

Novel Method of Management of Pseudoptosis with Ocular Prosthesis

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ABSTRACT

Introduction: Surgical removal of eye (enucleation) may cause disfigurement of the empty socket. Ptosis, an important post-operative complication, may be seen in Post-enucleation socket syndrome or occurring alone. When the ptosis occurs mainly due to loss of orbital volume, leading to loss of support and drooping of the upper eyelid, the condition is pseudoptosis. This complicates the rehabilitation process with an ocular prosthesis compromising the cosmetic result. In this article, a simple modification of an ocular prosthesis is made to correct ptosis in an enucleated socket with post-enucleation socket syndrome.

Case Report: An elderly male patient, suffering from post-enucleation socket syndrome of left eye received a modified custom ocular prosthesis. The anterior surface of the prosthesis was over contoured to effectively position the upper eyelid in a superior position and prevent it from migrating downward. The modified prosthesis satisfactorily corrected the drooping of eyelid, restoring the natural appearance of the lost eye.

Conclusion: In case of patients suffering from ptosis/pseudoptosis, a modified ocular prosthesis can replace the lost volume and support the eyelid in superior position, thus correcting the ptosis. In this article, a simple modification of an ocular prosthesis has been demonstrated that rehabilitates the lost eye and restores the aesthetic need of a patient with post-enucleation ocular defect.

Keywords: Ptosis, Ocular Prosthesis, Enucleation, Anophthalmia

INTRODUCTION

Replacement of a missing eye with an artificial eye has been in practice for many years.¹ Various ocular pathologies like irreparable trauma, intraocular tumours, a blind and painful eye or improvement of cosmesis etc. can call for an unfortunate removal of the affected eye.² The most common surgical procedure is called enucleation, which involves removal of the entire contents of the globe from the orbit, severing all connections.³ Following enucleation, however, the anophthalmic socket may show several post-surgical deteriorative changes, the most common being ptosis. Ptosis may occur alone or as a part of post-enucleation socket syndrome consisting of other clinical features like superior sulcus deformity, enophthalmos, lower lid laxity.⁴ These anatomic alterations result due to severe loss of orbital tissue volume, extra ocular muscle and orbital fat atrophy and scar tissue contracture, especially when the empty socket is not rehabilitated in the immediate post-operative period.⁵ As a result, in such patients, any attempt to rehabilitate the socket with an ocular prosthesis may be met with challenges in regards of achieving satisfactory cosmetic result.

Broadly, ptosis can be pseudoptosis or true ptosis.⁶ Pseudoptosis most often results from lack of orbital volume, when the superior eyelid doesn't have a proper tissue support. True ptosis, on the other hand, can be due to any traumatic incident or any myogenic, neurological or congenital cause. While pseudoptosis can be corrected by fabricating a well-fitting ocular prosthesis involving certain contour changes (ptosis shelf or ptosis crutch), true ptosis may require surgical intervention.⁷ A well-fitting ocular prosthesis replaces the lost volume of ocular socket and provides adequate support to the superior palpebra, eliminating the ptosis and restoring aesthetic of the eye.^{8,9}

In this article, a simple method of correction of pseudoptosis associated with post enucleation syndrome, with the help of an ocular prosthesis, has been described.

CASE REPORT

A 70 year old man reported to the department of dentistry for rehabilitation of missing left eye (Fig 1). The history of presenting condition elicited a traumatic injury to the eye 10 years back, following which he had to undergo enucleation of the same. In the post-operative period, however, he didn't receive any ocular prosthesis previously. There were no relevant medical conditions.

During clinical examination, the following features were observed (Fig 2). There was drooping of the upper eyelid, all the way down to the lower eyelid, indicating complete ptosis. Enophthalmos and deepening of the upper eyelid sulcus were among the other findings. Ectropion was seen in case of both the eyes. All these features helped us arrive at the diagnosis of post-enucleation socket syndrome. The lower fornix showed adequate depth for prosthesis retention. There was no ocular implant placed in the socket.

Treatment plan was made to proceed with fabrication of a

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conventional ocular prosthesis with mild over contouring of the cameo surface to manage the superior eyelid ptosis.

An irreversible hydrocolloid impression (Zelgan 2002, Dentsply, India) of the left socket was made (Fig 3). A working mold was obtained after impression investment in dental stone (Dental stone type III, Kalstone, Kalabhai, India). Wax pattern/scleral bank (Carving wax, Pyrax, India and Sticky wax, MAARC, India in ratio 7:3) was fabricated for evaluation and try-in. Special care was taken to overcontour the exterior surface of the pattern, that would hold the upper eyelid in a superior position (Fig 4). Wax was added along the height of contour, more towards the superior area, that would support the palpebra. The pattern was repeatedly inserted, evaluated. Wax was added to the cameo surface in an incremental manner until the superior eyelid was adequately supported (Fig 5). At each insertion, patient was asked to close his eyes and blink. After each increment,



Figure-1: Pre-operative appearance; **Figure-2:** Enucleated socket



Figure-3: Irreversible hydrocolloid impression of the socket



Figure-5: Superior eyelid supported by the modified contour of the wax pattern; **Figure-6:** Post-insertion view

care was taken to smoothen and polish the blank before each insertion. Any sharpness or roughness would irritate the upper eyelid and proper position determination would become difficult. Simultaneously, the upper and lower edges of the wax pattern were verified for engagement of fornices and appropriate retention during eye movements.

After a final evaluation, an iris button, having the same iris colour as the normal eye was positioned on the pattern and tried-in.¹ For satisfactory aesthetic outcome, in such cases, the corrected eyelid position and iris position can be related based on the following guideline which suggests that the normal upper lid should be 0.5-2mm below the superior corneal limbus and highest just nasal to the pupil.⁷ This feature can then be compared with the normal eye for accuracy. Retention, stability was checked. The finished pattern was then sent for processing. The definitive prosthesis was made with heat-polymerised resin (Heat cure resin, DPI, India). After finishing and polishing, the prosthesis was inserted (Fig 6). Any adjustment required was done in the same appointment. The patient was fairly satisfied with the cosmetic outcome of the prosthesis. He was instructed to maintain prosthesis cleanliness and socket hygiene perform eye exercises and dismissed. A one month follow-up appointment was scheduled.

Patient consent was obtained prior to proceeding with treatment procedure regarding reproduction of his case details and photographs for academic purpose.

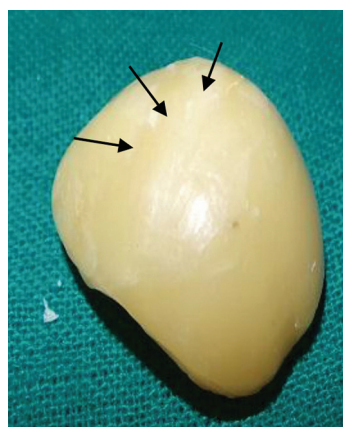


Figure-4: Over contoured wax pattern as indicated by arrows

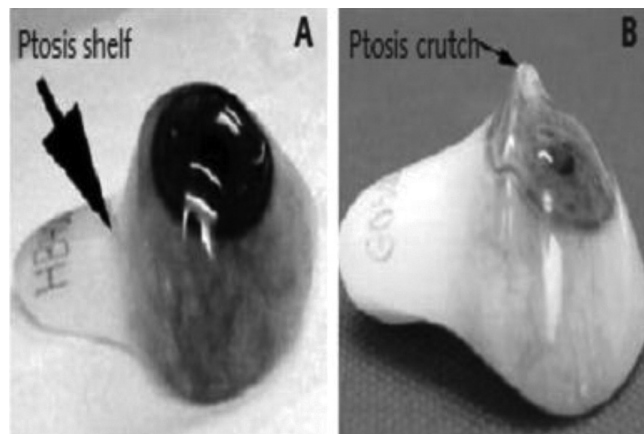


Figure-7: Representation of ptosis shelf and crutch

DISCUSSION

In this patient, loss of orbital volume is the main etiologic factor that led to a pseudoptotic condition of the affected eye. A well-fitting artificial eye, in such cases, helps in volume replacement and provides adequate support to the superior palpebra, reducing the ptosis. This is especially true, if the rehabilitation is done in the immediate postoperative period. The commonly used methods for ptosis correction involve fabrication of the ptosis shelf or the ptosis crutch⁴ (Fig 7). In case of a ptosis shelf, the superior aspect of the prosthesis is cut away or reduced to form a depressed area or shelf for the superior tarsal plate to rest. The ptosis crutch is prescribed for ptosis due to third cranial nerve paralysis. Here, an obstruction in the form of a transparent ridge is created on the anterior surface of the prosthesis, allowing a support for the upper eyelid. The major drawback of both the methods is that the upper eyelid cannot close properly, posing difficulty in blinking. This most often results in a staring gaze, compromising on the natural appearance of the eye.

The technique described in this article, however, overcomes this important drawback of the established methods, as the natural contour of the prosthesis itself is developed to manage the ptosis, without the need for alteration of the anterior surface. This not only allows the patient to blink normally but also restores the aesthetic of the missing eye. Moreover, the final contour is verified in the trial appointment itself. This eliminates the need of doing any surface alterations during insertion, giving a predictable cosmetic outcome to the definitive prosthesis.

Attempts were made at correcting the superior sulcus deformity by adding more material on the outer surface of the upper edge of the prosthesis. This resulted in limited shallowing of the deepened sulcus, yielding satisfactory aesthetics. For complete correction, surgical intervention was required. The patient, however, was not willing to undergo any operative procedure.

The mixture of paraffin and sticky wax that was used for making the pattern served two purposes. The paraffin wax helped in carving of the pattern while sticky wax helped in easy manipulation of molten wax during the contour development.

This technique, however, is not without limitation. The need for repeated and incremental addition of wax to the scleral blank to verify the upper eyelid position is time taking and may prolong the chair side work duration. This can be especially inconvenient in case of elderly individuals. In such case, the contour verification can be completed in one appointment and iris button attachment followed by final trial in another appointment. Another concern that can arise is that the excessive material can increase the weight of the prosthesis, which can cause sagging of the lower eyelid. In this case, such a difficulty was not seen. Should such a scenario arise, steps may be taken to fabricate a light weight/pneumatic ocular prosthesis.

CONCLUSION

Ptosis is a fairly common clinical feature observed in patients

with enucleation of eye, occurring either as a part of post-enucleation socket syndrome or as a single entity. An artificial eye, in such cases, not only replaces the missing ocular soft tissue volume, it also forms a support for the upper eyelid. In this article, a relatively simple and easy method has been described whereby over contouring of the ocular prosthesis corrects the pseudoptosis and restores a natural appearance of the missing eye.

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