

Case Report

Remote cerebellar hemorrhage: Report of two different cases

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Abstract

Background: Remote cerebellar hemorrhage (RCH) is a rare complication after supratentorial craniotomies, which usually presents as linear hemorrhages on the surface of the cerebellum; the exact mechanism of it is not established yet.

Case Description: In case one, a 57-year-old patient demonstrated hemorrhage in the cerebellar sulci in favor of RCH 2 days after craniotomy for sphenoidal wing meningioma resection. He was asymptomatic and showed good prognosis after conservative treatment. However, in the second case, a 21-year-old man presented with symptomatic RCH just after the surgery for resection of huge intraaxial parietooccipital lesion. He had a poor prognosis despite the treatment and died ultimately.

Conclusion: Although some studies reported the good prognosis for this type of hemorrhage, it can cause neurological and clinical deterioration and result to patient death.

Key Words: Postoperative complication, remote cerebellar hemorrhage, supratentorial craniotomy

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BACKGROUND

Remote cerebellar hemorrhage (RCH) after supratentorial surgery is rare, ranging between 0.08% and 0.6% in the literature, with poorly-understood underlying mechanisms.^[2] Here, we report two cases of RCH after supratentorial craniotomy with two different presentations and outcomes.

CASE DESCRIPTION

Case 1

A 57-year-old male was presented with headaches, gait problem, and dizziness. Physical examination showed no significant deficits. The brain imaging demonstrated an enhancing extra-axial mass in the left frontal lobe adjacent to the left carotid artery bifurcation in favor of inner third sphenoidal wing meningioma [Figure 1a].

Preoperative lab tests, including coagulopathy tests, were normal.

Under general anesthesia and in supine position, the patient's head was positioned in a slight extension and rotation to the right while fixed on Mayfield head fixation. Adopting pterional and transsylvian approaches, the sphenoid wing meningioma was resected completely

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with no significant intraoperative complication. Postoperation, the patient, alert and oriented, was transferred to the neurosurgical intensive care unit (ICU), with no new neurological deficit. Postoperative brain computed tomography (CT) scan showed a moderate volume of pneumocephalus bifrontally, little epidural hematoma, small contusions, and hematoma in the surgical field [Figure 1b].

The patient was stable neurologically and hemodynamically, with mean blood pressure between 90 and 110 mmHg. All lab tests, including prothrombin time (PT), partial thromboplastin time (PTT) and international normalized ratio (INR), were normal. Minimal blood was observed in vacuum drainage container. He was transferred to the ward on the second day of the surgery, with no more associated problems. On the third day after surgery, we noticed a large volume of bloody fluid (approximately 300 cc) in vacuum drainage container while the patient had no new complaint or neurologic deficit. Control CT scan showed cerebellar linear hemorrhage (zebra sign) and an intracerebellar hemorrhage of about $35 \times 8 \text{ mm}^2$ with no mass effect on the fourth ventricle [Figure 1c].

The patient was taken back to the ICU for close observation, and coagulation profile (PT, PTT, and INR, bleeding and clotting times) showed no abnormality. The patient remained stable hemodynamically and intact neurologically. Follow-up CT scans showed no changes toward hydrocephalus, and the patient was treated conservatively. Brain magnetic resonance angiography (MRA) and magnetic resonance venography (MRV) showed no significant vascular findings. The hematoma resolved after approximately 10 days

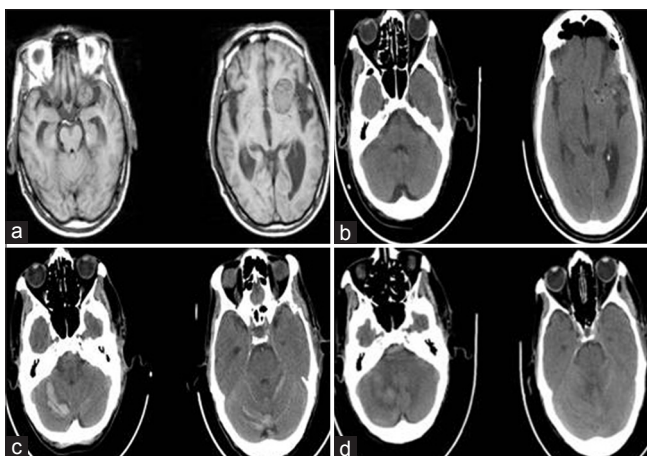


Figure 1: Case one: (a) axial T1-weighted magnetic resonance imaging defines anatomic location of the left sphenoidal wing meningioma, (b) early postoperative axial brain CT scan lacks any sign in favor of RCH, (c) late postoperative scan unmask RCH and (d) the scan just before patient discharge depicted resolution of hematoma

and the patient was discharged with satisfactory recovery [Figure 1d].

Case 2

A 21-year-old man presented with hearing problem. Physical exam was normal; whereas the brain imaging demonstrated a huge intraaxial mass in the parietooccipital lobe originating from lateral ventricle associated with calcification [Figure 2a and b]. Preoperative lab tests, including coagulopathy tests, were normal.

The patient underwent craniotomy in the semilateral position. The head was fixed on Mayfield head fixation, and after craniotomy, total resection of tumor was done without any intraoperative complication. Postoperation, the patient was extubated and transmitted to the recovery room and then to neuro ICU. In ICU, generalized tonic-clonic seizure occurred suddenly and progressed to status epilepticus. Despite administration antiepileptic agents, as seizure continued, the patient was intubated again after taking anesthesia. The postoperative CT scan showed the hemorrhage in the surgical field and in the cerebellar sulci in favor of RCH [Figure 2c and d]. The control CT scan showed a raised amount of hematoma in cerebellar sulci [Figure 2e]. All lab tests, including PT, PTT, and INR, were normal. The conservative treatment did not respond for the patient. He deteriorated during the following days and later he expired. The histopathologic finding of the tumor was compatible with ependymoma.

DISCUSSION

RCH is a rare complication after supratentorial surgeries with an incidence rate between 0.08% and 0.6% in literature and poorly-understood underlying

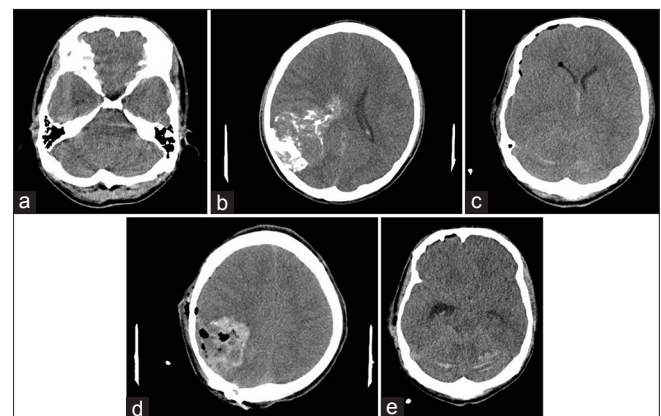


Figure 2: Case two: (a and b) preoperative CT scan demonstrated posterior fossa and supratentorial tumor, (c and d) the first scan postoperation showed linear hemorrhage in posterior fossa in favor of RCH and blood in surgical field and (e) the second scan postoperation demonstrated the exacerbated hemorrhage

mechanisms,^[2] some of which are as follows. The cerebellar sag, as a result of cerebrospinal fluid (CSF) hypovolemia and transient occlusion of superior bridging veins, results in hemorrhagic infarction.^[1] Postoperative suction drainage could result in transtentorial pressure gradient and cerebellar hemorrhage from venous bleeding.^[4] Intraoperative and postoperative CSF loss might lead to parenchymal shifts or a critical increase of transmural venous pressure with subsequent vascular disruption and hemorrhage.^[5] In addition, intracranial hypotension and coagulation disorders have been described as possible risk factors.^[5] Despite the unclear pathomechanism of this phenomenon, most authors agree that RCH is a result of intra- and postoperative loss of CSF, and has a venous origin.

It has been reported that RCH is a benign entity with a good prognosis,^[1,3,4] however, in some patients it can be a life-threatening complication and might even result in death.^[2,5]

Amini *et al.* suggested that the most common symptom of RCH is loss of consciousness. Therefore, the patient might show motor deficit, gait ataxia, and prolong anesthesia, or be asymptomatic.^[1]

In our cases, a moderate amount of CSF was lost during the operation while opening the cisterns. Blood pressure, platelets count, and coagulation profiles were normal.

In the first patient, a large amount of CSF drainage from vacuum drain might have played an important role in the occurrence of RCH, while in the second patient, RCH occurred just after the surgery and the vacuum drain cannot

be the reason. The first patient was asymptomatic and had a good prognosis, however, the second one was symptomatic and demonstrated deterioration and had a poor prognosis.

CONCLUSION

RCH after supratentorial craniotomy is a very rare complication and can be a life threatening and result to death. It is considered to avoid rapid loss of CSF intraoperative, avoiding excessive vacuum drainage, conservative treatment and serial CT scan.

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Conflicts of interest

The authors declare that they have no conflict of interest, financial or otherwise with any organization.

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