Vertex Epidural Hematoma—A Rare Cause of Quadriparesis

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Abstract

Vertex epidural hematomas (VEHs) are rare and account for 1 to 8% of all epidural hematomas (EDHs). The clinical picture of VEH is variable and nonspecific, and presentation with quadriparesis is very rare. A 60-year-old man presented after head injury to emergency department with quadriparesis and unconsciousness. His Glasgow Coma Score was E1V1M5 and motor power in the right upper limb was 3/5. Power in the rest B/L lower limb and left upper limb was 0/5. Cervical spine was stabilized. CT head revealed large epidural hematoma present over the vertex with bilateral parietal contusion and skull fracture. CT cervical spine was normal. The patient was taken for emergency surgery and EDH evacuated. His Glasgow Coma Score improved to E4V5M6 over the next 2 days and power improved to 3/5 in all four limbs within 3 days and later on to 4+/5 by the time of discharge at 15 days. In the postoperative period, after the patient's clinical status stabilized, he underwent screening MRI of the spine, which was normal. In conclusion, VEHs should be considered as a possibility in patients of TBI with quadriparesis, especially when the spine is normal.

Keywords

- vertex
- epidural hematoma
- trauma
- quadriparesis

Introduction

Vertex epidural hematomas (VEHs) are rare and account for 1 to 8% of all epidural hematomas (EDHs).[1] The location of a vertex EDH causes an unusual clinical-radiologic presentation and can be a diagnostic challenge. The clinical picture of VEH is variable, and the patient may present with headache, vomiting, and other features of raised intracranial pressure (ICP) such as abducent nerve palsy.[2] Many authors have reported upper motor neuron signs and motor weakness.[1,3] Consequently, diagnosis can be delayed with fatal consequences; the mortality rate is therefore high and reported to range between 18 and 50%.[4] However, timely surgery can gratify results. VEHs should therefore be considered as a possibility in patients with traumatic brain injury (TBI) with quadriparesis, especially when the spine is normal.

We report a case of VEH presenting with quadriparesis that is infrequently reported in literature.

Case Report

A 60-year-old man presented to emergency department in an unconscious state 18 hours after injury due to fall. On examination his Glasgow Coma Score (GCS) was E1V1M5 and both pupils were normal size and reactive to light. The motor power in his right upper limb was 3/5, both lower limbs and left upper limb was 0/5, and plantars were bilaterally extensors. The patient underwent fiber-optic intubation with cervical spine stabilization. His vital parameters were within normal limits. Computed tomography of the head and cervical spine revealed multiple skull bone fractures with right parietal depressed fracture compressing the brain parenchyma (►**Fig. 1**). A large EDH was present in bilateral frontal and parietal region with bilateral parietal contusions (►**Fig. 2**). CT cervical spine did not show any bony injury (►**Fig. 3**). Coronal reconstruction (►**Fig. 4**) showed an extensive

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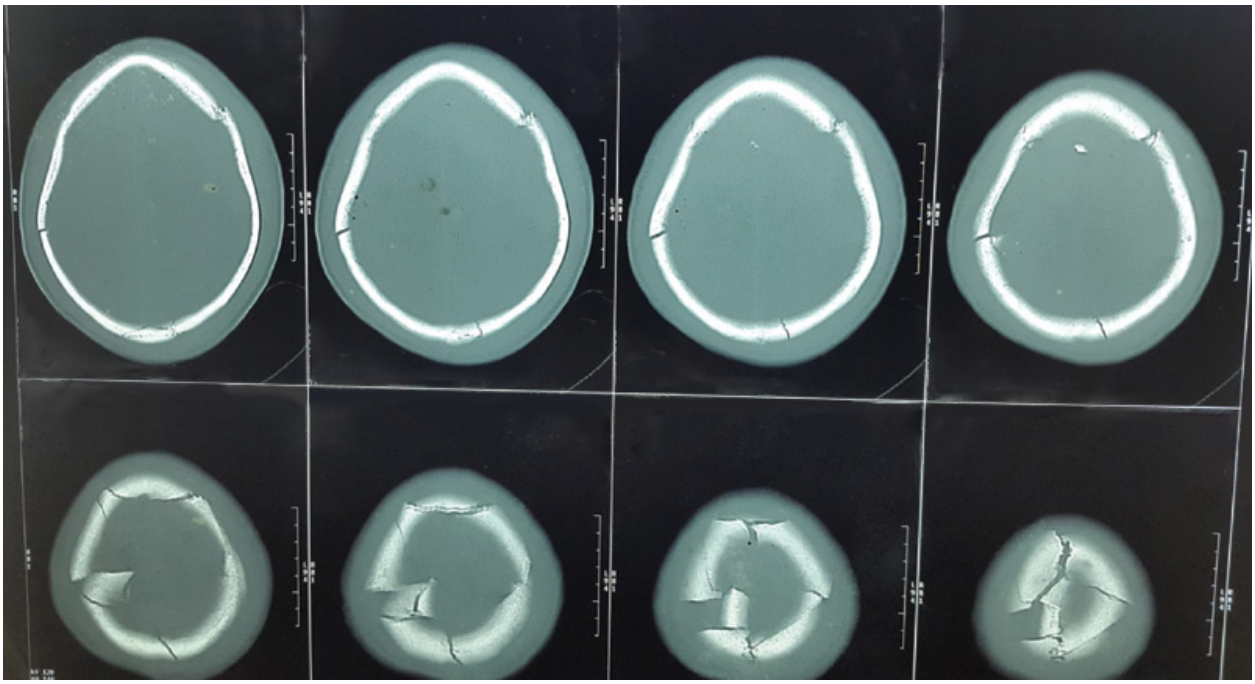

Fig. 1 Skull bone fracture.

vertex EDH going deep down the convexities and compressing region of the motor strip. The patient was taken for emergency surgery and bilateral frontal-parietal craniotomy was made leaving a thin strip of bone over sagittal sinus. Approximately 80 to 100 mL of hematoma was present on each side of the midline and sagittal sinus was separated from inner table of skull with multiple bleeding points along the course of superior sagittal sinus. Multiple dural hitch stitches were taken to secure bleeding. Postoperatively, the patient's GCS improved to E4V2M5 on postoperative day 1 and E4V5M6 on postoperative day 2. Screening magnetic resonance imaging (MRI) of the cervical spine was also done to rule out cervical spinal cord injury (►**Fig. 5**). Postoperative CT scan of the head revealed near-complete evacuation of VEH with no mass effect (►**Fig. 6**). Motor power improved to 3/5 in all four limbs within 3 days

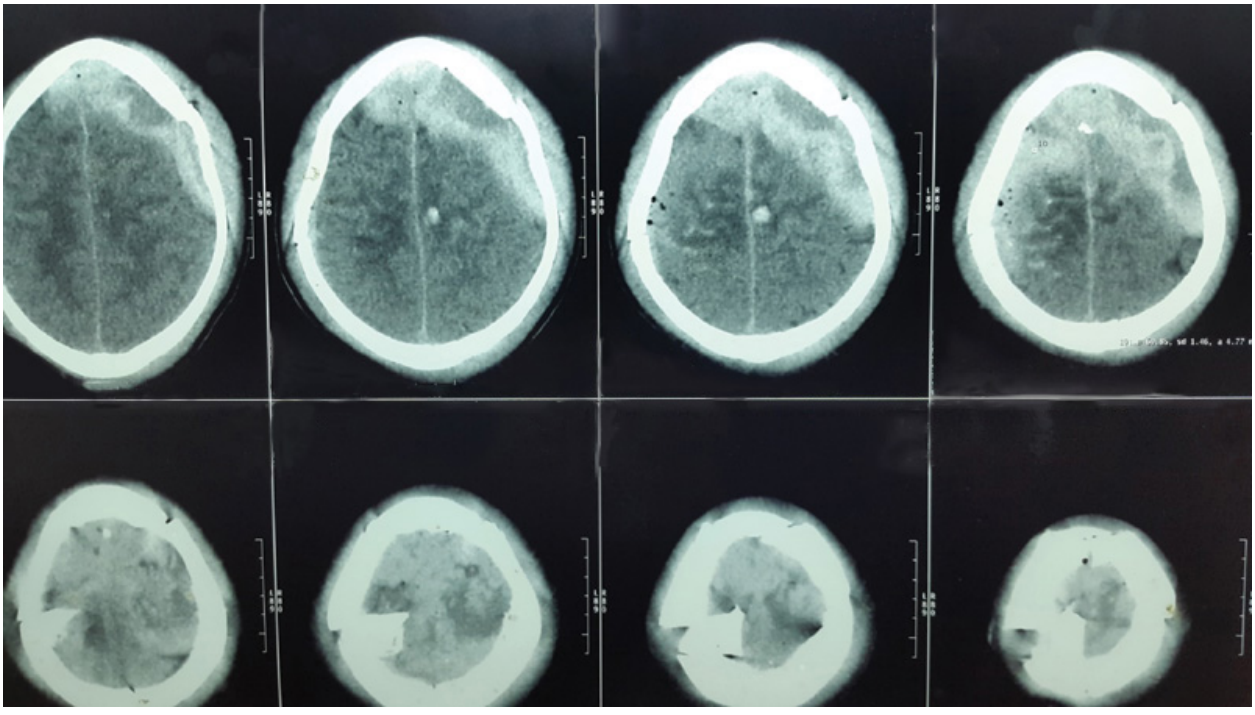

Fig. 2 Noncontrast computed tomography (NCCT) of the brain showing vertex epidural hematoma (EDH) with frontoparietal contusion.

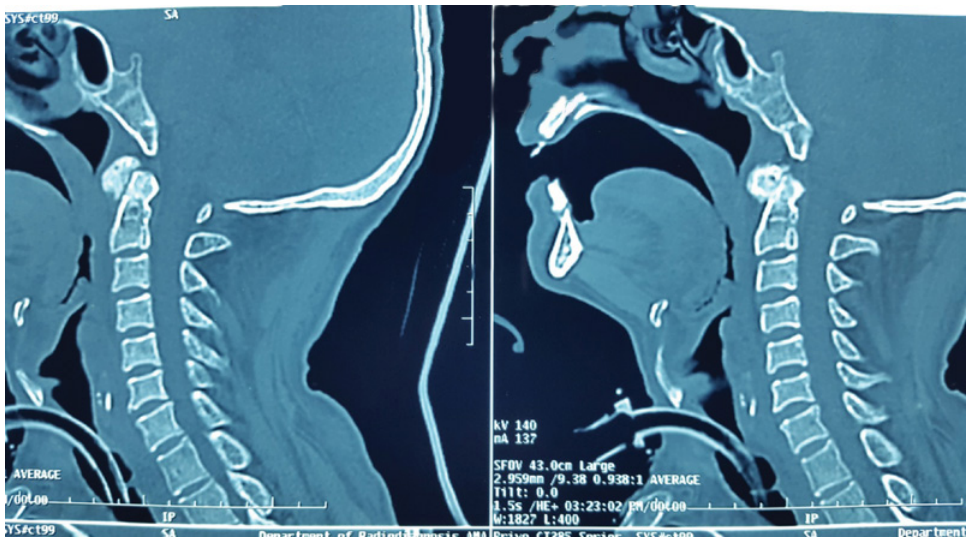

Fig. 3 Computed tomography (CT) of the cervical spine.

and later on to 4 + /5 by the time of discharge at 15 days.

Discussion

EDHs at the vertex are very rare. This is probably due to dense dural adhesions of superior sagittal sinus to the overlying bone particularly at the sagittal suture. The bleeding source could be the veins, venous sinuses, the fracture itself, or diffuse dural bleeding caused by dural stripping.[3,5] As many as 92 to 100% of the cases were associated with a fracture at the level of the vertex, but exact incidence of source of bleeding in these could not be evidenced.[4–7] EDHs of venous origin are usually small and progress gradually presenting with features of raised ICP without lateralizing signs. Source of bleeding in our case appeared to be multiple tiny points along the sagittal sinus. Many authors reported headache, vomiting, and raised ICP as major clinical symptoms.[6] Paraplegia and motor weakness are also important manifestations.[6–9] In the series of 14 patients, published by Borzone and coworkers, all 14 patients had hemiplegia and 5 had headache too.[1] Safavi-Abbasi and coworkers had published a case report of vertex EDH with monoplegia.[10] Kiboi and Muriithi reported a case of bilateral upper limb decerebrate posture.[11] Our

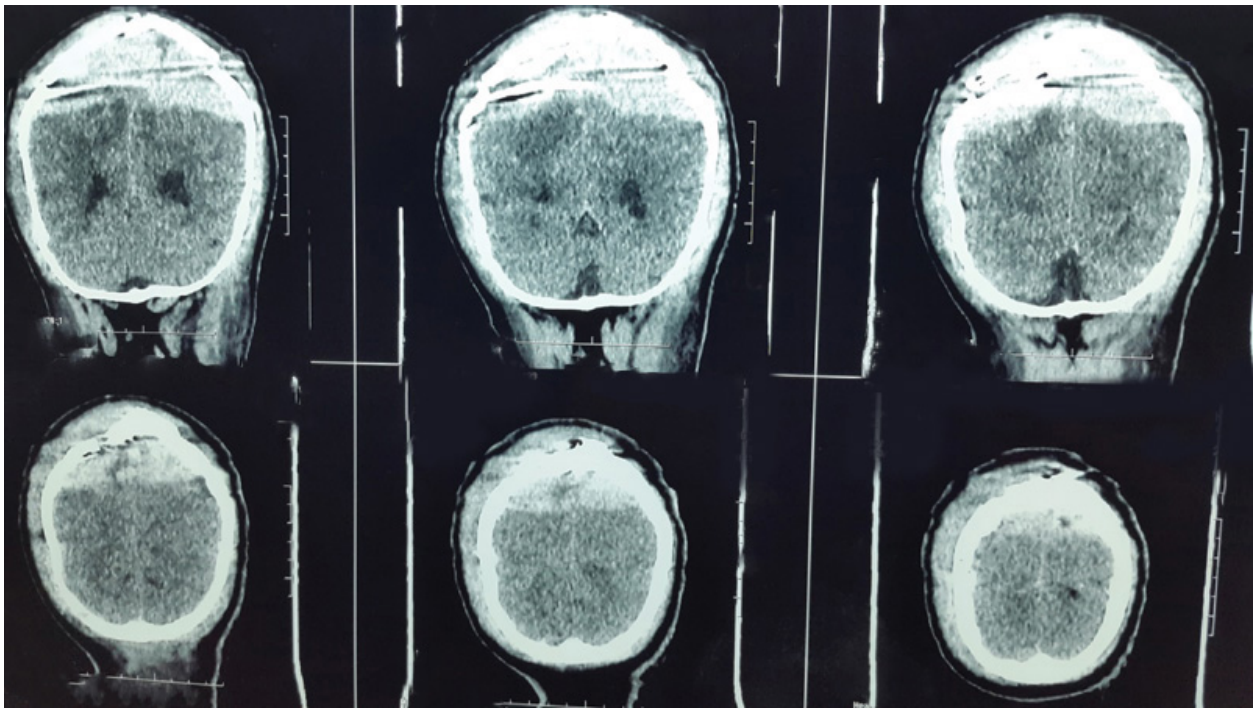

Fig. 4 Coronal reconstruction.

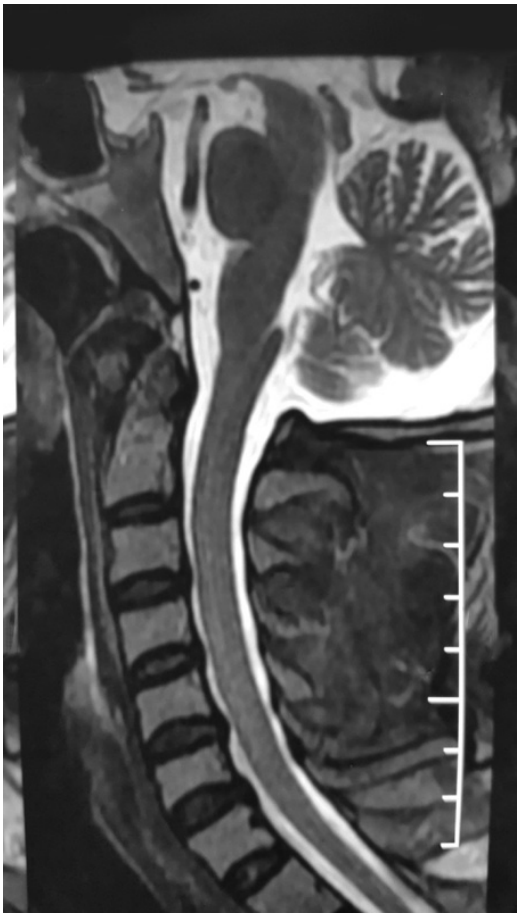

Fig. 5 Screening magnetic resonance imaging (MRI) cervical spine T2-weighted image (T2WI).

patient appears to have extensive direct bilateral compression of motor strip by the hematoma with associated edema around contusions as a cause of quadriparesis.

Many authors have noted the problems associated with the diagnosis of VEHs by conventional axial CT. The difficulty arises because of the location of the clot at the apex of the brain. At this location, the near isodensity of the hematoma and bone and volume averaging effects of routine CT scanning with relatively thick slices (10 mm) make the diagnosis more difficult.

Most other authors emphasize coronal MRI and CT as the most important diagnostic tools. We believe that coronal CT scanning or coronal reconstructions are preferable and sufficient in all clinically suspected cases of VEHs. With coronal views, the real size of the clot can be estimated and prompt surgical intervention without a time-consuming diagnostic delay can follow. Rapid diagnosis and surgical intervention are crucial to limit complications and death from the progressive event.

Surgical strategy proposed by many authors suggest bicoronal skin flap with separate bilateral fronto parietal craniotomy leaving bone along superior sagittal sinus.[8,12,13] Also, multiple hitch stitches all around the craniotomy site, including along the sagittal sinus, would control bleeding effectively.[8] Other techniques that are described include free duraplasty, direct stitching, clipping of the sinus, and the pedunculated duraplasty.[14]

Some authors believe that extradural hematomas do not always require surgical evacuation, depending on the patient's level of consciousness and the size of the hematoma. However, this position is controversial and the

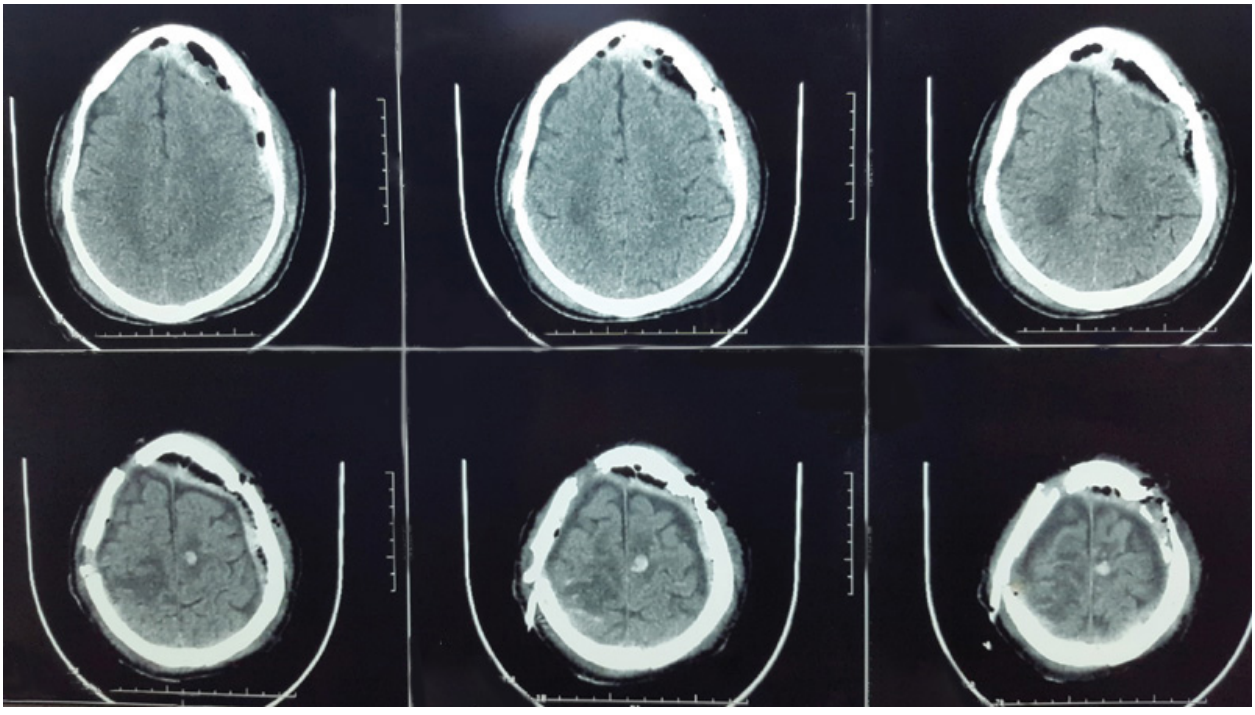

Fig. 6 Postoperative noncontrast computed tomography (NCCT) of the brain.

exception rather than the rule for large hematoma.[15–17] Conservative management of VEHs has also been discussed,[17] and should be chosen with great caution.

Conclusion

VEHs should be considered as a possibility in patients of TBI with quadriparesis, especially when the spine is normal. Patients with signs of raised ICP or paralysis should undergo CT scanning with thin cuts and coronal reconstructions to verify the location and size of the clot. Rapid surgical intervention, especially in patients with progressive symptoms, can limit morbidity and mortality. The lesson learnt from the case is that regardless of poor GCS and late presentation, surgical decompression of VEHs may result in excellent recovery from the resultant quadriparesis.

Conflict of Interest
None.

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