Chemosis as complication in transconjunctival approach for orbital trauma

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The aim of this report was to discuss a complication resulting from a transconjunctival approach to treating an orbital fracture. A 30-year-old male patient presented with a fracture to the zygomatic orbital complex. He was treated with transconjunctival conventional surgical treatment. Two days after surgical treatment, the patient presented with secondary chemosis which was initially slight and then subsequently worsened. The clinical situation was managed with topical and systemic corticosteroids and resolved within one postoperative month. Two-year follow-up showed ptosis of the upper eyelid and limited infraversion in the affected eye. This unusual complication associated with an orbital trauma was resolved with minor functional alterations, although the consequences observed after 2 years were not completely satisfactory.

Key words: Orbital fracture, Complications, Orbital approach

I. Introduction

A transconjunctival approach has been used frequently to treat fractures of the infraorbital rim and orbital floor¹, as well as other types of cosmetic and pathological situations. Advantages to this approach are easy access to the bone, rapid closure once the procedure is complete and favorable aesthetic results including minimal skin scarring².

Some complications have been associated with this approach showing it is a complex procedure. Baumann and Ewers¹ reported 2% complications and Malhotra et al.³ reported 10% complications at 2-year follow-up. This case report presents an important complication of the transconjunctival approach to treating an orbital fracture.

II. Case Report

A 30-year-old male patient was admitted to the Hospital at Temuco, Chile, due to a high-energy trauma caused by a fall from a height of 4 m. During admission the patient’s condition was assessed and a fracture of the left orbital complex was diagnosed, in addition to fractures of the orbital rim and floor, orbital sidewall, zygomaticomaxillary pillar and ipsilateral zygomatic arch. (Fig. 1) The patient was in intensive care for one week, at which point it was possible to provide surgical treatment. No medical history was present, including diabetes, Metabolic or facial syndromes or nutritional conditions and no smoking was reported.

The immediate preoperative stage showed severe left periorbital edema, ophthalmoplegia and diplopia in different fields. The surgical procedure was executed by a maxillofacial surgeon with 6 years experience in facial trauma; an upper approach was made for the left supraorbital rim, a left intraoral approach and a transconjunctival approach with lateral canthotomy. The procedure was performed conventionally and routinely, without complications. According to the proposed technique, internal rigid fixation was used with 1.5 plates, and no problem in screw insertion was present; at some stage during surgery, a forced retraction of the conjunctival approach was necessary due to limited access to the bone. The postoperative stage was uneventful and the patient was discharged on the second day postoperatively. Two days after surgical treatment, the patient presented with chemosis, which was initially slight and subsequently worsened. The clinical situation was managed with topical and systemic corticosteroids and resolved within one postoperative month. Two-year follow-up showed ptosis of the upper eyelid and limited infraversion in the affected eye. This unusual complication associated with an orbital trauma was resolved with minor functional alterations, although the consequences observed after 2 years were not completely satisfactory.
was introduced as well as an eye patch to avoid major complications associated with lack of lubrication. Physiotherapy was also prescribed to improve mobility of the upper eyelid.

The condition evolved in a limited fashion over the following 8 days (18 days after surgery), at which point the chemosis began to subside. One month after the surgery (Fig. 4) the patient showed symptom resolution, with resolved chemosis and associated conjunctivitis, but persistence of post-traumatic strabismus, which was subsequently solved with surgical treatment to manage the extrinsic muscles of the eye involved in the anomalous position of the eyeball. After two years of follow-up, the patient had an adequate recovery from the facial trauma with a slight ptosis of the upper left eyelid.

Fig. 1. Preoperative computed tomography showing an orbital fracture with compromised orbital rim and floor.

Fig. 2. Chemosis of the left orbit observed in supraversion accompanied by ptosis of the upper left eyelid.

Fig. 3. During forced movement of the upper eyelid, an extensive chemosis subsequent to the transconjunctival approach is observed in the left orbit.

Fig. 4. Condition after 1 month where total recovery from the chemosis can be seen.
requiring establishment of protocols for their treatment. It is likely that the transconjunctival approach which is oriented to remove fat tissue produces better conditions for the development of chemosis and that the physiopathological mechanism will be similar to that observed in this case, since this is a rare complication in orbital traumatology. Other conditions such as carotid-cavernous fistula have also been responsible for proptosis, ophthalmoplegia and chemosis, indicating it is a response to the volume of fluids present in the orbit. Lymphatic flow is key for postoperative chemosis. For instance, retrograde flow could result in the lymphatic channel filling with blood or may contribute to a rise in periocular or orbital pressure, resulting in venous engorgement and a backflow of blood into the conjunctival lymphatic system. On the other hand, dilated arterioles increase the pressure gradient between arteriolar and venule capillaries and lead to the extravasation of intravascular fluid with resultant vasodilatory edema. In this case, the patient presented with a great deal of edema at admission, a non-controlled traction of the conjunctival flap and failure in drainage which could all be related to his chemosis. A treatment protocol for this condition has been proposed based on topical and systemic corticosteroids. Oral steroids are an effective adjuvant treatment in younger patients and topical adrenaline could be an option; surgical treatment that includes sutures has been used in other trauma cases. The treatment strategies used in this case were in agreement with McCord et al. and Putterman, and showed good results. Prevention of this complication can be achieved by respecting anatomical landmarks and gentle retraction of the orbital flap.

This case was resolved with minor functional alterations, although the consequences observed after 2 years (ptosis of the upper eyelid and limited invagination) were not completely satisfactory, and may call into question the results obtained.
by the treatment provided during initial presentation and the surgical treatment of the orbital fracture.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

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