

# TRAUMATIC BILATERAL INTRAORBITAL (SUBPERIOSTEAL) HEMATOMA ASSOCIATED WITH EPIDURAL HEMATOMA

## Case report

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**ABSTRACT** - Extradural hematoma (EDH) is a frequent lesion, with an incidence varying from 0.2 to 6% in patients admitted to hospital due to traumatic head injury. The higher incidence is found in patients with more severe injuries. The association of EDH with subperiosteal intraorbital hematomas is rarely reported, and we were not able to find in the literature any report of traumatic bilateral intraorbital hematomas and EDH. We report this case of a 32 year-old man with bilateral intraorbital (subperiosteal) hematoma associated with unilateral EDH. The lesions were treated surgically, but unfortunately with an unfavorable outcome.

**KEY WORDS:** extradural hematoma, head trauma, orbital hematoma.

### **Hematoma intraorbitário bilateral traumático associado a hematoma epidural: relato de caso**

**RESUMO** - Hematomas epidurais (HE) são lesões frequentes, com incidência entre 0,2 a 6% em pacientes internados após traumatismo cranioencefálico, sendo a maior incidência associada a pacientes portadores de traumas mais graves. A associação entre o HE e o hematoma intraorbitário é rara, sendo que não conseguimos encontrar na literatura nenhum relato de HE e hematoma intraorbitário bilateral. Relatamos o caso de um paciente de 32 anos com HE associado a hematoma intraorbitário bilateral, tratados cirurgicamente.

**PALAVRAS-CHAVE:** hematoma epidural, hematoma intraorbitário, traumatismo cranioencefálico.

Intraorbital hematomas are rare lesions, usually associated with ophthalmologic procedures, coagulation disturbances, or trauma. The presence of subperiosteal (extradural) hematomas of the orbit is rarely reported in the literature. These uncommon lesions are found after head and facial trauma, usually associated with an orbital roof fracture, and can lead to permanent blindness. We report the case of a man operated on to drainage of a large frontal extradural hematoma, presenting a few days after with dilated pupils and visual deficit, when bilateral subperiosteal intraorbital hematomas were diagnosed and drained. This is to our knowledge the first case of an extradural intracranial hematoma associated with bilateral intraorbital subperiosteal hematomas,

and we stress here the difficult of this diagnosis in acute setting, especially with associated intracranial posttraumatic lesions.

### **CASE**

A 32-year old man was admitted to our trauma hospital with a history of a 3 meters fall. Neurological examination revealed Glasgow Coma Score of 11/15, no focal deficits, right otorrhagia and bilateral palpebral hematoma, that precluded pupillary examination. After the initial trauma evaluation and stabilization, he was submitted to an urgent CT scan, that showed a large right frontal extradural hematoma (EDH) and intracranial air (Figs 1 e 2). The frontal EDH was operated immediately. On the first postoperative day, the patient was alert and confused, with no other deficits. Five days after surgery, as the large bialpalpebral

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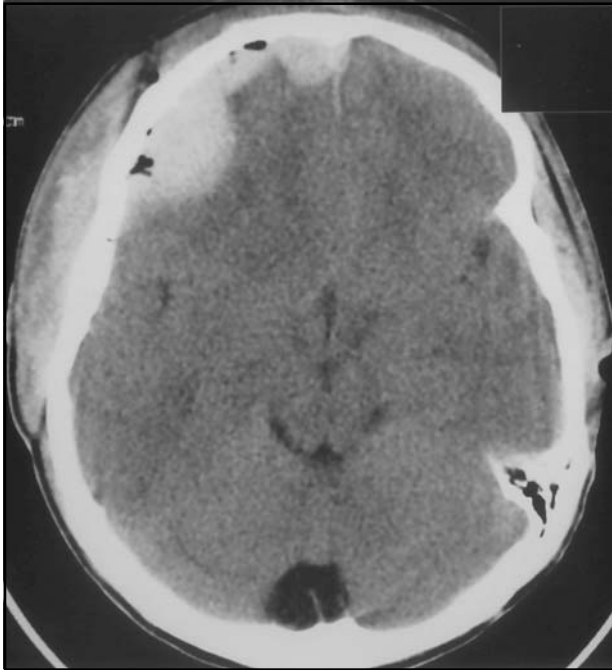


Fig 1. Right frontal epidural hematoma and intracranial air. Important edema of extracranial soft tissues can be noted.

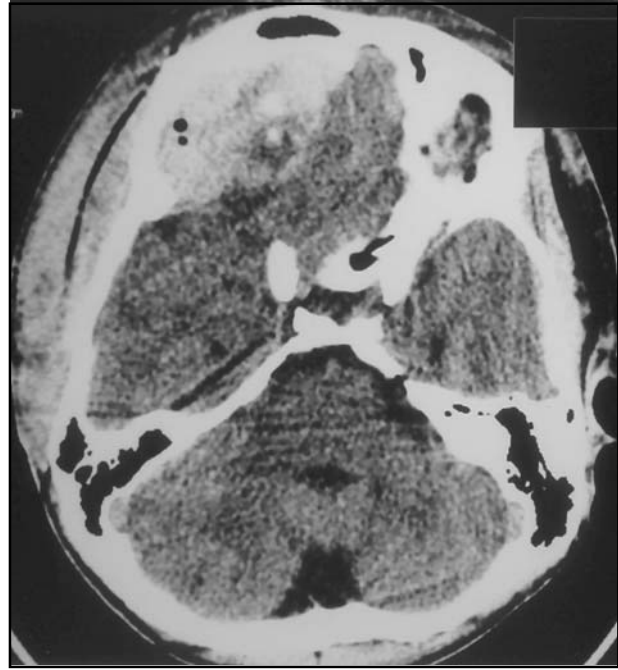


Fig 2. A lower slice, showing the fronto-basal extension of the hematoma, and again, intracranial air. A temporal fracture, unrelated to the hematoma, may also be seen.

hematoma slightly improved, ocular examination was possible and revealed proptosis and fixed dilated pupils, with no reaction to light. Ocular movements were normal on the right eye and showed a slight paresis of all muscles on the left one. An urgent CT scan was performed, and bilateral intraorbital hematoma was diagnosed, that were not saw in the initial CT scan (Fig 3). The patient was submitted to bilateral frontoorbital craniotomies with opening of both orbital roofs. A fracture was noted in the roof of the left orbita. Opening of the orbital roof revealed bilaterally a moderate amount of coagulated blood, that was removed. Both hematomas were subperiosteal (epidural), and there was not periorbital tears. No active bleeding points were identified. After surgery, there was improvement of the bipalpebral hematoma, ocular movements and proptosis. One month after surgery, the patient showed perception of light, but no further recuperation of visual function.

## DISCUSSION

Orbital hematomas are classified by Landa<sup>1</sup> either as intraorbital or subperiosteal. Subperiosteal hematomas of the orbit are rare lesions, reported in early literature as "blood cyst". Almost all cases are associated with trauma, although they can occur spontaneously, and children are more commonly affected, with an average age of onset of 17.3 years, occurring more frequently in men than women, with a 4.5:1 ratio reported by Pope-Pegram<sup>1,2</sup>. Proptosis, downward globe displacement, ophthalmoplegia, chemosis, lid hematoma, subgaleal hematoma and



Fig 3. CT scan about one week after the surgical evacuation of the frontal epidural hematoma, showing the bilateral intraorbital hematoma and a small right temporal epidural hematoma.

visual dysfunction are the most commonly related clinical manifestations, that occur most often acutely or within days of the traumatic event, but have been

reported as late as twenty years after minor orbital trauma. The differential diagnosis should include carotid-cavernous fistulae, orbital subperiosteal abscess, orbital roof fractures, frontal mucocele, sinusitis, complication of orbital and sinus surgery, tumors (rhabdomyosarcoma, leukemia, lymphangioma) and coagulopathies. Most of these diseases can be excluded based on the history, physical and radiological examination. Chronic hematic intraorbital cysts may result from undiagnosed or untreated intraorbital hematomas<sup>1-5</sup>.

The suggested mechanism of subperiosteal orbital hematomas is bleeding from subgaleal vessels, that enlarges and dissects the subgaleal space, extending to the orbita. A fracture of the orbital roof can dissect the periorbita and make room for blood to collect. In our case, one orbital roof was fractured, but not the other, and we could only suppose that the blood dissected the subperiosteal space coming from the frontal subgaleal space<sup>3</sup>. Concerning its cause, the subperiosteal hematomas can be divided in four categories: traumatic, congestive, systemic and spontaneous. As already mentioned, they occur most often after trauma. Traumatic lesions may result from direct injuries to the orbit or its neighbourhood, and may also be secondary to thoracic trauma, that results in increased venous pressure in the jugular vein and orbital veins. Minor head trauma is also related to subperiosteal orbital hematomas. Congestive etiologies include weight lifting, scuba diving and strenuous exercise. Sinusitis, coagulopathies, complications of ophthalmologic procedures, sinus or cranial surgery, and even labor are related among the systemic causes. Spontaneous intraorbital hematomas without any predisposing factor are very rare<sup>6-11</sup>.

When the hematoma presents as diplopia, proptosis or other symptoms and signs, without loss of visual acuity or signs of elevated intraocular pressure, some authorities advocate a trial of conservative management, ranging from observation alone to topical use of timolol maleate and intravenous or oral carbonic anhydrase inhibitors (acetazolamide). The question of how long one should observe a patient who is complaining of only diplopia and proptosis is still unanswered. The subperiosteal intraorbital com-

partment is a relatively avascular space, and it may take weeks for the hematoma to be absorbed. If there is any sign of increased intraocular pressure or decreased visual acuity, immediate evacuation of the hematoma is indicated. This can be accomplished through needle aspiration or orbital exploration and drainage. Needle aspiration is less technically demanding, but has the disadvantages of possible re-bleeding and of not allowing removal of clotted blood. With orbital exploration, the surgeon can stop any active bleeding, reduce possible orbital roof fractures, remove coagulated blood and to leave a drain, if necessary. We choose to approach the hematomas with craniotomies instead of using any of the orbital approaches, obviously because we were much more comfortable in performing a craniotomy than any other facial or orbital approach, but other approaches to the orbit, such as a lateral craniotomy, can also be used successfully<sup>1,2,3</sup>.

The unfavorable outcome of our patient, with blindness (at least up to the last follow-up visit), stresses the necessity of being aware to this uncommon but dangerous complication of head trauma, to make an early diagnosis and institute the effective treatment, enhancing the chances of visual preservation.

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