

# Prosthetic Eye - A Case Report

Dr. G Abhishek<sup>1</sup>, Dr. S. K. Vishwanath<sup>2</sup>, Dr. K Sounderraj<sup>3</sup>, Dr. Nagarajani Prakash<sup>4</sup>

<sup>1</sup> Post Graduate Student, Department of Prosthodontics, Government Dental College and Research Institute, Bengaluru, Karnataka, India  
abhishek656[at]gmail.com

<sup>2</sup> Associate Professor, Department of Prosthodontics, Government Dental College and Research Institute, Bengaluru, Karnataka, India  
dr\_skv[at]yahoo.com

<sup>3</sup> Professor and Head of the Department, Department of Prosthodontics, Government Dental College and Research Institute, Bengaluru, Karnataka, India  
sounderrajaya[at]gmail.com

<sup>4</sup> Assistant Professor, Department of Prosthodontics, Government Dental College and Research Institute, Bengaluru, Karnataka, India  
nagarajini[at]gmail.com

**Abstract:** Eye being a vital organ plays an important role in facial expression. The rehabilitation of a missing eyeball with an ocular prosthesis may be a technique that incorporates a significant place in the field of oral and maxillofacial prosthetics. Loss of any tissue or organ can have a significant physical, physiological, social, and psychosomatic impact on the affected individual and might arise as a result of a congenital defect, disorder, accidental trauma, or surgical intervention. Treatment includes implant retained or a custom made acrylic ocular prosthesis. A custom ocular prosthesis is favoured as it has the benefits of close adaptation to the tissue surfaces and provides maximum comfort. This report describes a simplified approach to fabricate custom-made ocular prosthesis.

**Keywords:** Ocular Prosthesis, Shallow Orbital Cavity, Anophthalmic socket, Enucleation, Eye prosthesis, Ocular defect.

## 1. Background

The trauma related to the loss of an eye can cause significant physical, psychological, and social problems for patients. Reasons for an eye loss are often innumerable ranging from anomaly, tumor or irreparable trauma.<sup>[1]</sup> Surgical procedure for the removal of the eye is broadly classified as evisceration, enucleation and exenteration. The rehabilitation of a patient who has experienced eye loss requires a prosthesis which is able to provide optimal esthetic and functional results. In such cases, collaboration between a maxillofacial Prosthodontist and an ophthalmologist is critical.<sup>[2]</sup> Today, the majority of the patients are rehabilitated with an artificial eye fabricated from acrylic resins, and these traditional ocular prostheses are most commonly fabricated by heat cured acrylic resins. In patients with anophthalmic sockets, blinking and tearing reflexes are either absent or don't function at optimal levels leading to problems like dryness, discomfort, irritation, bacterial infections, and mucous deposition all of which makes prosthesis wear uncomfortable.<sup>[3]</sup> This clinical report demonstrates a technique used for the fabrication of a custom-made ocular prosthesis.

## 2. Case Description

A 39-year-old male patient visited the Department of Prosthodontics for prosthetic rehabilitation of his missing right eye. Clinical examination revealed a completely healed right eye socket with healthy conjunctival lining and absence of infection. The treatment plan was to fabricate a custom-made ocular prosthesis and the steps and procedures in prosthesis fabrication along with the risks and benefits of treatment were explained to the patient.

## 3. Methodology

Before making the impression, the patient was allowed to relax. The anophthalmic socket was irrigated with cold saline and petrolatum jelly was applied over the eyelids, eyebrows and surrounding soft tissues.

### • Impression tray selection

A stock acrylic ocular impression tray was selected to fit into the confines of the socket. Modifications were made to achieve the correct shape and contour of the eye reducing any overextensions.

### • Impression

The irreversible hydrocolloid impression material (Zelgan 2002, Alginate Impression Material) was mixed and loaded in a 5ml disposable syringe. After placing the impression tray into the eye socket, the loaded syringe was attached to the stem of the impression tray. The impression material was injected slowly. The stem of the impression tray should be stabilized while injecting the impression material. Upon setting, the impression was gently removed from the socket, washed, and disinfected.

### • Fabrication of the wax pattern

"Double alginate technique" was used for the fabrication of the trial ocular prosthesis. Irreversible hydrocolloid impression material was mixed in thin consistency and poured in a disposable plastic cup. The stem of the impression tray should be kept stable until the impression material sets. Once the alginate was set, it was cut open and inlay wax was melted and flown through it. On hardening, the wax pattern was gently retrieved, cooled in cold water, and smoothed with the help of a carver and gauze. The wax pattern was then tried in the patient's eye for fit, comfort, size of the pattern and mobility of the eyelids.

• **Attaching the iris**

The size of the iris of the natural eye was measured using a millimeter measurement gauge or an optical scale. Iris size should match the iris size of the adjacent eye and should replicate the normal gaze position. The patient was made to look slightly medial and downward at this stage.

• **Fabrication of base sclera shell**

The wax pattern was then flaked in a two-part flask using type-IV dental stone. Once the stone had set, the wax pattern was removed.

The wax pattern was flaked along with the aluminum button. An iris button corresponding to the size of the aluminium button was selected and positioned. After dewaxing the aluminum button was replaced with iris button and the rest of the mold space was filled with white colored heat cure acrylic material. After completion of the curing, the prosthesis was removed. 1.0mm of the acrylic was trimmed from the scleral surface for the addition of the clear acrylic layer. The sclera part of the prosthesis was colored according to the color of the patient's natural eye. Red woollen fibers were used to simulate blood vessels in the

eye. The color of the prosthesis was checked after putting a drop of water over the scleral surface. [4]

The prosthesis was placed in the mold and packed with a thin layer of clear acrylic using the same flask and was heated in water and boiled for 2 minutes for the polymerization of the colors used for sclera painting. After boiling the prosthesis, it was cooled to room temperature.

After curing, finishing and polishing of the prosthesis was done. Disinfection of the prosthesis was performed using 0.5% chlorhexidine and 70% isopropyl alcohol for 5 minutes. [5]

The final prosthesis was inserted into the right eye socket of the patient. Post insertion instructions were given to the patient regarding the insertion and removal of the prosthesis. The patient was advised to keep the prosthesis in water or contact lens soaking solution at room temperature. Use of mild soap or detergent was advised for the cleaning of the prosthesis. [6]



Figure 1: Impression in Process



Figure 2: Ocular impression

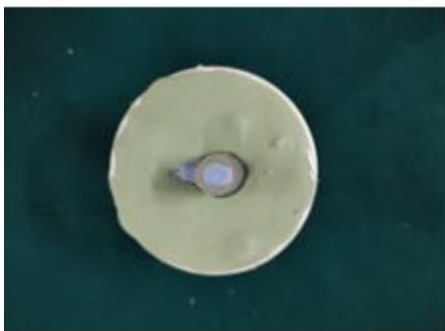


Figure 3: Impression poured in a different colour alginate



Figure 4: Scleral wax pattern



Figure 5: Scleral wax pattern tried in the patient's eye



Figure 6: Iris positioning done using aluminum button

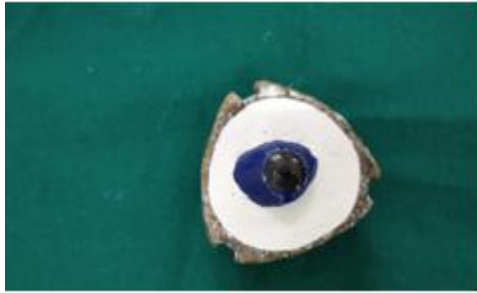


Figure 7: Invested scleral wax pattern



Figure 8: Flasking

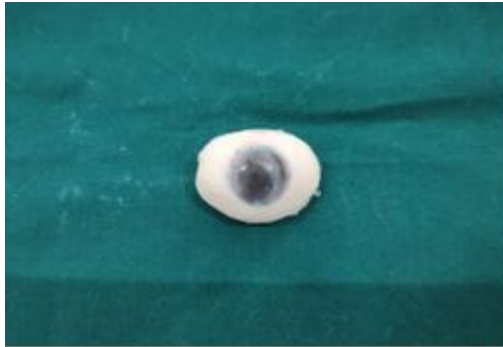


Figure 9: Final ocular prosthesis prior characterization and Finishing



Figure 10: Characterization of prosthesis.



Figure 11: Without Spectacle



Figure 12: With Spectacle

#### 4. Discussion

The prime goal of an ocular prosthesis is to restore the esthetics and psychological well-being of the patient. Custom made ocular prosthesis is a good alternative compared to stock eye prosthesis.<sup>[7]</sup> There are several disadvantages associated with stock eye prosthesis such as poor fitting and esthetics of the prosthesis, poor eye movements and irritation of the soft tissue due to poor adaptation of the prosthesis. Custom made eye prosthesis is used to overcome these shortcomings of the stock eye prosthesis.<sup>[8]</sup> Although fabrication of custom made eye prosthesis is a time-consuming procedure, it provides the better fit, retention and comfort to the patient. The iris and sclera are customized according to the natural eye of the patient hence it produces more esthetics and satisfaction to the patient.<sup>[9]</sup>

#### 5. Conclusion

In this clinical case report, PMMA iris disk with similar color, size and shape of contralateral natural eye was fabricated and color matched with contralateral iris disk, as

it provides better esthetics and comfort to patient. Advantages of this method are simple, less time-consuming, though artistic skill and knowledge about color and combination is required. This technique does not require expensive equipments. Ocular implant being costly and advanced age is also a factor; ocular implant was not used in this patient.

Source of support: Nil

Conflict of interest: None

#### References

- [1] Taylor TD. Clinical maxillofacial prosthetics. Quintessence Publication Co. Inc, Illinois. 2000.
- [2] Deekshitha NG, Ravichandran R, Vivek VN. Prosthetic rehabilitation of a patient with an ocular defect using a simplified approach: A case report.
- [3] EIDakkak M. Problem solving technique in ocular prosthetic reconstruction. Saudi Dental Journal. 1990;2(1):7-10.
- [4] Kale E, Meşe A, Izgi AD. A technique for fabrication of an interim ocular prosthesis. Journal of Prosthodontics:

- Implant, Esthetic and Reconstructive Dentistry. 2008 Dec; 17(8):654-61.
- [5] Kathuria N, Prasad R, Gupta N, Gulati M, Bhide SV. A modified technique and simplified laboratory procedure for Ocular Prosthesis Fabrication. Journal of prosthodontic research. 2012 Apr 1;56(2):147-50.
- [6] Shetty PP, Chowdhary R, Yadav RK, Gangaiah M. An iris positioning device and centering approach: A technique. The Journal of prosthetic dentistry. 2018 Jan 1;119(1):175
- [7] Abbas SK, Fatihallah AA, Ali MM. Matching the iris color of ocular prosthesis using an eye contact lens: new technique. Iraqi Dental Journal. 2017 Apr 13; 39(1):23-5.
- [8] Allen L, Webster HE. Modified impression method of artificial eye fitting. American journal of ophthalmology. 1969 Feb 1; 67(2):189-218.
- [9] Agrawal KK, Mall P, Alvi HA, Rao J, Singh K. Fabrication of custom made eye prosthesis for anophthalmic paediatric patients: 2 case reports. Journal of Interdisciplinary Dentistry. 2012 May 1;2(2):128.
- [10] Benson P. The fitting and fabrication of a custom resin artificial eye. The Journal of prosthetic dentistry. 1977 Nov 1;38 (5):532-8.