

CASE REPORT

Bilateral posterior fossa and temporo-occipital extra-dural hematomas: A simple novel technique

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ABSTRACT

Posterior fossa extra-dural hematoma is rare and early diagnosis and management is associated with good outcome. Twenty four year male presented with somnolence and soft tissue swelling of occipital region following road traffic accident. CT scan revealed bilateral posterior fossa with bilateral temporo-occipital Extradural Hematoma (EDH) with mass effect. He was operated through a trifoliate incision and craniotomies leaving a strip of bone over the transverse and occipital sinus. The blood loss with such technique was minimal and the control of sinus tear was easier as the dura on either sides of the sinus can be tied to each other to hitch the sinus up to the bone thereby, providing a good tamponade. Early diagnosis of posterior fossa EDH and prompt surgical evacuation especially in patients with mass effect provide excellent recovery. However, the surgery may be associated with significant blood loss due to venous sinus injury increasing the morbidity and mortality. We have described a novel technique that minimizes the blood loss for patients with PFEDH straddling across the venous sinuses.

Key words: Bilateral, extradural hematomas, posterior fossa

Introduction

Posterior fossa extra dural hematoma (PFEDH) is rare, although it is the commonest traumatic lesion of the posterior fossa.^[1] The Posterior fossa is an unfavorable location of a hematoma. The relative infrequency combined with the paucity of early signs makes PFEDH dangerous because it may have an especially rapid downhill course if not promptly treated.^[2] Further, bilateral extradural haematomas (EDH) are particularly rare, and most of them are frontal.^[3] We report a case of bilateral PFEDH with bilateral occipito-temporal EDH and the technique used to minimize blood loss.

Case Report

A twenty four year old unconscious male patient presented to our ER with GCS E2V2M5 following a road traffic accident. He fell down on his back while riding a bike without helmet.

After resuscitation, an urgent CT head performed that revealed bilateral occipito-temporal EDH abutting transverse sinus with bilateral posterior fossa EDH [Figure 1a and b]. There were fractures seen at the anterior cranial fossa base but no brain parenchymal injuries.

Patient was taken up for immediate surgery. In prone position, trifoliate incision was placed [Figure 2a]. After raising the flaps, diastasis of lambdoid suture was noted on either side [Figure 2b]. Bilateral craniotomies were done in the supratentorial region leaving strip of bone in the midline over the Superior Sagittal Sinus and the transverse sinuses. EDH was evacuated and a rent was seen in the bilateral transverse sinuses. Bilateral craniectomies were done in the posterior fossa and EDH was evacuated leaving a strip of bone over the bilateral transverse sinuses thus covering the torcular sinus and its confluence. [Figure 2c]. Dural hitches were taken across the sinus over the bone strips in horizontal mattress pattern [Figure 2d]. Absolute hemostasis was attained with this technique and bone flaps were replaced and wound closed

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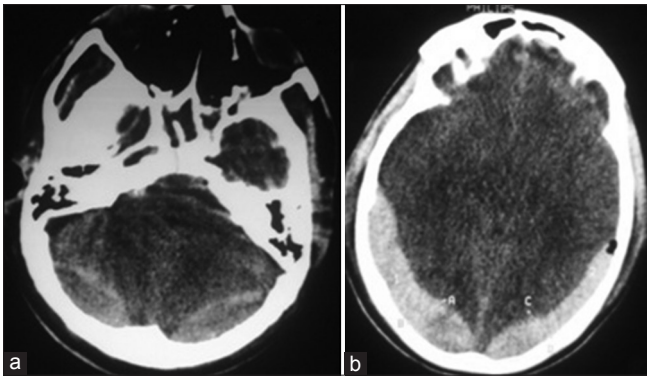


Figure 1: (a) Bilateral posterior fossa EDH. (b) Bilateral temporo-occipital EDH

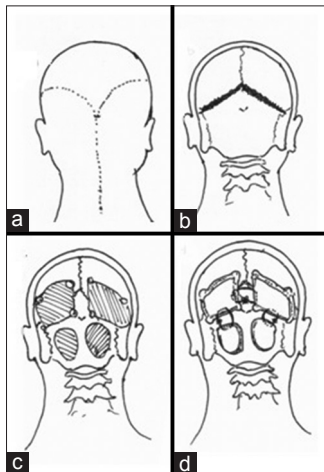


Figure 2: (a) Skin incision in trifoliate manner. (b) Bilateral diastasis of lambdoid sutures. (c) Bilateral craniotomies supra and infratentorial with a strip of bone left over the sinuses. (d) Hitch sutures taken in a mattress across the bone strip over the sinus

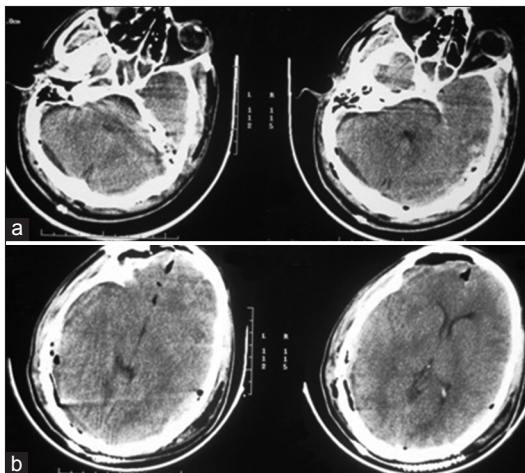


Figure 3: (a and b) Post operative CT showing evacuation of the EDH

in layers. The total blood loss in surgery for both sides was approximately 300 ml. The time taken for entire surgery was 70 minutes. Postoperatively patient became conscious with

no deficits. Post operative CT scan head showed adequate decompression [Figure 3a and b].

He developed CSF rhinorrhoea on 2nd postoperative day that was managed conservatively. He was irritable for 3 days after which his GCS improved to 15 and was discharged. He is doing well and independent with excellent recovery at 12 month follow up.

Discussion

Bilateral PFEDH is uncommon and its supratentorial extension is even rare.^[1] According to the speed of the clinical picture development, PFEDH can be divided into acute (<24 hours), subacute (2-7 days) or chronic (>7 days), depending on the onset of symptoms. The acute ones are caused by arterial injuries and chronic or subacute are secondary to venous injuries. However, in the index case there was venous sinus tear seen and the presentation was acute. Occipital bone fractures or diastasis of lambdoid sutures is seen in 40-86%.^[4] Swelling of soft tissue in occipital and retromastoid region is seen in almost all the patients.^[4] Distastic fracture of the lambdoid suture is usually associated with more complicated venous sinus injury making surgery more difficult.^[5]

Patients with occipital trauma should be evaluated immediately using cranial CT scans, and those having mass effect should be immediately treated surgically. PFEDH has a higher mortality than supratentorial localization. However, early diagnosis of PFEDH by urgent CT scan and prompt surgical evacuation provide excellent recovery.^[2] Patients with PFEDH with no mass effect, serial CT scanning is recommended especially in first 24 hours as repeat CT picks up delayed PFEDH even when the initial CT may be negative.^[1,2,6]

Classically, first one burr hole in the occipital region is made, immediately evacuating the hematoma from this burr hole, then performing the craniectomy. Bilateral or unilateral suboccipital craniectomy has been the standard approach.^[1] Strong dural attachment over the midline has been cited as the reason for bilateral PFEDH without continuity between the haematomas.^[3]

It is important to define mortality and morbidity risk factors in patients with PFEDH. In the previous studies, the risk factors were mentioned as pediatric age group, supratentorial extension of the hematoma, major sinus tear, cardiorespiratory instability, low admission coma score, and additional intracranial pathologies.^[1] However, in another series bilateral PFEDH, associated injuries, and hydrocephalus with effaced cisterns indicate poor prognosis and according to the authors, paediatric age group has better prognosis.^[2] In general, poor GCS at admission, older age and associated subdural and intracranial hematoma are associated with a poorer outcome.^[7]

In past, the mortality in PFEDH ranged between 0 and 50% in unilateral haematomas and 57% in bilateral cases.^[3] However, the recent studies have shown better outcome with early CT scan and aggressive management.^[1,2,5-8]

Evacuating epidural hematoma has always been the most gratifying neurosurgery. However, PFEDH forms the bane of trauma neurosurgery. Its rapid progression, proximity to brain stem, involvement of sinuses requires expertise of an experienced neurosurgeon. Early CT scan is recommended for any trauma victim with soft tissue injury in occipital region, somnolence and occipital fracture/lambdoid diastasis.

In cases with both supratentorial and infratentorial EDH, the source of bleed is a tear in the transverse sinus with fracture of the overlying occipital bone. In such cases the bony strip over the transverse sinus provides a natural tamponade on the torn sinus and removing this bony strip disturb the tamponade causing moderate to massive blood loss during surgery.

The technique which gives speed and ease of decompression along with minimum blood loss will definitely portend the final outcome. Different methods have been described for removing both supratentorial and infratentorial EDH. However the literature stating the exact amount of blood loss in evacuating such lesions is sparse. These include making a supratentorial craniotomy, evacuating the EDH and then evacuating the infratentorial component by exploiting the space created by hematoma between the bone and sinus. This technique has been described by Chinese authors.^[9] However, we feel that the control of sinus bleed is little more difficult and also the infratentorial EDH evacuation becomes blind. Another technique is to make a single craniotomy involving both supratentorial and infratentorial regions, thus exposing the sinus. We noticed that in such a technique the blood loss was about 800-1000 ml depending upon the extent of sinus tear. Furthermore the lack of bony strip made the job of taking hitch sutures difficult. The likely criticism for our technique may be the time consumed in making four small craniotomies rather than a single large craniotomy plus the theoretical inadequate decompression. However we felt that major time is lost in controlling the bleed than making a craniotomy, also the plaguing issues such as air embolism, hypotension and hypoxia that come with sinus tear can be circumvented, literally. The

target of any EDH evacuation is not only decompression but also the prevention of re-accumulation. By this method we maintain a natural bony framework across the area of hematoma to which dura can be adhered and recollection of blood can prevented.

Thus leaving the strip of bone provides a logical solution which not only gives a rigid frame against which sinus can be hitched but also saves the time lost in controlling the source of bleed.

Conclusion

Early diagnosis of Posterior fossa EDH and prompt surgical evacuation especially in patients with mass effect provide excellent recovery. Leaving a strip of bone over the venous sinus avoids opening up the tears in it. Besides, this bone acts as a bridge over which dura on either sides of the sinus can be tied to each other to hitch the sinus up to the bone thereby, providing a good tamponade.

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Conflicts of interest

There are no conflicts of interest.

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