

# Mirror-Image Epidural Hematoma

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Indian J Neurotrauma 2015;12:164–166.

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## Abstract

Mirror-image extradural hematomas (EDH) are bilaterally symmetrical and have same anatomical location on either sides. These are very rare and associated with high mortality unless managed emergently with surgical evacuation. Incidence of mirror-image EDHs is approximately 1.7%. Bilateral EDHs are of two types based on the source of bleeding. In the more common type, the bleeding source is venous and presents in a delayed manner, whereas the second type has arterial bleeding and presents more acutely and can deteriorate at an exceedingly fast pace. Quick decompression is the key in these cases to improve the outcomes. The authors illustrate a case of mirror-image EDH over parieto-occipital region that was evacuated surgically with bicoronal scalp incision and separate bilateral parietal craniotomies with excellent outcome.

## Keywords

- ▶ extradural hematoma
- ▶ bilateral
- ▶ symmetrical
- ▶ mirror-image

A 62-year-old male patient was brought to the emergency department of our trauma center, in unconscious state with a history of sustaining road traffic accident 6 days back.

His son gave details that the patient was hit by a motorbike while crossing a busy road. He immediately lost consciousness to regain it after approximately 40 minutes and remained conscious and oriented for next 6 hours but complained of mild to moderate headache for which he took analgesics. Soon after, he complained of severe headache, and gradually became drowsy, and then unconscious again over the next 2 hours. He was immediately taken to a nearby hospital where he was managed conservatively. He did not improve and was then referred to our center.

On arrival to our center 24 hours after sustaining injury, his Glasgow Coma Scale (GCS) was E1V1M2 and the pupils were bilaterally mid-dilated and sluggishly reacting to light. He was moving bilaterally well. Examination was suggestive of diffuse subgaleal hematoma in bilateral parieto-occipital regions. His hematologic and biochemical parameters were normal. He was immediately intubated. Noncontrast computed tomography (NCCT) of the head was done urgently, which showed bilateral parietal extradural hematoma in a bilateral symmetrical position looking like a “mirror image” along with a small hematoma in the right

basal ganglia (▶ **Fig. 1a**). Bone windows revealed bilateral parietal bone linear fractures that crossed over the midline (▶ **Fig. 1b**).

The patient was immediately taken to operating room and two separate linear incisions were given over the maximum thickness of the hematoma. Bilateral parietal craniotomies were made using a trephine and bilateral parietal extradural hematomas evacuated. No active bleeder could be identified intraoperatively. Good hemostasis was achieved. Multiple peripheral and central dural hitch sutures were taken to avoid reaccumulation of epidural hematoma (EDH). Bone flaps were fixed with nylon suture. Scalp closure was done in two layers.

The patient was electively ventilated and sedated in the immediate postoperative period. His GCS improved to E4VTM6. The pupils were bilaterally normal size with normal reaction to light. Postoperative NCCT of the head revealed complete evacuation of EDH bilaterally (▶ **Fig. 2**). He was gradually weaned off from ventilatory support and extubated and was discharged on sixth postoperative day with GCS E4V5M6. He was doing well at last follow-up 2 months after surgery.

Mirror-image EDHs are bilaterally symmetrical EDHs. These are very rare and associated with high mortality

received

October 16, 2015

accepted

November 2, 2015

published online

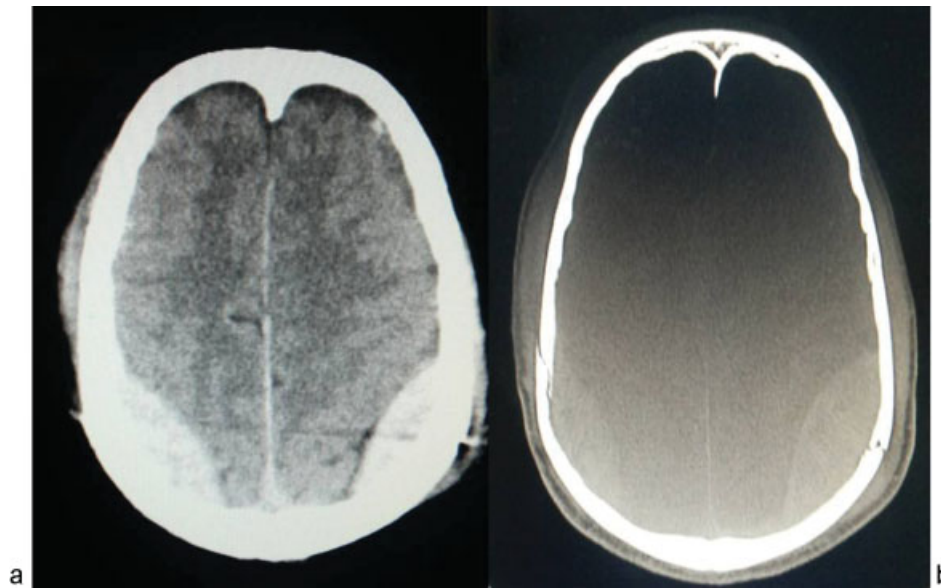
December 18, 2015

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DOI <http://dx.doi.org/>

10.1055/s-0035-1569476.

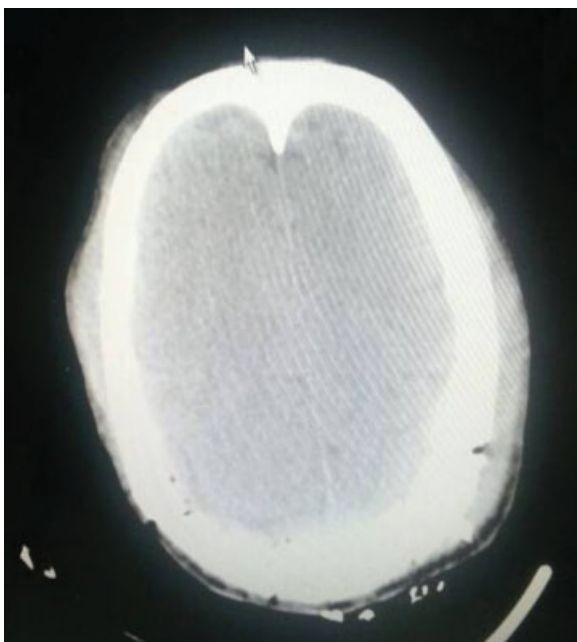
ISSN 0973-0508.



**Fig. 1** (a) Preoperative NCCT of the head showing bilateral parietal epidural hematoma in a “mirror-image” fashion. (b) Bone window showing bilateral parietal bone fracture crossing over the midline posteriorly.

similar to double EDHs.<sup>1</sup> The exact incidence of these mirror-image EDHs is not established in view of isolated case reports in literature. However, double EDHs (may be unilateral or bilateral) comprise approximately 2 to 25% of all EDHs.<sup>1-3</sup> Huda et al<sup>4</sup> studied double EDHs and the incidence of mirror-image (symmetrical) EDHs was approximately 1.7%. This has been tabulated in ►Table 1.

As per the literature review, patients with bilateral EDHs have a lucid interval less frequently, have a lower GCS at presentation, lateralization is less frequent, and deteriorate more often than patients with unilateral hematoma.<sup>4</sup>



**Fig. 2** Postoperative NCCT of the head showing no residual hematoma.

Significant impact is needed to produce bilateral intracranial hematoma. Dura is stripped from two different locations simultaneously by a single directed force. Stripping of dura can occur at the site of impact by inbending or outbending of the skull or due to motion of the skull. It can also occur due to extension of fracture across the midline leading to bilateral EDH under the fracture line as evident in present case.<sup>1,4</sup>

Bilateral EDHs are of two types based on the source of bleeding. In the more common type, the bleeding source is venous and presents in a delayed manner whereas the second type has arterial bleeding and presents more acutely.<sup>3</sup>

Emergent bilateral simultaneous cranial decompression is required in such cases to prevent mortality due to raised intracranial tension and consequent central or uncus herniation. Such cases should be approached by a bicoronal scalp flap that provides the fastest access to skull followed by two separate craniotomies, first made over the side with larger hematoma. Quick decompression is the key in these cases to improve the outcomes.<sup>4</sup>

**Table 1** Summary of reported series on symmetrical EDHs

Authors	Total EDH patients	Incidence (%) of symmetrical EDHs	Overall mortality (%)
Huda et al <sup>4</sup>	1,025	1.65	36
Gelabert-González et al <sup>5</sup>	240	2.50	50
Ramzan et al <sup>6</sup>	30	3.33	—

Abbreviation: EDH, epidural hematoma.

To conclude, bilateral EDHs are rare among the traumatic intracranial hematomas and symmetrical mirror-image EDHs are extremely rare. These cases can deteriorate at an exceedingly fast pace and mandates urgent bilateral decompression that requires careful planning, adequate exposure, judicious surgical approach, and timely management for good outcome.

**Conflict of Interest**

None.

**Sources of Support**

None.

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