



EPIDURAL HEMATOMA REVIEW AND UPDATE

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SUMMARY:

Objective: To conduct a review of the descriptive scientific literature on epidural hematoma and to gather information to provide the latest updates on the subject.

Brief description: Epidural hematoma is a neurosurgical emergency that occurs intracranially within the space between the outer layer of the dura mater and the inner table of the skull; It is of traumatic origin generally and occurs after a syncope with lipothymia approximately 74% of cases, and due to fall from height with 28%, cases due to physical aggression are also described, they are more frequent in men than in women with a ratio of 3:1.

Conclusions: the mortality rate was low at 3.6%, after surgical treatment it was 2% and non-surgical treatment at 3%. The percentages of associated skull fractures (57% and 85%). They are much less commonly associated with maxillofacial fractures. After surgical treatment they have a favorable outcome, that is, a good recovery and moderate disability. Regarding the prognosis, it was found that the patients with the greatest deterioration were those with diastasis of the lambdoid suture, that is, those where the bleeding originated in the sigmoid sinus, the transverse sinus and the small meningeal vessels of the fractured bone, in addition to bleeding from non-arterial vessels in the posterior fossa with an overall mortality of 20%.

KEYWORDS: epidural hematoma; craniocerebral trauma; intracranial fracture

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INTRODUCTION:

An epidural hematoma occurs in 2% of all head injuries and up to 15% of all fatal head traumas, males are more often affected than females, furthermore, the incidence is higher among adolescents and young adults. The mean age of affected patients is 20 to 30 years and it is rare after 50 to 60 years of age. As an individual age advances, the dura mater becomes more adherent to the overlying bone. This decreases the chance that hematoma can develop in the space between the cranium and dura.

Arterial Injury

Most epidural hematomas result from arterial bleeding from a branch of the middle meningeal artery. The anterior meningeal artery or dural arteriovenous (AV) fistula at the vertex may be involved.

Venous Injury

Up to 10% of epidural Hematomas are due to venous bleeding following the laceration of a dural venous sinus. In adults up to 75% occur in the temporal region, however, in children they occur with similar frequency in the temporal occipital frontal and posterior fossa regions.

A skull fracture is present in the majority of patients with epidural hematoma. These hematomas often present beneath a fracture of the squamous part of the temporal bone

Based on radiographic progression, it can be classified into one of the following

-Type I: Acute occurs on day and associated with a swirl of unclotted blood

-Type II: Subacute occurring between days 2 to 4 and usually solid

-Type III: Chronic occurring between days 7 to 20; mixed or lucent appearance with contrast enhancement

Evaluation

Imaging studies such as a computed tomogram, scan comprise the mainstay of diagnosis. Laboratory studies such as INR, partial thromboplastin time (PTT), thromboplastin time (PT), and liver function test (LEFT) may be obtained to

assess for increased bleeding risk or underlying coagulopathies.

The following standardized formula is used to estimate the amount of blood present $ABC/2$

A: maximum diameter of hemorrhage in the CT section with the largest hemorrhage area

B: the maximum diameter of 90 degrees with respect to A in the same tomography slice

C: the number of tomography slices with hemorrhage multiplied by the thickness of the slice in centimeters

Angiography:

Consideration should be given to the presence of a dural arteriovenous fistula, which may have usually arisen from the middle meningeal artery.

Treatment:

An epidural hematoma is a neurosurgical emergency, therefore its urgent surgical resolution is necessary, which aims to prevent irreversible neurological injury and death secondary to the expansion of the hematoma and hernia, surgical resolution within the first two hours being important. As a priority, the patient's stabilization should be carried out, including ABC (airway, breathing and circulation).

Surgical indications:

-Acute epidural hematoma

-Volume of the hematoma superior to 30 ml regardless of the Glasgow scale score

-Glasgow less than 9 with pupillary anomalies such as anisocoria

Non-surgical treatment:

Non-surgical treatment may be considered in patients with mild symptoms and if they meet all of the following criteria:

-Volume less than 30ml

-Diameter of the clot less than 15mm

-Midline displacement <5 mm

-Glasgow Coma Scale greater than 8 and asymptomatic on physical examination without focal neurological symptoms

Forecast:

Most of these patients have an excellent prognosis for functional outcome after



surgical evacuation, when it is detected and evacuated quickly, this depends on the following factors: age, time of injury, immediate coma or lucid interval, presence of pupillary anomalies, blood pressure score. Glasgow Coma Scale on arrival

DEVELOPING

The sources of information and search, for this literature review, consisted of searching two different databases (PubMed and Google Scholar).

For study selection, we performed initial searches of selected articles after assessment of the title and abstract. Full articles were preferred, excluding duplicate manuscripts or texts available only with abstracts.

Despite the most commonly used parameters, including the extent of the injury or the time between trauma and surgery, the factors with the prognostic values were the clinical parameters (baseline GCS score, respiratory rate, blood glucose, blood saturation, systolic

pressure, midline displacement, and type of hematoma).

Some review articles describe a typical case that occurs when the patient is initially assigned a conservative treatment and then his condition worsens, this situation is called by some authors "progressive epidural hematoma", that is, a hematoma of new onset or that increases in size at the time of a second CT scan

For this reason, Carlson et al. considered the safety of keeping subjects with mild TBI under observation, rather than transferring them to a neurosurgery center as they rarely worsened (1 of 19; 5.2%), were treated conservatively and showed that only 11.2% subsequently worsened and underwent surgery.

Jang et al.(4) found that the patients with the greatest deterioration were those with diastasis of the lambdoid suture, that is, those where the bleeding originated in the sigmoid sinus. Other sites of bleeding were the transverse sinus and the small meningeal vessels of the fractured bone.

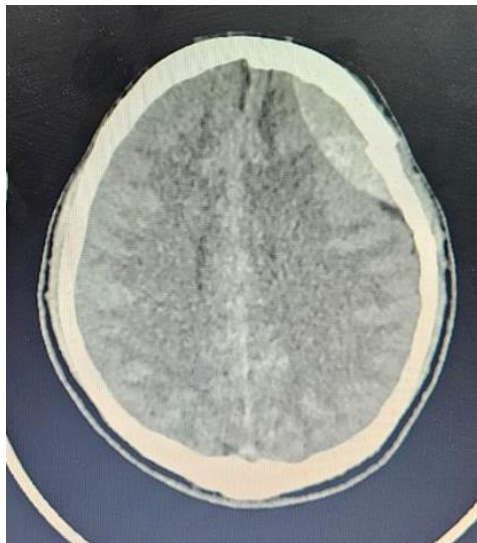


Figure 1. Cranial CT, Epidural Frontal Hematoma with fracture

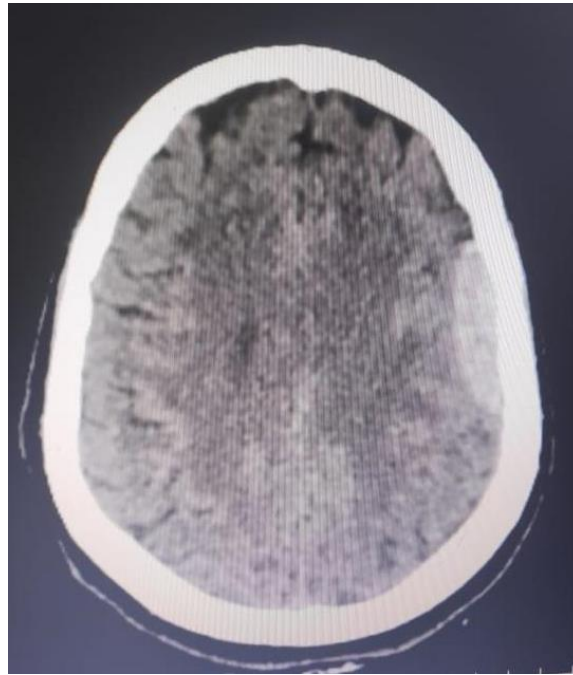


Figure 2. Epidural Parietal Hematoma without fracture

CONCLUSION:

Epidural hematoma is a neurosurgical emergency that must be resolved urgently. The patient with lamellar epidural hematoma may go unnoticed and be asymptomatic.

It may or may not occur with a fracture of a bone of the skull, however the percentage of its presence is minimal.

The prognosis is very good and depends on the evolution time of the condition, the Glasgow score presented at the beginning in emergency.

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