

EPIDURAL HEMATOMA WITH OSSIFICATION: TWO CASE REPORTS

Gagandeep Choudhary,¹ Ramandeep Singh,² Avneet Boparai,¹ Gurinder Singh¹¹ Chintpurni Medical College & Hospital, Pathankot, India.² Government Medical College & Hospital, Patiala, India.

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ABSTRACT

We report two case of ossified epidural hematoma (EDH). First case a 30 years male who had head injury 4 years back following a road traffic accident. Initial computed tomography (CT) showed EDH otherwise his hospital stay was uneventful. 3 years later he presented with seizure. Sequential CT scan shows hyperdense layer along the margins of the hematoma which increased in thickness. Second case a 26 years male presented with assault, CT scan showed depressed fracture of left frontal bone with resolving EDH and a thin hyperdense inner margin.

Key words: Epidural hematoma; Ossification; Computed tomography.

Introduction

Epidural hematoma (EDH) is a traumatic accumulation of blood between the inner table of the skull and the stripped off dural membrane. In 85-95% of patients, this type of trauma results in an overlying fracture of the skull. Blood vessels in close proximity to the fracture are the sources of hemorrhage in the formation of an epidural hematoma. Most common source is middle meningeal artery or dural venous sinuses. It is thought that initial impact with deformation or fracturing of cranium produces detachment of the dura directly beneath the site of the blow and injures blood vessels. Once bleeding begins the extradural space is filled with blood. It can cross dural attachments but not sutures. Calcification or ossification is rare and since the introduction of computed tomography (CT) scan, few such cases have been described in the literature.¹ Once the ossification develops, natural resolution of EDH becomes more difficult. Here we present two such cases which presented to our hospital with Epidural hematoma with acute onset of ossification.

Case Reports

Case 1: A 30 years old male presented with seizures from last 3 years, he had history of head injury 4 years

Correspondence : Dr. Gagandeep Choudhary
Assistant Professor
Department of Radiodiagnosis,
Chintpurni Medical College & Hospital, Pathankot,
India. 145001 Phone: +91-9814830163
Email: dr.gagan1984@gmail.com

back, immediate CT at the time of injury shows a extradural hematoma over left frontal region with fracture of left frontal bone, however his vitals were normal, for which he was manage conservatively, and the recovery was uneventful (Fig. 1). Sequential CT scan done after two weeks, six weeks and after two

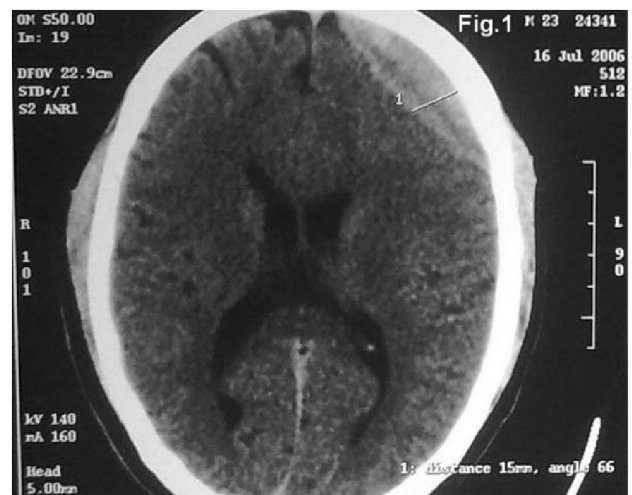


Figure 1: 30 year's old male with left frontal EDH. Axial Non contrast CT shows an epidural hematoma over left frontal region with mass effect (CT done on 16th July 2006).

years respectively shows hyperdense layer along the margins of the hematoma which increased in thickness (Fig. 2). This hyperdense layer was identified as early as six weeks after head injury. No enhancement was



Figure 2: Same patient in Figure 1. (A) Axial Non contrast CT scan One month later shows a thick hyperdense layer seen along the inner margin of EDH (14th August, 2006). (B & C) Axial Non contrast CT done Four year later shows Thick ossified inner margin of EDH (7th April, 2010).

seen after the contrast administration. Predisposing metabolic, hematological, electrolytes and endocrinological factor were ruled out. His EEG was normal. Patient was referred for neurosurgical consultation and was operated successfully with improvement of his symptoms.

Case 2: A 26 years male struck with brick on his head and with transient loss of consciousness. CT scan done after one week showed depressed fracture of left frontal bone with resolving EDH and a thin hyperdense layer along the inner margin of EDH (Fig. 3). as the patient was kept under observation and he recovered without any sequelae.

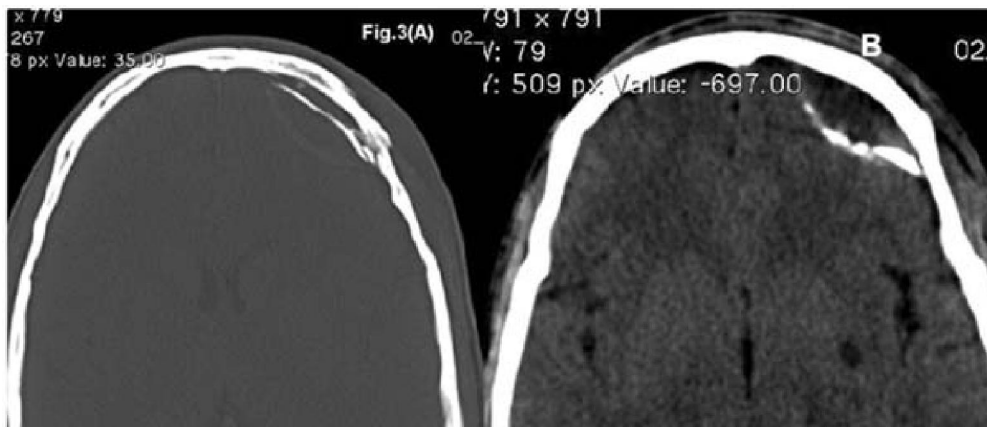


Figure 3: (A & B) 26 years old male Axial Non contrast CT scan shows depressed fracture of frontal bone on left with resolving EDH and a thin hyperdense inner margin.

Discussion

Ossification or calcification of a chronic EDH is a rare occurrence.^{2,3} However in children Epidural hematoma (EDH) is known to ossify and ossification of this condition further prevent natural absorption of EDH.³ So conservative treatment of an epidural hematoma is not effective in all cases. Sequential CT scan will reveal an expansion of the former hematoma accompanied by a thick hyperdense layer. Although precise mechanism of an ossification or calcification are still not well understood, it has been hypothesized are still

not well understood, it has been hypothesized that damage to vascularized tissues such as bone and dura provokes inflammation, repair and remodeling in tissues.⁴ Calcification/ossification of EDH starts with formation of fibroblast layer adjacent to dura as early as four days after bleeding. Which subsequently develops into connective tissue layer from hematoma margin to cranial vault, which undergoes hyalinization and subsequent calcium deposition under the condition of poor circulation or malabsorption of hematoma content? Other have suggested that the clot may undergo fibrous organization and microscopic

ossification, and infiltrated osteoblast at the junction of epidural granulation tissue and dura may initiate ossification.⁵ As such association of ossification with overlying fracture has not been proven.⁶ Stimulation of the periosteal layer between the dura and epidural hematoma capsule can also cause osteogenesis.⁷ Epidural hematomas can have varied clinical presentations. Most commonly, they present as an acute neurosurgical emergency necessitating urgent evacuation. Less commonly, they may be initially asymptomatic; remaining so without enlargement or sometimes, may also enlarge producing progressive symptoms, even after many days or years, ossifying and calcifying EDH has been detected 40 years after head injury by Nagane et al.¹ The presenting symptoms usually are headache, seizures or rarely patient may be asymptomatic. These cases usually occur in younger age group and calcification is seen only on inner wall of extradural hematoma adjacent to dura.⁸ Calcified or atypical Meningioma, bony tumors, Epidermoid and abscess are considered into the differentials.

Conclusion

Generally most of epidural hematoma are absorbed with time and those with mild symptoms can be treated conservatively. Rarely EDH may show calcification, ossification or enlargement which may latter on cause symptoms in the form of chronic head ache, seizures or focal neurological deficit. So, whenever the hematoma is observed not to be naturally absorbed during serial follow-up examinations, surgical removal must be considered, even if the patient's condition is good, because this entity carries the risk of bone calcification and ossification.²

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