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Clinical case

Reconstruction of orbital floor for treatment of a pure blowout fracture

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ABSTRACT

Pure blowout fracture is an injury in which only one internal orbit wall is affected, without any compromise of the orbital rim or another region. The inferior and the medial walls are the most frequently affected areas. The patient usually presents diplopia, infraorbital nerve paresthesia and entrapment of soft tissue within the maxillary sinus, which leads to a possible limitation of the ocular movements and enophthalmos. Computer tomography scan is a helpful method for the diagnosis and qualification of this fracture. Whether the orbit reconstruction is indicated, natural and synthetic materials are available. We report a case of a 27 years old man, who was diagnosed with a pure blowout fracture after a physical aggression. The surgical treatment involved orbital floor reconstruction with a titanium mesh and under general anesthesia. The result was satisfactory and the patient does not show visual disturbances or paresthesia in six months follow-up.

Reconstrução do pavimento da órbita para o tratamento de uma fractura Blowout pura

Palavras chave:
Órbita
Diplopia
Parestesia

RESUMO

Fractura Blowout pura ocorre quando apenas uma parede da oŕbita é afectada, sem comprometer o aro orbital ou qualquer outra regiaõ. As paredes inferior e mesial saõ normalmente as áreas mais afectadas. O paciente geralmente apresenta diplopia, parestesia do nervo infra-orbital, aprisionamento de tecido mole dentro do seio maxilar, o que leva a uma possível limitaçaõ de movimentos oculares e enoftlamia. A tomografia computadorizada é um método uťil para o diagnośtico e qualificaçaõ desta fractura. Caso a reconstrução seja indicada, materiais sintéticos e naturais estaõ disponíveis. O trabalho relata o caso de um homem, 27 anos de idade, em que foi diagnosticada uma fractura Blowout pura, apoś agressaõ fiśica. O doente foi tratado sob anestesia geral por reconstrução do assoalho da

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oŕbita com malha de titaˆnio. O resultado final foi satisfatoŕio e o paciente nãao apresenta distuŕbios visuais ou parestesia, num seguimento durante seis meses.

Introduction

The term blowout fracture was first described in 1957[1] and it refers to a condition in which the displacement of an orbital wall occurs, but the orbital rim suffers no damage. Three different theories have been proposed to explain the mechanism of blowout fractures: globe-to-wall contact theory, hydraulic theory and bone conduction theory. Common symptoms of this fracture are diplopia, enophthalmos, dystopia, paresthesia of the infraorbital nerve, and soft tissue incarceration or entrapment, leading to restriction of ocular movements.[2]

The computed tomography is a radiological tool for evaluation of orbital fractures, which helps the surgeon to see if there is any incarceration or entrapment of soft tissue related to the orbit within the adjacent sinus. Repairing the orbital wall fractures is still a surgical problem, due to the drawbacks of the reconstruction materials and technical errors,[3] such as misdiagnosis, timing of treatment as well as the accuracy during the repositioning of the soft tissue and the adaptation of the reconstruction material. In the treatment of blowout fractures, it is important to reconstruct and maintain the accurate anatomical structural support of the orbit, against herniation forces during the initial phase of healing to obtain a functional and an esthetic result. Joining and stabilizing small, thin and delicate bone fragments is usually impossible.[4] Therefore, natural and synthetic materials, like autogenous bone and titanium mesh, are available to reconstruct the orbital walls when it is necessary. The choice is based on the surgeon's experience and the availability of the material. We describe a clinical case of orbital floor reconstruction, with a titanium mesh as a treatment option for pure blowout fracture.

Case report

A 27 year old man was examined at the Oral and Maxillofacial Surgery Department of the University Hospital of Uberlândia after physical aggression. He was submitted to a clinical evaluation and showed orbital ecchymosis, paresthesia of the infraorbital nerve and diplopia during vertical and horizontal ocular movements. Nevertheless, no ocular movement restriction was found. A computed tomography scan was done and it revealed a blowout fracture of the floor of the right orbit and a herniation of the orbital soft tissue into the maxillary sinus (Figs. 1 and 2). A week after the trauma, the patient was submitted to a reconstruction of the orbital floor, under general anesthesia. A tarsorrhaphy suture was used, to protect the cornea during the operative procedure, followed by a subtarsal approach to access the orbital floor (Fig. 3). The herniated soft tissue was repositioned and the orbital floor defect covered with a trapezoidal titanium mesh with approximately 25 mm on the orbit margin and 20 mm on the posterior width

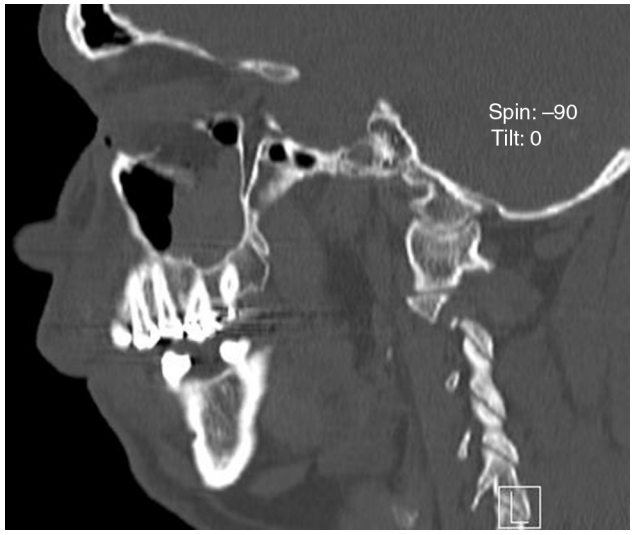

Fig. 1 – CT scan: sagital view showing inferior displacement of orbital floor.

(Neo-ortho, Curitiba, PR, Brazil), which was fixed on the orbital rim with 3 monocortical, 1.5 mm profile (Neo-ortho, Curitiba, PR, Brazil), 2 screws of 5 mm and 1 screw of 4 mm (Fig. 4). A forced duction test was conducted with a negative result and the globe mobility was intact. A 6-0 non-resorbable suture (nylon, ETHICON®, Johnson & Johnson, USA) was used along

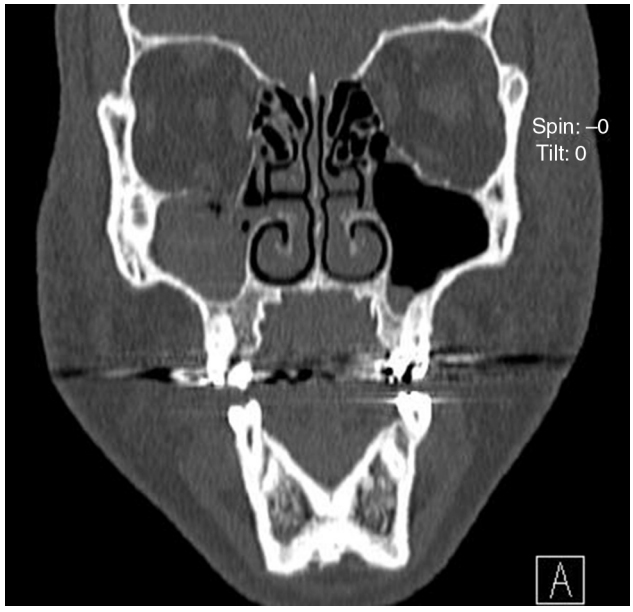

Fig. 2 – CT scan: coronal view showing displacement of soft tissue within the maxillary sinus.