SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 5.
Issue: 3.
Page N. 101-103
Year: 2021

Review Article www.wjahr.com

REDUCTION OF ORBITAL FLOOR FRACTURES BY USING A SINUSAL BALLOONING VIAINFERIOR MEATAL ANTROSTOMY. A REVIEW

***Dr. Isha Vipulkumar Patel BDS**

College of Dental Sciences and Research Center, Ahmedabad, Gujarat, India.

Received date: 13 March 2021 **Revised date:** 03 April 2021 **Accepted date:** 23 April 2021

***Corresponding author: Dr. Isha Vipulkumar Patel BDS**

College of Dental Sciences and Research Center, Ahmedabad,Gujarat, India.

ABSTRACT

When orbital floor fractures occur, its reduction is necessary in most cases to prevent ocular dystopia, diplopia and entrapment of the inferior rectus muscle, that leads to problems in upwardgaze. Closed and open techniques have been described, with a wide range of results. Without a doubt, open techniques are used more frequently, as they provide greater operational control and visibility. However, closed techniques are executed at a lower cost and with less postoperative sequelae. The aim of this article is to describe what the authors consider, the most conservative method to reduce orbital floor fractures, by using the catheter ballooning technique without performing the Caldwell Luc access or any other surgical approach than an inferior meatal antrostomy to insert a Foley catheter into the maxillary sinus and fill it with 10 - 15 mL of normal saline.

KEYWORDS: Orbital Floor Fractures; Sinusal Ballooning; Inferior Meatal Antrostom.

INTRODUCTION

It has been reported that orbital structures are involved in almost 25 - 40% of cases of craniofacial trauma, being the floor and medial wall, the most common sites of orbital fractures.[1,2] Due to the specific characteristics of the orbital cavity, reconstruction procedures are sometimes a challenge for the surgeon. The main objective of any treatment plan should be aimed at restoring anatomical shape and function, with minimal side effects and optimization of resources.[3] Post-traumatic sequels such as diplopia, enophthalmos, and visual acuity disturbances have been widely reported. Currently, there is a debate about which orbital fractures require surgical treatment. This is the reason why absolute and relative indications have been described.[4] In the past, many conservative managements for the damaged orbital floor have been documented, being the Foley catheter ballooning via Caldwell-Luc access one of them.

This article describes how the reduction of simple fractures of the orbital floor can be achieved by introducing a Foley catheter through a simple inferior meatal antrostomy into the maxillary sinus, a technique that, according to our knowledge, has been little or never described in the literature. By this means, we provide a true conservative, minimally invasive and cost-effective procedure, avoiding most of the inherent surgical risks and uncertain individual postoperative responses that can compromise aesthetics and function, such as entropion or entropion. An additional advantage is the proven reduction in surgical time. Surgical technique Under general anesthesia, using contralateral nasal intubation, a perforation of the lateral nasal wall is performed with a 14 cm Kelly clamp at the level of the inferior meatus. The clamp must be positioned slightly superior to the nasal floor, just below and behind of the infundibulum, and must carry a 16Fr.X30cc Foley catheter through the wall to place it inside the maxillary sinus (Figure 1). In this point, it is important to verify the correct placement of the balloon to avoid its placement into the naso or oropharyngea spaces. Once the Foley catheter is inserted, 10 - 15 mL of normal saline solution is injected to reposition the displaced bones of the orbital floor and the sinus anterior wall. At this moment, it is important to control the vital signs, paying special attention to any sign related to the oculocardiac reflex. The mechanical retention of the catheteravoids its displacement, so only a simple fixation with adhesive material is required to stabilize the device, as shown in figure 2. A post-operative computed tomography (CT) scan should be taken in order to verify the correct reduction of the compromised bones (Figure 3 and 4). The catheter must be removed after 20 days, once the stability of bone repositioning is reached.

DISCUSSION

The maxillary antrum is a paired air-filled cavity, located inside the maxillary body, which surrounds the nose. Pyramidal, it consists of three walls, a floor and a roof. The roof, which at the same time acts as the orbital floor, is thin and extends laterally to the inferior orbitalfissure. The floor is formed by the lower third of the base and the buccoalveolar wall. The posterolateral wall is the anterior of the maxillary sinus.

Figure 1: *Antrostomy maneuver using a 14 cm Kelly clamp holding a 16Fr.X30cc Foley catheter in which 3cm of the tip was removed to avoid undesirable forces over the fractured segments.*

Figure 2: *Catheter fixed with adhesive material.*

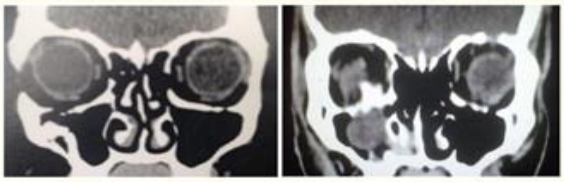

Figure 3: *Computed tomography showing the reduction of the left orbital floor fracture corresponding to the case of figure 1 and 2.*

04

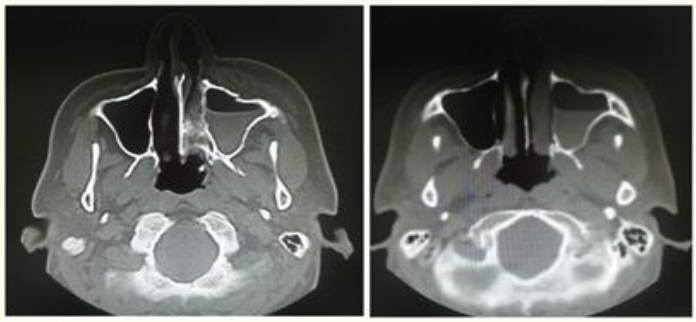

Figure 4: *The reduction of the anterior wall of the maxillary sinus without loss of bone substance is another advantage of the technique.*

Adding the fact that this structure is extremely thin, trauma to the middle facial third often causes its fracture. Most of the time, and depending on the intensity of the trauma, enophthalmos, ocular dystopia, diplopia and limitation of eye movements may appear. On other occasions, sequelae occur in a short or moderate posttraumatic period. It is for the above reasons that the reduction of these fractures is indicated, which are performed openly through the orbital cavity with approaches such as the subciliary or transconjunctival, or through the maxillary sinus using the Caldwell-Luc technique. In the first case, the main objective is the introduction of a substitute material for the orbital floor that provides support for the eye and periorbital tissues, as well as to raise herniated periorbital fat and, in many cases, release the entrapment of the inferior rectus muscle. In the second case, the objective is to introduce a Foley catheter, then fill it with a saline solution and, therefore, perform the reduction by positive intrasinusal pressure. Using this same physical principle is that the introduction of the catheter through a nasa antrostomy (closed technique) is proposed, so surgical fenestration of the anterior sinus wall should not be performed. The origin of the inferior antrostomy dates back to 1886 when Miculicz performed an endonasal fenestration of the maxillary sinus.[7] Although this method was not designed to access the sinus roof, we found it convenient to reach the lumen, insert the catheter and reduce the fracture. The main advantage of performing this technique is the little invasive procedure compared to the previous ones, the resulting inflammation is very localized and the artificial access ostium closes only when the catheter is removed in a maximum of 2 postoperative weeks. On the other hand, in the presence of comminuted fractures, which often occurs in these cases, the loss of bone substance that would occur when performing an open approach is avoided. Other advantages are the reduction of the operative time (total duration of approximately 15 minutes) and the reduction of costs, by avoiding the use of orbital floor mesh plates, screws or other reconstruction accessories. The main limitation of this Conclusion To the best of our knowledge, this is the first report on reducing orbital floor fractures using a Foley catheter ballooning via inferior meatal antrostomy. This method has proven to be a true conservative, minimally invasive, and cost-effective procedure. Conflict of Interest None declared.

BIBLIOGRAPHY

1. Steidler NE., et al. “Incidence and management of major middle third facial fractures at the Royal Melbourne Hospital. A retrospective study”. International Journal of Oral Surgery, 1980; 9.2: 92-98.
2. Elledge ROC., et al. “A retrospective audit comparing orbital fracture incidence and management in Birmingham UK and Sydney Australia”. British Journal of Oral and Maxillofacial Surgery, 2010; 48: S51.
3. Manolidis S., et al. “Classification and surgical management of orbital fractures: experiencewith 111 orbital reconstructions”. Journal of Craniofacial Surgery, 2002; 13: 726-738.
4. Ellis E. “Orbital Trauma”. Oral and Maxillofacial Surgery Clinics of North America, 2012; 24: 629-648.
5. McGowan D., et al. “The maxillary sinus”. First edition, Butterworth-Heinemann Ltd,Oxford, 1993.
6. Neivert H. “Surgical anatomy of the maxillary sinus”. Laryngoscope, 1930; 40: 1.
7. Reiskin A. “Röntgen diagnosis of sinus disease”. Quintessence International, Dental Digest, 1982; 13: 207.