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Orbital Floor Fractures: Retrospective Study of 29 Cases

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ABSTRACT

Objective: To evaluate the epidemiological, clinical, and therapeutic aspects of orbital floor fractures and to assess the outcomes of surgical management.

Methods: Retrospective study of 29 patients hospitalized for orbital floor fracture between January 2018 and September 2024.

Results: The mean age was 37 years (18–60), with a male predominance (sex ratio 3:1). Road traffic accidents were the leading cause (69%). Clinical findings included diplopia (45%), infraorbital hypoesthesia (72%), and enophthalmos (17%). Surgery was performed in 25 cases, mainly through a subtarsal approach with absorbable or non-resorbable implants. Postoperative outcomes were favorable, with improvement in diplopia and minimal residual enophthalmos.

Conclusion: Early diagnosis and appropriate surgical repair are essential to restore ocular motility and facial symmetry, thus minimizing functional and esthetic sequelae.

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KEYWORDS:

Orbital floor fracture, diplopia, enophthalmos, orbital reconstruction, ophthalmic trauma.

INTRODUCTION

Orbital floor fractures are among the most frequent maxillofacial injuries, mainly affecting young men after road traffic accidents or assaults[1]. They account for 10–25% of all facial fractures, often resulting from blunt trauma that generates a sudden increase in intraorbital pressure, leading to rupture of the thin orbital floor[2]. These fractures can result in functional sequelae such as diplopia, enophthalmos, and infraorbital hypoesthesia, and esthetic deformities including zygomatic flattening. An accurate clinical and radiological diagnosis followed by timely surgical intervention remains the cornerstone for achieving optimal functional and cosmetic outcomes[3].

MATERIALS AND METHODS

This retrospective study included 29 patients with orbital floor fractures treated at the Department of Ophthalmology, Hassan II Military Hospital – Laâyoune over a period of 6 years (January 2018 – September 2024). A standardized data sheet was used to collect information on epidemiological profile, clinical presentation, radiologic findings, surgical technique, and postoperative outcomes.

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Radiological evaluation included facial CT scans (axial, coronal, and 3D reconstruction), and functional evaluation used Lancaster and forced duction tests.

RESULTS

Epidemiology

Mean age: 37 years (range 18–60). Sex ratio (M/F): 3:1. Etiologies: road traffic accidents (69%), assaults (17%), domestic accidents (10%), work accidents (3%).

Clinical Findings

Periorbital ecchymosis and eyelid edema: 59%. Subconjunctival hemorrhage: 28%. Eyelid wounds or abrasions: 20%. Diplopia: 45%. Enophthalmos: 17%. Infraorbital nerve hypoesthesia: 72%. Zygomatic flattening: 21%. Lancaster test confirmed mechanical restriction in 4 cases and was normal in 3.

Imaging

Plain X-ray (Blondeau view): performed in 67% of cases, showing indirect signs such as drop sign, orbital frame widening, pneumoorbit, and maxillary sinus effusion. CT scan: performed in all patients, allowing precise assessment of fracture type, location, and extent.

Treatment

Conservative management was indicated in 4 patients (14%) with minor fractures. Surgical repair was performed in 25 cases (86%) within a mean delay of 6 days after trauma.

Approach: subtarsal in all patients. Reduction: by Ginestet hook. Reconstruction materials: Vicryl absorbable plates, Prolene non-resorbable mesh (23 cases), and iliac bone graft (1 case).

Postoperative Outcomes

Immediate postoperative period: uneventful in 28 cases; one patient developed sinusitis managed medically. Long-term outcomes: persistent hypoesthesia (62%), residual diplopia (31%, mild), persistent enophthalmos (1 case), limited mouth opening (3 cases), and residual zygomatic flattening (2 cases).

Iconography

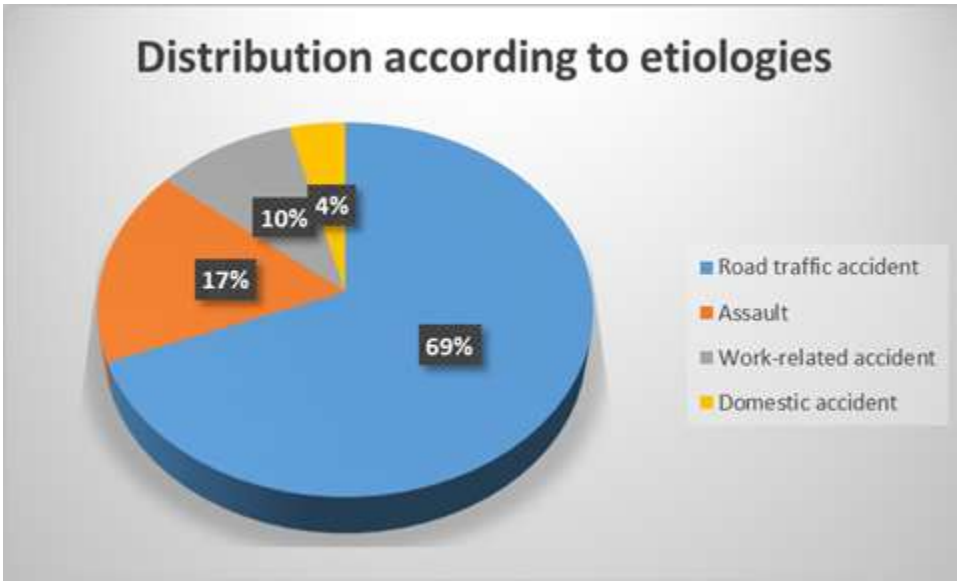

Figure 1: Distribution according to etiologies.

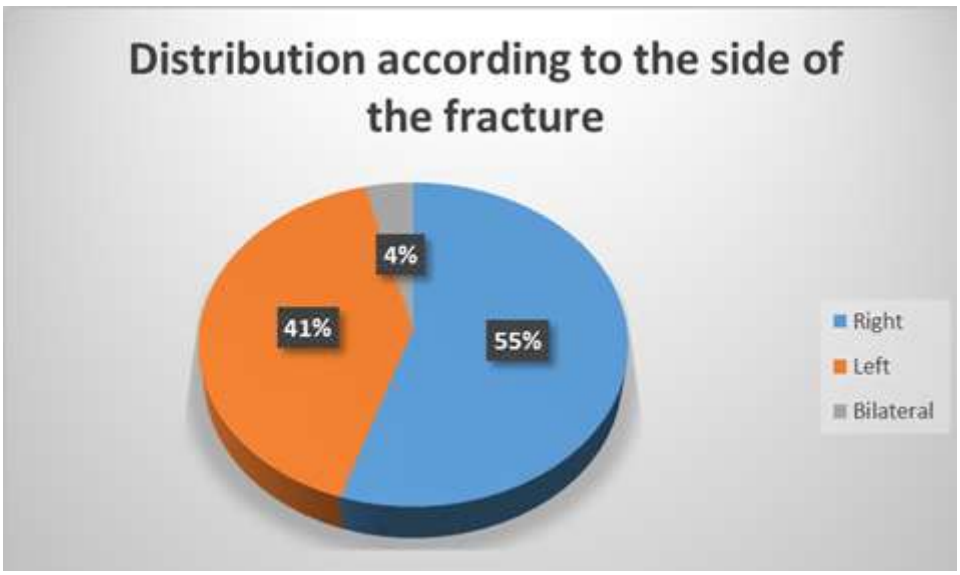

Figure 2: Distribution according to the side of the fracture.

Figure 3: CT coronal image showing an orbital floor fracture associated with prolapsed orbital contents.

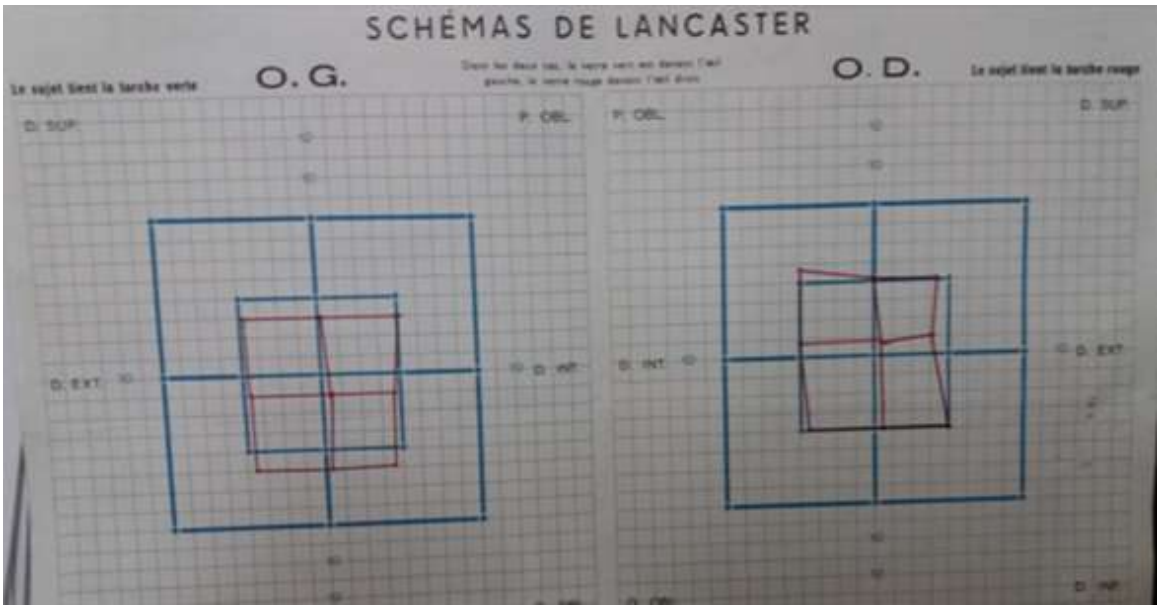

Figure 4: Figure showing the Hess-Lancaster test in a case of vertical diplopia.

DISCUSSION

Orbital floor fractures occur predominantly in young, active males, consistent with global literature[4]. Their mechanism involves sudden compression of the orbital contents, transmitting hydraulic pressure to the floor (the blowout fracture) or direct bone impact[5].

Diplopia is a major indicator of functional impairment, resulting from entrapment of the inferior rectus muscle or fibrotic adhesions[6]. Infraorbital hypoesthesia occurs in up to 70% of cases, due to stretching or compression of the infraorbital nerve[7]. Enophthalmos appears when orbital volume increases due to bone collapse, with frequencies ranging from 10–40%[8].

CT scan remains the gold standard, enabling assessment of both bone and soft-tissue involvement and guiding surgical planning[9]. MRI may be indicated in cases of suspected muscle incarceration or soft-tissue entrapment, especially in pediatric trapdoor fractures[10].

Surgical repair remains the treatment of choice when functional or aesthetic disorders are present. The goal is to

restore orbital volume and release incarcerated tissues while minimizing complications. The subtarsal approach provides optimal cosmetic and functional outcomes[11]. The choice of implant material—resorbable or non-resorbable—depends on defect size, cost, and surgeon experience[12].

In Morocco, cost constraints may limit access to high-end implants, increasing the risk of residual deformities. However, early and meticulous surgical repair remains key to preventing sequelae.

Long-term outcomes are favorable when intervention occurs within 8–15 days after trauma. Residual diplopia and hypoesthesia are the most frequent sequelae but usually improve with time or rehabilitation[13]. The management of orbital floor fractures must be multidisciplinary, involving ophthalmologists, maxillofacial and ENT surgeons for optimal outcomes.

CONCLUSION

Orbital floor fractures primarily affect young, active men, mostly following road traffic accidents. A thorough clinical and radiological evaluation is essential to detect functional and aesthetic complications early. Facial CT scan remains the gold standard for diagnosis and surgical planning. Prompt surgical repair, within two weeks of trauma, ensures the best visual and cosmetic results. A multidisciplinary and coordinated approach is essential for achieving satisfactory long-term outcomes.

Author Contributions

Dr. BOUI Hatim : conception, data analysis, manuscript drafting.

Dr. FILALI Zineb : data collection, critical revision.

Dr. Hanine Mohamed Amine : data collection, critical revision.

All authors approved the final version of the manuscript.

Conflict of Interest Statement

The authors declare no conflict of interest related to this study.

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