

# Contralateral Extradural Hematoma Formation following Evacuation of Chronic Subdural Hematoma: A Case Report and Review of Literature

Nabajyoti Borah<sup>1</sup> Deep Dutta<sup>1</sup> Basanta Kumar Baishya<sup>2</sup> Zakir Hussain<sup>2</sup>

<sup>1</sup>Department of Neurosurgery, Gauhati Medical College and Hospital, Guwahati, Assam, India

<sup>2</sup>Department of Neurosurgery, Neurosciences Centre, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence Nabajyoti Borah, MBBS, MS (Surgery), Mch (Neurosurgery), Rahman Hospital Private Limited, Guwahati-22, Kamrup, Assam, India (e-mail: drborahnj@gmail.com).

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## Abstract

Here, we report a case of a 42-year-old man with right frontoparietal chronic subdural hematoma who presented with headache and weakness of left side of the body. He underwent burr hole craniostomy with a closed drainage system. A computed tomography scan conducted on postoperative day 1 showed an extradural hematoma over the contralateral parietal convexity. Craniotomy and hematoma evacuation was immediately performed. Patient improved postoperatively without any neurological deficit. He was discharged on 7th postoperative day. To our knowledge, this is a very rare occurrence. We will review the literature and discuss the factors related to this.

## Keywords

- ▶ burr hole
- ▶ CSDH
- ▶ EDH

Chronic subdural hematoma (CSDH) is a common entity in day-to-day neurosurgical practice. It is more common in the elderly, but occurrence in a younger age group is not uncommon. Evacuation of CSDH is done by single or double burr hole craniostomy and twist drill craniostomy with or without continuous drainage.

Like any other neurosurgical procedures CSDH surgery is also not without complications. Contralateral extradural hematoma (EDH) formation is an uncommon finding in patients following evacuation of intracranial hematomas. The development of contralateral extradural hematomas following surgery for CSDH is even rarer, but this represents a potentially life-threatening complication. On the other hand, occurrence of contralateral hematoma following evacuation of acute subdural hematoma is a well-described complication.<sup>1,3</sup> But, there are very few mention in literature about contralateral EDH formation following CSDH evacuation and only two cases have been described till date.<sup>3,4</sup> Also, a single case report of contralateral interdural hematoma formation under similar circumstances have been noted in the literature.<sup>5</sup>

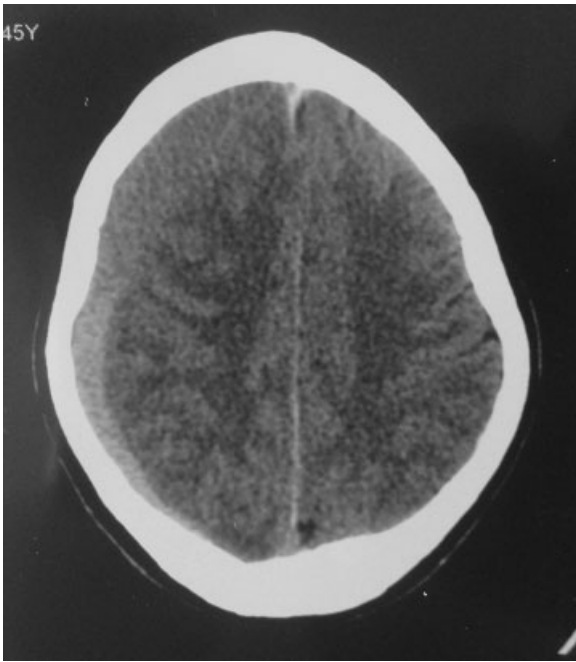
Here, we report a case of an EDH occurring after evacuation of a CSDH of the opposite side with single burr hole craniostomy and continuous closed drainage without irrigation.

## Case Report

A 42-year-old man presented to our emergency department with a history of headache and weakness of left side of the body of 3 days duration. He had a trivial trauma 2 months prior to admission. Computed tomography (CT) of head revealed right frontoparietal chronic subdural hematoma with mass effect (▶ **Fig. 1**). Baseline hematological, biochemical, and coagulation profile were within normal limit. A right parietal burr hole craniostomy was performed under general anesthesia and a continuous closed drainage system was kept in situ. The patient was shifted to neurosurgery ICU. On the morning of 1st postoperative day, patient complained of severe headache and gradually he became drowsy. Patient was rushed for a repeat CT head

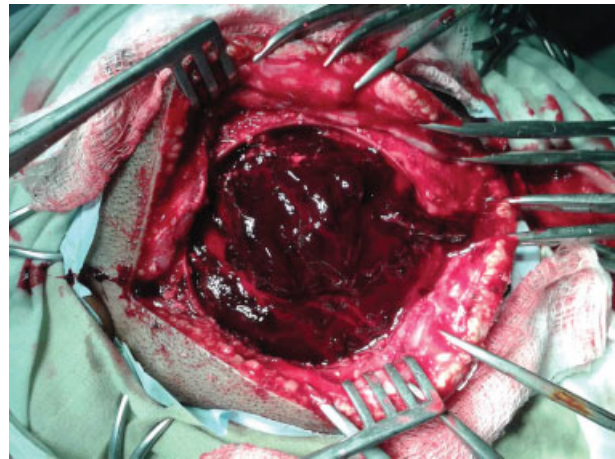
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**Fig. 1** Showing right frontoparietal chronic subdural hematoma.

which showed left parietal EDH formation (► **Fig. 2**). He was immediately shifted to emergency operation theatre and a left parietal craniotomy and evacuation of the EDH was done (► **Figs. 3** and **4**). There was an active bleeding dural vessel and it was coagulated. Patient improved postoperatively without any neurological deficit. He was discharged on 7th postoperative day.



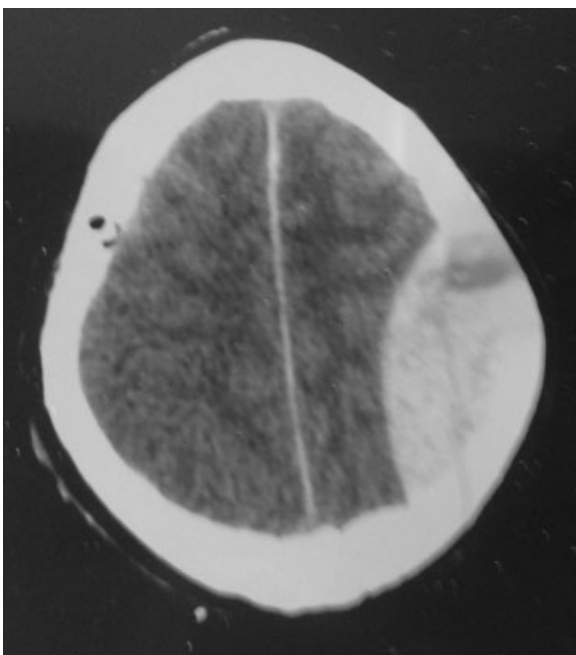
**Fig. 3** Intraoperative photograph showing the extradural hematoma.

### Discussion

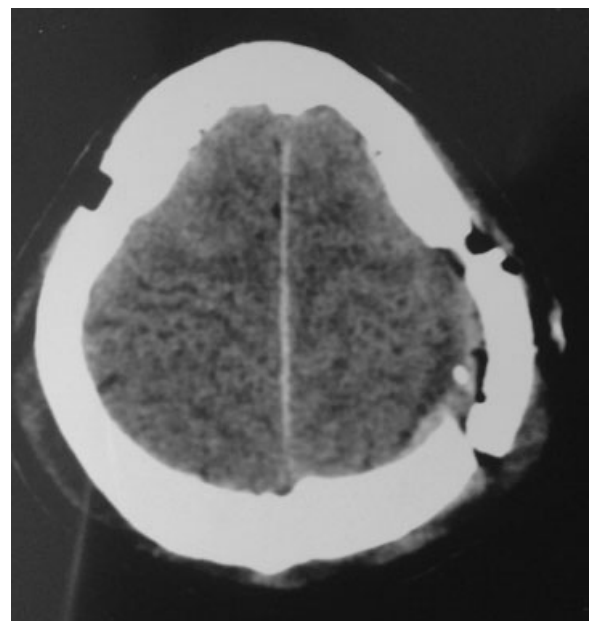
CSDH is one of the common neurosurgical pathology in the elderly. But it may also be found in a slightly younger age group as in our case. Surgery for CSDH is one of the most common and safe procedures done in any neurosurgical setup.

Hulke first described the successful neurosurgical evacuation of CSDH in 1883.<sup>6</sup> The rare complications of hematoma formation at same/remote site of surgery following CSDH evacuation include acute EDH, intraparenchymal hematoma, cerebellar hematoma, and acute subdural hematoma.<sup>4,7,8</sup>

The occurrence of contralateral EDH following CSDH evacuation is very rare. There are only two case reports in



**Fig. 2** Showing left parietal extradural hematoma formation.



**Fig. 4** Showing immediate postoperative computed tomographic scan following evacuation of the extradural hematoma.

the literature. Other neurosurgical procedures such as evacuation of acute SDH, ventriculoperitoneal shunt insertion, etc, have been reported to cause contralateral EDHs.<sup>1,2,9,10</sup> Solomiichuk et al has considered the reduction of intracranial pressure by removing the intracranial hematoma and/or performing decompressive craniectomy as a predisposing factor for development of contralateral EDH, and recommended to do CT scans on the first postoperative day to exclude contralateral EDH formation.<sup>10</sup>

Several causes have been proposed for delayed formation/expansion of contralateral EDH including loss of tamponade effect, vasomotor mechanisms, and coagulopathy, with the main cause appearing to be the upsetting of the equilibrium of the damaged vessels and the reactive intracranial pressure (ICP).<sup>1</sup> Possible sources of bleeding include a ruptured meningeal arterial branch (tamponaded because of edema, clot), venous lacerations causing low tension bleeding, or a skull fracture.<sup>3</sup> The possible cause of the EDH in our case could be due to rapid evacuation of the CSDH resulting in shifting of the brain towards the operated site with separation of the dura on opposite side. Separation of the dura might have caused tearing of a dural vessel resulting in hematoma formation. The tight adherence of the dura to skull might explain the rare occurrence of such complication in the elderly wherein CSDH is most common.

The diagnostic approach to possible contralateral EDHs is controversial. Some authors have proposed intraoperative brain swelling, postoperative neurological deterioration, papillary dilation contralateral to the operative side, seizures, and intractable raised ICP as some hints for the detection of such pathology.<sup>2,9</sup> On presentation of these clues, immediate CT is recommended to rule out presence of remote site hematoma. Mohindra et al recommends routine postoperative CT immediately after cranial surgery for head trauma which would help in timely detection and treatment of such a complication.<sup>1</sup>

In our case, the patient had severe headache and drowsiness before he was taken for CT head. Early detection and management of the contralateral EDH in such patients is of critical importance which otherwise can cause devastating consequences such as severe neurological deficit and even death. We do not routinely do CT head for postoperative cases of CSDH, but strongly recommend it for those who have even slightest deterioration of neurological status in the postoperative period. Some precautions are recommended to avoid rapid evacuation of CSDH for minimizing such complications and close monitoring is required even including a postoperative CT scan.

## Conclusion

Formation of contralateral EDH after CSDH surgery is a rare but potentially dangerous complication. Although many theories exist, the common initial event seems to be separation of dura from the inner table of the skull resulting from brain shift following rapid evacuation of hematoma. Close monitoring in the postoperative period, immediate CT scan even with the slightest deterioration of neurological status can certainly help in early recognition and treatment of this complication.

### Conflict of Interest

The authors have nothing to declare.

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