

Trapdoor Whiteyed Pediatric Orbital Blow in Fracture Management: About A Case

Chaimae Amezian MD^{1*}, Aicha benabdallah MD¹, Charaf Eddine Mohammed Chatar MD¹, Zainab El Zouiti MD¹, Adil Eabdenbi Tsen MD¹

¹Department of Oral and Maxillo Facial Surgery, University Hospital Center Mohamed VI Oujda Morocco, Faculty of Medicine and Pharmacy of Oujda, Morocco

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*Corresponding author: Chaimae Amezian MD

Department of Oral and Maxillo Facial Surgery, University Hospital Center Mohamed VI Oujda Morocco, Faculty of Medicine and Pharmacy of Oujda, Morocco

Abstract

Case Report

Orbital trapdoor fractures are a distinct subtype of blowout fractures that occur primarily in children, owing to their flexible bone structure, which predisposes them to soft tissue entrapment and symptoms such as diplopia. Often referred to as “white-eyed blowout” fractures due to the absence of prominent external signs, these injuries require meticulous clinical assessment and radiological evaluation. We report the case of a 13-year-old boy who presented with diplopia, photophobia and restricted upward gaze following blunt trauma to the left eye. Despite the absence of clinical external symptoms, CT imaging demonstrated inferior rectus muscle entrapment, evident by the tear-drop sign. The patient underwent emergency surgery within 2 hours, during which the entrapped muscle was released and a Vicryl mesh was placed to prevent re-entrapment. Postoperative management included anti-inflammatory therapy, and follow-up revealed marked improvement in ocular motility and complete resolution of diplopia. This case highlights the importance of early recognition, high-resolution CT imaging, and prompt surgical intervention in the treatment of pediatric orbital trapdoor fractures to avoid long-term functional deficits.

Keywords: Orbital trapdoor fracture, vicryl mesh, muscle entrapment, tear drop sign.

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INTRODUCTION

A trapdoor fracture is an uncommon injury characterized by a minimally displaced fracture of the orbital floor that spontaneously returns to its original position, entrapping an extraocular muscle [1]. Clinicians often refer to this injury as a “white-eyed blowout” fracture due to the minimal external signs on physical examination [2]. Diagnosis can be further complicated because this injury may not be visible on orbital computed tomography (CT) [3]. Recognizing trapdoor fractures is crucial for emergency physicians, as prompt surgical intervention is typically required to minimize morbidity.

OUR CASE PRESENTATION

A 13-year-old male patient with no medical history was admitted to our Department following a blow to the left eye, attributed to a punch. The clinical symptom presentation was poor with pain, photophobia and diplopia with restricted upward gaze. No signs of

oedema, subconjunctival hemorrhage nor ecchymosis were observed. (figure1)



Figure 1: Clinical presentation of the 13-year-old patient with a white-eyed trapdoor orbital fracture showing minimal external signs of trauma

Given the subtle external findings but functional impairment, an urgent computed tomography (CT) scan of the orbit was performed. The coronal CT images revealed a trapdoor fracture of the orbital floor,

with the classic tear-drop sign indicating entrapment of the inferior rectus muscle within the fracture site. (figure :2)

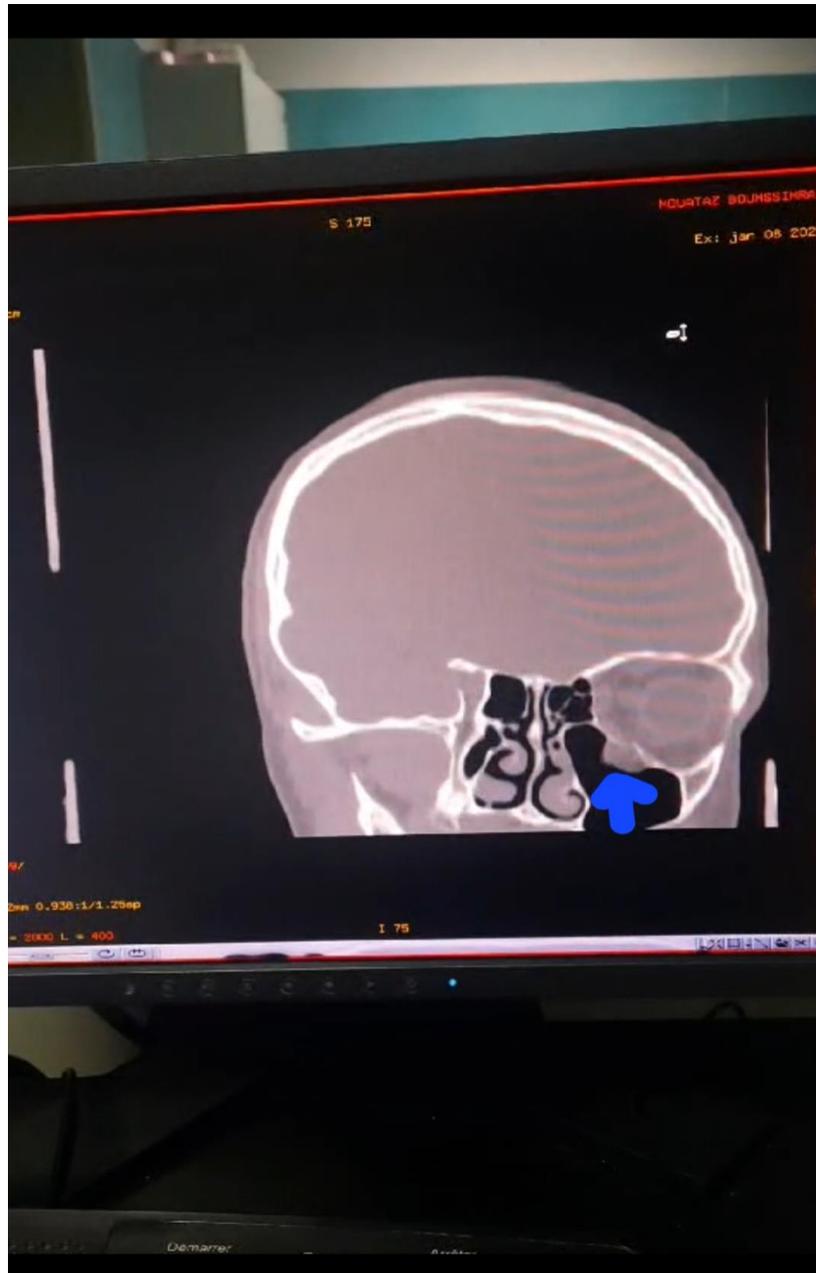


Figure 2: Coronal CT scan of the orbit demonstrating a “tear-drop” sign indicative of inferior rectus muscle entrapment in a pediatric trapdoor orbital floor fracture

There was no significant orbital hemorrhage or displacement of the globe. Based on these findings, a diagnosis of white-eyed trapdoor orbital floor fracture with muscle entrapment was made.

Due to the risk of ischemic injury to the entrapped muscle and to prevent permanent restriction of ocular motility, the patient underwent emergency surgical intervention within 2 hours of presentation. Under general anesthesia, the orbital floor fracture was

approached via a subciliary incision, providing optimal exposure while minimizing visible scarring. The entrapped inferior rectus muscle was carefully released, and the orbital floor defect was reconstructed using a resorbable Vicryl mesh to support the orbital contents and restore normal orbital anatomy. The surgical site was closed in layers, and hemostasis was achieved.

Postoperative evaluation demonstrated immediate improvement in ocular motility, resolution of

diplopia, and absence of nausea or oculocardiac symptoms. At follow-up, the patient maintained full upward gaze, with no residual enophthalmos or extraocular muscle dysfunction, indicating a favorable outcome following prompt recognition and timely surgical management.

DISCUSSION

White-eyed trapdoor orbital fractures are a distinct type of pediatric orbital injury, first characterized by Jordan *et al.* in 1998 [4]. Unlike adult orbital fractures, pediatric orbital bones are thin, elastic, and resilient, which predisposes them to hinge-like “trapdoor” fractures. These fractures can snap back into place after trauma, entrapping the inferior rectus muscle or orbital soft tissue while leaving minimal external signs, such as edema or ecchymosis [5-6]. The subtle presentation often leads to delayed diagnosis, which can result in persistent motility deficits or diplopia if not recognized promptly.

The hallmark of these injuries is restricted ocular motility, particularly in upward gaze, often accompanied by nausea, vomiting, or bradycardia due to the oculocardiac reflex [7-8]. In our patient, the absence of obvious external trauma, combined with diplopia and nausea, suggested muscle entrapment, consistent with a “white-eyed” orbital fracture [4-9]. This highlights the need for high clinical suspicion in pediatric orbital trauma, as relying solely on visible signs can result in missed diagnoses.

Accurate diagnosis in pediatric orbital fractures relies on high-resolution, multiplanar CT imaging, with 3D reconstruction providing an enhanced assessment of fracture patterns and soft tissue involvement [10]. Careful clinical correlation is equally important, particularly in “white-eyed” fractures where external signs such as edema or ecchymosis may be minimal or absent. Prompt identification of entrapment is critical, as delayed intervention can result in persistent diplopia, enophthalmos, and impaired ocular motility.

Surgical management is guided by the severity of clinical symptoms and the extent of muscle entrapment on imaging. In children, early intervention is strongly advocated to prevent long-term functional deficits and restore normal ocular motility [11]. In our case, the patient underwent emergency release within two hours, using a subciliary approach with a resorbable Vicryl plate, resulting in complete resolution of diplopia and restoration of motility. This outcome aligns with literature reporting excellent functional recovery following timely surgical intervention in pediatric trapdoor orbital fractures [12].

CONCLUSION

White-eyed trapdoor orbital fractures in children are rare and often subtle, with minimal external signs despite significant muscle entrapment. Prompt

recognition, aided by careful clinical assessment and CT imaging, is essential to prevent long-term complications such as diplopia or impaired ocular motility. Early surgical intervention, as demonstrated in this case with a subciliary approach and resorbable plate reconstruction, can result in complete functional recovery and excellent outcomes. Clinicians should maintain a high index of suspicion in pediatric orbital trauma, even when external signs appear minimal.

Patient consent

Consent was obtained from the patient for publication of this case report and accompanying images.

Footnotes:

Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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