

Progressive subdural hematomas after epidural blood patch for spontaneous intracranial hypotension

Satoru Takeuchi · Yoshio Takasato · Hiroyuki Masaoka · Takanori Hayakawa · Naoki Otani · Yoshikazu Yoshino · Hiroshi Yatsushige · Takashi Sugawara

Received: 31 July 2009 / Accepted: 28 September 2009 / Published online: 2 February 2010
© Japanese Society of Anesthesiologists 2010

To the Editor:

Spontaneous intracranial hypotension (SIH) is an increasingly recognized disorder of cerebrospinal fluid (CSF) volume depletion presenting with a postural headache and CSF pressure <60 mm H₂O. The headache typically resolves with bed rest and hydration, although an epidural blood patch (EBP) or epidural saline infusion may provide alternative and effective treatments. Subdural hematomas (SDHs) are frequently associated with SIH, although progressive SDH after EBP for SIH is extremely rare. Herein, we present a rare case of progressive SDH after EBP for SIH.

A 48-year-old woman presented with a severe headache. On admission, the headache was clearly a postural feature, being aggravated when she was erect and relieved when she was supine. Physical and neurological examinations were normal. Initial CSF pressure was 60 mm H₂O. A brain computed tomography (CT) scan (Fig. 1a) and coronal fluid attenuation inversion recovery (FLAIR) image (Fig. 1b) showed thin, bilateral SDHs. T₁-weighted magnetic resonance image (MRI) with gadolinium enhancement revealed diffuse pachymeningeal thickening (Fig. 1c), consistent with SIH. She was diagnosed with SIH and treated with hydration and rest. Four days after admission, EBP was performed with 10 ml autologous blood injected at the T3–T4 interspace. The following day, although the postural features had disappeared, the headache persisted, and the patient lost consciousness

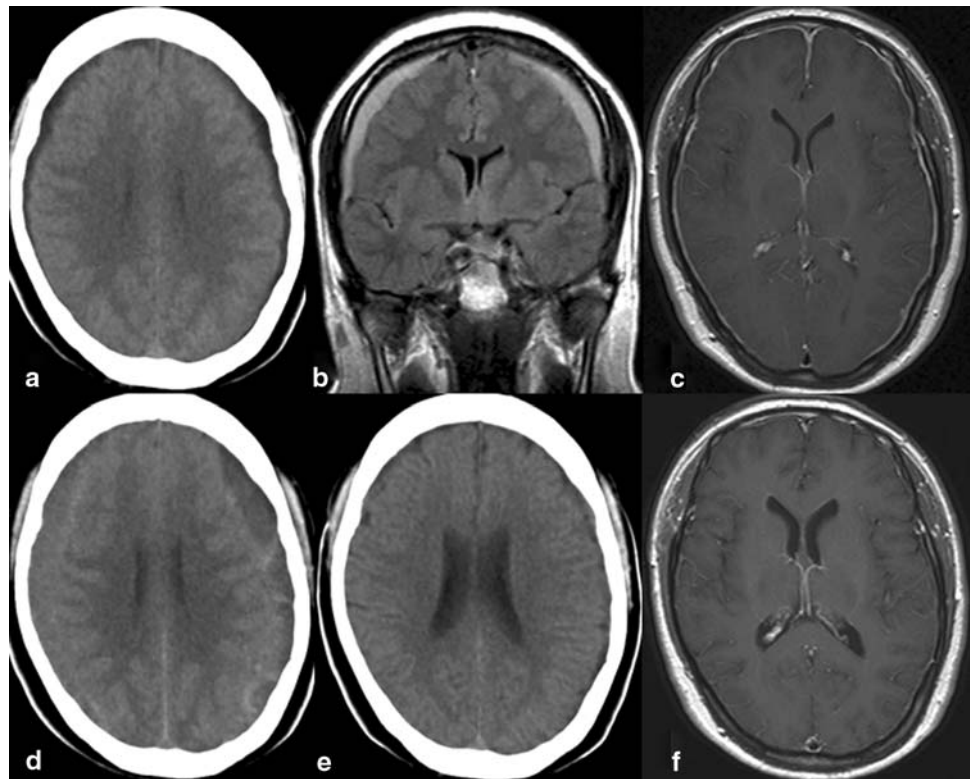
(Glasgow Coma Scale score, 13) 6 days after EBP (10 days after admission). A CT scan demonstrated increased bilateral SDHs (Fig. 1d). Bilateral burrhole irrigations were performed and the patient's consciousness immediately improved. She was discharged with no neurological deficits. A CT scan 1 month after presentation showed disappearance of the hematomas (Fig. 1e). Follow-up T₁-weighted MRI with gadolinium enhancement at 5 months showed disappearance of the SIH signs (Fig. 1f).

Progressive SDH after EBP for SIH is extremely rare, with only two reported cases [1, 2]. Fujimaki et al. [1] reported a patient with thin SDH associated with SIH who underwent burrhole irrigation because of SDH progression 5 days after EBP, and Mikawa and Ebina [2] reported a patient with thin SDH associated with SIH who underwent burrhole irrigation because of oculomotor palsy 18 h after EBP. Interestingly, all three cases (including our patient) complained of a persistent nonpostural headache [1, 2] after disappearance of the postural headache. This observation suggests that persistent nonpostural headache after EBP might be predictive of progressive SDH and that an early CT scan should be performed.

The mechanism responsible for progressive SDH after EBP is unclear. Many reports have suggested that SDH associated with SIH can resolve after CSF leaks are secured; this could be explained by the theory suggesting that SDH with SIH is caused by rupture of the bridging veins as the brain is pulled away from the dura by a decrease in CSF volume. Sato et al. [3], however, suggested that even after CSF leaks were secured, persistent fragility and dilatation of small dural vessels could result in vascular rupture leading to progressive SDH. The present case supports this hypothesis as one possible mechanism of progressive SDH after EBP.

S. Takeuchi (✉) · Y. Takasato · H. Masaoka · T. Hayakawa · N. Otani · Y. Yoshino · H. Yatsushige · T. Sugawara
Department of Neurosurgery, National Hospital Organization Disaster Medical Center, 3256 Midori-cho, Tachikawa, Tokyo 190-0014, Japan
e-mail: s.takeuchi@room.ocn.ne.jp

Fig. 1 Initial computed tomography (CT) scan and coronal fluid attenuation inversion recovery (FLAIR) image (**a**) and coronal fluid attenuation inversion recovery (FLAIR) image (**b**) show thin bilateral subdural hematomas (SDH). Initial axial T₁-weighted magnetic resonance image (MRI) with gadolinium enhancement reveals diffuse pachymeningeal thickening (**c**). Ten-day CT scan (6 days after epidural blood patch) demonstrates progressive SDH (**d**). One-month CT scan shows disappearance of hematomas (**e**). Five-month T₁-weighted MRI with gadolinium enhancement (*axial view*) shows disappearance of signs of SIH (**f**)



References

1. Fujimaki H, Saito N, Tosaka M, Tanaka Y, Horiguchi K, Sasaki T. Cerebrospinal fluid leak demonstrated by three-dimensional computed tomographic myelography in patients with spontaneous intracranial hypotension. *Surg Neurol*. 2002;58:280–4.
2. Mikawa S, Ebina T. Spontaneous intracranial hypotension complicating subdural hematoma: unilateral oculomotor nerve palsy caused by epidural blood patch (in Japanese with English abstract). *No Shinkei Geka*. 2001;29:747–53.
3. Sato Y, Honda Y, Maruoka H, Kunoh H, Oizumi K. Subdural hematoma following disappearance of orthostatic headache and pressure normalization in two patients with spontaneous intracranial hypotension. *Cephalalgia*. 1998;18:60–3.