

Surgical Management of Isolated Orbital Fractures (The Choice of the Surgical Technique)

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ABSTRACT

Isolated fractures of the floor of the orbit are secondary to intraorbital hyperpressure that results from a direct anteroposterior impact on the eyeball. Our study is a retrospective study over a period of 03 years (2017_2020) relating to 20 cases of isolated fracture of the floor of the orbit with a mean follow-up of 01 year. The average age of our patients is 25 years with extremes ranging from 13 to 40 years, in 80% of cases our patients were victims of aggression. The initial clinical examination showed diplopia in 80% of cases with enophthalmia in 20% of cases. Computed tomography and Lancaster test were performed for all our patients. The surgical treatment consisted of a musculogastrocnemius disincarceration with a reconstruction of the floor of the orbit. With a mean decline of one year the evolution was favorable in 80% of the cases. Isolated fractures of the floor of the orbit respond to a precise mechanism of direct ocular impact, vertical diplopia and enophthalmia are the major clinical signs, and CT remains the standard radiological examination for diagnosis and analysis. The surgical treatment must be rapid. The complications are mainly due to delayed management.

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Introduction

Isolated fractures of the orbital floor result from a direct anteroposterior impact on the eyeball causing an intraorbital hyperpressure and could lead several complications.

They are very frequent, 10% of all facial fractures are orbital floor fractures.

Materials And Methods

Our study is a retrospective study over a period of 03 years relating to 20 cases of isolated fracture of the orbital floor with a mean follow-up of 01 year. The study was done in the maxillofacial surgery department in the hospital of specialities -Rabat.

Results

The average age of our patients is 25 years with extremes ranging from 13 to 40 years.

90% of our patients were male.

In 80% of cases our patients were victims of aggression, 10% were victims of a sport accident and the left 10% were victims of public road accident. (figure 1)

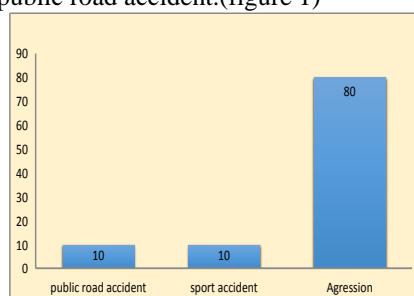


Figure 1. Graph showing the causes of orbital floor fractures.

Most of our patients suffered from diplopia (80% of cases), an enophthalmia was found in 20% of cases (figure 2), no case of infraorbital hypoesthesia OR OCULOCARDIAC REFLEX was found.



Figure 2. Preoperative image showing a left enophthalmia.

A facial CT scan was done for all our patients which determined the fracture type and helped to choose the right surgical approach. (figure 3)



Figure 3. CT scan image objectifying a left trap door fracture.

An ophtalmological examination was done for all our patients (to elimintae an emergency such an orbital compartment syndrome)and those who suffered from diplopia benefited from a LANCASTER TEST.

All our patients have undergone surgical treatment with 2 surgical approaches:Subciliary approach for 17 patients and transconjunctival technique for 3 patients.

The operating date ranged from 5 hours to 10 days ,the surgical treatment consisted on a removing of the fat and the muscle and reconstruction of the orbital floor.

The reconstruction choice varied between an autologous transplant in 4 cases(figure 4) and a vicryl plate in 16 cases.The post operative evolution was good in 17 cases,In 2 cases we had a persistance of the diplopia and an ectropion was found in only 1 case.



Figure 4. Autologus grat taken from the iliac crest.

Discussion

In our study the average of age was 25 years and 90% of our patients were men ; Juan marcelo found that 72% of cases were male with the mean age of 32 years;rodriguez also reported a mean age of 33 years(1), so the orbital floor fractures occur more commonly among adults and adolescent males.(2)

In our study most patients were victims of an aggression (80% of case), same results were found in rodriguez study who reports that aggression was the leading cause of orbital floor fractures.

CRUZ in argentina reported that most cases of an orbital floor fractures were caused by traffic accidents.(3)

An orbital floor fracture may be responsible for a diplopia, it may cause the incarceration of the lower right muscle and / or the fat that surrounds the muscle which limits the normal rise of the eye. This is going to be responsible for a difference of elevation of the gaze (vertical diplopia and limitation of the elevation of the gaze).

A large and collapsed fracture of the floor of the orbit may cause an enophthalmia. (4);Indeed, when the floor is collapsed, the orbital cavity becomes too big for the eye. This complication is most often masked initially by edema related to the trauma.

An orbital floor fracture can cause the compression of the infra-orbital nerve . This is responsible for disorders of the sensitivity of the cheek, the lateral part of the nose, the upper lip and the upper teeth. These disorders generally regress in a few weeks to a few months.

Classic Blondeau X-ray imaging probably has no place . It must however be known and remains useful in the absence of CT scan availability

CT scan is preferred because of faster acquisition times , superior imaging of the bony structures , cost effectiveness and identification of foreign bodies.(5)

In our study two approaches were used: sub-ciliary in 57% of cases and the tranconjunctival approach in43% of

cases. Stuck fat and muscle were removed in order to restore normal eye mobility.

The subciliary incision was prefereed in our study because it gives a good access to the floor and gives camouflage to the scar,however most authors do prefer the transconjunctival approach because it gives no visible scars and it has the lowest incidence of complications but this technique could lead to corneal abrasion and lack of exposure if a lateral canthotomy is not performed.(6)(figure 5)

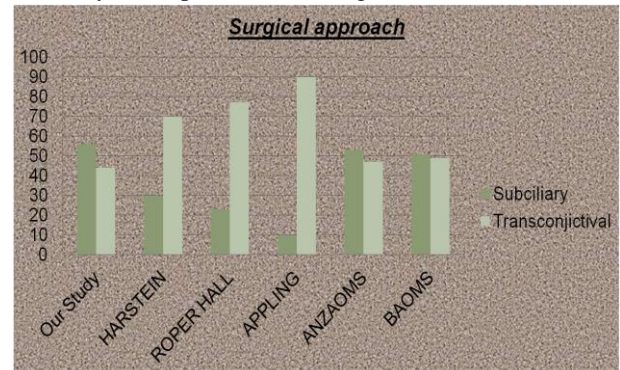


Figure 5. Graph showing the percentage of use of the two surgical approaches.

In our study the reconstruction was done by an autologous transplant taken from the iliac crest in 4 cases and a plate a vicryl was used in 16 cases ;Several choices exist for reconstructing falling into 2 categories:autologous Graft and alloplastic materials.

Autologous graft are highly biocompatible with a low risk of infection and extrusion nevertheless they are associated with increased intra operative time and donor site morbidity, plus they have an important rate of resorption which may lead to an unpredictable orbital volume.(7;8)

There is a wide range of alloplastic material , they are cost effective ,easily conformed to the orbital contour, their downsides are the high risk of infection , extrusion ,foreign body reaction and capsular hemorrhagea.(8;9)

Conclusion

Isolated fractures of the floor of the orbit respond to a very precise mechanism of direct eye impact, they areconfirmed by an orbital CT scan and the rapid management helps avoid the after effects.

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