

A Combined Surgical and Prosthetic Approach for the Successful Management of a Mutilated Eye Socket

A case report

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طريقة جراحية بديلية مشتركة لعلاج ناجح لحجاج مجدوع تقرير حالة

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الملخص: تشوه الوجه نتيجة فقدان العين بسبب حوادث المرور قد يكون مُدمراً للمريض وربما يترك خيارات قليلة لأخصائي العيون، خاصة إذا ما كانت الحالة ملحة وتستوجب السرعة. في تقرير هذه الحالة التي أصيبت بجاذب مرور عنيف نتج عنه تمزق شديد في السنخ. متطلبات تقني البدليّات السنيّة فيما يتعلق بشكل السنخ دلت أخصائي العيون لعمل جراحة رأبيّة. صنعت القطعة البديلة بحيث ضمنت سلامة وشكل المحجر. مفتاح الكلمات: حجاج، بدلة عينيّة، فصع العين، إجراءات جراحية رأبية تجميلية، تقرير حالة. الهند.

ABSTRACT: Facial disfigurement through the loss of an eye due to a road traffic accident can be devastating for the patient and may leave few options for an ophthalmologist, especially if the situation demands urgency. In the present case report, the patient had a major accident, which resulted in the severe disruption of the socket. The requirements of the prosthodontist regarding the morphology of the socket guided the ophthalmologist to undertake reconstructive surgery. The prosthesis was then fabricated such that both its longevity and the morphology of the socket were safe guarded.

Keywords: Eye socket; Ocular Prosthesis; Eye enucleation; Cosmetic reconstructive surgical procedures; Case report; India.

THE RECONSTRUCTION OF AN EYE socket presents a series of complex problems. The interdependence of the elements of the orbit is such that change in one element will automatically affect the function and structure of each of the other elements, and thus the integrity of the whole. Therefore the surgical approach should provide a soft tissue bed for movements and aesthetics in order for the prosthesis to have a natural appearance.

This case report describes the timely intervention of a prosthodontist resulting in a prosthesis which prevented contraction and prolapse of the contents of the eye ball and ensured its satisfactory appearance.

Case Report

A male patient aged 35 years was referred to the Department of Prosthodontics and Implantology, Government Dental College and Research Institute, Bangalore, India, with a missing right eye. The patient had had a major road traffic accident one year previously, following which he had undergone emergency surgical treatment at a local hospital. The initial treatment was the enucleation of the right eye as it was badly ruptured with no visual potential. The tears in the upper and lower eyelid of the right eye were also repaired. The initial management of the injury was unsatisfactory as the socket was left with disrupted tissues and suture.

A year later, the examination of the patient revealed a right anophthalmic socket with severe loss



Figure 1: Pre operative



Figure 2: Post operative

of contour, depressed and with scarred tissues. The contour of the upper eyelid was lost as the medial end of the eye lid was sutured near the supraorbital rim. As it had remained like this for about a year, this had resulted in the formation of a notch at the medial end of the socket. The lower eye lid was shrunk with medial fornix contracture leading to a shortening of the lower fornix. A fibrous band running from the medial margin of lower lid to the bulbar conjunctiva was also seen. There was a nasoethmoidal fracture on the right side which resulted in the distance of the nasion from right medial canthus having increased to almost double that of the left eye (traumatic telecanthus) [Figure 1].

Cosmetic rehabilitation surgery was performed. In the upper eyelid, the notch was removed by releasing the lateral portion that was adherent to the supraorbital rim. The edges were freshened and the medial end was reapproximated to the medial canthus. In the lower lid, the fibrous band was released and fornix reconstruction stitches were placed from the inferior fornix to the skin over the intraorbital rim.

The healed socket was found suitable to support the prosthesis [Figure 2] so then the prosthetic rehabilitation procedure could begin. According to Allen and Webster's "modified impression method",¹ an impression was made using a stock ocular tray along with syringe filled with irreversible hydrocolloid. In the first appointment, an iris button was selected according to the size of iris of other eye. The selected iris button was preliminarily painted under natural light,² to match the basic colour and tint of the other eye. The impression was poured

with irreversible hydrocolloid into a small tumbler. On setting, it was cut to remove the impression, leaving the mould space behind. The mould space was filled with a combination of molten inlay wax and carving wax in order to have sufficient rigidity for carving and handling. The poured wax was then removed and smoothed carefully for a trial to verify its fit and support of the soft tissue for bulge in the depressed socket. After the contour and retention were assured, the movements of the wax template in the socket were matched with that of the other eye. Therefore, an aluminium button (to simulate the movement of the iris) with an outward projection or stent was secured to the centre of the external surface of the wax template in order to help to assess the movement easily). The patient was instructed to gaze in different directions and then the movement of the aluminium button was matched with the other iris. Following this, the wax template and attached aluminium button were invested. After dewaxing, the aluminium button was replaced with a pre-painted iris button in the mold space. Acrylization was completed with white acrylic. The processed eye shell was removed, trimmed and tried on the patient. At this stage, the support, fit and movements were checked. Later, final scleral painting was carried out. To give the effect of blood vessels small red fibers were incorporated [Figure 3]. During the painting, patient was asked to remain calm to keep the sympathetic reflexes down in order to avoid redness and watering of the other eye. Subsequently the shell was trimmed about 1-2 mm on the external surface and then packed with transparent acrylic to give a natural appearance. Later it was removed, trimmed, finished and polished. Finally, it was tried on the patient and was

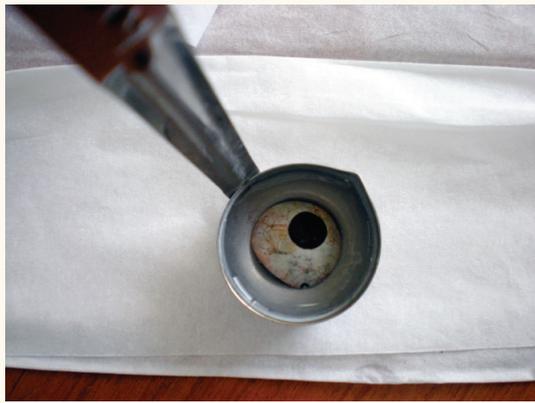


Figure 3: Sclera and iris painted



Figure 4: Use of spectacles to camouflage the traumatic telecanthus

found to support the surrounding natural tissue with acceptable aesthetics [Figure 4].

Due to persisting traumatic telecanthus, the distance from the medial end of the prosthesis to the nasion appeared to be more than the distance from the medial canthus of other eye to the nasion. To mask this asymmetry, it was decided that the patient should wear spectacles of same power for both the eyes. This camouflage provided an enhanced natural appearance [Figure 5].

Discussion

In a long standing case like this where suture has been present for around a year, the soft tissue anatomy changes considerably. The postoperative changes as described by Iverson and Vistness result in superior sulcus depression, pseudoptosis of the upper eyelid and ptosis of the lower eyelid.³ This further leads to a backward shift of the entire muscle cone and a downward and forward shift of

the orbital fat.

Frequently, patients report to the prosthodontist after surgery is over when little can be done to improve the anatomy of the existing socket. A socket that is not treated bearing the requirements of the prosthodontist in mind may result in an ill-fitting prosthesis. On the other hand, if the prosthesis is not well designed it eventually alters the size, shape and surface of the conjunctival sac. Thus the maxillofacial prosthodontist plays an important role in the surgery and subsequent fabrication of an aesthetically acceptable ocular prosthesis in order to restore facial symmetry and a normal appearance for an anophthalmic patient.⁴

The fabrication of an ocular prosthesis is arguably the most difficult of the three single-site facial prostheses, including the nasal and auricular prosthesis. The difficulty arises because the ocular prosthesis must correctly match the other eye in size and contour, and should be positioned exactly in a 3-dimensional space to simulate the correct gaze and interlid opening.⁵ The movement of the prosthesis in harmony with other eye is the most realistic aspect of an ocular prosthesis. Close adaptation to the tissue beds uses the full potential of the prosthesis to produce movement.⁶ Thus it is critical to ensure that the soft tissue of the eye socket is handled to support the prosthesis fabricated by prothodontist.



Figure 5: Final prosthesis

Conclusion

This case report shows how a carefully constructed ocular prosthesis can markedly improve the facial appearance of an anophthalmic patient.

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