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Case Report

Remote hemorrhage after burr-hole surgery for chronic subdural hematoma: A report of two cases

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Abstract

Background: The standard neurosurgical procedure for chronic subdural hematoma is a burr-hole surgery. Postoperative hemorrhage is one of the complications after burr-hole surgery. The hemorrhage generally occurs at the surgical site; however, remote hemorrhage is rare. Here, we report two cases of remote hemorrhage after burr-hole surgery for chronic subdural hematoma and discuss the possible mechanism underlying this rare complication.

Case Description: Two patients presented remote hemorrhages after burrhole surgery for chronic subdural hematoma. In the first case, hemorrhage occurred in the interhemispheric fissure and contralateral subdural space. In the second case, hemorrhage occurred in the subdural space of the posterior fossa.

Conclusion: Postoperative remote hemorrhage is a rare complication, and it can occur after both craniotomy surgery and burr-hole surgery. Neurosurgeons should consider the possibility of this rare complication, and sufficient care should be taken to select the most appropriate surgical procedure to prevent remote hemorrhage.

Key Words: Burr-hole surgery, chronic subdural hematoma, remote hemorrhage

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INTRODUCTION

The standard neurosurgical procedure for chronic subdural hematoma is a burr-hole surgery. The procedure is associated with several complications, such as wound infection, convulsion, recurrence, and hemorrhage. After burr-hole surgery for chronic subdural hematoma, hemorrhage frequently occurs at the burr-hole site; however, remote hemorrhage is rare. Here, we report two cases of remote hemorrhage after burr-hole surgery for chronic subdural hematoma and discuss the possible mechanism underlying this rare complication.

CASE DESCRIPTION

Case 1

A 72-year-old woman was admitted to the department of neurosurgery after gradual worsening of headache. Brain computed tomography (CT) revealed bilateral chronic subdural hematomas [Figure 1a]. The left subdural hematoma was thicker than the right subdural hematoma; therefore, surgery was only performed for the left chronic subdural hematoma. Burr-hole irrigation without drainage was performed. The surgery was uneventful; however, her headache did not improve. CT obtained on postoperative

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day 1 showed new hemorrhage in the interhemispheric fissure and contralateral subdural space [Figure 1b]. The hemorrhage disappeared within a few days, and her headache improved.

Case 2

A 93-year-old man with a history of burr-hole surgery 2 months previously was admitted after gradual worsening of consciousness and right hemiparesis. CT revealed a recurrent left chronic subdural hematoma [Figure 2a]. Burr-hole irrigation with drainage was performed. The surgery was uneventful; however, CT obtained immediately after the surgery showed hemorrhage in the left subdural space of the posterior fossa [Figure 2b]. The patient did not experience any symptom. The hemorrhage disappeared within a few days. The CT angiography was performed to explore the cause of hemorrhage; however, vascular malformations were not detected.

DISCUSSION

Postoperative hemorrhage is one of the complications after burr-hole surgery. The hemorrhage generally occurs at the surgical site. Accordingly, remote hemorrhage after burr-hole surgery, as presented here, is rare and has been hardly reported.

Conversely, remote hemorrhage after craniotomy surgery is relatively known. In particular, there are many reports on remote cerebellar hemorrhage after supratentorial surgery.[1,4-6,8,9,11] The mechanism underlying remote hemorrhage after craniotomy surgery involves multiple factors,[1,6] such as intraoperative procedure, perioperative hypertension, and overdrainage of cerebrospinal fluid (CSF) by intraoperative manipulation and drainage replacement.[2,5]

There are few reports on remote hemorrhage after burr-hole surgery for chronic subdural hematoma.[3,4,7,10] In these reports, remote hemorrhage occurred at various locations, such as the ipsilateral side, contralateral side,[3] and cerebellum.[7] In addition, the clinical courses were almost benign. These reports speculated that multiple factors contributed to the occurrence of remote hemorrhage. Although these factors were similar to those for remote hemorrhage after craniotomy surgery, few reports mentioned that overdrainage of CSF was mainly associated with remote hemorrhage.[3,10]

We speculated the other mechanism underlying remote hemorrhage. In the current cases, remote hemorrhage occurred in the subdural space of the ipsilateral side and contralateral side in case 1 and in the posterior fossa in case 2. A drainage system was not placed in case 1, and the drainage system was not opened on detection of remote hemorrhage in case 2. Therefore, overdrainage of CSF did not appear to be the cause of hemorrhage in these cases. We speculated that a mechanism involving damage and stretching of the bridging veins might have been associated with this remote hemorrhage. Irrigation and removal of the hematoma might have rapidly changed the intracranial pressure. This change in the intracranial pressure might have damaged and stretched the bridging veins, causing venous congestion and remote hemorrhage after burr-hole surgery. Therefore, remote hemorrhage might occur even if overdrainage of CSF is not happened.

We speculated that exclusion of irrigation or gentle irrigation for chronic subdural hematoma is a better approach to prevent the occurrence of remote hemorrhage after burr-hole surgery. Moreover, we consider that obtaining CT images immediately after surgery is important for early diagnosis, even in the case of burr-hole surgery for chronic subdural hematoma.

CONCLUSION

Postoperative remote hemorrhage is a rare complication, and it can occur after both craniotomy surgery and burr-hole surgery. Neurosurgeons should consider the

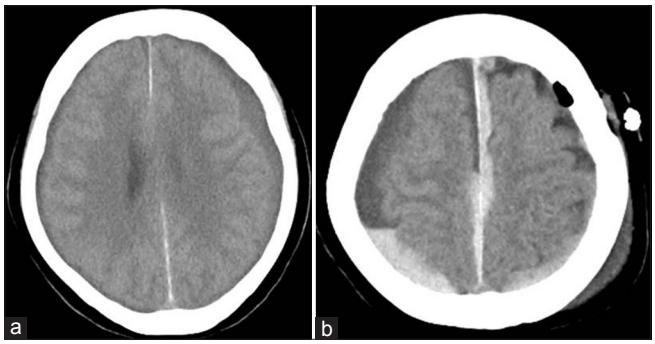

Figure 1: Computed tomography (CT) images of case 1. (a) CT performed at admission showing bilateral chronic subdural hematomas. (b) CT performed on postoperative day 1 showing new hemorrhage in the interhemispheric fissure and contralateral subdural space

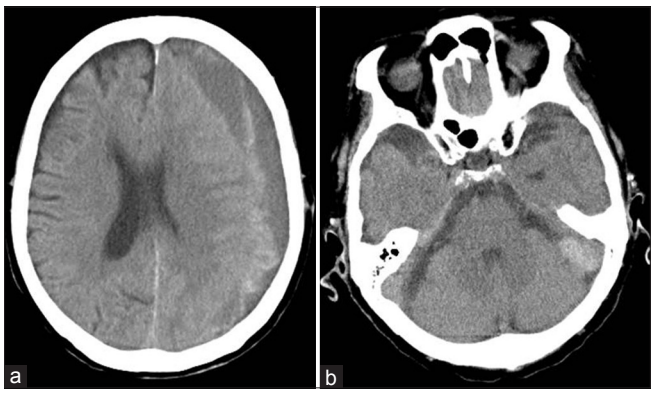

Figure 2: Computed tomography (CT) images of case 2. (a) CT performed at admission showing recurrence of a left chronic subdural hematoma. (b) CT performed just after the surgery showing hemorrhage in the left subdural space of the posterior fossa

possibility of this rare complication. We consider that sufficient care should be taken to select the most appropriate surgical procedure to prevent remote hemorrhage.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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