

# A Case of Ocular Defect: Prosthetic Rehabilitation with Semi Customized Prosthesis

Rahman MR<sup>1</sup>, Tariquzzaman M<sup>2</sup>, Hyder MLA<sup>3</sup>, Rab MA<sup>4</sup>, Chowdhury GM<sup>5</sup>

DOI: <https://doi.org/10.3329/jafmc.v17i2.58377>

## Abstract

Facial defect rehabilitation is a challenging task. Individualized technique is required for each patient to accomplish the task. Due to any cause loss of an eye with disfigurement of face makes severe physical and psychological distress. A 65-year-old male Patient complaint with missing left eye was referred to the Department of Prosthodontics, Military Dental Centre Dhaka for artificial eye replacement. A defect with compressed orbit and unharmed tissue bed was found by clinical examination. Mode of rehabilitation for the missing eye is ocular prosthesis. Here I tried to describe a simple technique for the fabrication of ocular prosthesis. With stock iris and customized sclera, we have fabricated a semi customized ocular prosthesis. It provides very good result functionally and esthetically.

**Key-words:** Ocular defect, Rehabilitation, Ocular prosthesis, Semi-customized.

## Introduction

In our day to day life eyes play a very important role as they are the first feature of the face to be noticed. Due to any reason if patients losses part of face especially eye, it gives the patients severe emotional and physical problems<sup>1</sup>. Reasons of loss of eye might be congenital defect, irreparable trauma, malignancies, painful blind eye or sympathetic ophthalmia<sup>2</sup>. According to severity of the cases surgical management include enucleation, evisceration and exenteration<sup>3</sup>. Excision of the intraocular contents of the globe is called evisceration without involving sclera and sometimes cornea. Surgical removal of a portion of the optic nerve from the orbit and the entire globe is called enucleation. Including extraocular muscle en block removal of the entire contents of the orbit is called exenteration<sup>3</sup>.

The patient with ocular defect followed by evisceration or enucleation, ocular prosthesis can be given to them. Patients suffering from psychological distress due to loss of eye can be

significantly improved by an ocular prosthesis. Ocular prosthesis made by acrylic resin are of three types (a) Custom fitted ocular prosthesis made from an impression (b) Modified stock ocular prosthesis (c) Stock (prefabricated) ocular prosthesis. Methyl-methacrylate resin was first incorporated to fabricate ocular prosthesis in 1944 by individuals of the Armed forces of the United States<sup>4,5</sup>. Acrylic resin got the popularity due to its intrinsic and extrinsic coloring, better fracture resistance, easy adjustability, ease of fabrication, light weight, translucency etc<sup>6</sup>.

Several techniques are available for fitting and fabricating the artificial eye. Various methods include fitting stock eye, modifying and fitting stock eye and custom made sclera with stock iris. Direct fitting stock eye and fitting of modifying stock eye are less time consuming but has some disadvantage of poor esthetic and misfit. Custom ocular prosthesis gives perfect esthetic and well fitted but time consuming and complicated procedure<sup>7,8</sup>. Here we narrated a technique for fabricating ocular prosthesis with custom made sclera and stock iris to provide well fitted better esthetic.

## Case Report

A 65 year old male patient reported to the Department of Prosthodontics, Military Dental Centre Dhaka Cantonment. The patient complained of missing left eye which was enucleated following an accidental traumatic injury (Figur-1). Consequent to this, patient was using prefabricated ocular prosthesis, which was loose fitted and iris was mispositioned. With that prosthesis he bears severe mental trauma which is related to facial esthetics and his social acceptance. The patient was demanding new artificial eye prosthesis. On ocular examination intact tissue bed was found with shrunken orbit. Considering all factors semi customized ocular prosthesis were advised. For fabrication of semi customized ocular prosthesis with custom made sclera and stock iris was planned and the treatment procedure and its difficulties were explained to the patient.

1. Lt Col Md Rezaur Rahman, BDS, D-Protho, Graded Specialist in Prosthodontics, Military Dental Centre (MDC), Sylhet (E-mail: rhmn.reza@gmail.com) 2. Col Md Tariquzzaman, BDS, D. Protho, FCPS, Classified Spl in Prosthodontics, MDC, Dhaka. 3. Brig Gen Md Liakat Ali Hyder, BDS, FCPS, Classified Spl in Orthodontics, MDC, Dhaka 4. Brig Gen Md Abdur Rab, BDS, FCPS, Commandant MDC, Dhaka. 5. Maj Gen Golam Mohiuddin Chowdhury (Retd), BDS, PGC, FCPS, Ex. Consultant Dental Surgeon General, Directorate General of Medical Services, Dhaka.



Figure-1: Pre-operative view showing ocular defect

### Clinical Step-1

**Ocular impression:** An impression of the anophthalmic socket was made. In this method impression tray in the shape of ocular prosthesis was used (Figure-2). The eyebrow and eye lashes were lightly lubricated then thin mix of light body rubber base impression material was injected into the socket and some impression material was taken in the impression tray and impression tray inserted into the anophthalmic socket (Figure-3)

### Laboratory Step-1

1. The impression of an anophthalmic socket was made by injecting and inserting the rubber base addition elastomeric impression material (light body), firstly below the upper eyelid and then in the lower eyelid. Now the patient advised to close his eyes so that excess material can come out. When the impression material start setting then instruct the patients to do different movement of the eye like mediolaterally followed by up and down and finally in a circular motion.
2. Tray with impression material was removed from socket after impression material was set.
3. The impression was checked so that it recorded all the surface properly and there was no porosity (figure-4).
4. Half flusing of the impression was done with stone plaster and after setting the plaster, carefully cut the acrylic handle of the impression tray (Figure-5).
5. Full flasking was done with stone plaster and after setting of the plaster, flask separated and impression tray was removed from the flask.
6. Cold mould seal was applied on the plaster surface as separating media and packing was done by heat cure acrylic resin followed by curing.
7. After curing of the acrylic two parts of the flask was separated and the artificial sclera removed from the flask.

8. Grinding, finishing and polishing of the artificial sclera were done (Figure-6).

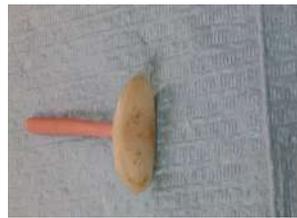


Figure-2: Impression tray



Figure-3: Tray with material inserted



Figure-4: After taking impression



Figure-5: Half flasking impression

### Clinical Steps-2

Try-In: Finishing and polishing-after polishing try in the artificial sclera was done in the socket (Figure-7)

### Laboratory Steps-2

1. Selection and position of iris : Maintaining the similarity of the contralateral natural eye, size, shade and configuration of iris for prosthesis were selected. Nearly matching iris was selected from stock eyes. By using acrylic trimmer sclera of artificial eye was trimmed off. Then stock iris was placed on the sclera (Fig-8). By using graph grid method ,position of the iris was finalized<sup>9</sup>. Also using the natural eye as a guide shade selection for the sclera was done.
2. Fabrication of final prosthesis by coloring of resin sclera: To give life like appearance of the prosthesis, plane sclera need to be decorated. Sclera made by acrylic resin was trimmed to about 1mm depth uniformly. Then trimmed surface of the sclera was painted using soft brown, yellow, blue, and pink color to match with patients natural eye. To bring the shadow of blood vessels on the sclera we used red nylon fibers along the outer periphery of the prosthesis (Fig-9). By applying thin layer of cyanoacrylate adhesive all the nylon fabric and collors were fixed over the sclera (Fig-10). Then polishing was carried out. After polishing when we get the final prosthesis we inserted into the socket and observed for fit, position and esthetics (Fig-11,12). Regarding the maintenance of the prosthesis, uses and limitations, all instructions were given to the patient<sup>10</sup>.



**Figure-6:** Artificial Sclera After polishing



**Figure-7:** Try-in sclera into socket



**Figure-8:** Positioning of iris



**Figure-9:** Red nylon fiber



**Figure-10:** Sclera showing blood vessels



**Figure-11:** Insertion of final prosthesis



**Figure-12:** Rehabilitation of ocular defect with prosthesis

## Discussion

Comparison to stock eyes laboratory fabricated ocular prosthesis has the advantages like color matching, better contouring and symmetrical movements with contralateral eye<sup>4,8</sup>. It requires more skill and time of operator for better customizing the iris<sup>11-12</sup>. If stock iris is available and match with natural eye then

requirements of skilled operator can be avoided. By using the stock iris customized sclera will have the better advantage. If the color, contour and configuration of stock iris is not match with natural eye in that case this technique should be avoided.

To relief the patients from mental agony due to loss of an eye maxillofacial prosthodontists are the perfect person who play an important role of providing the patients with an artificial eye<sup>13</sup>. Along all maxillofacial defect ocular defect constitute an important part which requires prosthetic replacement<sup>14,15</sup>.

## Conclusion

To fabricate better ocular prosthesis it requires perfect laboratory technique. New ideas and techniques have developed and experience of work has changed the field of Dentistry. Those who want to practice maxillofacial prosthetics must keep their current knowledge. The simple method elaborated here is popular and can be carried out in a small chamber set up to provide better service to patient with anophthalmic socket defect. Those patients who cannot bear the expense of implant retained prosthesis; custom made ocular prosthesis is the perfect choice of treatment for them. During fabrication if the impression, shade selection of sclera and iris can be done properly the functional outcome and esthetics will be similar to that of implant retained prosthesis. Without prosthesis patients try to hide the ocular defect behind dark glasses. As part of rehabilitation better ocular prosthesis makes the patient more confident and then patients can face the social world confidently.

## References

1. Lubkin V, Sloan S. Enucleation and psychic trauma. *Adv Ophthalmic Plast Reconstr Surg*. 1990; 8:259-62.
2. Raflo GT. Enucleation and evisceration. In: Tasmun W, Jaeger E, editors. *Duane's Clinical Ophthalmology*. Revised edition. Vol. 5. Philadelphia: Lippincott-Raven; 1995:1-25.
3. Parr GR, Goldman BM, Rahn AO. Surgical considerations in the prosthetic treatment of ocular and orbital defects. *J Prosthet Dent*. 1983; 49:379-85.
4. Benson P. The fitting and fabrication of a custom resin artificial eye. *J Prosthet Dent*. 1977;3 8(5):532-8.
5. Murphey PI, Schlossberg L. Eye replacement by acrylic maxillofacial prosthesis. *Naval Med Bull*. 1944; 43:1085.
6. Dyer NA. The artificial eye. *Aust J Ophthalmol*. 1980; 8(4):325-7.
7. Allen L, Webster HE. Modified impression method of artificial eye fitting. *Am J Ophthalmol*. 1969; 67(2):189-218.
8. Taicher S, Steinberg HM, Tubiana I, Sela M. Modified stock-eye ocular prosthesis. *J Prosthet Dent*. 1985; 54(1):95-8.
9. Guttal SS, Patil NP, Vernekar N, Porwal A. A simple method of positioning the iris disk on a custom-made ocular prosthesis. A clinical report. *J Prosthodont*. 2008; 17(3):223-7.

10. Parr GR, Goldman BM, Rahn AO. Postinsertion care of the ocular prosthesis. *J Prosthet Dent.* 1983; 49(2):220-4.
11. Sykes LM. Custom made ocular prostheses: A clinical report. *J Prosthet Dent* 1996; 75(1):1-3.
12. Sykes LM, Essop AR, Veres EM. Use of custom-made conformers in the treatment of ocular defects. *J Prosthet Dent.* 1999; 82(3):362-5.
13. Doshi PJ, Aruna B. Prosthetic management of patient with ocular defect. *J Indian Prosthodont Soc.* 2005; 5:37-8.
14. Guttal SS, Patil NP, Vernekar N, Porwal A. A simple method of positioning the iris disk on a custom-made ocular prosthesis. A clinical report. *J Prosthodont.* 2008; 17:223-7.
15. Shivji AR, Bhat S, Shetty P. Prosthodontic management of an ocular defect – A case report. *J Indian Prosthodont Soc.* 2001; 1:33-5.