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Case Report

Surgery Section

Remote Cerebellar Haemorrhage after Burr Hole Drainage of Chronic Subdural Haematoma: A Case Report

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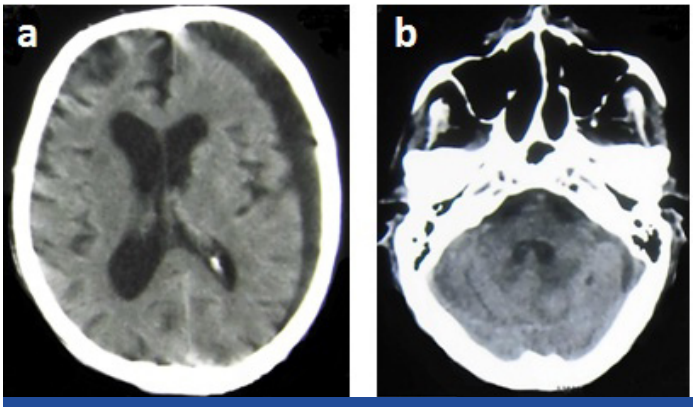
ABSTRACT

Remote cerebellar haemorrhage (RCH) is an unusual complication of supratentorial neurosurgical procedures. Even the rarer is cerebellar haemorrhage occurring after supratentorial burr hole drainage of Chronic Subdural Haematoma (CSDH). The exact mechanism is still unclear despite some possible causative factors such as rapid evacuation of haematoma and overdrainage of CSF (Cerebrospinal Fluid). We report a 80-year-old male patient who developed cerebellar haemorrhage after burr hole drainage of left frontoparietal chronic subdural haematoma and discuss the possible aetiological mechanisms through the review of the current literature.

Keywords: Overdrainage, Remote site haemorrhage, Supratentorial burr hole

CASE REPORT

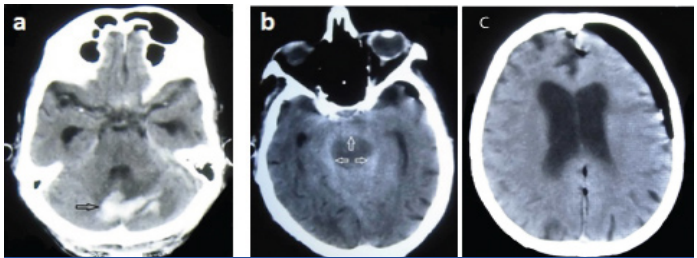
An 80-year-old male patient had been admitted to an outpatient neurology clinic with two-week history of gradually increasing headache and newly presenting right haemiparesis. Upon detection of left frontoparietal chronic subdural haematoma in Cranial CT (Computed Tomography), the patient had been referred to our clinic. There was a 3-month history of minor head trauma as a result of fall to the ground. Hypertension was the only systemic disease which was under control with only one antihypertensive drug. The physical and laboratory examinations were unremarkable. Cranial CT scan revealed left frontoparietal chronic subdural haematoma with no abnormality in the posterior fossa [Table/Fig-1a,b]. Preoperative coagulation parameters were within normal limits. After preoperative evaluations the patient underwent an operation of supratentorial burr hole drainage of chronic subdural haematoma through two burr holes. During the operation; immediately after the opening of the dura, rapid evacuation of haematoma (nearly 100 ml) suddenly drained and additional 200 ml of CSF drained from the burr hole in a few minutes. Intraoperative blood pressure was monitored continuously and remained within normal limits. The procedure was completed without any obvious complication. At the end of the operation, a subdural frontal closed system of drainage without negative pressure was placed. Postoperative recovery was uneventful. The patient had no neurological abnormality on the first day of operation. Postoperative CT which was taken approximately 2 hours after the operation revealed cerebellar haemorrhage, perimesencephalic subarachnoid haemorrhage and successful evacuation of subdural haematoma was done [Table/Fig-2a-c]. No surgical intervention was considered and the patient was followed conservatively including close neurological observation in the clinic. The admission was prolonged to 15 days because of an electrolyte imbalance emerged after the operation which was corrected successfully in that interval. No prompt neurological abnormality was noted other than a slight tendency to sleep for the first 2 days after the day of operation. Postoperative CT scan taken on postoperative day 15 revealed the resolution of both subdural haematoma and cerebellar haemorrhage [Table/Fig-3a,b]. The patient was discharged from hospital with no neurological deficit. At 6-month follow-up no abnormality was noted.



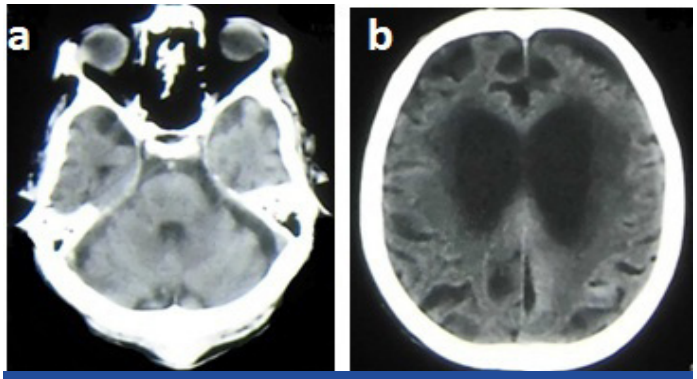
[Table/Fig-1a,b]: a) Preoperative CT scan reveals left frontoparietal chronic subdural haematoma and mild compression of the frontal horn of the left lateral ventricle. b) No abnormal finding is seen in the cerebellum

DISCUSSION

Postoperative intracranial haematomas generally occur at the site of the surgery, mostly due to insufficient hemostasis. Intracranial haematomas occurring at the sites remote from the initial operation are called remote intracranial haemorrhage. Remote cerebellar haemorrhage after supratentorial surgery is the most common type of remote intracranial haemorrhage [1-3]. However, remote cerebellar haemorrhage occurring after supratentorial burr hole drainage of chronic subdural haematoma is a more seldom presentation. The rate of remote cerebellar haemorrhage after all types of supratentorial surgery is 0.3%-0.8% in different series [4,5]. The rate of RCH after burr hole evacuation of CSDH is rarer. In the series of Park et al., the number of RCH after burr hole evacuation of CSDH was 1 in 695 cases [4].



[Table/Fig-2a,b]: a) Postoperative CT scan taken 2 h after surgery reveals cerebellar haemorrhage shown with black arrow. b) Postoperative CT scan reveals perimesencephalic subarachnoid haemorrhage shown with white arrows. c) Postoperative CT scan reveals successful evacuation of subdural haematoma and postoperative air in the subdural space.



[Table/Fig-3a,b]: a)Postoperative CT scan taken on postoperative day 15 reveals the resolution of cerebellar haemorrhage. b) Postoperative CT scan taken on postoperative day 15 reveals no subdural haematoma.

Several possible causative factors have been suggested such as hypertension, blood coagulopathy, jugular venous compression during surgery, rapid evacuation of a haematoma and overdrainage of CSF, although the actual pathophysiological mechanism still remains unclear [3,4]. Despite all these suggested mechanisms, no exact pathophysiology has been found to properly explain its occurrence. Blood coagulopathy was initially suggested as a causative factor [5,6]. However in some cases reported, there was no coagulation abnormality or usage of drugs that influence coagulation cascade [1,7,8]. In our case, there was no coagulation abnormality or history of recent use of drug leading to coagulation abnormality.

Venous obstruction as a result of head rotation and neck extension during surgery was introduced as another possible mechanism behind RCH after supratentorial surgery [9]. However, no extensive head rotation or neck extension is required in the surgery for burr hole evacuation of CSDH. In our case, no head rotation or neck extension were required for burr hole evacuation of CSDH and we concluded that head rotation or extension is unlikely to contribute to RCH.

Arterial hypertension is another contributing factor since arterial hypertension itself is associated with cerebellar haemorrhage [10]. Hypertension was noted in 33.1% of the patients with RCH [4]. Preoperative and intraoperative hypertension was emphasized as an important cause of postoperative cerebellar haemorrhage [11].

However, since RCH has been reported even in the absence of arterial hypertension, another theory was developed accusing venous bleeding of leading to RCH [12]. In our case preoperative, intraoperative and postoperative blood pressure was monitored and found in normal limits. König et al., pointed out that a sudden decrease in the overall CSF content of the brain result in a significant reduction in the intracranial pressure which facilitates the rupture of the cerebellar veins and thus cerebellar haemorrhage [5]. In our case, beside cerebellar haemorrhage, there was also perimesencephalic subarachnoid haemorrhage which is believed to occur as a result of the rupture of the perimesencephalic veins and/or venules which also supports this theory [13].

Park et al., emphasized intraoperative and postoperative loss of large amounts of CSF as the most important factor leading to RCH after supratentorial surgery [4]. König et al., suggested that the significant reduction in the intracranial pressure occurring after the removal of CSF lead to an increase in venous pressure resulting in haemorrhage [5]. Excessive drainage of CSF is believed to be aggravated by displacement of the posterior fossa content, and the resultant stretch and rupture of the cerebellar veins lead to haemorrhage [14]. This theory is supported by the fact that RCH may also occur after spinal loss of CSF [15]. The occurrence of RCH after aneurysm surgery which include large amount of cisternal CSF drainage is another fact supporting this theory. In our case, a rapid evacuation of haematoma and CSF (nearly 300 ml) were observed contributing to all these conclusions.

CONCLUSION

We have seen remote cerebellar haemorrhage seen after burr hole evacuation of chronic subdural haematoma is a rare condition, it is essential to be aware of the possible pathophysiological mechanisms of this rare entity and avoid rapid evacuation of haematoma and loss of large amounts of CSF during the surgery in order to decrease its possibility of occurrence.

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