

## Compound Elevated Skull Fracture with Occlusion of the Superior Sagittal Sinus. A case report

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### ABSTRACT

**This is a case report of compound elevated skull fracture. This is a very rare variant of skull fractures. A CT angiogram demonstrated occlusion in the mid 1/3rd of superior sagittal sinus. Only few cases have been reported before. This patient was managed by the Neurosurgery department of Square Hospitals Ltd. Dhaka who had a history of assault and diagnosed as compound elevated fracture. He was managed surgically and was discharged without any intracranial complication. Etiology, clinical findings and operative findings had a similarity with other published cases.**

### INTRODUCTION

Skull fractures are classified into linear, depressed and comminuted<sup>1</sup>. A depressed fracture is one wherein the fractured fragment is driven inwards. On the other hand, in elevated fracture, this fractured portion is elevated above the level of the intact skull<sup>2</sup>. Compound elevated fractures are caused by tangential injuries which slice off a portion of the scalp, skull and the underlying dura and brain. They are frequently due to assaults with sharp edged weapons<sup>3</sup>. The principle of management is identical to those of compound depressed fractures with the elevated bone fragments being replaced into position after proper closure of the dura. Delay or failure to operate these may result in meningitis or formation of abscess<sup>4</sup>.

### CASE REPORT

This is case report of a 40 year old man, after being hit on the head with a sharp object was brought to us about 8 hours after the alleged assault. He had immediate loss of consciousness for 1 ½ hours followed by development of quadriplegia. There was no history of seizures, vomiting or CSF rhinorrhoea or otorrhoea. Clinically his GCS was 15/15 pupils were equal and reacting. He had quadriplegia, proximal muscle weakness in the upper limbs and both lower limbs grossly weak. He had an open wound over right parietal region which was dressed in a local hospital. The CT scan of the brain showed bilateral frontal contusions with a comminuted elevated fracture of the right parietal bones near the midline. A CT angiogram was performed after admission which suggested thrombosis / occlusion in the mid 1/3 rd superior sagittal sinus. There was a bone fragment found in the CT which injured the superior sagittal sinus. He was scheduled for an emergency surgery and was taken to

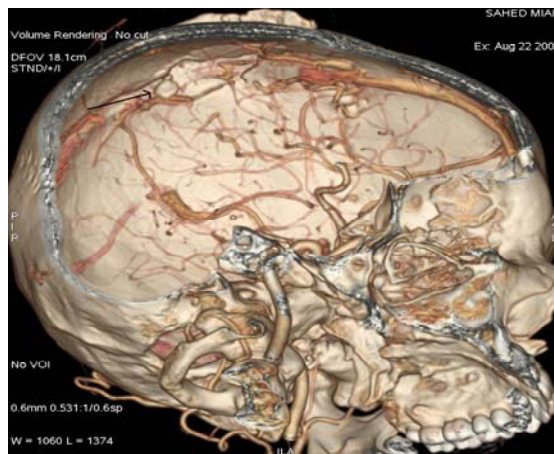
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operation room immediately. After removal of the bandage we found one lacerated wound measuring about 4 inches into 1 inch over the right parietal area half inch lateral to the midline. Previous wound was used as one of the margin of a horse shoe skin incision and retracted the scalp flap. On raising the flap, two large bone fragments were found across the sagittal suture. These fragments were carefully isolated and gently removed. This led to significant bleeding from the sagittal sinus. This was controlled with gelfoam and pressure. The dura appeared lacerated on the right side of the midline with the brain exposed. Some contused brain matter had herniated out. As the laceration was quite close to the sagittal sinus no attempt could be made to close the rent. Bleeding was controlled with gelfoam and pressure and dural defect covered with gelfoam. The wound was irrigated with H<sub>2</sub>O<sub>2</sub>. As the brain was full and tense it was decided not to replace the bone fragments.

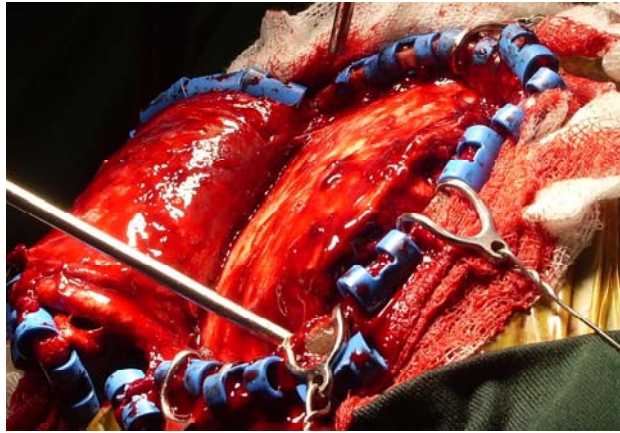
His post operative recovery was unremarkable. He was discharged two weeks after the surgery when he was afebrile without any evidence of intracranial infection or CSF leak. He was conscious and oriented at the time of discharge. Motor power of both lower limbs showed mild improvement. It was planned to consider cranioplasty after 6 months.



**Figure1** CT scan of compound elevated fracture.



**Figure2** Angiogram showing occlusion of superior sagittal sinus with presence of a bone fragment (pointed by arrow).



**Figure3** Intra-operative picture of elevated skull fracture.

### **DISCUSSIONS**

Compound elevated fracture is a rare type of skull fracture. Presentation of compound elevated fracture with superior sagittal sinus thrombosis is also very rare and unusual. Only few cases have been reported on this type of fracture. We have operated on such a case. We have compared our case with other published reports. Adeolu et al. has published their article on 4 patients of compound elevated skull fracture<sup>5</sup>. Etiology of their cases was assault, domestic accident and road traffic accident. We found assault was the etiology of our case. One of the cases of their series has developed brain abscess for delayed surgery. Wound debridement, dural repair and reduction were done in 75% of their cases. We have also done wound debridement and dural repair for our case. Nitin et al. has published a case report on elevated skull fracture<sup>6</sup>. That was also a compound fracture. Etiology was assault. Fracture was associated with extradural haematoma due to rupture of anterior branch of middle meningeal artery and dural tear. In our case we found that the middle one third of superior sagittal sinus was torn and thrombosed. Sagittal sinus injured by bone fragment. Dural tear was also present in this case. The etiology and management plan of this case were similar to other reported cases. Superior sagittal sinus occlusion with elevated compound fracture is an unusual presentation.

We suggest that this type of fracture can be included in the classification of skull fractures and superior sagittal sinus occlusion can be included as complication of compound elevated fracture. Early surgical intervention is necessary to prevent further complications like intracranial sepsis or CSF fistula.

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