# Frontal epidural hematoma associated with intraorbital subperiosteal hematoma. Case report and literature review

## Hematoma epidural frontal asociado a hematoma subperióstico intraorbitario. Reporte de caso y revisión bibliográfica

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### Resumen

**Introducción:** La presencia de hematoma epidural frontal asociado a hematoma intraorbitario se considera poco frecuente. Generalmente, se debe a un traumatismo craneoencefálico moderado o grave. **Caso clínico:** Un joven de 16 años, víctima de un accidente de motocicleta, presentó un hematoma epidural frontal bilateral asociado a hematoma intraorbitario. **Resultado:** El paciente se sometió a una craneotomía bifrontal y drenaje del hematoma epidural, con resolución espontánea del hematoma intraorbitario. **Conclusión:** La presencia de hematoma epidural frontal asociado a hematoma intraorbitario es poco frecuente. Se indicó tratamiento quirúrgico de urgencia y el paciente ha presentado buena evolución.

**Palabras clave:** Hematoma intraorbitario, hematoma epidural frontal, traumatismo craneoencefálico.

### Abstract

**Introduction:** Presence of frontal extradural hematoma associated with intraorbital hematoma has been considered rare. It is usually due to moderate or severe head injury. **Case report:** 16-year-old patient, motorcycle accident victim. She presented bilateral frontal extradural hematoma associated with intraorbital hematoma. **Outcome:** Bifrontal craniotomy and drainage of extradural hematoma and spontaneous resolution of intraorbital hematoma. **Conclusion:** Presence of frontal extradural hematoma associated with intraorbital hematoma is rare. The surgical treatment of urgency has been indicated and presents a good evolution.

**Keywords:** Intraorbital hematoma, frontal extradural hematoma, cranioencephalic trauma.

### Introduction

Epidural hematoma (EH) usually presents with acute evolution, being most common in the temporal and temporoparietal region in about 70% of cases[6]. In 10% of cases they occur in the frontal region, 10% in the parietooccipital region and 10% in the posterior fossa, being rare in the vertex and clivus region[19]. Frontal EH associated with orbital subperi-

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osteal hematoma is considered rare[1,5,12,16,22].

The authors report a case of bilateral frontal EH associated with subperiosteal hematoma of the left orbit in a patient victim of cranioencephalic trauma. They discuss treatment and prognosis.

## Case report

ADN, 16 years old, male, student. Motorcycle accident victim. Admitted to the emergency department drowsy and eupneic. Physical examination: frontal edema and abrasions in the frontal region, face and upper limbs. Neurological examination: drowsy, Glasgow Coma Scale on admission 12. Isochoric and photoreactive pupils. No evident focal motor deficit.

**Imaging:** Skull CT with 3D reconstruction: presence of extensive linear fracture trace in the frontal region (Figura 1). Non-contrast axial skull CT showing bifrontal extradural hematoma (Figure 2), non-contrast coronal skull CT demonstrating presence of bifrontal extradural hematoma and blood in the left orbital cavity in its lateral portion (Figure 3). Non-contrast axial skull CT revealing presence of blood in the intraorbital cavity (Figure 4), non-contrast sagittal skull CT showing frontal extradural hematoma associated with intraorbital hematoma (Figure 5) and non-contrast skull CT post-operative control showing absence of bifrontal extradural hematoma (Figure 6).

Underwent bifrontal osteoplastic craniotomy and drainage of extradural hematoma. Was discharged from hospital without neurological or visual deficit.

## Discussion

Frontal EH occurs in 10% of all EH cases, compresses the frontal lobe pole and is usually unilateral[8,14,18]. It affects more young adult males and has a good prognosis[3,11,18].

Intraorbital hematoma is usually associated with coagulation disorders, ophthalmologic procedures and craniomaxillofacial trauma that compromises the orbital floor. Exophthalmos with subperiosteal hematoma in the orbit has been described in cases of frontal EH[9,15,17,20,21,24]. Proptosis as a primary clinical manifestation of frontal EH is rare, but has been reported in association with subperiosteal hematoma within the orbital cavity[5,21,23]. Intraorbital subperiosteal hematoma may manifest with proptosis, ophthalmoplegia, chemosis, subgaleal hematoma and visual dysfunction[1,5,13].

Zucarello et al.[25], report that the brain can better tolerate anterior and posterolateral compression than lateral compression or in the posterior fossa. Pereira et al.[18] found in their series of 30 cases of frontal EH five patients with subacute evolution and six with chronic evolution, probably due to venous bleeding (diploic venous sinuses), a fact described by Reale et al.[19].

The diagnosis of frontal EH may be neglected in the acute phase of TBI, where often early computed tomography (CT) examination has not been performed or neurological signs may appear late[21]. Cases of large frontal EH without the presence of focal neurological signs have been reported, due

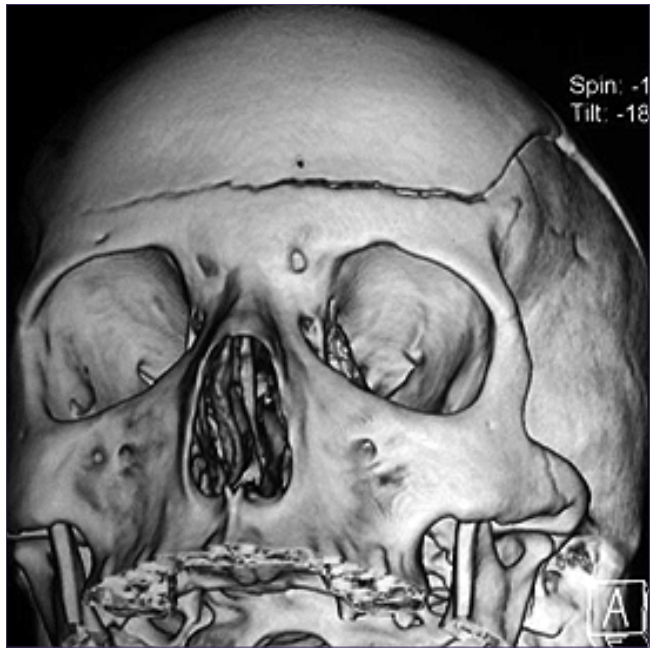


**Figure 1.** CT scan of the skull with reconstruction showing extensive skull fracture.

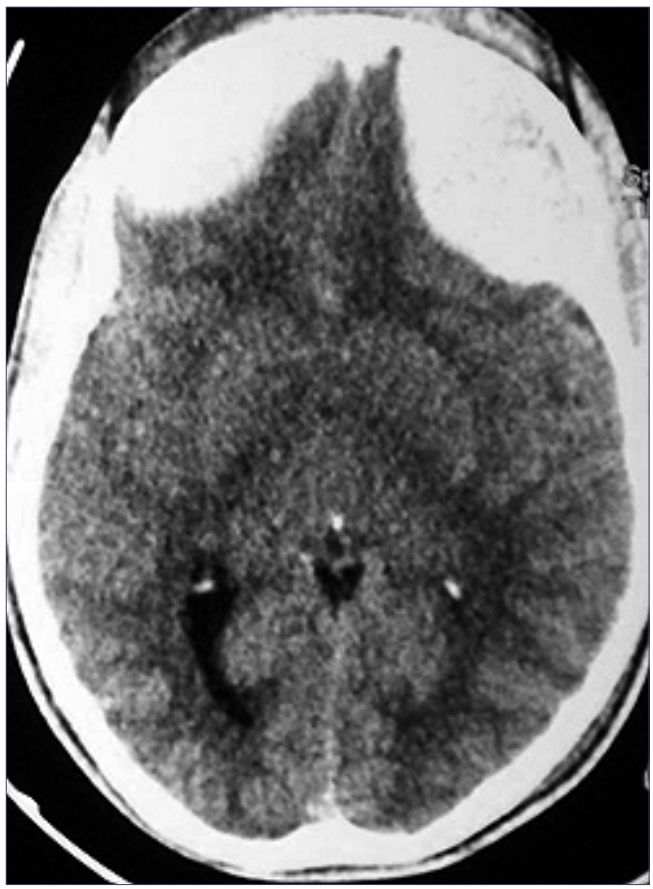

**Figure 2.** Non-contrast axial CT scan of the skull showing bifrontal epidural hematoma.

**Figure 3.** Non-contrast coronal CT scan of the skull showing a bifrontal epidural hematoma and blood in the intraorbital cavity in the left superolateral portion.

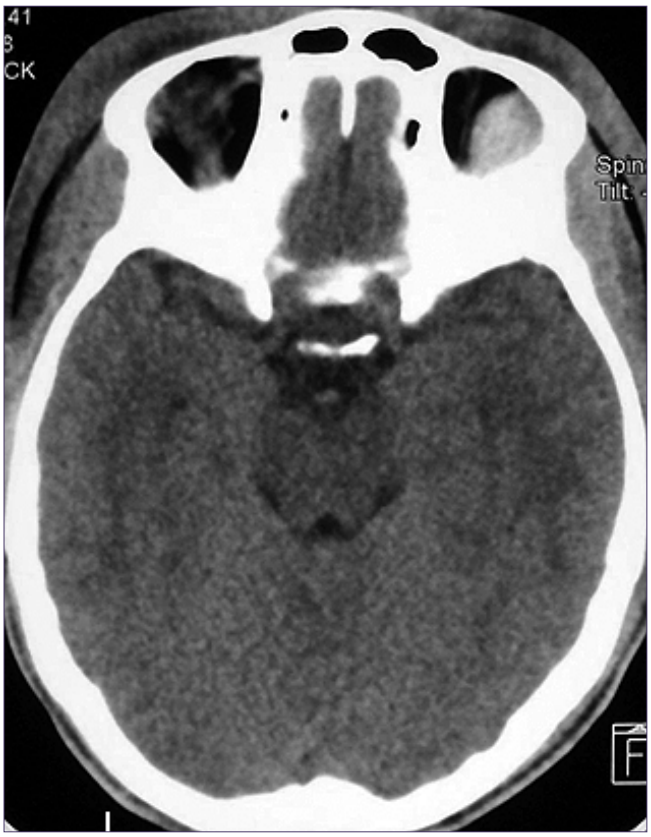


**Figure 4.** Non-contrast axial CT scan of the skull revealing the presence of blood in the intraorbital cavity.

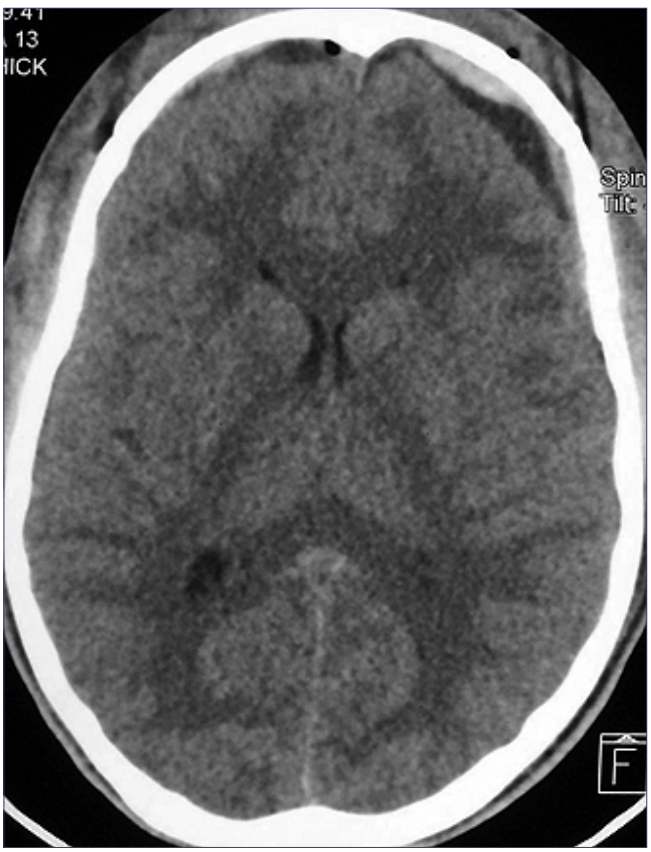


**Figure 6.** Postoperative non-contrast CT scan of the skull showing absence of the bifrontal epidural hematoma.

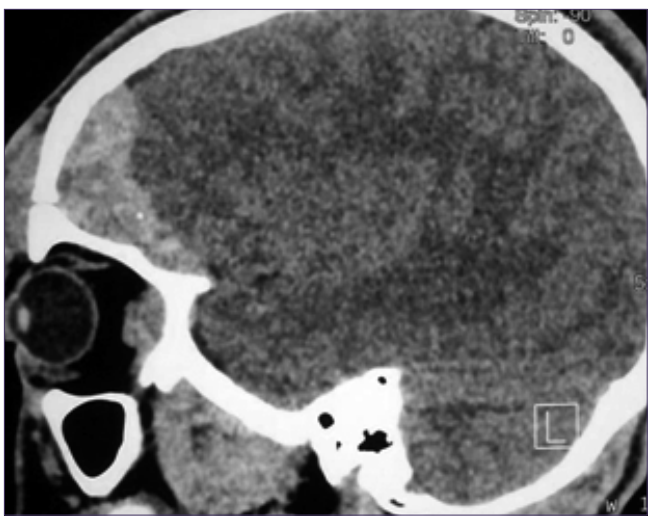


**Figure 5.** Non-contrast sagittal CT scan of the skull showing a frontal epidural hematoma associated with an intraorbital hematoma.

to their location in "silent areas"[3]. In these cases, symptoms when present are headache and occasionally irritability[7].

The incidence of skull fracture trace in these cases is lower compared to other EH locations (Brennan). CT is the examination of choice for diagnosis, management and evolution[10,16].

The treatment of frontal EH is surgical drainage through

osteoplastic craniotomy. Early surgical treatment has been indicated to prevent complications. Naren et al.[16], suggest frontal craniotomy and superior orbitotomy for hematoma evacuation, with good results. Chen et al.[4], suggest that hematoma with volume above 30 ml, with thickness greater than 15 mm and midline shift more than 5 mm are indications for surgical treatment. Intraorbital subperiosteal hematoma has treatment options: observation, needle aspiration and surgical drainage[2,13]. In case of association with frontal EH, surgical drainage of both is indicated in the same surgical procedure[12,16]. It has a good prognosis, a fact evidenced in our case.

***Contribution***

Marcos Paulo dos Santos Teixeira. ORCID 0000-0003-2565-4599. Conceptualization, Data Curation, Formal Analysis,Writing - original draft.

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