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Remote acute subarachnoid hemorrhage after drainage of chronic subdural hematoma: A case report and review of the literature

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ABSTRACT

INTRODUCTION: Chronic subdural hematoma (CSDH) can be treated by a relatively simple burr hole surgery. Acute subarachnoid hemorrhage (SAH) occurring after surgery for CSDH has been reported as a rare but severe complication.

CASE REPORT: An 88-year-old female complained of progressive headache and dizziness for one month. A right fronto-temporo-parietal CSDH with a shift in the midline structures and lateral ventricle compression was shown by computed tomography (CT) scans. Closed-system drainage of the hematoma was performed via one burr hole under general anesthesia. Two hours after we began draining the hematoma at the patient's bedside, the patient complained of headache and exhibited impaired consciousness that progressively degenerated. The drainage bag collected 200 ml of bloody liquid over a short time. A subsequent CT scan revealed SAH and an acute subdural hematoma. A CT angiogram excluded the presence of intracranial aneurysms. The patient died of hypostatic pneumonia after 15 days despite conservative medical management.

DISCUSSION: Relevant literature was reviewed, and we believe that the occurrence of a hematoma in the opposite hemisphere and the hyperperfusion resulted from the rapid drainage of the hematoma, which caused the rupture of weak bridging veins during drainage.

CONCLUSION: Slow decompression with closed-system drainage is recommended to avoid rapid dynamic intracranial changes during drainage of a subdural hematoma, including brain shift or restoration of normal perfusion, to prevent devastating complications.

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1. Introduction

A chronic subdural hematoma (CSDH) can be treated by a relatively simple burr hole surgery, which exhibits a mortality rate of 0.5–4.0%. Elderly individuals and alcoholics are commonly affected by CSDH [1,2]. A CSDH might be found incidentally on brain imaging. Surgical intervention is considered when the mass effect on the surrounding brain tissue results in symptomatology. Relatively simple, safe, and effective procedures have been used to manage this condition [3]. Treatment for CSDH is often successful. A burr hole with closed drainage is a simple and effective method that most surgeons prefer. However, some rare but severe complications, such as intracerebral hematoma and intracranial extracerebral hemorrhage, have been reported [4,5]. Here, we report a case of a subarachnoid hemorrhage (SAH) and CSDH occurring immediately after we began draining a CSDH following a burr hole operation. The possible mechanisms of this rare complication are discussed, and

the relevant literature is also reviewed. Our report is in accordance with the SCARE criteria [6].

2. Case report

An 88-year-old female was admitted to our hospital with a one-month history of progressive headache and dizziness. She also complained of a walking disability. A neurological examination revealed gait difficulties, and the power in the left lower limb was 3/5 based on the Medical Research Council grading system. The routine laboratory test results were within normal limits. Routine tests such as chest computed tomography (CT), electrocardiography, and routine blood tests showed normal findings. CT scans and MRI showed a right fronto-temporo-parietal CSDH with a shift of the midline structures and lateral ventricle compression (Fig. 1). Closed-system drainage of the hematoma was performed via one burr hole under general anesthesia. The burr hole was located at the parietal protuberance. After incision of the dura mater, spontaneous outflow and aspiration of the hematoma produced a volume of approximately 220 ml. The subdural compartment was irrigated with Ringer's solution, and a subdural drainage system was carefully placed.

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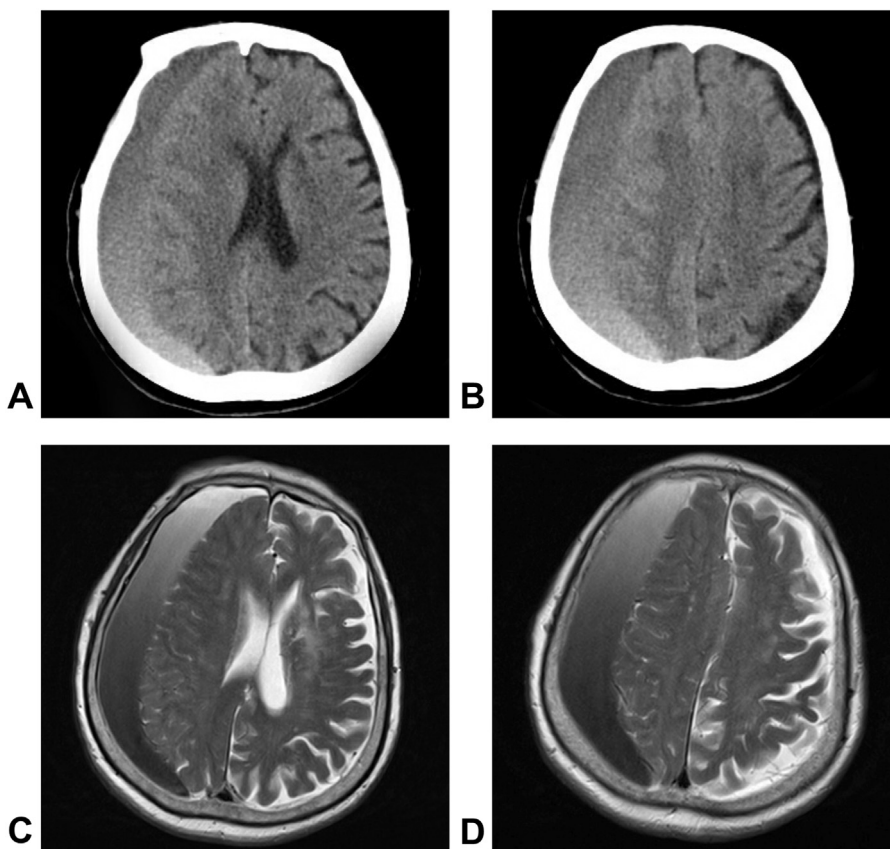


Fig. 1. Preoperative images, CT scans and MRI showed a CSDH in the right hemisphere with a shift of the midline structures and lateral ventricle compression. A–B: brain CT images; C–D: brain T2-weighted MRI.

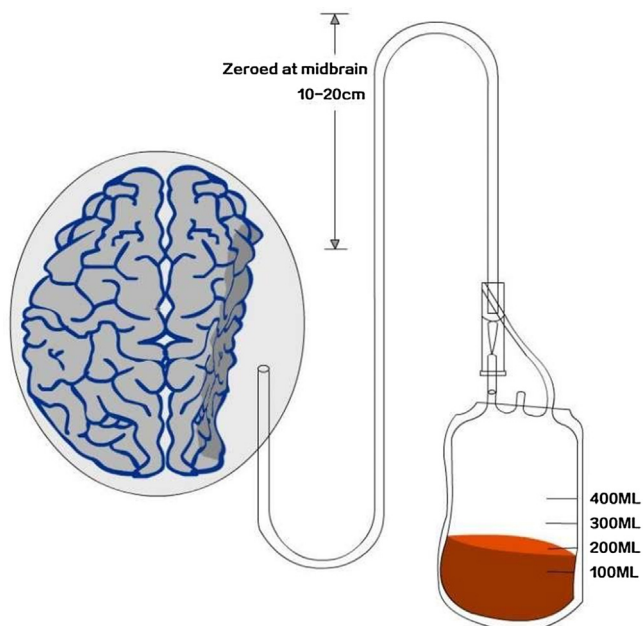


Fig. 2. Closed-system drainage for CSDH after a burrhole craniostomy.

The operation itself was performed uneventfully, and the patient’s blood pressure was well-controlled. The drainage system was initiated when she returned to the ICU ward, and the highest point of the drainage system was 15 cm, relative to the mid-brain (Fig. 2). However, 2 h after we began draining the hematoma at the patient’s bedside, the patient complained of a headache

and exhibited consciousness functionsthat progressively degenerated. The drainage bag collected 200 ml of bloody liquid. A subsequent CT scan revealed an SAH focused on the tentorium cerebella, a parasagittal acute subdural hematoma and a contralateral acute subdural hematoma. The right lateral ventricle compression was markedly reduced, and the midline structure had generally returned to the correct position compared to the preoperative image (Fig. 3). A postoperative CT angiogram excluded the presence of intracranial aneurysms (Fig. 4). Conservative treatments such as pharmacological sedation, hyperventilation, blood component transfusion, and administration of hypertonic saline, osmotic diuretics, human serum albumin, and systemic antibiotics were administered. A tracheotomy was performed at two days postoperative, but the patient died of hypostatic pneumonia after 14 days despite intensive medical management.

3. Discussion

CSDH is one of the most common neurosurgical pathologies. Complications during the postoperative period, including failure of the brain to re-expand, recurrence of hematoma and tension pneumocephalus, are associated with a poor prognosis [1]. Postoperative hemorrhagic complications, such as intracerebral hematoma, acute subdural hematoma or SAH, are rare but severe. Acutely deteriorated symptoms have been found in CSDH patients within several hours after the initial burrhole craniostomy, and the subsequent CT scans of the brain confirmed diagnoses of various intracranial hemorrhages. In previous reports, postoperative bleeding almost always occurred in a single spot [7]. However, in our case, bleeding occurred in multiple spots, including an acute subdural hematoma and SAH. The location of the hemorrhagesincluded the tentorium

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