The Role of Soft Tissue Suspension in Prevention of Postoperative Ectropion in Posttraumatic Orbital Floor Reconstruction

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ABSTRACT

Introduction: Cicatricial ectropion and scleral show are among the most common complications following posttraumatic orbital floor reconstruction using the subciliary incision. The incidence of these complications is widely various in different studies.

Aim of the Work: Is to clarify the role of soft tissue suspension in decreasing postoperative ectropion after posttraumatic orbital floor reconstruction using subciliary incision.

Patients and Methods: A randomized controlled comparative study was conducted at the plastic surgery department at Cairo University Hospitals. The present study included 30 patients having orbital floor fractures associated with large orbital floor defects either isolated or with other maxillofacial fractures, attending the outpatient and emergency services of the department from June 2012 to December 2013. Patients were subdivided into two groups, 15 cases were managed using subciliary incision with soft tissue suspension for reconstruction of the orbital floor defects (group A), and 15 cases were managed using the same approach without soft tissue suspension (group B).

Results: 20% of all patients had postoperative scleral show with incidence of 6.7% in group A compared to 33.3% in group B. Ectropion did not occur in group A, while occurred in 13.3% of patients in group B.

Conclusion: Surgical technique can alter the incidence of post-operative complications after posttraumatic orbital floor reconstruction. Postoperative ectropion and scleral show is much less when soft tissue suspension is used with subciliary incision.

INTRODUCTION

One problem that may accompany any incision to gain access to the infraorbital rim and orbital floor is a vertical shortening of the lower lid after healing. This probably occurs as a result of scarring and shortening of the orbital septum. The subciliary approach described by Converse is made a few millimeters below the lash line. The incision is carried down through the orbicularis muscle to the tarsal plate. The plane above the tarsal plate can then be followed to the orbital septum and subsequently the orbital rim periostium which is then divided anteriorly for access to the orbital floor [1].

Barbon, et al. [2] found a 20% incidence of ectropion associated with subciliary approach. Using the subciliary incision also, Ridgway, et al. [3] declared the occurrence of ectropion in 14% of cases operated upon for facial fractures. Holtmann et al. [4] observed a significantly higher rate of ectropion (42%) in the subciliary incision approach.

This obvious difference in the incidence of ectropion after subciliary incision in different studies appears to be due to different technical points. In this study, the soft tissue suspension in the closure of subciliary incision after reconstruction of orbital floor fractures would be assessed if has a role in prevention of postoperative ectropion.

Aim of the Work:

The aim of this study is to clarify the role of soft tissue suspension in prevention of postoperative ectropion in posttraumatic orbital floor defects reconstruction.

PATIENTS AND METHODS

A randomized controlled comparative study was conducted at the Plastic Surgery Department at Cairo University Hospitals. The present study included 30 patients having orbital floor fractures associated with large orbital floor defects either isolated or with other maxillofacial fractures, attending the outpatient and emergency services of the department from June 2012 to December 2013.

Patients were subdivided into two groups, 15 cases were managed using subciliary incision with soft tissue suspension for reconstruction of the orbital floor defects (group A), and 15 cases were
managed using the same approach without soft tissue suspension (group B). The patients were selected randomly irrespective of age, sex, and other social categories.

Patients fulfilled the following inclusion criteria: (1) clinical diagnosis of orbital floor defects; (2) imaging showing orbital floor defects; and (3) surgical treatment had never been undertaken before our management.

Exclusion criteria include orbital floor fracture without bone defect or patients who had prior unsuccessful surgery.

Subciliary incisions were used in all cases. Other incisions were used when needed (intraoral vestibular incision in 22 cases, bicoronal incision in one case, and eye brow incision in 6 cases).

Stepped skin-muscle flap technique is used leaving a 4mm of pretarsal part of orbicularis muscle, incision of perioisteum on the anterior surface of the rim, away from the orbital septum avoiding wide dissection of the perioisteum anterio-

Open reduction with rigid fixation of facial fractures and orbital floor reconstruction were undertaken in all cases.

Defects of orbital floor larger than 1.5cm² were reconstructed by bone graft or titanium mesh, while smaller defects were reconstructed by conchal cartilage or collagen membrane.

Closure and suspension of the perioisteum and resuspension of the orbicularis oculi muscle and tarsal plate to the lateral orbital rim to the level of midpupil and lastly closure of the skin was done in 15 cases (group A). Closure of perioisteum and skin only was done in 15 cases (group B) without suspension.

Intra-operative recording of the surgical steps and technical difficulties was done.

Postoperative patient care included intravenous fluids, analgesics, soft diet (for accompanying mandibular or maxillary fractures), and firm hospital discharge instructions regarding home care, and follow-up.

Patients were examined in outpatient clinic at 1, 3, and 6 months. Moreover, digital photos were taken at the time of injury, pre, intra and post operative and with follow-up.

Examination was directed for complication existence especially for occurrence of ectropion or scleral show.
RESULTS

Of the 15 patients in the group A, where soft tissue suspension took place, there was no postoperative ectropion at all, while in the other group (group B) without soft tissue suspension 2 cases suffered from significant postoperative ectropion for which both patients were re-operated up on to correct ectropion after 3 months of conservation and massaging.

One of the two cases was satisfied by the result of the second operation where resuspension of the soft tissue was done, while severe soft tissue shortage had occurred in the other case and residual ectropion is still found after 3 trials of correction (one by resuspension, one by upper eye lid flap, and one by full thickness graft).

20% of all 30 patients treated for orbital floor fractures using subciliary incision showed postoperative scleral show with higher incidence in the group B that had not soft tissue suspension (1 case in group A and 5 cases in group B).

Fig. (7): Left: Postoperative ectropion following subciliary incision without soft tissue suspension. Right: Residual ectropion of the left eye lid after trials of surgical correction.
DISCUSSION

Ectropion with scleral showing or entropion are among common postsurgical sequelae after orbital floor reconstruction are, these are related to surgical approaches and incisions and can be minimized by meticulous surgical dissection and soft tissue resuspension [5].

Loeb [6] has questioned if scleral showing and ectropion are just different degrees of severity on a scale or are separate entities altogether. Both result from scar contracture, muscle tone loss, and abnormal fibrous connections between orbicularis oculi and surroundings [7].

In this study the incidence of scleral show with subciliary incision is 20%, while ectropion occurred in 6.7% of patients with subciliary approach. When comparing the subciliary approach with soft tissue suspension to the same approach without suspension the incidence of both sclera showing and ectropion was less with the first group where scleral show incidence is 6.7% compared to 33.3% in the second one and ectropion incidence is 0% in the group with soft tissue suspension compared to 13.3% in those without suspension.

The literature shows that the incidence of ectropion and scleral show after subciliary incision largely varies from one study to another. Netscher et al. [8] found a sclera show rate of 70% in a prospective study of 20 subciliary incisions. Heckler et al. [9] on the other hand did not find any cases of permanent ectropion or scleral show after revising 154 subciliary incisions.

There are many factors related to surgical technique that may prevent the occurrence of ectropion and scleral show, as by avoiding deep lateral dissection of the orbicularis oculi muscle [10], meticulous hemostasis [10], right incision of periosteum on the anterior surface of the rim, away from the orbital septum [11]; avoidance of wide dissection of the periosteum anteriorly [12] and, of major importance, the use of stepped skin-muscle flap and soft tissue suspension as found in this study.

Conclusion:

Surgical technique can alter the incidence of post-operative complications after posttraumatic orbital floor reconstruction. Postoperative ectropion and scleral show is much less when soft tissue suspension is used with subciliary incision. Postoperative correction may be so difficult due to soft tissue shortage due to fibrosis.

REFERENCES