



# Refinements in Tranconjunctival Approach: Quick and Safe

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## Clinical Note

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## Abstract

This article derives from the surgical experience developed over a period of almost 7 years, from June 2008 to September 2018, at a single institution, the Maxillo-Facial Surgery Department of Ancona Regional Hospital.

During this period of time, 817 trauma surgeries involving the orbit were performed. Improving with time, we developed a surgical technique to reduce the operating time and the dissection.

**Keywords:** Orbit; Trauma; Transconjunctival Approach; Surgical; Forma Mentis

## Introduction

Many papers have been written about aesthetic approaches to the orbital walls and floor, arising from the developing need of reducing the scars or surgical sequelae. This "forma mentis" led us to change from infraorbital approaches to midpalpebral and subciliary first and to change lately from subciliary to transconjunctival. The first report we read about a transconjunctival and transcarucular approach in maxillo-facial surgery came from Prof. Baumann and Prof. Ewers from the School of Wien [1] and, as we read the paper, the interest arose and we began using this approach routinely.

In the beginning this surgical route seemed difficult and time consuming but our increasing knowledge of the anatomy of the orbit and eyelids offered us a quite easy option in traumatology as well as oncology. Many other papers were written after this but they all reported the use of sutures positioned through the lower eyelid to allow the traction and, for us, increasing the difficulty of the procedure for several reasons. First, many instruments and sutures are in the surgical field (which is indeed very small), second is the need for three people to perform the procedure because one is caring the surgery, one is performing the traction on the stay sutures and another one is assisting.

Then we tried the retroseptal approach but we didn't like it because we encountered too much bleeding and fat tissue protruding in the surgical field. Immediately after that we changed to the preseptal approach. This is performed in an almost avascular space, clean and with good visibility. No fat is bulging in the surgical field and it is possible to use the bipolar cautery without the fear of fat resorption/post-surgical enophthalmos. We performed 817 cases involving the orbit in the following years and half of these were performed through a transconjunctival route, always preseptal.

## Patients and Methods

Over a period of almost 7 years, from June 2008 to September 2018, 817 trauma surgeries involving the orbit were performed at the Maxillo-Facial Surgery Department of the Ancona Regional Hospital. We included in our analysis the orbital floor, medial orbital fractures and orbital floor revision in zygoma fractures. The percentage of transconjunctival approaches according to the different surgeons varies from 90% to 0%. The first two surgeons performed 513 procedures. Along the years we tried to standardize the procedure in the way to reduce the surgical time and dissection. Bigger cutaneous wounds of the lower eyelid generally brought us to choose the external route but smaller full thickness wounds of 4-5 mm do not excluded the transconjunctival approach.

## Surgical Technique

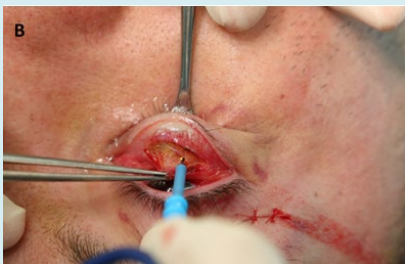
The tranconjunctival approach must always be decided before the surgery. Medial extension (i.e. transcaruncular approach) is always performed first. For short eyelids or for the need of wide exposure we generally performed the lateral canthal incision, a modification of the De Chalain procedure [2], always releasing the lateral inferior canthal ligament at the level of the lid commissure.

We don't infiltrate the lower eyelid with any anesthetic solution with adrenaline in the way to preserve the natural anatomy of the eyelid. Before incising the conjunctiva we position a Desmarres retractor on the lower eyelid pushing the working part of the instrument on the external lower eyelid skin. At the same time we gently hold with a micro Hudson forceps the lower eyelid and with an everting movement we expose the inner mucosal layer. Thus the tarsal part of the eyelid is loaded by the Desmarres' retractor which pushes up the lower tarsal edge and the lower eyelid is folded on the instrument (Figure 1A).



**Figure 1A:** Desmarres positioning to evert inferior eyelid and expose the inner mucosa.

The conjunctival incision is performed 3-4 mm below the inferior tarsal edge with a low settled cautery, incising only the mucosa and exposing the loose areolar tissue in front of the inferior orbital septum (Figure 1B).



**Figure 1B:** Conjunctival mucosa incision and exposing the loose areolar tissue in front of the inferior orbital septum.

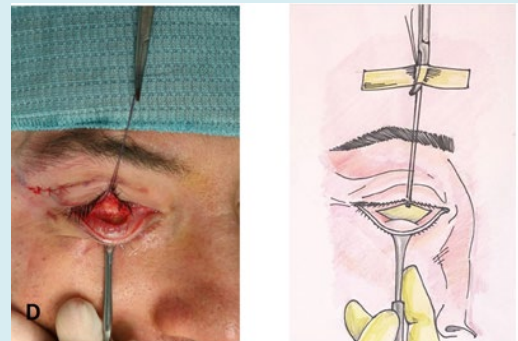
A 4-0 thread suture is positioned in the proximal submucosa and reflected proximally to cover and protect the

cornea. The tails of the suture are taped on the forehead of the patient to secure the cornea from injuries. (Figure 1C).

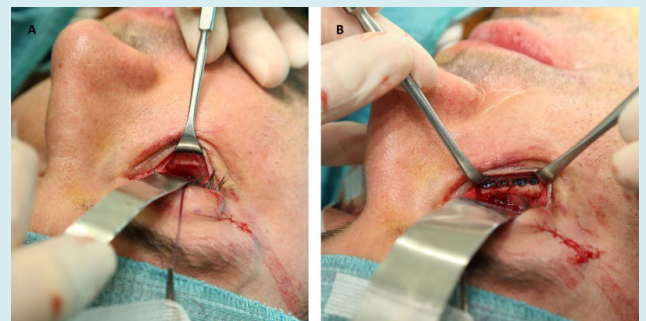


**Figure 1C:** Blunt dissection to expose the surgical field.

A blunt dissection performed with the blunt tip of the scissor ends the exposure of the surgical field (Figure 1D). Frequently it is possible to identify flimsy small vessels between the septum/orbit and the deep face of the orbicularis muscle. It should be care to coagulate them before proceeding to avoid bleeding. They are coagulated with bipolar forceps or with a low settled monopolar cautery.



**Figure 1D:** Proximal submucosa traction with thread suture to protect the cornea.



**Figure 2A:** Exposure of the inferior orbital rim with repositioning of Desmarres' retractor inside the conjunctival wound.

**Figure 2B:** Fracture stabilization with plate and screws.

Caudal dissection is, for the rest, performed in a almost avascular plane since the inferior orbital rim is exposed. Now it is possible to reposition the Desmarres' retractor inside the conjunctival wound to widely retract the eyelid and gain complete exposure of the surgical field (Figures 2A & 2B).

With the cautery we incise the periosteum at the inferior orbital rim and elevate the periosteum in usual manner. After the reconstruction of the bony defect, we left the periosteum of the inferior orbital rim not sutured in the way to allow the exit of collected blood from the conjunctival wound and avoid the formation of intraorbital haematoma. No suture of the conjunctiva is performed. Antibiotic ocular ointment is applied on the cornea at the end of the surgery and for further two days before rest. A daily medication with eye antibiotic drops twice a day is carried on for approximately a week. The conjunctiva will heal spontaneously within 7-10 days maximum and impossible to detect it in the next weeks.

## Discussion

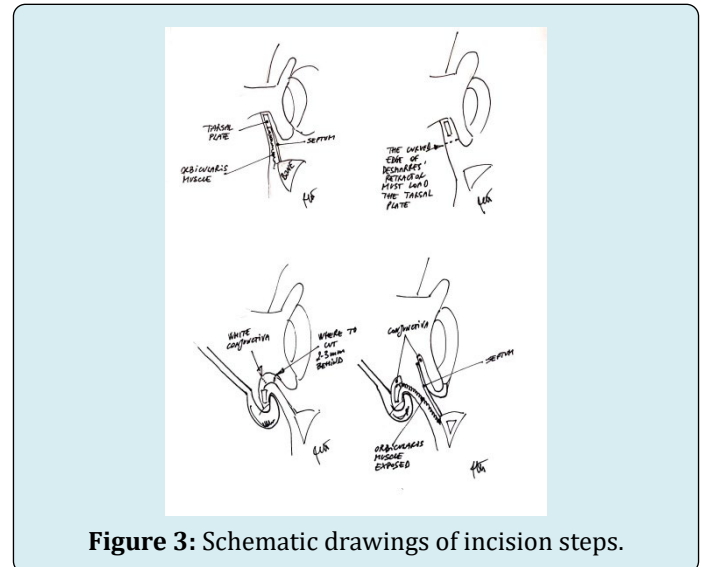
The transconjunctival approach was initially described in 1924 by Bourget for cosmetic blepharoplasty [3]. Tenzel and Miller used this approach, 50 years later, to explore and repair orbital floor fractures [4]. Tessier used this technique to address facial traumas and congenital malformations [5]. Different authors use transconjunctival preseptal or retroseptal for the treatment of orbital fractures [1,6-9].

Reconstruction of the bony orbit through the transconjunctival route has different indications from aesthetic surgery and are represented by the exposure of the orbital floor and reconstruction/repositioning of the fracture. For us the main disadvantage of the retroseptal approach is represented by the disturbance of the intraorbital connective tissue framework during the healing process [1,10,11]. The scarring in the anterior part of the intraorbital system can influence the eye movements and produce enopthalmos.

The preseptal approach allow us to performed the surgery without any protruding fat in the surgical field and the dissection plane is almost avascular since the surgeon reaches the inferior orbital rim. An important point is represented by the level of the surgical incision [1,12]. When the incision is too high there is the risk of fibrosis and shortening of the tarsal plate. When too low, deep in the inferior conjunctival fornix, there is the risk of injury of the inferior rectus muscle (and developing of a Pseudo-Brown Syndrome) [10].

Thus we adopted and incision line which is approximately 3-4 mm below the inferior tarsal plate [13,14]. The eversion of the lower eyelid allows us a perfect visualization of

the white tarsal lamella reducing the risk of injury of this structure (Figure 3).



**Figure 3:** Schematic drawings of incision steps.

After performing the incision with a low settled electrocautery, a 4-0 suture is passed in the proximal submucosal tissue and the tails of the suture are suspended with a tape on the forehead of the patient. The aim of this step is represented by the protection of the cornea by the patient's own conjunctiva which is soft and moist, avoiding corneal shields.

Like Lorentz, et al. [6], we believe that it is not necessary to perform a lateral canthotomy to address the orbital floor. When it is necessary to reach the medial orbital wall or the fronto-malar suture, a lateral canthotomy can represent a good alternative to blepharoplasty-like upper eyelid incision. A preseptal transconjunctival incision plus canthotomy can be a good access to control the medial orbital wall extension of the fracture even though does not provide adequate exposure of the entire medial orbit [10,15,16].

## Conclusion

We never had major complications like blindness or corneal damages with the transconjunctival approach.

It can be a safe and time saving procedure when performed respecting the anatomical structures and surgical steps. Moderate post-surgical ectropion was observed in some patients but disappeared with massages.

Surgical time was reduced up to 15 to 7 minutes in the hands of all our surgeons, thus decreasing the eye swelling and the hospital recovery.

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