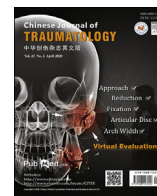




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Case Report

Supra- and infra-tentorial subacute extradural hematoma

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ABSTRACT

Extradural hematoma (EDH) is a rare but serious complication of brain injury. The supra- and infra-tentorial EDH is even rarer and only a few articles focusing on this topic have been published. The clinical manifestations are nonspecific but early diagnosis of supra- and infra-tentorial EDH and prompt treatment are mandatory to avoid complications. We report this case of a supra- and infra-tentorial subacute EDH on a 4 years old child.

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Introduction

Extradural hematoma (EDH) is a rare complication of brain injury, which represents about 1%–4% of traumatic brain injury.^{1,2} The location of supra- and infra-tentorial EDH is very rare and only a few related articles were published in the literature. The clinical signs are not specific and there may be no symptom in acute EDH initially. It is reported that an occipital fracture is associated with 84% of EDH and among the EDH cases, 39% had parenchymal lesions.³ Since the advent of computed tomography (CT) scanning, the diagnosis of the lesion has been simplified and the prognosis of patients has been improved. We report the case of a supra- and infra-tentorial subacute EDH on a 4 years old child.

Case report

A 4 years old child suffered cranial trauma for falling from height during sports exercise. Three days later, consultation was required at the emergency department. The child was drowsy at admission, with a Glasgow coma scale (GCS) score of 14 and complain of headache and vomiting. There was no neurological deficiency but a left occipital swelling as the impact sign. Blood routine examination was conducted. Brain CT scan revealed a subacute left occipital EDH

(69 mm × 28 mm) extended to the posterior fossa with detachment of the left lateral sinus (Fig. 1).

We operated on the child under general anesthesia, in a prone position. After incision of the left occipital skin, a left supra-tentorial bone flap and a left infra-tentorial craniectomy were performed to expose and evacuate the hematoma (Fig. 2).

There was a left occipital temporal simple fracture that did not show on the CT scan and dural sinus was found as the source of bleeding. After total removal of the supra- and infra-tentorial EDH, suspension of the left lateral sinus and the dura mater was carried out and hemostasis was achieved.

The wound healed well at 8 days after surgery and the child was discharged after sutures removal. There was no remaining collection on the postoperative brain CT scan (Figs. 3–5). Patient was followed up once a week at the clinical center. At one year and three months after surgery he has no complaint.

Discussion

A simultaneous acute supra- and infra-tentorial EDH is a rare case which appears both in front of lateral sinus and behind it. The cases are generally associated with lateral sinus injury.^{4,5} EDH of the posterior fossa is mainly seen in young-aged patients, which representing 55% of the reported series of Jang et al.⁶ The reason for the high incidence rate in children could be the rich vascularisation of the children's dura and diploe, and cranial trauma in children most frequently attacks/involves the occipital region.

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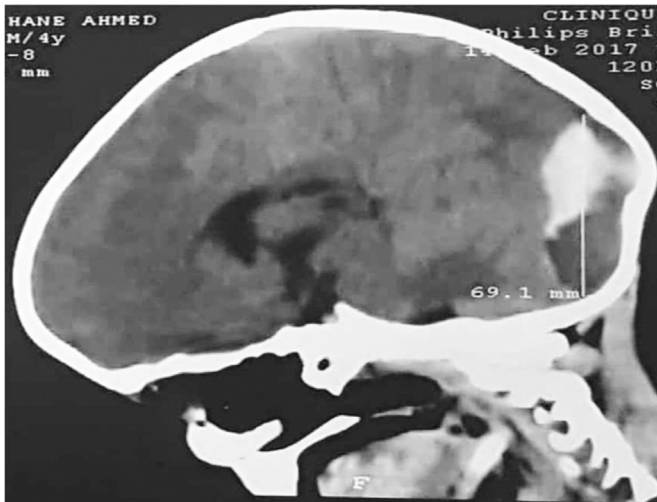


Fig. 1. Brain CT scan showing supra- and infra-tentorial extradural hematoma.

The cause of trauma could be variable intensive energy violent even benign like in our case: the patient fell from height during sports exercise. Unlike EDH in the anterior and middle cranial fossa, supra- and infra-tentorial EDH has no characteristic clinical symptoms. Supra-tentorial EDH clinical manifestations could be headache, nausea, vomiting, memory loss, hemiparesis, and unconsciousness; meanwhile, neck pain, cranial nerve palsy and cerebellar dysfunction can be seen in infra-tentorial EDH.¹ Indeed the lack of clinical signs does not exclude the diagnosis.

Hooper classified traumatic posterior fossa EDH as acute, subacute, and chronic, with the beginning of symptoms within the first 24 h after trauma, the 2nd to 7th days after trauma, and later than 7 days, respectively.¹ The acute EDH is characterized by the severe trauma and the main sign is consciousness impairment or coma. In the subacute EDH, the main signs are intracranial hypertension, cerebellar or brain stem compression; usually seen in children as in our case. The chronic form is rare, the signs are like infra-tentorial expansive process, and usually this form is not operated but managed by follow-up. The posterior fossa EDH is usually associated with occipital fracture.^{1,3,6,7} The fracture cannot be visible on

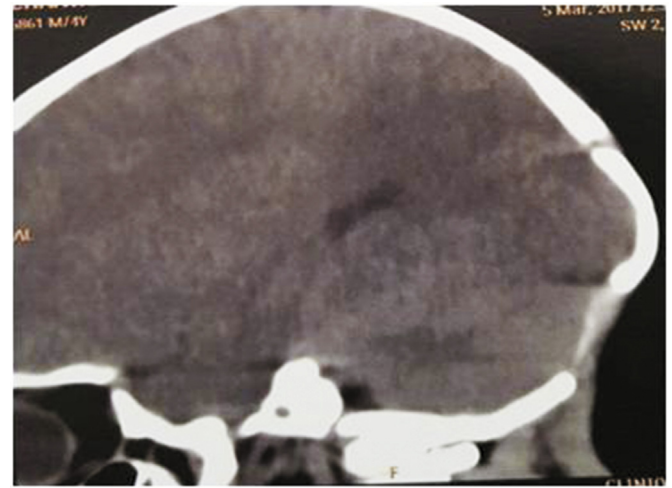


Fig. 3. Eight days after surgery brain CT scan showing no residual collection.

radiological exam and CT scan but can be seen during operation. Like our patient in the case, the absence of fracture is rare in children because of the plasticity of the skull.

Surgery is the gold standard treatment of supra- and infra-tentorial EDH based on the evacuation of the hematoma through a craniotomy. Perioperative examination gave some time to determine the origin of bleeding. According to the study of Upadhyay et al.,⁴ the origin of bleeding could be arterial from the posterior meningeal artery or venous from the lateral sinus or the torcula.

As we do, many authors^{1,6,8} recommended combined supra-tentorial and sub-occipital craniotomy and leave a bone bridge over the transverse sinus for dural suspension. Nasi et al.⁸ reported that the source of bleeding of supra- and infra-tentorial EDH is venous bone fracture with diploe bleeding (50%), transverse/

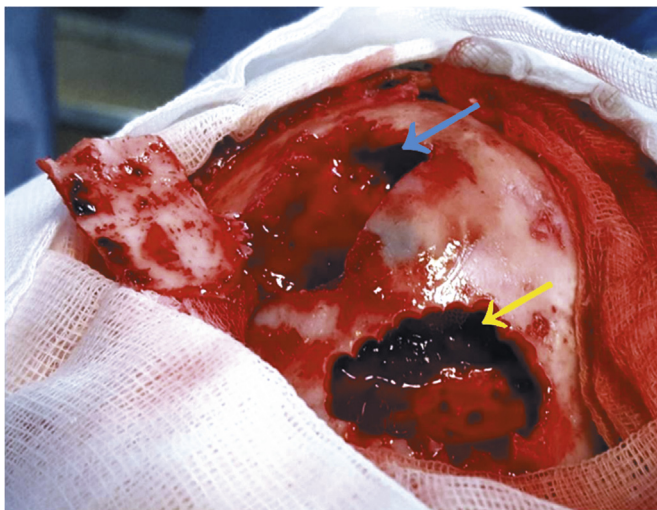


Fig. 2. Intraoperative evacuation of the extradural hematoma through the supra-tentorial bone flap (blue arrow) and infra-tentorial craniotomy (yellow arrow).

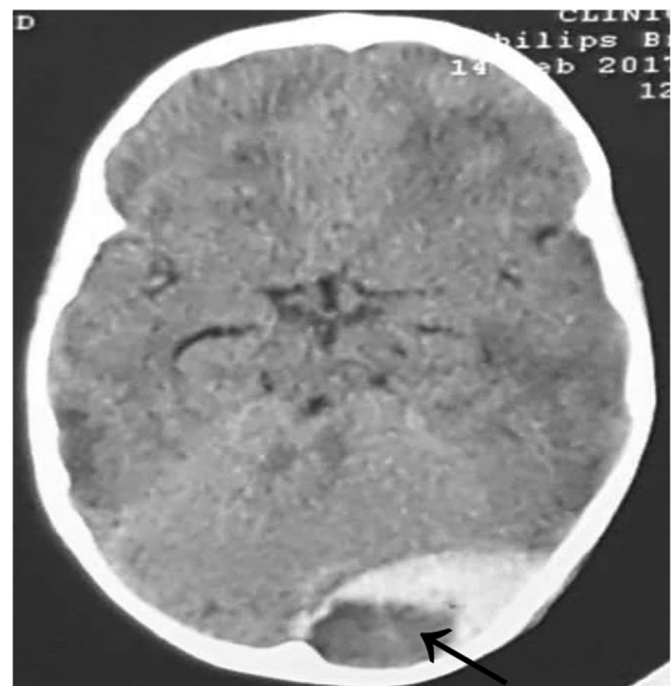


Fig. 4. Axial CTscan before surgery showing the EDH.

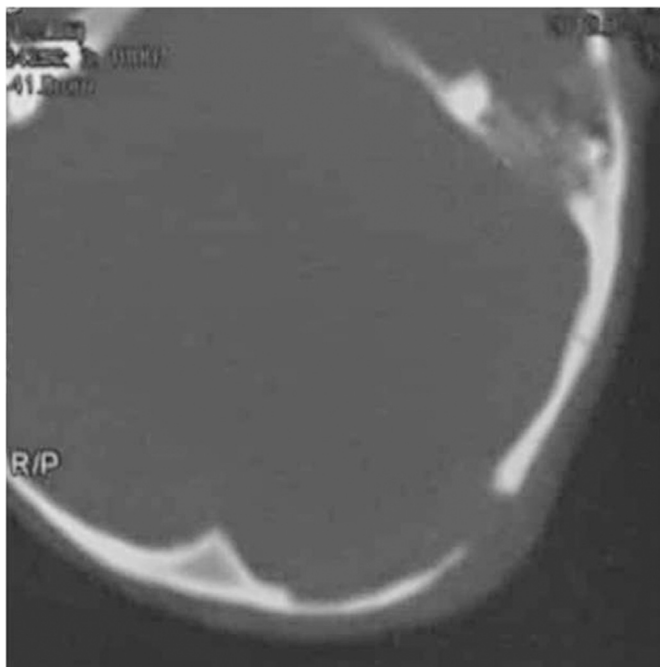


Fig. 5. Axial CTscan after surgery, no residual hematoma.

sigmoid sinus injury (22%), oozing meningeal venous vessel (8%), detachment of transverse sinus without wall injury (6%), and unknown in the other cases. Some authors suggested providing conservative treatment for small non-compressive hematomas but strict clinical and radiological follow-up is mandatory.⁶

The supra- and infra-tentorial EDH prognosis has improved since the advancement of the CT scan. The bad prognosis factors of supra- and infra-tentorial EDH including initial or secondary consciousness disorders associated parenchymal lesions. The reported mortality rates were various. Aji et al.¹ in their literature review reported that in general, the overall mortality of supra- and infra-tentorial EDH is 17%, the operative mortality rate is 14%, and the morbidity rate is 6% and a better prognosis can be achieved in patients under 10 years of age. After literature review, Nasi et al.⁸ reported that overall mortality of supra- and infra-tentorial EDH is 4%; 92% of the supra- and infra-tentorial EDH patients obtained favorable outcomes (Glasgow outcome score (GOS) 4–5) after

surgery, while 8% of them obtained an unfavorable outcome (GOS 1–3).⁸

EDH is the veritable neurosurgical emergency, and that located in the supra- and infra-tentorial is rare. Because supra- and infra-tentorial EDH has no specific clinical signs, more attention needs to be put on the diagnosis of child trauma patient with occipital impact. Early diagnosis by CT scan and removal of hematoma on time predict/signify a good prognosis.

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Ethical Statement

The written consent was obtained from parent of the patient.

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Declaration of Competing Interest

The authors declare that they have no conflicts of interest.

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