture, although its true incidence is unknown.<sup>1</sup> We perform approximately 3,500 epidurals per year in our department, and over an eight-year period, three patients were found to have a CVST after investigation of a persistent post-dural puncture headache (PDPH). Therefore, in our view, CVST should be considered in all patients complaining of persistent headache despite epidural blood patching, including those who present with new neurological symptoms.

All three of our patients were provided with epidural anesthesia for labour that was complicated by a dural puncture. An intrathecal catheter was subsequently placed in one patient, and a repeat epidural was performed in the other two patients. A classical PDPH associated with nausea and vomiting developed in all three patients.

An epidural blood patch was performed on two of the patients after the third and fourth postpartum days, respectively; the third patient declined secondary to anxiety about the procedure. The blood patch resolved the postural headaches in both cases.

Both patients who received the patch were discharged home but presented 48 hours later with new neurological symptoms (one with dysphasia and the other with

dysarthria), including non-postural headaches, and were found to have a CVST on magnetic resonance imaging (MRI) (Figure). The third patient developed dyspraxia and agnosia on postpartum day four; an MRI confirmed a CVST and a parietal infarct.

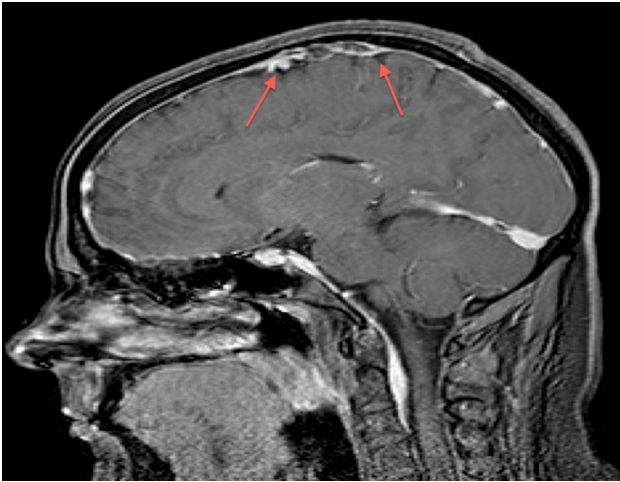
All three patients made a good recovery after treatment with unfractionated heparin for 24 hours, and they were discharged on warfarin for six months.

In addition to several reports of CVST presenting as PDPH after unintentional dural puncture in pregnancy,<sup>1-3</sup> CVST has also been reported after lumbar puncture in the non-pregnant population, particularly with malignancy.<sup>4</sup> It has been speculated that the mechanism of CVST is due to excessive leakage of cerebrospinal fluid (CSF) from the dural puncture site. The volume of CSF is thus reduced, first lowering the intraspinal pressure and subsequently the intracranial pressure. This alteration in cerebrospinal dynamics induces a caudally directed movement of the spinal cord with traction and traumatic damage to the fragile venous endothelium, which then triggers venous vasodilatation and resultant stasis. Indeed, Canhao *et al.* used transcranial Doppler to show a decrease in the velocity of cerebral sinus blood flow after dural puncture.<sup>5</sup> Thus, a classic Virchow's triad of stasis, endothelial damage, and hypercoagulability (of pregnancy or malignancy) may lead to the CVST.

This case series emphasizes the importance of considering CVST in the differential diagnosis of a recurring PDPH, even after a successful epidural blood patch and especially if the headache is not postural in nature. Other causes of late PDPH headache include migraine, pregnancy-induced hypertension, meningitis, and intracranial hemorrhage.<sup>2</sup> Prompt diagnosis and early anticoagulation therapy likely contributed to the good outcome in our patients.

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**Figure** Magnetic resonance image of the cerebral venous thrombosis (indicated by the arrows) in the superior sagittal sinus

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