



**INTRACRANIAL CHRONIC EPIDURAL HEMATOMAS: TECHNICAL NOTE**

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**ABSTRACT**

Intracranial chronic epidural hematomas can be rarely found in patients victims of head trauma. The diagnosis is usually delayed because of the absence of neurologic focus signs. Re-bleeding is possibly the underlying mechanism for the long term permanence of the hematoma. This pathologic entity has rarely been reported in literature, and there still no consensus about a precise therapeutic approach. We report a case of a patient with an intracranial chronic epidural hematoma with a long period of time between trauma and symptom's onset. This patient was operated through a burr hole with a good outcome. We also go through a review of the literature for diagnosis pitfalls, management options and report our surgical experience.

**KEYWORD**

Intracranial chronic epidural hematoma (CEH)

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**INTRODUCTION:**

Intracranial chronic epidural hematoma (CEH) is a benign lesion found in the follows of head trauma. It has rarely been reported in the literature. It is frequently misdiagnosed because of its delayed and mild neurologic symptoms. It counts for 3.9 to 6.9 % of all epidural hematomas (1,2). Nevertheless, CEH are more and more recognised thanks to the widespread use of CT scan. Signs of elevated intracranial pressure may orientate the diagnosis. A variety of definitions of CEH according to the period of time between the acute of trauma and moment of diagnosis exists in the literature. Most of the cases had been operated through a craniotomy. We report our surgical experience of evacuation of a CEH through a burr hole.

**Case presentation:**

A 27-year-old patient, who had head injury two months ago following a traffic accident. The impact point was right frontal. He had a short loss of consciousness, and did not present to hospital after the trauma. One month later, he noticed progressive headaches. Neither vomiting nor blur vision were associated. General and neurological examination on admission revealed no abnormal findings. Cerebral CT scan showed a right frontal, homogeneous, isodense, biconvex epidural collection, associated to a minim mass effect (Fig.1). The diagnosis of CEH was retained. The decision of surgery was taken in regard to the important signs of intracranial hypertension.

Under general anaesthesia, a burr hole was made in front of the collection. Upon reaching the inner table of the vault, a voluminous, brown, semi- viscous collection gushed out (Fig.2). No active bleeding was noticed. The dura mater seemed to be thickened, but no capsule was found. In order to insure a complete evacuation of the hematoma, we introduced the extremity of a urinary catheter through the burr hole, and injected saline solution. Irrigation helped evacuating

approximately 20cc of coagulated blood. Afterwards, we noticed cerebral re-expansion, as the dura mater came closer to the skull. Before closure, we made 2 suspension stitches through the burr hole between the dura and the pericranium. A suction drain was placed finally in contact with the dura. Postoperative course was uneventful. The patient reported complete regression of headaches. Control CT scan showed complete evacuation of the hematoma (Fig.3). No recurrence was noticed after 6 months follow up.

**DISCUSSION :**

CEH are defined in various ways in the literature. Sparacio defined them as hematomas diagnosed 48-72 hours after head injury (3). Iwakuma proposed a histologically based definition and defined CEH as those of more than 13 days, having capsule ossification (4). Bradley used radiologic features on magnetic resonance imaging to define CEH as cases diagnosed more than 14 days after head injury. He built his study on the breakdown of haemoglobin products on T1- and T2- weighted images (5). CEH is a rare type of epidural hematoma. Most of the time, CEH occur after head injury in patients younger than 40 years of age (1). It has no specific clinical presentation, and its chronology distant from trauma misleads the diagnosis —(6,7). Most of CEH cases are associated with an overlying skull fracture (7,8). CEHs are usually associated to non-specific symptoms that could be related to subjective complaints frequently seen after head traumas. The most common symptoms are headache, vomiting and disturbance of consciousness (8,9). The presence of focal neurologic signs such as motor weakness or signs of intracranial hypertension, should always guide a careful investigation of a possible surgical lesion.

Physiopathology of CEH is still under debate. Some authors build their theories upon the principle of the expansion of certain hematomas that occur in different locations throughout the body that persist and increase in size even

more than a month after the initial trauma (9). Other authors impute these delayed lesions to repetitive haemorrhages from the haematoma capsule (10). During our review of the literature, we had noticed that most of the authors consider the membrane as the most incriminated in the genesis and expansion of chronic epidural hematomas. Some of them do even point to the fact that a chronic epidural hematoma can only be considered as healed when there is a radiological evidence of removal of this membrane. In our case, we were not able to view any membranes, so this would put into question previous affirmations.

CEH is more commonly supratentorial, only 1,5% are located in the posterior fossa (2). The CT appearance is usually biconvex with a hypodense central area surrounded by a hyperdense margin with mild mass affect (1,2). Radiological diagnosis of CEH may be improved by contrast injection due to the presence of an enhancing margin. A skull fracture is almost always associated with CEDH. In our case, we did not request contrast injection as we considered that the radiological features of lesion were enough specific, and no skull fracture was observed nearby the hematoma.

While management guidelines are precise for acute epidural hematomas, there still no clear recommendations for CEH. Thus the decision depends on the surgeon's estimation (11). Some authors have a conservative attitude and operate only when patients become symptomatic. Indeed, CEH may resolve spontaneously. However, patients with CEH can deteriorate rapidly and unpredictably. Deterioration may sometimes be delayed for months or years (12), and CEH can spontaneously expand by rebleeding of the capsule (1,12). Knowing that, and according to the excellent results of surgical treatment, most of authors prefer surgical approach (8,13). Furthermore, conservative management implies a high cost due to the need for serial scans and long clinical follow up. Conversely, surgery may represent an unnecessary risk considering the high rates of spontaneous resolution (8). Therefore, conservative option must be chosen with caution on an individual basis. The presence of neurological signs or symptoms should prompt a surgical intervention.

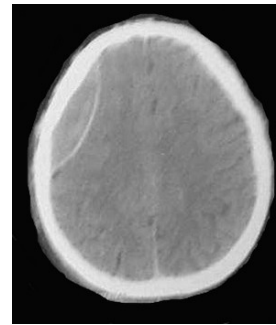
Concerning the surgical technique, most of the authors proceeded through a craniotomy (1,4,12). This approach insures a complete evacuation of the hematoma, a control of the origin of bleeding, and removal of the capsule if existent. We propose a burr hole technique, which is less invasive, with less postoperative complications. With this method, we could achieve a complete evacuation of the hematoma. This technique has also been reported by Is (14) with an excellent outcome.

However, we still think that a conversion to a craniotomy after first time burr hole may be necessary in cases of presence of active bleeding, or an adherent capsule that could not be removed.

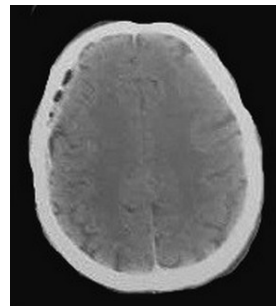
MRI would help making the choice between the two techniques, depending on the hematoma signal and contrast enhancement of the capsule and select cases favourable for burr hole approach.

**CONCLUSION :**

CEH is a rare and a not well-known clinical entity. Serious consequences may occur when misdiagnosed. Symptoms are usually due to increased intracranial pressure and appear a long time after a head trauma. Mechanism of expansion is thought to be re-bleeding. Treatment is mainly surgical, but conservative option can be occasionally chosen. Burr hole approach, in selected cases gives the opportunity to evacuate the hematoma in a mini-invasive way, but possible conversion to a classic craniotomy should be kept in mind.



**Figure n°1: preoperative CT scan showing a frontal epidural chronic hematoma**



**Figure n°2: postoperative CT scan showing after surgical evacuation of the hematoma through a burr hole**

**REFERENCES:**

1. Tatagiba M, Sepehrnia A, El Azm M, Samii M. Chronic Epidural Hematoma and Review of the Literature Report on Eight Cases. *Surg Neurol.* 1989;32:453-8.
2. Liu Y, Wang Y, Song T, Zhang Q, Li G, Zhu S. Chronic epidural hematoma a report of 10 cases and review of the literature. *J Clin Neurosci.* 1999;6(5):412-5.
3. Sparacio R, Khatib R, Chiu J, Cook A. Chronic epidural hematoma. *J Trauma.* 1972;12:435-9.
4. Iwakuma T, Brunnigaber C. Chronic extradural hematoma. A study of 21 cases. *J Neurosurg.* 1973;34:488-93.
5. Bradley W. Hemorrhage and hemorrhagic infections in the brain. *Neuroimaging Clin N Am.* 1994;4:707-32.
6. Server A, Tolleson G, Solgaard T, Haakonsen M, Johnsen U. Vertex epidural hematoma—neuroradiological findings and management. *Acta Radiol.* 2002;43(5):483-5.
7. Harbury O, Provenzale J, Barboriak D. Vertex epidural hematomas: imaging findings and diagnostic pitfalls. *Eur J Radiol.* 2000;36(3):150-7.
8. Miller D, Steinmetz M, McCutcheon I. Vertex epidural hematoma: surgical versus conservative management: two case reports and review of the literature. *Neurosurgery.* 1999;45(3):621-3.
9. Reid J, Kommareddi S, Lanckerani M, Park M. Chronic expanding hematomas. A clinicopathologic entity. *JAMA.* 1980;244:2441-2.
10. Watanabe T, Nakahara K, Miki Y, Shibui S, Takakura K, Nomura K. Chronic expanding epidural haematoma: Case report. *Acta Neurochir (Wien).* mars 1995;132(1-3):150-3.
11. Matsumoto K, Akagi K, Abekura M, Tasaki O. Vertex epidural hematoma associated with traumatic arteriovenous fistula of the middle meningeal artery: a case report. *Surg Neurol.* 2001;55(5):302-4.
12. Bonilha L, Mattos J, Borges W, Fernandes Y, Borges G. Chronic epidural hematoma of the vertex. *Clin Neurol Neurosurg.* 2003;106(1):70-4.
13. Bullock M, Chesnut R, Ghajar J, Gordon D, Hartl R, Newel D. Surgical Management of Acute Epidural Hematomas. *Neurosurgery.* 2006;58:7-15.
14. Is M, Can A, Akgül M. Chronic Supra- and Infratentorial Epidural Hematoma. *Case Report. Turk Neurosurg.* 2006;16(4):212-3.