Frontal Epidural Haematoma: Analysis Of 30 Cases

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Citation

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Abstract

Background: The epidural haematoma is the most important expanding lesion due to head injury with high indexes of mortality and morbidity when the correct management is not done. Frontal epidural haematoma is considered rare, representing about 10% of the whole epidural haematoma. They are usually unilateral and may present with subacute and chronic evolution in 40% of the cases.

Objective: To study thirty cases of frontal epidural haematoma and analyze the causes, clinical findings, evolution, and outcome.

Patients and Methods: We studied 30 patients, retrospectively, with frontal epidural haematoma. Twenty-four cases were male and six female. The age ranged from 10-32 years old, with a mean of 18 years old.

Results: The main causes were traffic accidents and falls. In three cases the haematoma was bilateral. Acute collection occurred in 19 cases, subacute in 05 and chronic in 06. The most important clinical findings were headaches, vomiting and seizures. Skull x-rays detected fracture in 18 cases and computed tomography was positive in demonstrating the haematoma. Surgery was carried out in 28 patients and two cases had conservative treatment. Two patients died in consequence of associated intracerebral and extracerebral lesions.

Conclusions: 1) the frontal epidural haematoma is more frequent in young adults; 2) its evolution is slow, usually subacute or chronic, in majority of the cases; 3) the clinical findings of the frontal epidural haematoma course with few neurological symptoms during its evolution and 4) the prognosis is good, except those cases with multiples lesions or systemic injury.

INTRODUCTION

Epidural haematomas generally have an acute onset and are located in the temporoparietal area.[16] The main cause of the epidural haematomas is the head injury and the young adults have more risk to this lesion. However, other causes were described to explain the epidural pathology.[10] In Brazil, about 500.000 persons died per year due to traffic accident and its considered by the Brazilian government a public health question. Much money is dispending to treat these patients and few advances were done.

Nowadays, the best exam to diagnostic the epidural haematoma is the computed tomography (CT). In the era before CT, the mortality due to epidural haematoma was 40-80%, and after CT, the mortality is about 10%.[9] The CT scan is appropriated to trauma because is an exam relatively fast with high accuracy. Therefore, the first case of conservative treatment was described by Weaver et al [20] in the CT era. These authors refer that the CT scan created a new group of patients: the patients with epidural haematoma and no symptoms. Pang et al [15] described the evolution of the epidural haematoma by CT and divided it in two groups: type A and type B. Much advances were obtained with CT.

A specific frontal epidural haematoma (FEH) type has been observed in 10% of the cases, and there are few papers about it.[4,8,12] FEH may present with subacute or chronic evolution in one third of the cases and few neurological symptoms are found with good outcome.

The aim of this study is to report thirty cases of FEH and to discuss the evolution, neurologic presentation, treatment and outcome.

MATERIAL AND METHODS

We studied, retrospectively, during 2001-2004, 30 patients with FEH by the Department of Neurosurgery of the João

Alves Filho Hospital (Aracaju-Sergipe-Brazil) and by the Department of Neurosurgery of the Santa Lucia Clinic (Rio de Janeiro-Rio de Janeiro-Brazil). This study was approved by the Ethical Committee of each Hospital.

The patients were study according to sex, age, etiology of the FEH, clinical findings, treatment and outcome. The Glasgow Coma Score was obtained from all patients at admission. The outcome was gauged by the Glasgow Outcome Scale $(GOS)_2$: 1) good recovery; 2) moderate disability; 3) severe disability; 4) persistent vegetative state; 5) death. The patients with one or two points in GOS were considered excellent outcome. The criteria to conservative treatment were: 1) no focal neurological deficit; 2) midline shift less than 5 mm in CT scan; 3) fifteen or fourteen points in Glasgow Coma Score (GCS). FEH predominated in males (26:4), with age ranged from 10 to 32 years old (mean: 18 years old).

RESULTS

The principal causes of the FEH were: traffic accidents in 11 (36.7%) patients, falls in 8 (26.7%), beating in 5 (16.7%), bicycle and horseback falls in 4 (13.3%) and unknown in 2 (6.6%) patients. Main symptoms were headaches, vomiting and seizures. Contralateral motor deficit were found in 8 (26.7%) cases and anisocoria in 6 (20%). Glasgow coma score upon admission varied from 15 to 12 in 22 patients, from 12 to 9 in 2 patients and it was below 9 in 2 patients. Clinical presentation had an acute (first 24 hours) evolution in 19 cases, subacute (48-72 hours) in 5 cases and chronic (more than 72 hours) in 6 cases. Fracture was detected in skull x-rays in 18 patients. CT scan was very important for demonstration of size and the location of the haematomas: three patients had bilateral frontal epidural haematomas (Figure 1) and two patients presented calcifications in the haematoma (Figure 2). In six cases, it was possible to disclose lesion of the anterior part of the superior sagital sinus, with confirmation by surgical findings. Twenty patients were treated with osteoplastic craniotomy and haematoma drainage, eight underwent frontal craniotomy followed by haematoma evacuation and two had conservative treatment. Two patients died in consequence of associated intracranial and extracranial lesions.

Figure 1

Figure 1: Bilateral frontal haematoma

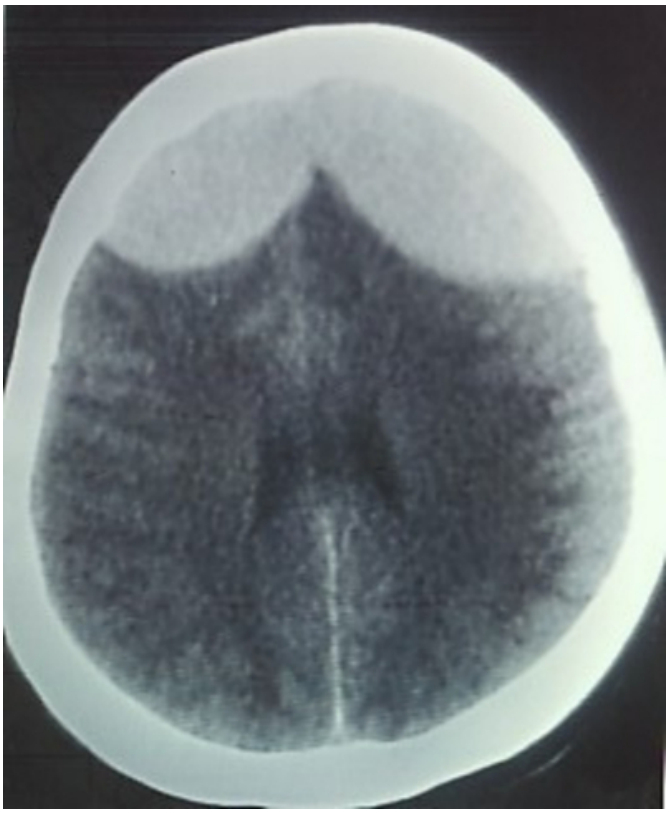
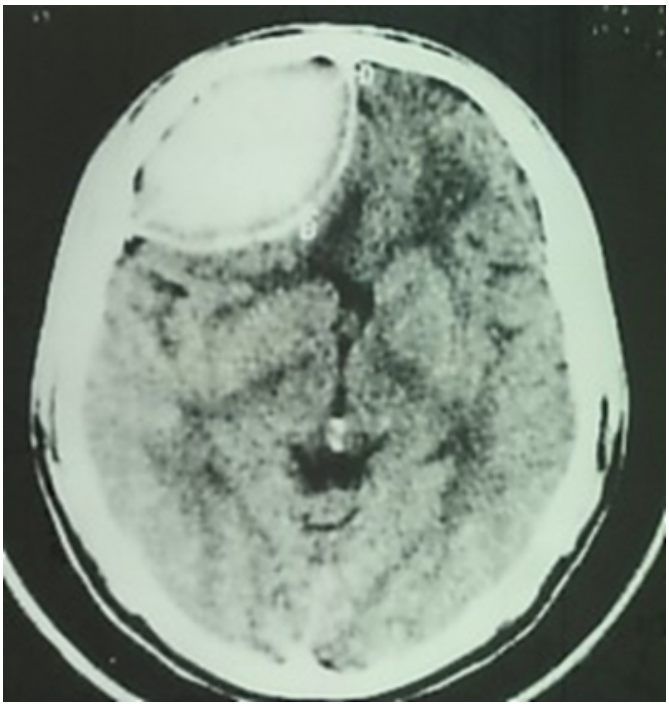


Figure 2

Figure 2: Chronic frontal epidural haematoma



DISCUSSION

Epidural haematomas, which lie between the inner surface of

the skull and the stripped of dural membrane, are nearly always caused by, and located near, a skull fracture. The collections take several forms in terms of size, location, speed of development, and the effects they exert on patients. Epidural haematomas usually form within a matter of hours from the time of injury but sometimes run a more chronic course, being detected only days after injury. In some cases, initial CT scan may be performed too soon in a patient in whom an epidural haematoma is still in process of forming. In circumstances in which CT scan is obtained within the first 06 hours of injury and the patient shows subsequent deterioration, a second CT scan must be obtained. In a small number of instances, repeat CT scan reveals a sizeable epidural haematoma not shown on the first films.

Epidural haematomas may affect any part of the skull, although it is more common in some areas. Temporal and temporoparietal areas are involved in 70% of the cases. Approximately 10% occur at the frontal area, 10% at the parieto-occipital and 10% at the infratentorial area, being less frequent in the vertex and in the clivus.[16]

The frontal epidural haematoma represents 10% of all cases of epidural haematomas, being generally unilateral. In our study, we found three bilateral frontal cases. Tatagiba et al [18]reported a higher incidence of subacute and chronic evolution and had lower morbimortality. According to Zucarrello et al [21], the frontal epidural haematoma presents a subacute or chronic evolution, because the brain can easily tolerate an anterior and postlateral compression rather than a lateral compression or in the posterior fossa. Some authors found a little predominance of epidural haematoma with chronic evolution when it occurs in the frontal and in the parieto-occipital areas.[6,11]Were studied five patients with subacute evolution and six patients with chronic evolution. The lower incidence of calcification in these haematomas[16] has been reported, even though in this work there were two chronic patients with calcification.

According to Jamiesson & Yelland[6], a patient with epidural haematoma in the frontal fossa remains conscious all the time even though usually becoming irritable and with headaches. These authors stated that young patients remain generally unconscious longer than elderly patients, just the opposite as with the epidural haematoma located in the posterior fossa, where the patient remains unconscious all the time. In some cases the only symptom found in patients with frontal epidural haematoma was headache and occasional irritability.[3] Many authors reported that pupillary abnormalities are rare in cases of epidural haematoma in the frontal area.[5,6] In this series, eight patients presented unilateral mydriasis and in two of them direct ocular trauma was confirmed; the others presented with mydriasis secondary to third cranial nerve compression due to a large haematoma or adjacent brain edema. According to Jamieson and Yelland[6], signs of cardiocirculatory disturbances such as arterial hipertension/hipotension/bradicardia are more common in epidural haematomas of the anterior and posterior fossa than those located in the lateral area, what has been observed in the patients studied here. The existence of exoftalmia associated with subperiostal haematoma in the orbits, secondary to subfrontal epidural haematoma has been described in medical literature.[13,14,17,19]Was found one case in this present series.

Surgery is the treatment of choice for epidural haematomas, although in some cases of small haematomas, non-surgical treatment is performed. Patients with GCS 14-15, heamatomas smaller than 5 mm and with no midline shift demonstrated by CT scan, can be submitted to conservative treatment with excellent outcome (good recovery or moderate disability in GOS). In this series, twenty-eight patients underwent surgery for haematoma drainage and two had conservative treatment because the haematomas were small (less then 5 mm) and without symptoms. Two patients died, one of them secondary to lung damage and the other due to associated brain lesion.

Many authors say that the relation between the area of the haematoma and its prognosis is rather contradictory and conclude that this does not influence the mortality rates.[1,7] Others authors say that epidural haematomas in the temporal fossa are usually associated with a bad prognosis.[11,16]According to Jamieson and Yelland[6], haematomas located in the parasagital and frontal area have a favorable prognosis. They also postulated that the mortality was more related to the growing speed of the haematoma than to its location, being higher for the haematomas located at temporal fossa. Tatagiba et al [18]reported that frontal epidural haematomas are associated to the lower mortality rates, because of its evolution is slow. Two of our patients died, one of them due to associated intracranial damage and the other due to multiple thoracic lesions.

CONCLUSIONS

These data suggest that:

- The FEH is more frequent in young adults;

- Its evolution is slow, usually subacute or chronic, in majority of the cases;
- The clinical findings of the FEH course with few neurological symptoms during its evolution;
- The prognosis is good, except those cases with multiples lesions or systemic injury.

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References

1. Baykaner K, Alp H, Çeviker N, Keskil S, Seçkin Z. Observations of 95 patients with extradural hematoma and review of the literature. Surg Neurol 1988; 30:339-341.
2. Cook RJ, Dorsch NWC, Fearnside MR, Chaseling R. Outcome prediction in extradural haematomas. Acta Neurochir (Wien) 1988; 95:90-94.
3. Grevsten S, Pellettieri L. Surgical decision in the treatment of extradural hematoma. Acta Chir Scand 1982; 148:97-102.
4. Gruskiewicz J, Doron Y, Peyser E. Frontal extradural hematomas. Surg Neurol 1976; 5:122-128.
5. Hooper R. Observations on extradural haemorrhage. Br J Surg 1959; 49:71-87.
6. Jamieson KG, Yelland JDN. Extradural hematoma. Report of 167 cases. J Neurosurg 1968; 299:13-23.
7. Kvarnes TL, Trumpy JH. Extradural hematoma. Report of 132 cases. Acta Neurochir (Wien) 1978; 41:223-231.
8. Lecuire J, Lapras C, Goutelle A, Gacon G, Dechamme JP. Extradural prefrontal hematomas: a propos of 18 cases. Neurochirurgie 1967; 13:431-433.
9. Lee EJ, Hung YC, Wang LC, Chung KC, Chen HH. Factors influencing the functional outcome of patients with acute extradural hematomas: analysis of 200 patients undergoing surgery. J Trauma 1998; 45:946-952.
10. Marks SM, Shaw MDM. Spontaneous intracranial extradural hematoma. Case report. J Neurosurg 1982; 57:708-709.
11. McLaurin RL, Ford LE. Extradural hematoma. Statistical survey of 47 cases. J Neurosurg 1964; 21:364-371.
12. Miyazalli Y, Isojima A, Takakawa M, Abe S, Sakai H, Abe T. [Frontal acute extradural hematoma due to contrecoup injury: a case report]. No Shinkei Geka 1995; 23:917-920. Japanese.
13. Naga A, Chellaoui A, Ibaihoiu K, Benhaddou M, Mortawakil A, El Kamar A, El Azhari A, Amraoui A. Subperiosteal hematoma of the orbit associated with subfrontal extradural hematoma. Neurochirurgie 2002; 48:101-103.
14. O' neil OR, Delashaw JB, Phillips JP. Subperiosteal hematoma of the orbit associated with subfrontal hematoma: case report. Surg Neurol 1994; 42:308-311.
15. Pang D, Horton JA, Herron JM, Wilberger JE, Vries JK. Nonsurgical management of extradural hematomas in children. J Neurosurg 1983; 59:958-971.
16. Reale F, Delfini R, Mencantini G. Epidural hematomas. J Neurosurg Sci 1984; 28:9-16.
17. Romano TA, Walzer SI, Krivoy OS, Garcia E, Estribi M. Ipsilateral exophthalmos due to subfrontal epidural hematoma. Surg Neurol 1983; 19:77-79.
18. Tatagiba M, Sephernia A, El Azm M, Samii M. Chronic epidural hematoma. Report on eight cases and review of the literature. Surg Neurol 1989; 32:453-458.
19. Watts C. Exophthalmos and epidural hematoma. South Med J 1976; 69:1539-1553.
20. Weaver D, Pobereskin L, Jane JA. Spontaneous resolution pf epidural hematomas. Report of two cases. J Neurosurg 1981; 54:248-251.
21. Zuccarello M, Fiore DL, Pardatscher K, Trincia G, Andrioli GC. Chronic extradural hematoma. Acta Neurochir (Wien) 1983; 67:57-66.

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