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# Half and Half Eye Prosthesis - A Case Report

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**Abstract**

Eye prosthesis can be ocular or orbital prosthesis. An ocular prosthesis restores the lost eyeball whereas the orbital prosthesis restores the eyeball with eyelids, parts of nose, cheek, and forehead. This paper highlights the rehabilitation of enucleated eye defect.

**Keywords:** conformers, enucleation, ocular prosthesis, orbital prosthesis

## Introduction

Maxillofacial defects are defined as facial disfigurements resulting from congenital abnormalities, surgical resection of tumors, and/or trauma [1,2]. A facial prosthesis is the most practical alternative when surgical methods cannot fulfil the patient's esthetic and functional demands[3]. This paper discusses the challenges faced and techniques used to rehabilitate the enucleated eye defect in a post covid mucorrmycosis case.

## Case Report

A 38-year-old male patient reported to the department of prosthodontics for prosthetic eye. It's a known case of Rhino orbital Mucorrmycosis underwent, enucleation of right eye 8 months ago. Patient had history of type 2 diabetes. Examination of the defect revealed inadequate socket depth with upper eyelid level lower than the contralateral eye. The lower eyelid area was depressed and gave a sunken appearance. Socket depth measured was less than 2mm using acrylic stent revealed shallow Fornices. Superoinferior and Mediolateral dimensions were measured as 4mm and 32mm respectively using Vernier caliper. Treatment planning was done to restore the inadequate socket depth and correction of upper eyelid level with the conformers initially and then to

proceed with the fabrication of the ocular prosthesis for the upper half and silicone orbital patch for the lower half.

Figure 1: Preoperative Image

**Steps of Fabrication**

Step1: A preliminary impression was taken with alginate. Alginate was mixed in a flowable consistency and loaded in 2ml syringe and injected into the eye socket. A putty index was made for the alginate for fabrication of special tray.

Figure 2: Initial Socket Depth

Step 2: Special tray was fabricated using clear acrylic (heat cure) and fitted to the hub of the 2ml syringe. Extensions were checked for the special tray and light body (addition silicone-photosil) was loaded in the syringe for master impression. Putty index was made for secondary impression. Mock waxup sheets were melted and poured in the index for conformer's customization. Conformers of three different sizes (small, medium, large) were made of clear acrylic heatcure (DPI clear acrylic) material with reference to the stock conformer shell sizes and inserted at 1st week, 5$^{th}$ week and 8$^{th}$ week respectively. Desired socket depth and upper eyelid level was achieved at the end of 8$^{th}$ week.

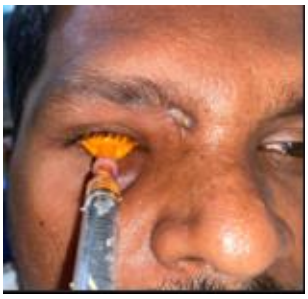

Figure 3. Impression For Conformers

Figure 4. Customised Conformers

Figure 5. Conformer Insertion

Step 3: Final impression for ocular part after achieving desired socket depth was made with light body syringe technique. Putty index was made for wax pattern using white mock wax up sheets.

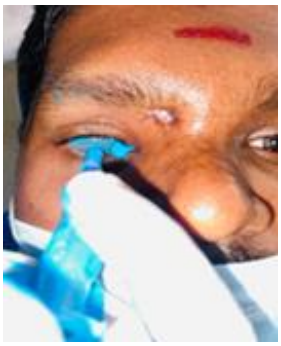

Figure 6: Master Impression

Figure 7: Putty Indexing

Step 4: Wax trial done. Checked for extensions. Stock iris and scleral shade selection was done. Positioning of iris was done using grid scale. Final positional verification of iris with ocular wax pattern was done.

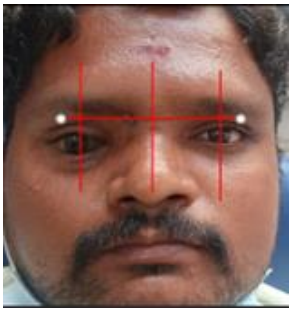

Figure 8. Iris Positioning

Step 5: Flasking done in orbital flask using plaster of paris. Mould space created after dewaxing was packed with heat cure tooth moulding powder(shades B and E)(DPI tooth moulding powder).Standard curing cycle was followed and ocular prosthesis was retrieved from the flask. For the glaze, 2 mm of scleral part of acrylic was trimmed off and the ocular part was stabilized in the counter part of the same flask using anabond. It is packed with clear heat cure material and standard curing cycle was repeated. Final prosthesis was trimmed and polished. Insertion of the ocular part was done.

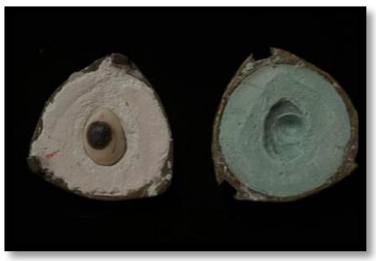

Figure 9. Flasking

Figure 10: Finished Ocular Prosthesis

Figure 11: Ocular Prosthesis Insertion

Step 6: For the lower sunken part, facial moulage was made using alginate facial impression. Wax sculpting was done. After wax trial, Normal flasking procedure was carried out for silicone orbital patch fabrication. Proper shade matching was achieved. Packing of silicone done with RTV medical grade silicone (Technovent medical grade silicone system).Artificial eyelashes were pasted after final finishing and polishing. Orbital Silicone patch was retained using silicone adhesive (G609 ProBond ) .

Figure 12: Facial Impresssion

Figure 13: Facial Moulage

Figure 14. Wax Sculpting

Figure 15. Flasking And Dewaxing

Figure 16. Technovent Medical Grade Silicone

Figure 17. Shade Matching

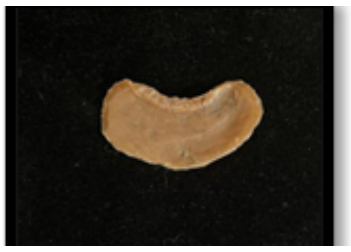

Figure 18. Processed Orbital Patch With Eye Lashes

Figure 19. Post Operative Image

**Discussion**

This is a known case of rhino orbital mucorrmycosis involving the right eye, reported to Department of Prosthodontics after 8 months of postoperative period. Patient had history of uncontrolled diabetes. Due to the possibility of recurrence of mucorrmycosis in diabetic patients, Conventional method of fabrication of eye prosthesis was used. The salient features of this case were enucleated defect with lack of adequate socket depth, Level of upper eyelid lower than the contralateral eye and the sunken lower eyelid region. A good outcome after enucleation is dependent on adequate volume replacement in orbit, the formation of fornices lined by conjunctival or mucous membranes, a well-fitting ocular prosthesis, and good cosmetic and functional eyelids[4,5,6] Orbital fat atrophy and cicatricial orbitopathy can be due to decreased circulation, metabolism, and inadequate volume replacement, leading to features of the post-enucleation socket syndrome (PESS)[5] .Initially, conformers were used as socket expanders. A conformer is a clear acrylic shell fitted to an anophthalmic socket or in the case of a microphthalmia socket before fitting an ocular prosthesis. It helps in the formation of fornices and helps to expand the socket. In the case of congenital contracted sockets, we need to change conformer size

every six weeks to two months for size to expand the socket gradually. It is also used after an enucleation and evisceration of the eyeball over the implant inside the socket to hold the shape of the eye socket and allow the eyelids to blink over the shell without rubbing the suture line. The conformer shell holds the shape ready for the artificial eye[7]. For the prosthetic correction of the shallow fornix, the candidate should have sound socket for prosthetic correction. The muscle can be evaluated to see the possibility of tissue compression and the balance of muscle tone of lower, upper eyelid. To overcome the upward force from the extraocular muscle, compression of the muscle downward is indicated using conformer which creates a continuous force to expand the socket. Fornix depth of 3 mm is enough to maintain the prosthesis in socket[8].Three different oversized conformers were used at different intervals of time exerted pressure in the fornices to achieve desired socket depth and the upper eye lid level. A 2ml syringe loaded with light body to which attached a special ocular tray with retentive holes drilled, was easy to handle and record the anatomical undercuts accurately. Customized ocular prosthesis enabled the excellent shade matching as well as for proper retention. Blinking of eye was satisfactory. The prosthesis was user friendly, easy to clean and maintain. For the sunken lower eyelid part, orbital prosthesis is the potentially economic and conservative alternative to surgical reconstruction for aesthetic and emotional rehabilitation of the patient [9]. It was retained using silicone adhesive. Patient was reviewed after one week. No tissue irritation and inflammation were seen with adhesive usage and the ocular prosthesis. 6 month's follow-up had been done. No evidence of loosening of ocular prosthesis or color change in the orbital patch.

## Conclusion

Complicated cases always pose challenges in rehabilitation of maxillofacial defects. Combination of techniques and usage of right materials will enhance the fabrication of life-like prosthesis.

## Acknowledgements

Photo documentation was done with proper patient consent.

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