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# **Bilateral Chronic Subdural Hematomas of the Posterior Fossae**

## **—Case Report—**

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### **Abstract**

An 86-year-old female presented with rare bilateral chronic subdural hematomas (CSHs) of the posterior fossae which were successfully treated by surgical intervention. She had experienced mild head trauma one month before admission. She was transferred to our hospital because of consciousness disturbance and tetraparesis. Magnetic resonance (MR) imaging showed simultaneous occurrence of supratentorial and infratentorial CSHs. We tried to evacuate the CSHs of the bilateral posterior fossae because brainstem compression was markedly severe. Through bilateral burr-hole trepanations, chocolate-colored fluid, not containing clotted components, gushed out under great pressure. Postoperative course was uneventful. MR imaging revealed that the CSHs of the posterior fossae had completely disappeared and brainstem compression had also improved. The patient's neurological deficits were immediately improved after the operation. The patient was discharged one month after the operation for further rehabilitation. Trepanation and evacuation of the hematoma through the posterior fossa might be one of the therapeutic options for posterior fossa CSH, which is similar to supratentorial CSH. However, we considered that the emergency of this rare entity and the method of anesthesia were quite different from supratentorial CSH.

Key words: chronic subdural hematoma, posterior fossa, infratentorial hematoma, trepanation, burr hole

### **Introduction**

Chronic subdural hematoma (CSH) of the posterior fossa is extremely rare in adults, only a few case reports previously reported.<sup>1,2,4,6,11-13,16,18</sup> Burr-hole evacuation and irrigation with or without closed-system drainage has been widely accepted as the optimum method to treat supratentorial CSH,<sup>3,8,14,15,17,19</sup> but the optimal therapeutic strategy for CSH of the posterior fossa is still controversial. Here, we present a case of bilateral CSHs located in the posterior fossae which were successfully treated by posterior fossa trepanation and evacuation of the hematomas.

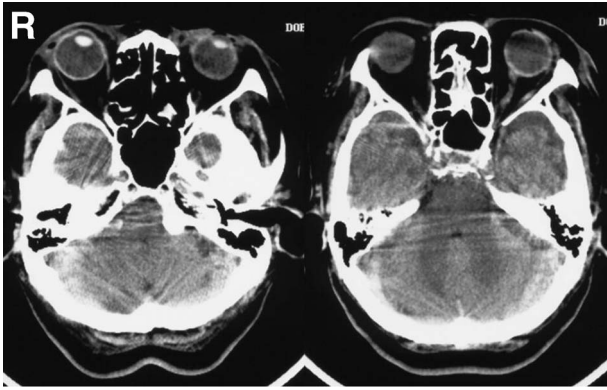
### **Case Report**

A 86-year-old female who had never been treated with antiplatelet therapy or anticoagulation therapy fell down and suffered a blow to her forehead. She demonstrated no neurological deficit at this time. About 2 weeks after this traumatic episode, she became drowsy with vomiting. She was admitted to another hospital. Computed tomography (CT)

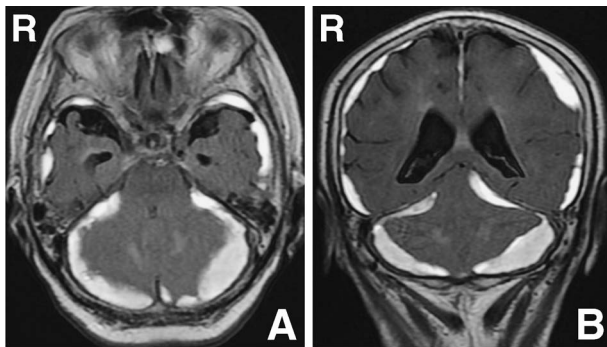
revealed thin acute subdural hematomas in the bilateral posterior fossae (Fig. 1). Although she was treated with conservative therapy, her consciousness gradually deteriorated. About 1 month after the trauma, she was transferred to our hospital for further examination and treatment.

Neurological examination on admission revealed conscious disturbance (Glasgow Coma Scale 9/15) and tetraparesis. Magnetic resonance (MR) imaging demonstrated bilateral supra- and infratentorial subdural space-occupying masses as hyperintense areas on T<sub>2</sub>-weighted images and fluid-attenuated inversion recovery images, which indicated CSH (Fig. 2). Marked compression of the brainstem was observed because of the presence of CSHs in the bilateral posterior fossae. Coronal MR imaging showed no apparent connection between the supra- and infratentorial CSHs, and the bilateral subdural hematomas. Her progressive neurological deficits were thought to result from marked brainstem compression by the CSHs in the posterior fossae, so surgical treatment for these bilateral CSHs was carried out.

To treat both CSHs at one time, the patient was placed in the prone position under general anesthesia. The head



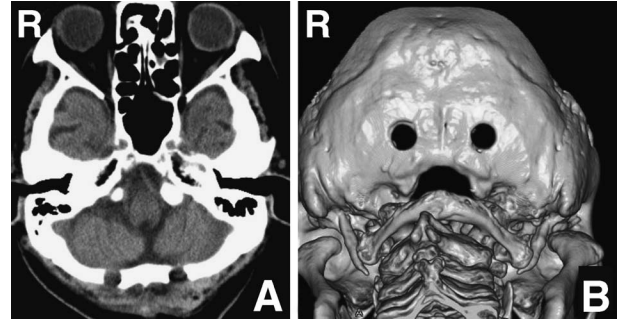
**Fig. 1** Computed tomography scans performed 2 weeks after the traumatic episode revealing acute subdural hematomas in the bilateral posterior fossae.



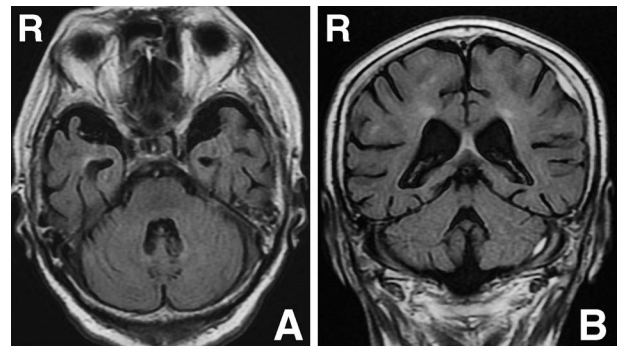
**Fig. 2** A: Preoperative axial fluid-attenuated inversion recovery (FLAIR) magnetic resonance (MR) image showing bilateral supra- and infratentorial subdural space-occupying masses indicating chronic subdural hematoma (CSH), and marked compression of the brainstem. B: Coronal FLAIR MR image showing no connection between the supra- and infratentorial CSHs.

was fixed with flexion of the neck. Midline skin incision from theinion to the C7 level was made and the suboccipital muscles were retracted bilaterally for sufficient exposure of the occipital bone and the atlas lamina, as in the midline suboccipital approach. Bilateral burr-hole trepanations were performed on each side of the occipital bone. After the dural incision, typical outer membrane of the CSHs was observed. Chocolate-colored fluid gushed out under great pressure after puncturing the outer membrane on both sides. The hematomas were evacuated and irrigated with ACF-95 (Otsuka Pharmaceutical Factory, Inc., Naruto, Tokushima), an artificial CSF that is similar to physiological CSF.<sup>7)</sup> The subdural space was thoroughly rinsed. No drain was placed because sufficient re-expansion of the bilateral cerebellum was confirmed. Finally, the wound was closed in standard fashion.

Postoperative course was uneventful. CT demonstrated the localization of the bilateral trepanations (Fig. 3). MR imaging performed 14 days after surgery showed disappearance of the CSHs in the posterior fossae, and the



**Fig. 3** Postoperative computed tomography scan (A) and three-dimensional reconstruction image (B) showing the placement of the bilateral burr-hole trepanations.



**Fig. 4** A: Postoperative axial fluid-attenuated inversion recovery (FLAIR) magnetic resonance (MR) image performed 14 days after the surgery revealing disappearance of the chronic subdural hematomas (CSHs) of the bilateral posterior fossae. B: Coronal FLAIR MR image demonstrating disappearance of the CSHs of the posterior fossa, and spontaneous reduction of the supratentorial CSHs.

CSHs located in the supratentorial regions were also reduced after conservative treatment (Fig. 4). Her clinical condition improved immediately after surgery. She regained consciousness and her tetraparesis was improved. One month after the surgery, she was discharged for further rehabilitation.

## Discussion

CSH is one of the most common diseases in neurosurgical practice, and the incidence is reported as 1–2 cases per 100,000 inhabitants per year.<sup>9,18)</sup> However, despite improvements in imaging techniques, CSH of the posterior fossa is extremely rare in the adult population. Only 3 of 535 intracranial subdural hematomas were located in the posterior fossa.<sup>5)</sup> Only 10 cases have been reported since the introduction of CT (Table 1).<sup>1,2,6,11–13,16,18)</sup> These reports highlight the rarity,<sup>1,12,13)</sup> the developmental mechanism,<sup>6,18)</sup> or the difficulty of diagnosis.<sup>2,11,16)</sup>

In general, burr-hole surgery or twist-drill craniostomy over the skull convexity under local anesthesia and slight sedation is often performed for symptomatic supra-

**Table 1** Reported cases of chronic subdural hematoma (CSH) of the posterior fossa

| Author (Year)                               | Age (yrs), Sex | Disease side | Supra-tentorial CSH | Symptoms                         | Treatment                     | Outcome |
|---------------------------------------------|----------------|--------------|---------------------|----------------------------------|-------------------------------|---------|
| Kanter et al. (1984) <sup>13)</sup>         | 59, F          | bil          | no                  | coma                             | surgical evacuation           | poor    |
| Izumihara et al. (1993) <sup>11)</sup>      | 72, F          | bil          | yes                 | lt hemiparesis                   | conservative                  | good    |
|                                             | 70, M          | lt           | yes                 | rt hemiparesis, gait disturbance | conservative                  | good    |
| Ashkenazi and Pomeranz (1994) <sup>1)</sup> | 65, F          | lt           | no                  | vertigo, nystagmus               | suboccipital craniectomy      | good    |
| Kachkov et al. (1999) <sup>12)</sup>        | 41, F          | rt           | no                  | ataxia                           | surgical evacuation           | good    |
| Stendel et al. (2002) <sup>18)</sup>        | 70, F          | bil          | no                  | vertigo, ataxia                  | bil suboccipital trepanations | good    |
| Pollo et al. (2003) <sup>16)</sup>          | 52, F          | bil          | no                  | tetraparesis                     | bil suboccipital trepanations | good    |
| Costa et al. (2004) <sup>6)</sup>           | 64, F          | rt           | no                  | somnolence, ataxia               | suboccipital craniectomy      | good    |
| Berhouma et al. (2007) <sup>2)</sup>        | 38, F          | rt           | no                  | vertigo, ataxia                  | suboccipital craniectomy      | good    |
| Present case                                | 86, F          | bil          | yes                 | stupor, tetraparesis             | bil suboccipital trepanations | good    |

bil: bilateral, F: female, lt: left, M: male, rt: right.

tentorial CSH, and is broadly used in neurosurgical practice.<sup>3,8,10,14,15,17,19)</sup> On the other hand, several therapeutic options should be considered for CSH of the posterior fossa.

Two cases of CSH which occurred in both supra- and infratentorial regions were treated with burr-hole surgery only for the supratentorial CSH, but not for the infratentorial CSH, because the infratentorial lesion was thought to be asymptomatic.<sup>11)</sup> Both two cases demonstrated gradual and complete resolution of CSH located in the posterior fossa after conservative therapy. Based on these 2 cases<sup>11)</sup> and our case, we considered that some unrecognizable connection might exist between supra- and infratentorial CSH, even if MR imaging showed no apparent connection. However, our present patient developed progressive neurological deficits because of brainstem compression caused by CSH in posterior fossa. Therefore, we decided to perform surgical evacuation for infratentorial CSH.

All 8 previous cases which were thought to be symptomatic CSH of the posterior fossa were treated with surgical evacuation, including several surgical approaches.<sup>1,2,6,12,13,16,18)</sup> For example, some cases of unilateral CSH of the posterior fossa were treated with lateral suboccipital craniectomy. However, there are no detailed records of the operative procedure in these reports.<sup>1,2,6)</sup> Therefore, we could not define the area and the size of craniectomy. We considered that small craniectomy, including trepanation or twist drill craniostomy, is sufficient and effective to treat this rare disease, which is a less invasive method. Previous cases of bilateral CSHs of the posterior fossae,<sup>16,18)</sup> which were similar to our case, were treated successfully with evacuation of hematoma by bilateral trepanation. Although the detailed operative procedures were not described,<sup>16,18)</sup> we speculated the method used was very similar to the present procedure. Based on these findings and our experience, we considered that evacuation of hematoma by trepanation, either

unilateral or bilateral, might be an effective surgical approach for CSH of the posterior fossa, which does not differ from supratentorial CSH.

Surgery performed under local anesthesia carries a lesser risk of complications in severely ill or elderly patients,<sup>10)</sup> but general anesthesia was chosen for bilateral trepanation via the midline suboccipital approach in our present patient. Trepanation in the bilateral posterior fossae at one operation requires that the patient be placed in the prone position for a few hours. Therefore, we performed the operation under general anesthesia. General anesthesia would also be suitable for unilateral CSH of the posterior fossa, because the patient must also be placed in the lateral position or prone position. Previous cases have not discussed the requirements of anesthesia.<sup>1,2,6,11-13,18)</sup> However, we considered that general anesthesia is needed for to perform safe surgery of both unilateral and bilateral CSHs of the posterior fossa. This is the most significant difference from surgery for supratentorial CSH.

In conclusion, we considered that the surgical approach for CSH of posterior fossa does not differ from that for supratentorial CSH. However, we should take into consideration the emergency of this rare disease and that general anesthesia might be desirable for surgery, which are the differences with supratentorial CSH.

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