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# Epidural Hematoma Complication after Rapid Chronic Subdural Hematoma Evacuation: A Case Report

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Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
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**Conflict of interest:** None declared

**Patient:** Male, 41  
**Final Diagnosis:** Healthy  
**Symptoms:** Headache  
**Medication:** —  
**Clinical Procedure:** Chronic subdural hematoma  
**Specialty:** Neurosurgery

**Objective:** Diagnostic/therapeutic accidents  
**Background:** Chronic subdural hematoma generally occurs in the elderly. After chronic subdural hematoma evacuation surgery, the development of epidural hematoma is a very rare entity.  
**Case Report:** We report the case of a 41-year-old man with an epidural hematoma complication after chronic subdural hematoma evacuation. Under general anesthesia, the patient underwent a large craniotomy with closed system drainage performed to treat the chronic subdural hematoma. After chronic subdural hematoma evacuation, there was epidural leakage on the following day.  
**Conclusions:** Although trauma is the most common risk factor in young CSDH patients, some other predisposing factors may exist. Intracranial hypotension can cause EDH. Craniotomy and drainage surgery can usually resolve the problem. Because of rapid dynamic intracranial changes, epidural leakages can occur. A large craniotomy flap and silicone drainage in the operation area are key safety points for neurosurgeons and hydration is essential.

**MeSH Keywords:** Hematoma, Epidural, Cranial • Hematoma, Subdural, Chronic • Intracranial Hypotension

**Full-text PDF:** <http://www.amjcaserep.com/abstract/index/idArt/894539>

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## Background

Chronic subdural hematoma (CSDH) generally occurs in the elderly. Trauma is identified in most cases and is the most common risk factor in both young and elderly patients. Occurrence of frontal and parietal CSDH is rarely seen in the young [1].

Other etiologies, including intracranial arachnoid cyst (AC) or spontaneous intracranial hypotension (IH), alcohol abuse, and seizures, often coexist with and promote the development of subdural hematoma [1–4].

Artery, vein, or dural sinus bleeding can cause epidural hematoma (EDH). Arterial bleeding dissects the dura from the inner table, or dissection of the dura from the inner table occurs first and bleeding occurs into the space created [1].

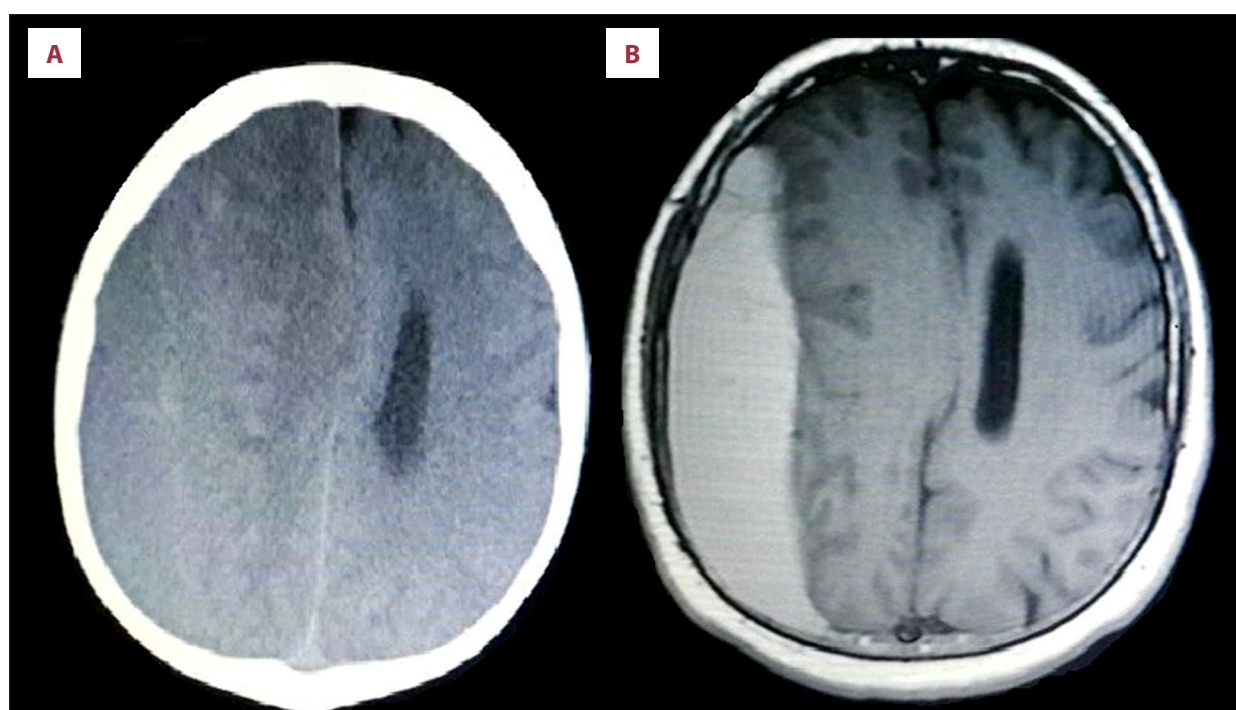
## Case Report

A 41-year-old man presented to our outpatient unit with an increasingly severe headache of 4-week duration. Upon admission, the patient's neurologic examination indicated left-side hemiparesis (with muscle strength test: 2/5). He had not been able to walk without help for 3 days. He was examined in the emergency department after a head trauma 4 weeks ago. Hematological and biochemistry profiles were within the normal limits.

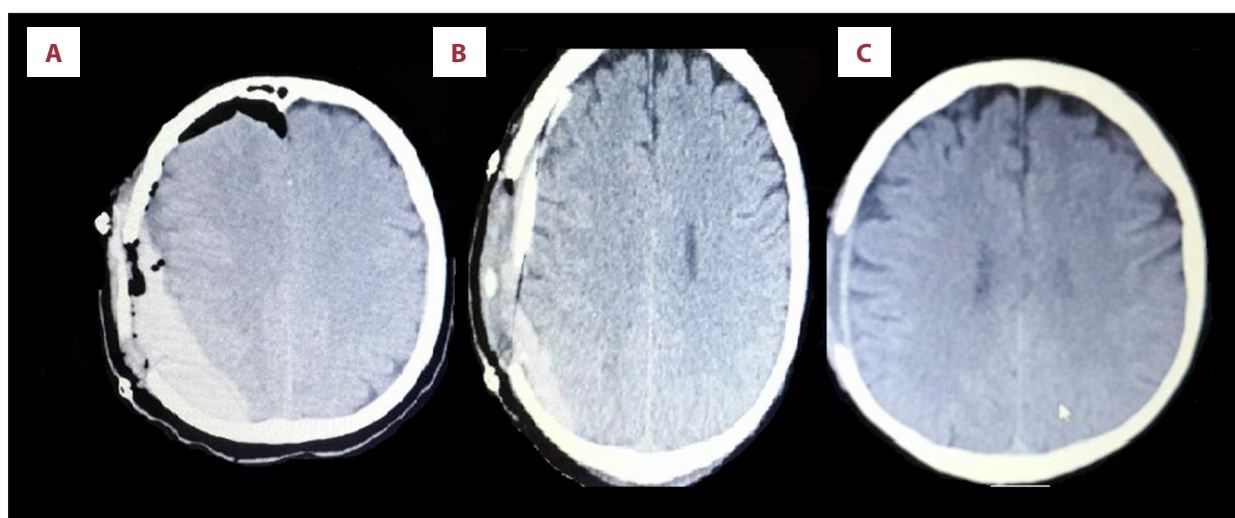
A magnetic resonance imaging (MRI) scan of his head revealed CSDH at the right-side frontoparietal region, with midline shift (Figure 1A, 1B).

After explaining the procedure to the patient and obtaining written informed consent, the patient underwent a large craniotomy flap at the frontal and parietal region as an urgent procedure under general anesthesia. We opened the dura layer and evacuated the CSDH. We irrigated the hematoma with normal saline solution through a silicone catheter from parietal to frontal. We gently disrupted the integrity of the inner membrane by use of a hook. At that time, dissection of the dura from the inner table first occurred, and epidural leakage was started. Bipolar coagulation was used to control leakage. After leakage control, we tightly attached the dura matter to the calvarium with 3.0 silk suture at 4 points. Minimal epidural bleeding was observed during the procedure. The surgical area was washed with normal saline and a closed-system drain was put in place. We did not put the parietal bone back in place because of brain swelling and neurological deficits. The procedure was finished with no more problems. After the operation, the patient was transferred to the intensive care unit.

The day after the operation, a CT scan revealed removal of the CSDH with subdural air and catheter image, but there was parieto-occipital EDH without a midline shift (Figure 2A). The neurological examination result was normal. Three days after the operation, a CT scan revealed EDH with subdural air and



**Figure 1.** (A, B) Preoperative CT scan and magnetic resonance imaging showing chronic subdural hematoma.



**Figure 2.** (A–C) CT scan showing epidural hematoma complication after subdural hematoma evacuation, and the progressive improvement of epidural hematoma.

silicone catheter image (Figure 2B). The drainage was followed-up 10 days later. Prophylactic antibiotics and antiepileptic drug were given. Every day, nearly 120 cc of xanthochromic fluid was evacuated. Four weeks after surgery, a follow-up CT scan revealed the epidural hematoma was resolved (Figure 2C). The patient tolerated the procedure well; after 4 weeks, he was discharged without any neurological deficit.

## Discussion

Bridging vein tearing after a head injury caused by blood effusion in the subdural cavity is widely accepted as the pathogenetic mechanism. The patient's brain injury could have been caused by translation, rotation, or angular motion of the head that caused an acceleration/deceleration injury to the brain. With or without trauma, predisposing conditions may cause subdural bleeding [1,2].

A sudden alteration of intracranial pressure, systemic vascular hypotension, or increase in intravenous pressure may cause the rupture of bridging dural veins [3]. IH has been reported to be associated with CSDH and was suspected as a possible cause of EDH [4,5].

Spontaneous IH is often an underdiagnosed condition resulting from low cerebral spinal fluid (CSF) pressure. Failure to diagnose this may lead to life-threatening complications, including subarachnoid hemorrhage, subacute subdural hematoma, and EDH [6].

Some young CSDH patients may have 1 or more predisposing risk factors: AC, arteriovenous malformation, coagulopathy, aneurysm, or IH [1]. Burr hole evacuation and drainage

yield a satisfactory result in most cases. Different methods of surgical procedures for management includes burr hole alone, burr holes with subdural drain placement, twist drill craniotomy drain, and even craniotomy [1,7].

Postoperative CSDH complications include recurrence, acute ipsilateral subdural, EDH, epilepsy, IH, subdural empyema, intracerebral hemorrhage, and tension pneumocephalus. The overall rate of CSDH evacuation complications has not been determined. After craniotomy and CSDH evacuation operation, EDH complications are not reported in the literature [8,9].

Burr hole creation and drainage surgery can usually resolve the problem, but intraoperative dehydration and aggressive cerebrospinal fluid aspiration may contribute to the perioperative brain parenchymal shift. It has also been hypothesized that the sudden onset of a restoration of normal perfusion pressure in areas of faulty cerebral vascular autoregulation may lead to vascular damage that results in acute bleeding. Slow decompression with closed silicone drainage is considered to avoid rapid dynamic intracranial changes, including brain shift or restoration of normal perfusion during decompression of the brain, and to prevent these devastating complications [10,11].

With the patient under general anesthesia, we used a high-speed drill for craniotomy and burr hole creation because of brain swelling and neurological deficits. Although we hydrated the patient with a large volume of saline, quickly balancing intracranial pressure is difficult. Because of rapid midline shift restoration, epidural leakages can occur, and slow decompression by a craniotomy procedure is impossible. Volume replacement is seen as the only way to protect intracranial pressure.

## Conclusions

Although trauma is the most common risk factor in young CSDH patients, some other predisposing factors may exist. Intracranial hypotension can cause EDH. Craniotomy and

drainage surgery can usually resolve the problem. Because of rapid dynamic intracranial changes, epidural leakages can occur. A large craniotomy flap and silicone drainage in the operation area are key safety points for neurosurgeons and hydration is essential.

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