A Simplified Method to Fabricate Semi-customized Ocular Prosthesis: A Case Report

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ABSTRACT

The ocular and orbital disorders require surgical intervention that may result in defects. The associated psychological effect of these on the patient requires immediate management and rehabilitation. In the present case, a patient reported to our department with the chief complaint of facial deformity due to missing left eye. There are two different methods to restore enucleated socket, viz., prefabricated ocular prosthesis (stock eye shell) and custom-made ocular prosthesis. This article aims at describing a simplified technique to fabricate semi-customized ocular prosthesis. In the present case, the iris of prefabricated and custom made sclera was used for the fabrication of the prosthesis. Through this, precisely selected stock iris fulfills the demand for artistic skill and reduced time consumption for painting. The customized sclera met the esthetic and functional requirement.

Keywords: Customized ocular prosthesis, Enucleation, Evisceration, Exenteration, Semi-customized prosthesis, Stock eye shell

INTRODUCTION

The eyes are the first features of the face to be noted. The unfortunate absence of can be caused due to trauma, tumor, malignancies or by sympathetic ophthalmia. These situations can be managed by one of the three approaches: Evisceration, enucleation, or exenteration.¹ As per the Perman KI, the principle of evisceration is the removal of the contents of the eye leaving only the scleral shell, enucleation involves removal of the whole intact eye by cutting the six extraocular muscles, and transecting the optic nerve and exenteration is entire orbital contents down to the bone are removed.²

The above-mentioned procedures can cause significant psychological distress in the patient and it may result in leaving the patient with psychic trauma.³ The management of such patients needed to be done as immediately as possible to minimize the mental trauma and to restore the appearance of the patient. The similar aims can be achieved with the help of two approaches either by stock ocular prosthesis which are readymade available or by custom made ocular prosthesis.⁴,⁵ The first, technique is less time-consuming but often has the disadvantages like compromised esthetics and unreliable fit. On the other hand, the custom-made ocular prosthesis provides even distribution of pressure, better mobility, reducing the incidence of ulceration, improved fit, comfort, and improved facial contours.⁶,⁷

The present case report demonstrates the combination of both the techniques for fabrication of the ocular prosthesis.

CASE REPORT

A 65-year-old male patient reported to our department with the chief complaint of a missing left eye since 5 years. The history revealed that the patient had undergone enucleation procedure of the same (Figure 1), and on examination, the eye socket displayed a healthy conjunctiva with no signs of infection or inflammation (Figure 2). It was decided to replace the missing eye with a semi-customized ocular prosthesis with stock iris and
custom made sclera. A complete medical history was elicited before starting the treatment procedure. All the routine investigations including a “patch test” for acrylic were done. The procedure and its drawbacks were explained to the patient to determine the motivation of the patient toward the treatment.

**Fabrication of the Custom Tray and Impression of Ocular Area**

The putty impression was made of stock eye shell. The impression was modified with the help of blade, and stock eye shell was retrieved (Figure 3) and same was poured with self-cure acrylic resin to get a custom tray. The hollow injectable tip of light body material attached and served as an inlet for the impression material (Figure 4). The escape holes were prepared to a custom tray to relieve pressure and to avoid unnecessary tissue displacement. After injecting the light body, the patient was asked to do functional eye movement to record muscles in activated position (Figure 5). The impression retrieved slowly from position (Figure 6). The impression was poured with die stone in two sections to obtain two piece molds (Figure 7).

After the impression, the size and configuration of the iris was selected by taking the contralateral natural eye as a guide.

**Scleral Try in**

A separating medium was applied to the cast; wax was filled in the mold and retrieved. The modified iris from stock shell (Figure 8) was fixed in position considering adjacent iris of an eye. The necessary modifications were made during try in for the adjustment of the position and orientation of the iris.

**Fabrication of Resin Sclera**

The stock iris and scleral wax were removed from the socket and washed with tap water. To stabilize the structure within the mold, an auto polymerizing clear acrylic resin extension of a diameter of around 2 mm and length of around 4 mm was attached to its center.
In conventional manner, flasking and dewaxing were proceeded. The shade of heat cure acrylic resin was selected and manipulated according to manufacturer’s instruction and then packed into the prepared mold. The acrylization was done by a long curing cycle.

Resin sclera with the iris attached to it was obtained after deflasking. Acrylic resin extension from the iris was trimmed off using an acrylic trimmer, followed by finishing and polishing. The uncharacterized prosthesis was inserted into the socket. The position of iris, a contour of the sclera and stability of the prosthesis was reconfirmed.

**Fabrication of the Final Prosthesis**

The original contour of the sclera was maintained by the two compartment methods of flasking. The acrylic resin forming the sclera was trimmed uniformly to a depth of around 1 mm. The red silk fibers were placed with the help of a layer of cyanoacrylate along with the outer periphery to simulate the blood vessels. The trimmed sclera was replaced by packing clear heat polymerizing acrylic resin, followed by curing, deflasking, finishing, and polishing of the prosthesis. The finished final ocular prosthesis was inserted into the socket and evaluated for fit, esthetics, and the coordinated movements with the natural eye (Figure 9). Post-insertion instructions were
given to the patient, regarding the usage, limitation, and the maintenance of the prosthesis.

DISCUSSION

The disfigurement related to ocular tissue keeps a person away from social and professional activities. Restoring such defect is a big challenge for the maxillofacial prosthodontist. Hence, maxillofacial prosthodontist plays a role in bringing back such patient to a normal social life.

Such kind of missing defects can be corrected by the ocular implants or by an artificial ocular prosthesis, which is either a pre-fabricated stock prosthesis or a custom-made prosthesis. In the present case, the ocular prosthesis is used. The prefabricated prosthesis has several drawbacks such as poor fit, poor esthetic and limited eye movements, etc. The intimate contact between the ocular prosthesis and the tissue bed is needed to distribute even pressure, so a prefabricated prosthesis should be avoided.

In the present technique, both the methods are used in combination which each other to eliminate the time required for the iris preparation and to achieve better contouring, color matching, and better movements.

CONCLUSION

The success rate of the fabrication of the ocular prosthesis is completely dependent on the artistic work of the operator. It also needs the extensive cooperation from the lab and a satisfactory color, contour, and configuration of iris.

REFERENCES


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