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Esthetics Evaluation of Scar Between Subciliary Incision and Infraorbital Incision for Inferior Orbital Rim Fracture

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INTRODUCTION

The oral and maxillofacial surgeon is constantly facing changes involving orbital trauma, pathology, reconstruction and aesthetics. Orbital fractures account for 40% of craniofacial injuries; of the four walls of the orbit. Orbital floor fractures can be broadly classified as pure or impure blowout fractures; the first are isolated orbital floor fractures, and the second are also associated with an orbital rim fracture, involving other skeletal elements: zygomatic, frontal, nasoethmoidal, or maxillary bones. Conventional approaches to the infraorbital rim/orbital floor have been cutaneous infraciliary incisions namely the subciliary, mid lower eyelid or subtarsal and infraorbital incisions. These approaches leave behind a scar which may be cosmetically disfiguring at times. The first reports in the literature of open reduction of infraorbital rim and floor fractures through use of a subciliary incision was first described by Converse in 1944. The increasing emphasis on open reduction in the management of orbital fractures has led to an extensive debate as to which approach provides adequate exposure for these fractures. Scarophobic patient and history of keloid formation are considered relative contraindications to the subciliary incision.

MATERIALS AND METHOD

A total of 14 patients were selected who had undergone treatment for the inferior rim fractures. Patients who fulfilled our criteria were enrolled and analyzed. The procedure to be performed were explained, followed by written consent.

14 patients with fracture of inferior orbital rim fracture with or without other fractures of the facial skeleton were selected for the study and randomly divided into two groups, each group having seven patients. The exclusion criteria included patients with comminuted fracture of the rim and orbital floor, more than 5mm of displacement of fracture segments and patients with extensive soft tissue injury in the zygoma region.A detailed history of the patients was recorded; both clinical and radiographic examinations were done. A cyclic order was followed with the selection of the type of incision.

The parameters for comparison is the aesthetic appearance of the scar

Subciliary approach procedure

A subciliary skin incision was made 2mm below and parallel to the lid-margin, beginning near the punctum and extending 5-8mm past the lateral canthus in a skin crease. The dissection was carried directly down to the tarsal plate, separating the preseptal orbicularis oculi fibers from it. Once the tarsal plate was cleared of orbicularis fibers, the orbital septum, held tense by upward traction on the previously placed lid marginsutures, was likewise separated from the preseptal orbicularis by spreading the two layers with scissors. The

dissection followed the orbital septum down to the inferior orbital rim. A 5-8mm incision through the orbicularis fibers underlying the lateral extension of the skin incision permitted the skin- muscle flap to be retracted away from the fractured site easily, without danger of tearing the lower eyelid skin. After the exposure of the fracture reduction of the fracture was done and fixed by plates and screws. After fracture repair, a 4-0 absorbable vicryl suture reapproximated the orbicularis muscle; skin closure done 5-0 ethilon.

Infraorbital approach procedure

Infraorbital incision is placed on the skin. In the skin crease along the infraorbital ridge from the medial canthus to the lateral canthus. If an extension is required in the lateral side it should be along the line of minimal skin tension along the zygomatic bone. The incision should not cross the lateral canthus to avoid cutting the lymphatic channels that will lead to excess postoperative edema. The infraorbital incision is typically placed in a skin crease at the junction of the thin eyelid skin and the thicker cheek skin, overlying the inferior orbital rim. The orbicularis muscles is divided in this same level[6].

RESULTS

All the patients selected for the study were followed up for a minimum period of 6 months. Postoperative assessment for the above mentioned parameters were done on the first, third and sixth month respectively. All the photographs were evaluated by the surgeon and three independent observers and the patient itself by means of questionnaires.. The mean grade was calculated as for group one as 20 and group two as 16.

DISCUSSION

The average distance between the scar and the ciliary margin was 2.4 mm for the Subciliary Incision and 9.6 mm for the Infraorbital Incision. Bähr et al.[1]foundan average distance of 1.5 mm for the subciliary incisions and 9.5 mm for the infraorbital incisions. Regarding the scar appearance, the rate of unnoticeable scars is significantly higher when the higher incisions subciliary are used instead of the infraorbital incision. As far as it could be ascertained, there are no other studies comparing the esthetic appearance of the scars among these types of incisions, but the superiority of the scar appearance when subciliary incisions are used is also corroborated by Heckler et al.[2], who analyzed 154 subciliary incisions and found that in 100% of the cases, the scar appearance was considered to be excellent. Bähr et al. reported that the occurrence of chronic edema is an approach-dependent phenomenon based on the observation of a higher incidence of chronic lid edema as far as the incision was more inferiorly placed. A possible explanation for this edema distribution is that lower incisions interrupt larger lymphatic vessels, thus being responsible for a greater amount of chronic edema[3].

Netscher et al.[4], in a prospective study of 20 subciliary incisions, found a scleral show rate of 70%. Smith and Wood-Smith[5] reported that with an incision placed below the tarsus, avoiding the orbicularis' pretasalfibers, a vertical shortening of

Fig. 1: subciliary incision outcome

Fig. 2: Infraorbital incision outcom

the lid is less likely than with the subciliary incision, since the vertical shortening deformity seems to be causally related to the tonus of the orbicularis oculi muscle in its tarsal portion. The occurrence of ectropion and sclera show seems to related with the type of flap rather than the kind of incision, since subciliary when used with the stepped skin muscle flap, preserve the pretarsal portion of the orbicularis attached to the tarsal plate. There are many other factors that may contribute to the occurrence of vertical shortening, such as preexisting lid laxity, hypoplasticzygoma and relative globe protrusion[6,7]. According to Bähr et al. the advantages of the infraorbital incision regarding the low risk of vertical shortening of the lower eyelid with the advantages of the subciliary incision regarding the formation of unnoticeable scars. Ellis III and Zide[8], supported by their vast clinical experience, have suggested the use of the subciliary incision because of the unnoticeable scar that generally results from it, associated with the stepped skin-muscle flap, in order to prevent the occurrence of ectropion.

CONCLUSION

This study suggests the superiority of the subciliary incisions, and advocates their use instead of the infraorbital incision, since the subciliary showed rates of unnoticeable scars higher than the infraorbital incision and no statistically significant difference in ectropion, scleral show or chronic edema rates were found between the two types of incision. In order to prevent vertical shortening of the lower eyelid, the use of a stepped skin-muscle flap or any other preventive measure, such as the use of a Frost suture, is suggested.Hence Subciliary is more promising than infraorbital incision in terms of scar outcome.

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