

## NEUROLOGICAL PICTURE

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## An unusual "empty delta sign"

**A** 34 year old man developed fever, right ear pain, and diffuse pulsatile headache 10 days prior to admission. Five days later he noticed difficulty in walking, instability, and intention tremor. Neurological examination showed a wide base gait, stance instability, slurred speech, bilateral horizontal nystagmus, intention tremor, four limb dysmetria, and dysdiadochokinesia. There were no signs of intracranial hypertension or cranial nerve dysfunction. Otoscopy revealed a hyperemic right tympanic membrane. Computerised tomography (CT) scan showed slow emptying of contrast in the left transverse sinus with an image very similar to that described as empty delta sign (fig 1A). Lumbar puncture showed clear cerebrospinal fluid (CSF) with 138 leucocytes (98% of lymphocytes), 137 mg/dl of protein, and 60 mg/dl of glucose. CSF immunological reactions and culture for microorganisms were negative. Ceftriaxone was prescribed for a probable infectious process in the right ear. The patient showed clinical improvement, and neurological examination three days later was normal but the CT scan image remained unchanged. Magnetic resonance imaging (MRI) showed a round image in the left transverse sinus that was hyperintense on T2 weighted (fig 1B) and hypointense on T1 weighted imaging (not shown). MR venography (MRV) confirmed the presence of a thrombus in the left transverse sinus (fig 1C). This patient did not receive anticoagulants because of his rapid improvement. Extensive screening excluded thrombophilia, vasculitides, and infections. He was released from the hospital fully recovered and has been well for the past two years.

## Comment

Cerebral venous thrombosis (CVT) may have heterogeneous clinical presentations.<sup>1</sup> This case is unusual in that it manifested as an isolated cerebellar syndrome, which is an uncommon presentation of lateral sinus thrombosis.<sup>2</sup> The clinical presentation could presumably be explained by abnormal venous drainage of the cerebellum. In addition, CT showed an uncommon image in the left transverse sinus that can be interpreted as a variant of the empty delta sign. This sign has traditionally been considered a specific image of dural sinus thrombosis, and is found in approximately one third of patients, particularly in thrombosis of the superior sagittal sinus. MRV and T2 weighted images are now the diagnostic technologies of choice for showing CVT.<sup>3</sup>

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## References

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- 2 Kuehnen J, Schwartz A, Neff W, et al. Cranial nerve syndrome in thrombosis of the transverse/sigmoid sinuses. *Brain* 1998;121:381-8.



**Figure 1** (A) Contrast enhanced CT showing slow emptying of the left transverse sinus with an image resembling an empty delta sign. (B) Fast spin echo T2 weighted MRI revealing a round, hyperintense signal in the left transverse sinus. (C) MRV showing a filling defect in the left transverse sinus, confirming the presence of a thrombus.

- 3 Selim M, Fink J, Linfante I, et al. Diagnosis of cerebral venous thrombosis with echo-planar T2\*-weighted magnetic resonance imaging. *Arch Neurol* 2002;59(6):1021-6.