

Image Report

Acute vertex epidural hematoma

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Epidural hematomas (EDH) are often located at the cerebral hemisphere convexities or the posterior fossa often following trauma. The offending source of bleeding in a majority of EDHs is secondary to arterial, venous, or bony vascular channel compromise.^[4] EDH located on the vertex cerebrum (vEDH) are relatively uncommon, however, may be associated with significant morbidity and mortality if not promptly identified, as they often involve a breach of the superior sagittal sinus.^[4,5]

We present a previously healthy 26-year-old male seen at our tertiary center 6-hours after sustaining blunt force trauma to the head. He was found to be Glasgow Coma Scale (GCS) 14, disoriented, intermittently bradycardic, but had no focal neurologic deficits. A computer tomography (CT) scan [Figure 1] revealed a large subgaleal hematoma, coronal suture diastasis, and acute vEDH, seen crossing the midline above the falx cerebri. The vEDH exerted mass effect on both hemispheres, causing downward herniation of the brain and superior sagittal sinus (SSS) by 30 mm. This is appreciated best on the coronal and sagittal cuts [Figure 1a and c]. The mixed density seen within the vEDH suggested hyperacute blood concerning for active extravasation.

Given the prolonged lucid interval, it was felt the hemorrhage was likely venous in etiology. A CT venogram (CTV) [Figure 2] was emergently obtained to address the concern for superior sagittal sinus (SSS) injury with active extravasation. The CTV again demonstrated the downward displacement of the SSS. Attenuation of the SSS in the posterior frontal region suggested possible SSS and compression from downward mass effect. Multiple spot signs within the vEDH again suggested active extravasation with injury to the SSS felt to be the most likely source, however, additional injury to diploic veins could be not ruled out.

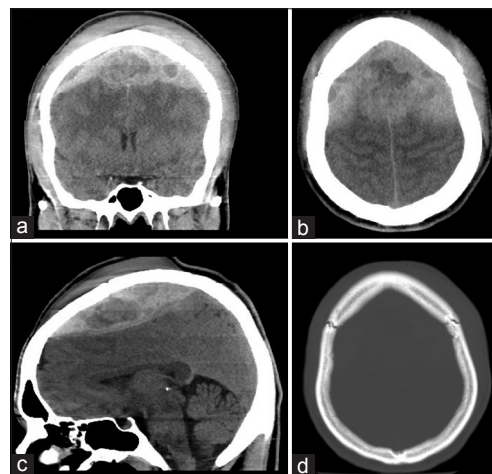


Figure 1: Preoperative noncontrast CT head – (a) coronal cut at the level of the sphenoid sinus, (b) vertex axial cut, (c) mid-sagittal cut, showing a large vertex epidural hematoma with mixed density suggestive of hyperacute hemorrhage, active extravasation and downward herniation. (d) vertex axial cut, bone window, showing coronal suture diastasis

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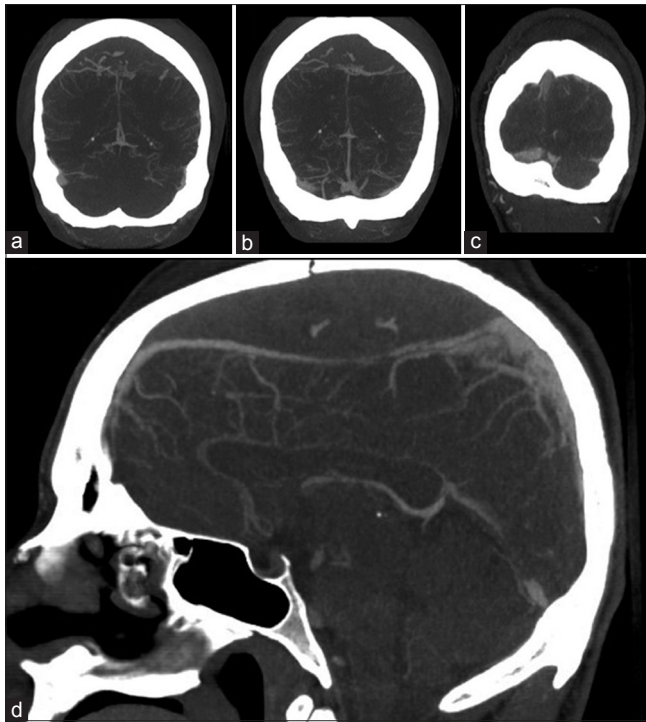


Figure 2: Preoperative CT angiogram head – (a-c) coronal cuts, progressively more posterior, showing downward displacement of the superior sagittal sinus (SSS) with spot signs within the epidural hematoma suggestive of active extravasation. (d) mid-sagittal cut, showing attenuation of the SSS in the posterior frontal region suggesting possible sinus injury or compression

The patient underwent an emergency bifrontal craniotomy for vEDH evacuation. No SSS injury was identified, though several arachnoid granulations were seen actively bleeding. This was controlled with Gelfoam, active pressure, and Tisseel fibrin glue. The bone flap was then replaced and the subgaleal hematoma evacuated. Postoperative imaging [Figure 3] showed extensive evacuation of the EDH. There is correction of the downward herniation with evidence of epidural air and fluid consistent with postsurgical change. There is persistent attenuation of the SSS in the frontoparietal region. Following surgery, the patient returned to full neurologic function, without any deficits.

DISCUSSION

In the pre-magnetic resonance imaging era, acute vEDH were thought to comprise only around 1–8% of all EDHs.^[5] If undetected, however, these hemorrhages were associated with a potential mortality of 18–50%. In current practice, with improved imaging modalities (particularly thinner axial cuts and routine reformats on CT and coronal sequences on MRI) the prevalence is thought

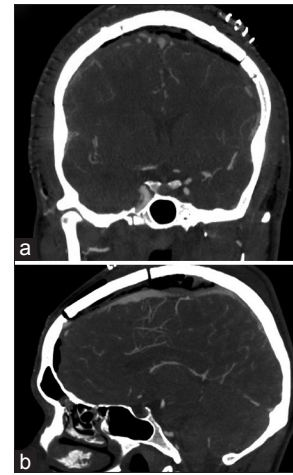


Figure 3: Postoperative CT angiogram head – (a) coronal cut at the level of the sphenoid sinus, (b) mid-sagittal cut, showing evacuation of epidural hematoma, resolution of the downward herniation, and patency of the superior sagittal sinus

to be higher, though not yet confirmed given the lack of contemporary studies with large sample sizes.^[3] Now that detection is more straightforward, the challenge of vEDHs is establishing etiology, which includes superior sagittal sinus injury, and drastically impacts management.^[1] Often patients are stable, particularly in cases where the vEDH is small, and can tolerate further imaging modalities such as MR venography (MRV) or digital subtraction angiography (DSA).^[2] In the more acute patient, if possible, a CTV is obtained but can be nondiagnostic or misleading; therefore, all provisions should be made preoperatively to manage an SSS injury should it be encountered.

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Conflicts of interest

There are no conflicts of interest.

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