

LETTER / *Neuroradiology*

## Reversible cerebellar herniation after epidural blood patch in a patient with spontaneous intracranial hypotension



**Keywords** Cerebellar herniation; Epidural blood patch; Magnetic resonance imaging (MRI); Spontaneous intracranial hypotension

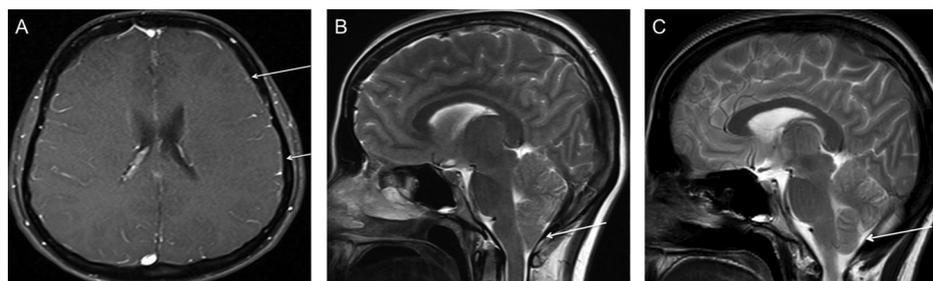
Dear Editor,

We report a case of reversible cerebellar herniation in a woman with spontaneous intracranial hypotension (SIH) that favorably resolved after epidural blood patch (EPB).

A 32-year-old woman suffering from headaches with increasing severity in an upright position lasting for the last six months was admitted to our neurosurgery department. Magnetic resonance imaging (MRI) revealed slight dural thickening and pachymeningeal enhancement on the left frontoparietal lobe (Fig. 1A). MRI findings in addition to typical headache were suggestive of SIH and the patient was instructed to follow conservative treatment. Two months later, she complained of worsening of her headache despite her full compliance to the treatment. Repeat MRI examination revealed cerebellar tonsillar herniation in addition to the previous findings (Fig. 1B). Tonsillar herniation was considered as a possible explanation for headache. The characteristics of the headache, presence of the headache at first admission, and dural thickening and dural enhancement suggested SIH. EPB was thus offered to the patient. Four days later, EPB was performed using 5 mL of autologous venous blood slowly injected into the epidural area at

the L4/L5 level under fluoroscopic guidance. The patient's symptoms dramatically improved within the first days after the treatment, and follow-up MRI showed resolution of the dural enhancement and cerebellar herniation (Fig. 1C).

SIH is now an increasingly recognized condition, which is commonly caused by the loss of cerebrospinal fluid (CSF) [1]. SIH typically characterized an orthostatic headache, yet the disease could manifest as several symptoms, which might lead to misdiagnosis [1]. The most reliable imaging finding is the presence of extrathecal CSF on computed tomography (CT) or MR-myelography [1]. Subdural fluid collections, pachymeningeal enhancement, and sagging of the brain are the other cardinal findings of SIH on conventional MRI [1]. EPB is a well-established minimally invasive treatment of SIH [1]. Researchers have questioned the fundamentals behind the therapeutic effect of EPB on SIH, and two main explanations have been proposed [2]. First, the autologous blood rapidly corrects reduced pressure in the epidural area, substantially reducing CSF leakage from subarachnoid to epidural space by pressure; therefore, leading to dramatic improvements of the symptoms [2]. Second, the autologous blood rapidly coagulates in the epidural space, and if it reaches, might permanently close the potential defect in the dura [2]. Cerebellar herniation is also a complication of SIH, which is a consequence of pressure alterations. Therefore, we assume that the rapid increase in CSF pressure after EPB should be the main factor reversing the tonsillar herniation in our patient. To date, reversed cerebellar tonsillar herniation in SIH after appropriate treatment have been reported three times [3,4]. Two patients were treated with EPB and one with conservative treatment. Of these, good quality MR images were reported only in once [3]. In conclusion, cerebellar herniation in SIH might be recognized by careful



**Figure 1.** A 32-year-old woman with spontaneous intracranial hypotension. A. T1-weighted MR image (TR/TE = 600/17 ms) in the transverse plane obtained after intravenous administration of a gadolinium chelate shows mild thickening of the dura and contrast enhancement of the pachymeninges adjacent to the left frontoparietal lobe (arrows). B. T2-weighted MR image (TR/TE = 4010/108 ms) in the sagittal plane shows herniation of the cerebellar tonsils (arrow). C. T2-weighted MR image (TR/TE = 4010/108 ms) in the sagittal plane after epidural blood patch shows complete regression of cerebellar tonsillar herniation (arrow).

interpretation of the clinical and imaging findings, and accurate diagnosis is essential to avoid unnecessary surgery and apply appropriate therapy.

#### Disclosure of interest

The authors declare that they have no competing interest.

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