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# Paramedian Suboccipital Craniectomy followed by Frontoparietal Burr hole trepanation for Posterior Fossa Extradural Hematoma with Contrecoup Injury presenting as Frontal Lobe syndrome: A case report of staged surgery for Traumatic Brain Injury.

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**ABSTRACT**
Introduction: A brief description of Posterior Fossa Extradural Hematoma (PFEDH) and Contrecoup brain injury
Case Report: We present a case of PFEDH with contrecoup frontal injury who was posted for Paramedian Suboccipital Craniectomy followed by Frontoparietal Burr hole trepanation twelve days later
Conclusion: The success of the case is primarily attributed to emergent decompression and staged surgery

## I. INTRODUCTION

Posterior fossa extradural hematoma (PFEDH) is a rare entity and is present in 4-7% of patients with EDH [1]. When compared to other Traumatic Brain Injuries, PFEDH has a rapid progression to acute clinical deterioration with very little warning signs. The posterior fossa is an unfavourable location of a haematoma as its compact anatomy predisposes all space occupying lesions to increased intracranial pressure and subsequent brain herniations [2]. The mortality of traumatic PFEDH is about 26% which is significantly more than EDH to other regions of the head.This number is further increased when the hematoma is accompanied by other primary or secondary brain lesions [3]. Rapid radiological diagnosis is essential to guide surgical management.Contrecoup injury refers to injury away from the site of initial trauma. It is explained by the theory that shock waves that generate from the point of impact and spread through the brain may get reflected from the opposite side of the skull and reverberate within the brain [4]. The presence of contrecoup injury implies a poor prognosis. We describe a case of Posterior fossa extradural hematoma with contrecoup frontal brain injury and its surgical management.

## II. CASE REPORT

A 31 year old male presented to the emergency department with history of fall from a moving truck which led to a severe impact on the back of the head.His vital parameters were normal: pulse 80/min and blood pressure 110/70 mmHg.He had a decreased consciousness level with a Glasgow Coma Scale of 8.Bilaterally his pupils were equally reactive and contracting to light.He was intubated and shifted for emergency Computed Tomography (CT) scan of the head which revealed the following significant findings:

- Right occipital acute extradural hematoma of maximum thickness 22mm
- Acute subdural hematoma of thickness 8mm along left basifrontal lobe convexity
- Multiple intraparenchymal haemorrhagic contusions in bilateral frontal and left parietotemporal lobes with vasogenic edema
- Fracture of the occipital bone on the right

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In the Intensive care unit,he received anti edema measures,analgesics,adequate hydration,mechanical hyperventilation and anti epileptics. Recognising the severity of the brain injury, decision was made to proceed with emergency decompressive craniectomy of the posterior fossa.

Stage 1: Paramedian Suboccipital Craniectomy

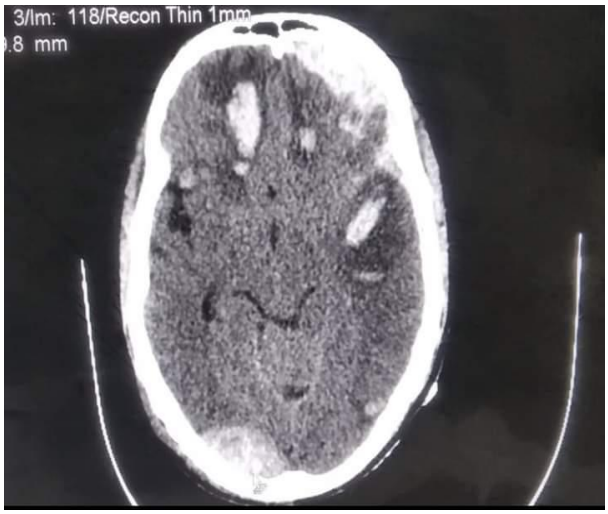


Fig 1. Imaging of the head on presentation

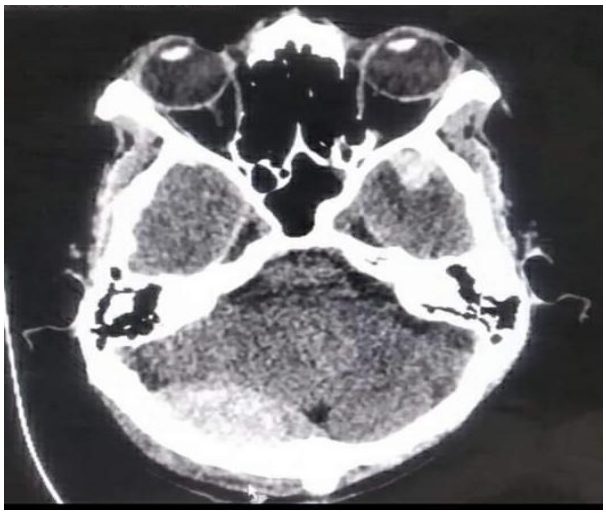

Fig.2 PFEDH is 22mm at maximum thickness

- Patient was placed in prone position and a right paramedian suboccipital incision is taken about 5mm medial to the right mastoid notch
- The incision is deepened and extended upto 6cm above and 4cm below the mastoid notch
- Occipital muscles divided and separated from the nuchal lines
- The subocciput is exposed using mastoid retractors
- Multiple burr holes are made using perforator and piecemeal removal of occipital bone is done
- Hematoma is adequately exposed and evacuated till dura is visualised
- Flat drain is placed and fixed to skin
- Scalp layers are resutured and wound is closed

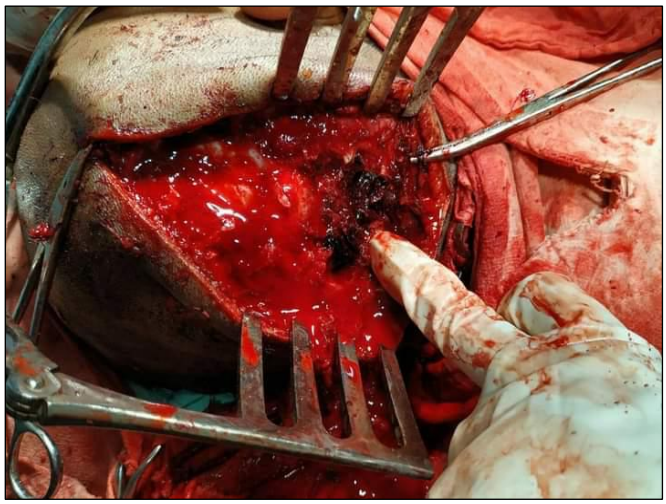

Fig. 3: Evacuation of hematoma through paramedian suboccipital approach

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**Postoperative period:**

The patient shifted to the Trauma Intensive Care Unit where he was maintained on ventilation and vitals were stabilised.He received 2 units each of packed red blood cells,fresh frozen plasma and platelet rich plasma.He was extubated on the second post operative day.Postoperative CT scans revealed near complete evacuation of the posterior fossa extradural hematoma with frontal lesions similar as compared to the previous CT scan.There was marked improvement in the Glasgow Coma Scale with spontaneous eye opening and obedience to commands.The drain was removed on the fourth postoperative day.But even till the twelfth postoperative day, the patient showed signs of damage to the higher functioning processes of the brain. He displayed very limited social behaviour and motivation. A significant clinical finding was impairment of expression of speech with intact comprehension. He also complained of intense frontal headaches. Keeping in mind the clinical presentation and the findings seen in the previous CT scans, a diagnosis of Frontal Lobe syndrome with Brocas aphasia was made.

A repeat CT scan on Postoperative Day 12 confirmed the diagnosis.It revealed:

- Chronic subdural hematoma of size 8mm along left frontoparietal lobe causing compression of left frontal lobe
- Resolving bilateral frontal contusions
- Subfalcine herniation of left frontal horn and early transtentorial herniation on left side with midline shift of 9mm towards right.

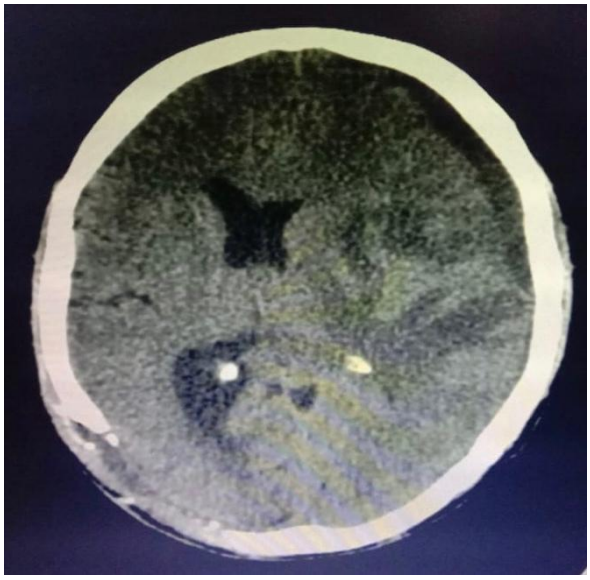

**Fig. 4:** Chronic subdural hematoma along left frontoparietal region with changes of subfalcine and tentorial herniation

A decision was made to evacuate the chronic subdural hematoma

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Stage 2: Frontoparietal Burr hole trepanation

Fig. 5: Frontoparietal Burr hole trepanation

- Patient was placed in supine position and a 4cm incision is taken in left frontal region
- Layers of the scalp are divided and retracted using mastoid forceps exposing the skull
- Burr hole is made using perforator and dura is exposed
- Cruciate incision is taken over the dura and hematoma is drained
- Similar procedure is done in the left parietal region
- Thorough washes are given for confirming the drainage of remnant clots
- Subperiosteal drain is placed and closure is done

Postoperative period:

There was a gradual improvement in expressive aphasia and social behaviour over the next few days.CT scans on postoperative Day 2 and Day 5 showed resolution of the hematoma and absence of midline shift.The patient was.
discharged with a Glasgow Outcome Score of 5.His follow up scan after 1 month of discharge showed a near complete resolution of the injuries and a significant drift towards normalcy.

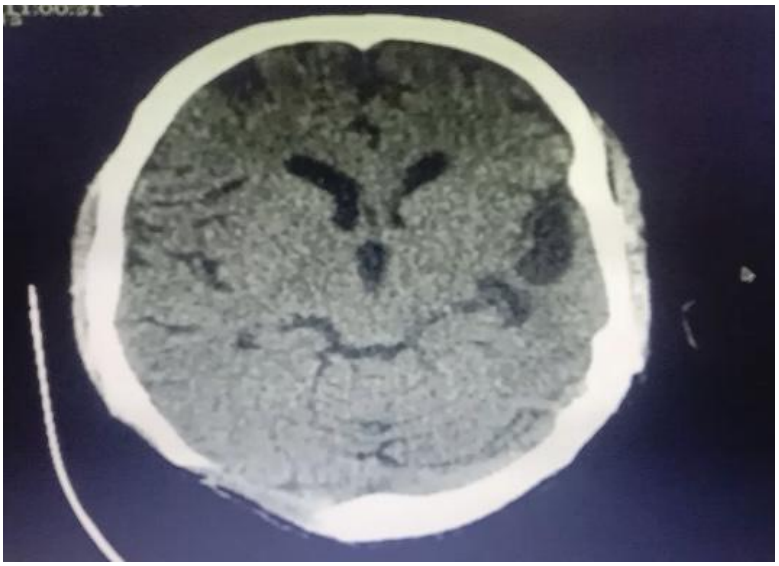

**Fig 6**. Follow up CT scan after 1 month

## III. CONCLUSION

Posterior Fossa Extradural Hematoma is a surgical condition that requires emergent drainage.Acute clinical deterioration is commoner in PFEDH when compared to EDH of other regions of head.It has a higher mortality that increases with the extent of contrecoup injuries.Staged surgery might be required in individuals when the contrecoup injury cannot be evacuated in a single anesthesia.

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