



## Case Report

# Use of semi-customized method for fabrication of an Ocular prosthesis-A case report

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### ABSTRACT

Loss of an eye can be physically and psychologically challenging for a patient. The purpose of the ocular prosthesis is to restore the appearance of the lost eye. There are many techniques for iris customisation which can be employed to fabricate the ocular prosthesis. This is a case report where in semi-customized method was employed to fabricate an ocular prosthesis in a simple, fast and satisfactory manner.

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## 1. Introduction

Eyes are a quintessential component of the facial complex as they not only sensory organs for vision but also are a dominant feature of the aesthetic appeal of a person. Hence, eyes are the first part of the body to noted.<sup>1</sup> Thus the loss of an eye can physically and psychologically handicap an individual. There are multiple reasons for this impairment among which, trauma, congenital absence and tumors are the primary causes.

The surgical management is broadly classified as enucleation, evisceration and exenteration. Enucleation entails removal of the orbit while preserving all other orbital structures. Evisceration is the removal of the contents of the globe while keeping the sclera and the extraocular muscles intact. Exenteration involves the removal of the eye along with part of the bony orbit.

The primary means of rehabilitation of an ocular defect is by fabrication of an ocular prosthesis. These can be pre-fabricated or custom made. A well fabricated custom made prosthesis

Contributes immensely to the physical and mental wellbeing of the patient by improving the patient's esthetics,

restoring and maintaining the health of the remaining structures.<sup>2</sup>

In cases where there is loss of eye due to trauma and the healthy eye has suffered damage, it is difficult to characterise the iris and sclera and achieve replication of the features of the contralateral eye in the ocular prosthesis.

The following is a case report wherein a semi-customized technique was followed to rehabilitate an ocular defect with stock iris and custom made sclera.<sup>3-7</sup>

This clinical report demonstrates a semi-customized technique for fabricating ocular prosthesis with stock iris and custom made sclera to provide functionally and esthetically satisfactory result.

## 2. Case Report

A 22-year-old female patient reported to the Department of Prosthodontics Crown & Bridge Dr. R Ahmed Dental College and Hospital Kolkata with a defect in her right eye. Patient met with a road traffic accident which resulted in the defect. On inspection, the sclera and iris were not completely present indicative of a physical eye which left behind only the socket with the eye lids intact [Figure 1]. No inflammation was present. The muscle function of both the upper and lower eyelid seemed normal. Patient was planned

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for a prosthetic eye. Consent of the patient was taken for the procedure. (Figure 1)



**Fig. 1:** Showing defect in the right eye

### 2.1. Technique

1. Primary impression of the defect was obtained with alginate (Algitex, DPI) by mixing it into a liquid consistency and injecting it into the defect with a syringe and asking the patient to do all the functional movements. (Figure 2)
2. The primary impression was boxed and poured to obtain primary mould from which customised scleral shell was made of acrylic resin (DPI). (Figure 3)
3. After trying in of the shell in the patient's eye a central hole was made into it to ensure fitting of a syringe and peripheral holes were made for retention of the PVS impression material.
4. Light body PVS (Affinis, Coltene) was loaded in the syringe and with the scleral shell inserted in the eye, Light body was slowly injected while the patient performed all the functional movements of the right eye. (Figure 4)
5. The final impression obtained was boxed and poured in two pieces to make the final mould. (Figure 5)
6. A wax pattern was fabricated from the mould and was tried in the patient to check for accuracy of fit and bulge.
7. The size, shade, and configuration of the iris were selected by taking the contralateral natural eye as a guide. Most closely matching iris was selected from the stock eyes. Scleral part of the stock eye was trimmed off using an acrylic trimmer. This stock iris was positioned using measurements from the natural

eye on the scleral wax pattern, and the border was merged. (Figure 6)

8. Try-in with scleral wax pattern was done to finalize iris positioning and ensure fit and comfort. (Figure 7)
9. A handle of auto polymerizing acrylic resin (DPI-Self cure, Dental products of India Ltd.) was made to hold the stock iris in position within the mold and was placed over the iris centre which was followed by flasking and dewaxing of the wax pattern.
10. The shade of the heat cure acrylic resin (DPI-Heat cure, Dental Products of India Ltd.) was matched according to the contralateral natural eye and was manipulated and packed into the prepared mould. Flask was kept for acrylization following a long curing cycle.
11. Iris attached with resin sclera was procured after deflasking. Hereafter the process of finishing and polishing was done. Prosthesis was tried in the patient's socket and was checked for stability of the prosthesis, contour of the sclera, and the position of the iris.
12. Final corrections were made and the final processing was done with the application of a layer of clear acrylic resin.
13. Final ocular prosthesis was placed into the patient's socket and was checked for retention, esthetics, and the coordinated movements with the contralateral eye. Patient was instructed regarding the usage, limitation, and the maintenance of the prosthesis. (Figure 8)



**Fig. 2:** Showing primary Impression

### 3. Discussion

One of the primary criteria for a prosthesis to be successful is that it should be as close in appearance to natural



**Fig. 3:** Showing boxed and poured



**Fig. 5:** The final mould



**Fig. 4:** Final impression using light



**Fig. 6:** Stock iris was positioned using measurement from the natural eye on the scleral wax pattern



**Fig. 7:** Try-in with scleral wax pattern



**Fig. 8:** Final Ocular prosthesis

tissues as possible. This is of paramount importance when rehabilitating a missing eye as it is one of the most aesthetically sensitive area of face, if not the entire body. Authors agree in general that close matching the natural eye is must to compensate for the loss and to produce the best aesthetic result for the patients with an ocular defect.<sup>8</sup>

Although various methods have been described by different authors for fabrication of ocular prosthesis, the characterization of iris and/or sclera is done manually. The traditional method described by Taylor, the iris is painted manually on paper and the scleral part is characterized by adding plastic fibres as veins on mono-poly layer. In another modified technique a pre-fabricated acrylic scleral blank is modified and relined to gain acceptable fit.

As the advantages of custom made prosthesis being the good contouring of the eye, better color matching in comparison with the natural eye and functionally co-

ordinated movements with the contralateral eye. But the huge disadvantage being the requirement of the artistic skills and the time for the exact reproduction of the color and contrast in comparison with the natural eye. With the use of the semi-customized method we overcome the disadvantages of the custom made technique and yet achieve the desired result in terms of esthetics and functional movements. Contraindications of this techniques are when the contour, color of stock iris is not similar to that of contralateral natural eye, when the esthetic resemblance is not met.<sup>9,10</sup>

#### 4. Conclusion

Many techniques were introduced for the management of the ocular defect. In the custom made technique of fabrication, artistic hand of the dentist come into consideration and to naturally depict the sclera often becomes difficult and cumbersome for the dentist. With the digital technique requiring the thorough knowledge of the digital photography and the additional need of the software. Thus to overcome the drawbacks of all the techniques this simple, time saving techniques is used. This technique not only reduces the time and skills but it also meets the functional and the esthetic demands.

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#### 6. Conflict of Interest

The authors declare that they have no conflict of interest.

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