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SURGICAL NEUROLOGY INTERNATIONAL
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Editor: Ather Enam, M.D., Aga Khan University, Karachi, Sindh, Pakistan

Case Report

Chronic subdural hematoma of the posterior fossa treated by suboccipital craniotomy

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Received: 30 June 17 Accepted: 27 November 17 Published: 05 February 18

Abstract

Background: Chronic subdural hematoma (CSDH) of the posterior fossa is uncommon in adults. Only a few cases have been reported, and most of these were secondary to head injury or anticoagulant therapy. We herein describe a case of successful surgical treatment of CSDH in the posterior fossa after surgical removal of a large supratentorial and infratentorial dermoid cyst.

Case Description: A 71-year-old woman underwent removal of a left supratentorial and infratentorial dermoid cyst via a left transzygomatic approach. Three years, 6 months after surgery, screening computed tomography revealed CSDH in the supratentorial and infratentorial regions. Four months later, the patient was transferred to the emergency department with cerebellar ataxia, vomiting, and deterioration of consciousness. Two hematomas, one in the supratentorial region and one in the infratentorial region, were greatly compressing the brain, and seemed to be separate lesions. It was difficult to judge on computed tomography whether there was communication between these two hematoma cavities. The patient underwent hematoma removal via suboccipital craniotomy for the posterior fossa CSDH to resolve brain stem compression. Burr-hole irrigation was used for the supratentorial CSDH to avoid upper herniation. The patient recovered uneventfully and was discharged with no neurological deficits.

Conclusion: Although the optimal treatment for CSDH of the posterior fossa remains unclear because of the limited number of previous reports, direct decompression of the posterior fossa via suboccipital craniotomy should be considered, especially when CSDH exists primarily at the cerebellopontine angle and strongly compresses the brain stem.

Key Words: Chronic subdural hematoma, craniotomy, dermal cyst, posterior fossa, trepanation

Access this article online
Website: www.surgicalneurologyint.com
DOI: 10.4103/sni.sni_239_17
Quick Response Code:

How to cite this article: Mochizuki Y, Kobayashi T, Kawashima A, Funatsu T, Kawamata T. Chronic subdural hematoma of the posterior fossa treated by suboccipital craniotomy. Surg Neurol Int 2018;9:20.
http://surgicalneurologyint.com/Chronic-subdural-hematoma-of-the-posterior-fossa-treated-by-suboccipital-craniotomy/

INTRODUCTION

Chronic subdural hematoma (CSDH) of the posterior fossa is uncommon in adults. Only a few cases have been reported,[2,3,5] and most of these were secondary to head injury or anticoagulant therapy. We herein report a case of successful treatment of CSDH in the posterior fossa that developed after surgical removal of a large supratentorial and infratentorial dermoid cyst. Our report emphasizes the strategy of suboccipital craniotomy with supratentorial burr-hole irrigation.

CASE REPORT

An asymptomatic 71-year-old woman was diagnosed with a left supratentorial and infratentorial dermoid cyst on screening magnetic resonance imaging (MRI) [Figure 1] and admitted to our hospital. She had a past history of atrial fibrillation, tympanoplasty for tympanitis, and total ovariohysterectomy. Removal of the supratentorial and infratentorial cyst was performed via a left transzygomatic approach. The tumor was almost totally resected with no sequelae; the supratentorial and infratentorial compartments remained. Because the patient had a preoperative history of atrial fibrillation, postoperative warfarin therapy was administered to prevent embolism. The patient was followed-up by the outpatient service and developed no recurrence or any abnormal imaging signals in the residual cavity [Figure 2]. Although the patient had no history of head injury, a screening computed tomography (CT) scan performed 3.5 years postoperatively as part of annual follow-up revealed a density change within the supratentorial and infratentorial regions. At that point, we decided to perform periodic follow-ups once monthly because the patient was asymptomatic, and the hematoma did not appear to be compressing the brain stem. Four months after the start of follow-up, the patient was transferred to the emergency department because of cerebellar ataxia, vomiting, and deterioration of consciousness (Glasgow Coma Scale score: E3V4M6) with no paresis. A CT scan revealed enlargement of the hematoma in the posterior fossa and compression of the brain stem [Figure 3]. Two hematomas, one in the supratentorial region and one in the infratentorial region, were greatly compressing the brain, and seemed to be separate lesions. It was difficult to judge on CT whether there was communication between the two hematoma cavities. Because the patient's symptoms were considered to have resulted from compression of the brain stem and cerebellum, we urgently performed hematoma removal under general anesthesia via suboccipital craniotomy with a 6-cm linear incision behind the mastoid process along the hairline for the posterior fossa CSDH. Burr-hole irrigation was performed via a linear incision for the supratentorial CSDH. The tension in the posterior fossa was high, and the outer membrane was seen under the dura mater [Figure 4a]. We resected the outer membrane of the CSDH as completely as possible and copiously irrigated the hematoma cavity. The fluid in both the supratentorial and infratentorial portions was the same reddish brown. After adequate irrigation of both fields, we confirmed communication between the supratentorial and infratentorial spaces. Closed-system subdural drainage catheters were inserted in both cavities until the day after the operation. Postoperative CT scans of the head revealed disappearance of the CSDH in both the supratentorial and infratentorial spaces [Figure 4b and c]. Signal change was also confirmed on postoperative MRI [Figure 4d]. The patient's symptoms gradually subsided, and she was discharged to her home with no neurological deficits on postoperative day 12. Apixaban was prescribed as anticoagulation therapy upon discharge. No recurrence was detected on CT scan 1 month postoperatively. At 1 year, CSDH had not recurred.

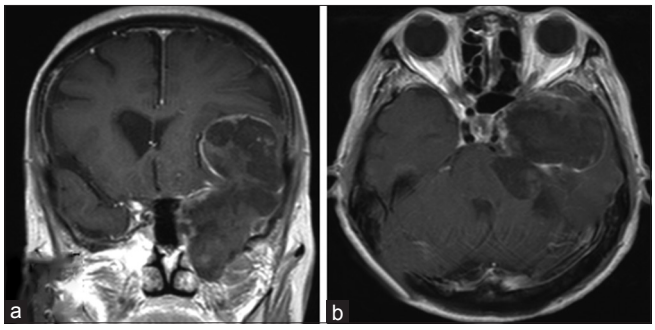

Figure 1: T1-weighted magnetic resonance imaging with contrast enhancement before tumour removal. The images revealed a supratentorial and infratentorial mass with a cyst. (a) Coronal view (b) Axial view

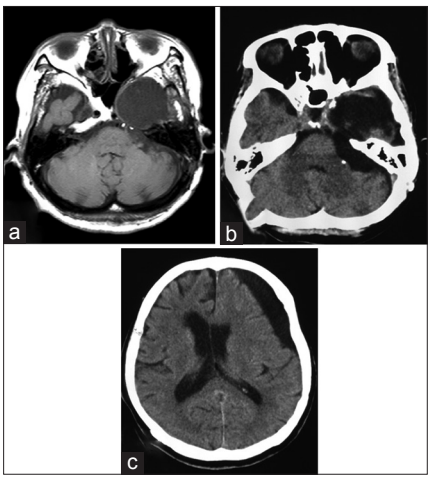

Figure 2: Postoperative imaging findings. (a) T1-weighted magnetic resonance imaging without enhancement 6 months postoperatively showed low signal intensity within the cavity. (b and c) Computed tomography 6 months postoperatively showed low density in the supratentorial and infratentorial cavities

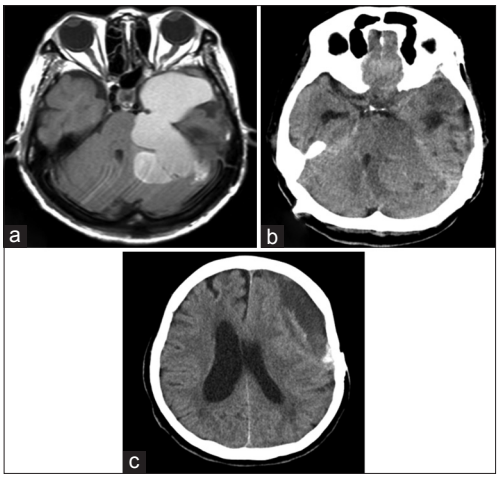

Figure 3: Imaging findings upon admission. (a) T1-weighted magnetic resonance imaging with contrast enhancement on admission showed a signal change from low to mildly high within the cavity. (b) Computed tomography on admission revealed low and iso-density of the infratentorial lesion with compression of the brain stem. (c) The supratentorial lesion also exhibited mixed density on computed tomography

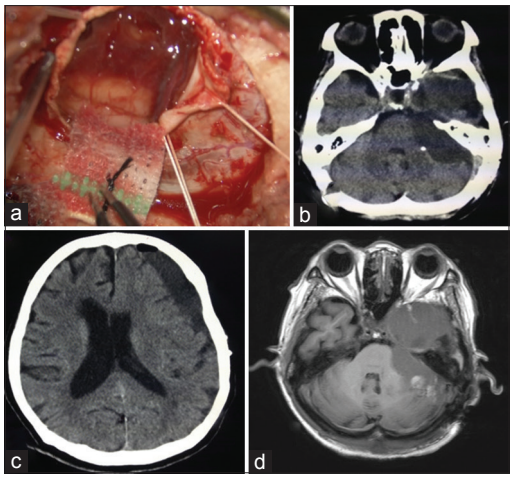

Figure 4: Intraoperative and postoperative findings. (a) Intraoperative image after dural incision shows the outer membrane of the haematoma on the cerebellar hemisphere. (b and c) Computed tomography after haematoma evacuation shows removal of the haematoma and resolution of the brain stem compression. (d) Postoperative MRI shows signal change in the cavity

DISCUSSION

The reported incidence of postoperative CSDH is 1.6% after brain tumor surgery, and the period between craniotomy and development of CSDH ranges from 3 to 5 months (mean, 4.3 months).[4] In the present case, CSDH occurred 3.5 years after tumor removal. To the best of our knowledge, this is the latest reported onset of CSDH after tumor removal.[4]

CSDH of the posterior fossa is rare in adults.[2,3,5] Infratentorial subdural hematomas can result from mild traumatic events, anticoagulation therapy, blood clotting disorders, and intracranial hypotension. In some cases, no cause is found.[1,3] Stendl *et al.* reported that six out of 15 patients with posterior fossa CSDH had taken anticoagulant drugs.[3] Previous reports have indicated that there is no difference in the mechanism of occurrence of supratentorial and infratentorial CSDH.[1] The rather low incidence of CSDH in the posterior fossa may be explained by the rare occurrence of venous sinus injuries and the low number of bridging veins present in the posterior fossa.[3] There are no previous reports of dermoid cyst removal resulting in postoperative CSDH. In our case, the patient did not have a history of head trauma or prolongation of international normalized ratio resulting from anticoagulant drugs. The mechanism of this delayed CSDH is unclear. However, our case indicates that patients with a postoperative cavity who take anticoagulant drugs need periodic imaging follow-up for at least several years.

Previous reports have described surgical drainage (craniotomy or trepanation) and conservative therapy for treatment of CSDH.[1,2] However, the optimal treatment is unknown because of the limited number of reports. In the present case, because the CSDH developed in the residual cavity, the hematoma was mainly located at the anterior surface of the brain stem and cerebellopontine angle, and strongly compressed these structures. Based on the state of the residual cavity, we initially predicted the presence of communication between the supratentorial and infratentorial hematomas; we therefore considered performing only supratentorial irrigation. However, we removed the hematoma via suboccipital craniotomy for the posterior fossa CSDH and with burr-hole irrigation for the supratentorial CSDH for the following two reasons. First, the patient developed vomiting and cerebellar ataxia without paresis, and we considered these symptoms to be caused by severe compression of the brain stem. CSDH in the posterior fossa often causes nonspecific symptoms.[1] More than half cases of CSDH in the posterior fossa are associated with symptoms such as vertigo, cerebellar ataxia, and nystagmus without hemiparesis.[2] Because the hematoma in the present case was mainly located at the left cerebellopontine angle and anterior surface of the brain stem, and not on the surface of the cerebellar hemisphere, we had to directly open the cerebellopontine angle to resect the outer membrane and irrigate the hematoma via suboccipital craniotomy. Second, although we performed preoperative MRI, it was not clear whether a communication existed between the supratentorial and infratentorial hematomas. Additionally, even if such hematomas communicate, adequate irrigation is difficult if approached only from the supratentorial portion.

We finally confirmed the presence of communication between the supratentorial and infratentorial compartments and observed drainage to the infratentorial

space upon irrigation of the supratentorial portion. Because we opened the top and bottom of the long hematoma cavity, including both the supratentorial and infratentorial portions, gravity induced the formation of a spontaneous drainage route, and complete removal of the hematoma was achieved.

CONCLUSION

We have herein described suboccipital craniotomy with supratentorial burr-hole irrigation for resolution of brain stem compression resulting from CSDH in the posterior fossa, with a good functional outcome. From a clinical viewpoint, we recommend that clinicians consider direct decompression of the posterior fossa via suboccipital craniotomy, especially when CSDH exists primarily in the cerebellopontine angle and strongly compresses the brain stem.

Disclosure

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this article.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initial will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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