



## CASE REPORT

# Prosthetic Management of a Patient with Ocular Defect with Custom Ocular Prosthesis

Arunjaikumar R<sup>1</sup>, Krishnaraj R<sup>2</sup>, Vijitha D<sup>3</sup>

**ABSTRACT:** As loss of an eye has high psycho-social impact on a patient, the main aim in management in such patients is to replace the missing tissues with an artificial prosthesis, not only to restore optimum aesthetics, facial symmetry and function, but also the self-confidence of the patient. These prosthesis are challenging as they try to reconstruct a mobile organ with a non-mobile prosthesis. Treatment includes implants and acrylic eye prosthesis. Although implant eye prosthesis has superior outcome, due to economic factors it may not be advisable for all patients. Therefore a custom-made ocular prosthesis is a viable alternative. This case report explains a custom-made ocular acrylic prosthesis made for an anophthalmic patient.

**Key words:** *evisceration, enucleation, exenteration, anaophthalmos, orbital prosthesis.*

Most notable feature in the human face are the eyes<sup>[1]</sup>. Loss of such important facial feature can be due to tumor, congenital defect, painful blind eye, irreparable trauma or sympathetic ophthalmia<sup>[2]</sup>. This loss has a significant impact on physical, psychological and emotional aspects of the patient<sup>[3]</sup>.

Just after the loss of the eye ball, a conformer is usually given, that can prevent change in the socket size due to scar contractures. It can also maintain conjunctival fornices shape. The conformer is later replaced by a permanent ocular prosthesis. Fabrication of an ocular prosthesis involves an inter-disciplinary team work<sup>[4-7]</sup>.

Here we report case where acrylic orbital prosthesis was provided for an anophthalmic patient.

## CASE REPORT

A fifty five year old male patient reported with a complaint of missing left eye. He did not report of any pain or discomfort in the peri-orbital tissue. History revealed that left eye was enucleated seven months back due to trauma. The Pre-operative evaluation of socket anatomy and the control of the musculatures were evaluated (Fig-1). Keeping in mind the economic status of the patient and other aesthetic requirements, a custom ocular prosthesis was planned. The entire procedure including the maintenance aspects and the limitations

were explained to the patient.

Petroleum jelly was applied to the areas around for the easy removal of the impression material. The ocular defect was recorded with a fluid viscosity, irreversible hydrocolloid impression material (Alginate, Zelgan) loaded in a syringe (Fig-2). Care was taken so that no air was incorporated in the impression material during the procedure. While inserting the material into the defect, the patient is asked to look straight in the front. Once the material has been introduced, the patient is asked to perform various eye movements so that the impression is recorded in a functional form. The impression was carefully removed and was examined for completeness, or for any voids or defects (Fig-3). It was then invested with dental plaster (Type II, Goldstone, Asian chemicals, Gujarat, India) to obtain the primary cast (Fig-4).

Spacer was adapted and a custom tray was fabricated using self-cure clear acrylic resin (DPI RR cold cure; Bombay Burma Trading corp. Ltd). To attach a syringe for injecting impression material, a 2-3 mm diameter perforation was made approximately at pupil location (Fig-5). Multiple perforations of 1-2 mm were made over the remaining surface, for the retention of the impression material. The custom tray was trimmed, polished and disinfected. It was tried in the patient to check for extension and proper orientation (Fig-6).

Received : 16.11.12

Accepted : 25.12.12



**Fig 1: Enucleated eye after trauma**



**Fig 2: Impression of the socket**



**Fig 3: Completed impression**



**Fig 4: Plaster primary cast**



**Fig 5: Acrylic custom tray**



**Fig 6: Checked on the patient**



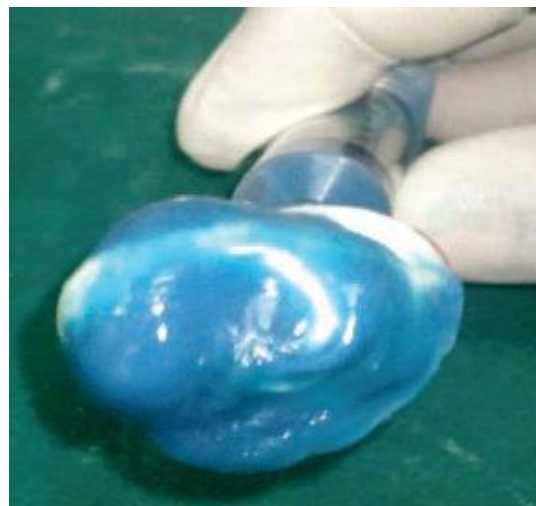
**Fig 7: Soft putty impression**



**Fig 8: Hole made through the impression**



**Fig 9: Light body loaded through syringe**



**Fig 10: Final impression**

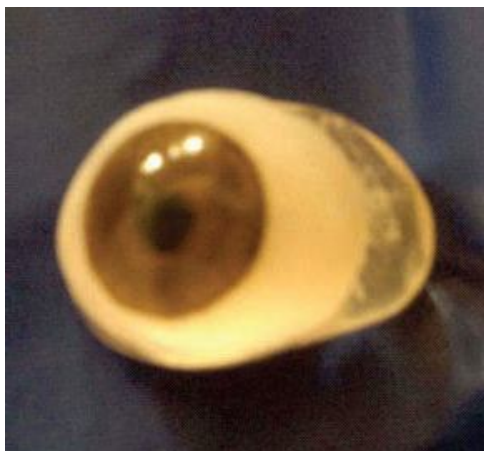


**Fig 11: Final cast**



**Fig 12: Wax up of the prosthesis**





**Fig 13: Finished acrylic eye prosthesis**

The tray was placed in the socket and the syringe was loaded using soft putty consistency polyvinyl siloxane and lightbody addition silicone impression material. Gross extent of the defect was recorded with soft putty (Fig-7) and a hole was made connecting the syringe hub and the external surface of the putty (Fig-8). The final impression was then made using light body. Patient was asked to move the eyes in all directions, so that a functional impression was obtained (Fig-9). After removal it was checked for defects (Fig-10). Another cast was obtained from this impression, keeping in mind the handle length and position. The impression was invested with dental stone (Fig-11).

Wax pattern conformer was then carved and contoured to simulate the lost eye. The selection of the iris was done by trimming and modifying a commercially available stock eye which had almost matching resemblance to his unaffected natural eye (Fig-12). Fullness and extensions were assessed with the eyes closed as well as from the profile view.

To maintain the position of the iris in accordance with the adjacent natural eye, the midline of the face was marked. Distance between the midline and natural iris was reproduced on the artificial iris by adjusting. The movements of the wax trial were also assessed for synchronicity of movement with the natural eye ball.

The secondary cast with the wax pattern was assembled in a denture flask. A handle made of cold cure acrylic resin was attached to the iris to prevent the displacement of the iris during dewaxing. After thorough dewaxing, a thin layer of heat cured clear acrylic was spread evenly in and around the iris. Certain characterizations were done



**Fig 14: Satisfied patient**

to match the vital look of the natural eye. Appropriate shade of heat cure tooth coloured acrylic resin was packed and cured with long curing cycle so as to ensure that no residual monomer was present in the final prosthesis. It was finished and polished to a glossy surface since the eye socket is very sensitive to even mild roughness or irregularities (Fig-14).

The final outcome was satisfactory for the patient (Fig -15). The patient was given instruction for maintenance that it should be handled with clean hands, should be removed at nights and should be stored in antibacterial solutions. Patient was also instructed for follow-up and polishing of prosthesis every year.

## DISCUSSION

It is challenging to replace an anatomic structure by artificial means especially in the facial region. The replacement must blend with the adjacent tissues as well as replace the missing structures. A team work with interdisciplinary interaction is mandatory to face this challenge<sup>[8,9]</sup>.

Ocular prostheses are either ready-made or custom-made. Fitting a stock eye, modifying a stock eye by making an impression of the ocular defect<sup>[10]</sup> and the custom eye technique<sup>[11]</sup> are few of the methods adopted. Stock acrylic resin prosthesis, though enable a rapid fabrication, to incorporate individualized natural looking aesthetics is a problem. Thus custom acrylic resin eye fabrications is preferred as it provides better adaptation to the tissues resulting in good contours, control over aesthetic factors, and also increased mobility.

The ocular prostheses are produced from either glass or

methyl methacrylate resin. Methyl methacrylate is preferred over glass as it is prone for damage and deterioration. A longevity of 18-24 months have been reported<sup>[12]</sup>. On the contrary, the methyl methacrylate acrylic resin eyes are lightweight, unbreakable, translucent, easy to fit and adjust, easily fabricated, capable of colouring, and are inert to the socket secretions.<sup>[13,14,15]</sup>

## CONCLUSION

Successful rehabilitation of the lost vital tissues of the head and neck region is possible with the integration of maxillofacial prosthetics with allied fields like plastic surgery. Custom made acrylic eye prosthesis is a viable alternate to other expensive and elaborate treatments such as implants. These prostheses not only restore the lost tissue, but also the self esteem of the affected patients.

## REFERENCES

1. Doshi PJ, Aruna B. Prosthetic management of patient with ocular defect. *J Ind Prosthodont Soc* 2005;5:37-8.
2. Raflo GT. Enucleation and evisceration. In: Tasmun W, Jaeger E eds. *Duane's Clinical Ophthalmology*, Revised edn, Vol. 5. Philadelphia: Lippincott-Raven, 1995;1-25.
3. Lubkin V, Sloan S. Enucleation and psychic trauma. *Adv Ophthalmic Plast Reconstr Surg* 1990;8:259-62.
4. Guttal SS, Patil NP, Nadiger RK, Basutkar B. Use of acrylic resin base as an aid in retaining silicone orbital prosthesis. *J Indian Prosthodontic Soc* 2008;8:112-15.
5. Patil SB, Meshramkar R, Naveen BH, Patil NP. Ocular prosthesis: a brief review and fabrication of an ocular prosthesis for a geriatric patient. *Gerodontology* 2008;25:57-62.
6. Artopoulou II, Montgomery PC, Wesley PJ, Lemon JC. Digital imaging in the fabrication of ocular prostheses. *J Prosthet Dent* 2006;95:327-30.
7. Ow RKK, Amrith S. Ocular prosthetics: use of a tissue conditioner material to modify a stock ocular prosthesis. *J Prosthet Dent* 1997;78:218-22.
8. Bartlett SO, Moore DJ. Ocular prosthesis: a physiologic system. *J Prosthet Dent* 1973;29:450-59.
9. Guerra LR, Finger IM, Echeverri J, Shipman B. Impression making, sculpting, and coloring of orbital prostheses. *Adv Ophthalmic Plast Reconstr Surg*. 1992;9:287-96.
10. Taicher S, Steinberg HM, Tubiana I, Sela M. Modified stock-eye ocular prosthesis. *J Prosthet Dent* 1985;54:95-8.
11. Benson P. The fitting and fabrication of a custom resin artificial eye. *J Prosthet Dent* 1977;38:532-38.
12. Mathews MF, Smith RM, Sutton AJ, Hudson R. The ocular impression: a review of the literature and presentation of an alternate technique. *J Prosthodont* 2000;9:210-16.
14. Cain JR. Custom ocular prosthetics. *J Prosthet Dent* 1982;48:690-94.
15. Dyer NA. The artificial eye. *Aust J Ophthalmol* 1980;8:325-27.

### Address for correspondence:

Dr. Arunjaikumar R  
Senior lecturer  
Department of prosthodontics  
Rajah mutiah dental college & hospital  
Annamalai university  
Chidambaram – 608002  
Email id :jaikumar.arun@gmail.com

### Authors:

<sup>1</sup> Lecturer, <sup>2</sup> Lecturer, <sup>3</sup> Reader  
Prosthodontia  
RMDCH, Annamalai University.

### How to cite this article:

Arunjaikumar R, Krishnaraj R, Vijitha D. Prosthetic management of a patient with ocular defect with custom ocular prosthesis—a case report. *Journal of Scientific Dentistry* 2012;2(2):56-60.

**Source of Support:** Nil, **Conflict of Interest:** None declared