

Customized ocular prosthesis: A case report

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ABSTRACT

The eye is a vital organ and an important component of facial expression. Loss of an eye has a crippling effect on the psychology of the patient. Enucleation of the eye is therefore normally followed by fabrication of an ocular prosthesis to improve esthetics. This article describes a technique of rehabilitation of a patient with missing the left eye with custom-made ocular prosthesis.

Key words: *Enucleation, Implant, Iris, Ocular*

The disfigurement associated with the loss of an eye can cause significant physical and emotional problems [1]. Removal of this organ may be indicated in cases of a congenital abnormality; severe trauma; or disease such as an infection, a tumor or malignancy either by evisceration (where the contents of the globe are removed leaving the sclera intact), enucleation (most common, where the entire eyeball is removed after severing the muscles and the optic nerve), or exenteration (where the entire contents of the orbit including the eyelids and the surrounding tissues are removed) [2,3]. Rehabilitation of such patients with ocular prosthesis will provide cosmetic result.

An ocular prosthetic does not provide vision; this would be a visual prosthetic. Individual with an ocular prosthesis is totally blind on the affected side and has monocular (one-sided) vision which affects depth perception. An ocular prosthesis can be either ready-made (stock) or custom-made. Stock prosthesis comes in standard sizes, shapes, and colors. They can be used for interim or post-operative purposes. Custom eyes have several advantages including better eyelid movements; even distribution of pressure due to equal movement thereby reducing the incidence of ulceration, improved fit, comfort, and adaptation improved facial contours, and enhanced esthetics gained from the control over the size of the iris, pupil, and color of the iris and sclera. This case report explains the direct impression technique of eye socket without the fabrication of custom tray.

CASE REPORT

A 36-year-old male reported to the department of prosthodontics and maxillofacial prosthetics with a chief complaint of missing the left eye (Fig. 1). He had lost his right eye as a result of an episode of chickenpox at the age of 6–7 years. On examination, the mucosa was healthy. Sulcus depth was sufficient enough to retain the prosthesis. A custom-made ocular prosthesis was

planned to meet the needs of the patient since it would result in better esthetics than a stock eye shell.

Procedure

1. Patient was instructed to tilt the head backward, and impression was made with medium body polysiloxane impression material. The impression material was injected directly into the socket using a syringe (Fig. 2). The patient was instructed to make various eye movements as the material was injected so that the impression was recorded in the functional form. Then, the patient was asked to look at a distant spot at eye level with gaze maintained in a forward direction. After the material had set, the impression was retrieved from the socket and checked to ensure that all the surfaces were recorded.
2. After an acceptable impression of the eye socket has been obtained, it was invested in type III dental stone (green). A two-piece type III dental stone cast was poured to immerse the lower part of the impression (Fig. 3). After the stone had set, separating media was applied on the surface. Then, a second layer was poured. Marking was made on all the four sides of cast for proper reorientation of the cast.
3. The space left in the mold was filled with molten baseplate wax to fabricate a scleral wax pattern. The fit of the pattern was observed by placing it in the socket and lifting the eyelids. Wax was added or trimmed from the basic scleral pattern outside the socket and replaced until satisfactory contours of the eyelids were achieved both in open and closed positions.
4. Modification was made on the wax pattern to match the eye contours and lid configurations of the patient's normal eye (Fig. 4). The color of iris was selected and positioned with the help of millimeter grid placed on the patient's face.



Figure 1: Patient with the left ocular defect



Figure 4: Wax trial



Figure 2: Impression of eye socket



Figure 5: Investing



Figure 3: Two-piece mold



Figure 6: Final prosthesis

5. After the trial of wax pattern, the whole assembly is invested (Fig. 5). After the stone had set, one or two small projections of auto polymerizing acrylic resin were attached to the iris portion. The second pour was poured in such a way that the handle attached to the iris was embedded into the plaster of the counter flacking. Then, the dewaxing was done after the final set, taking care so that there was complete wax elimination from the mold space.

6. Before packing appropriate tooth colored heat cured polymethylmethacrylate of matching natural eye is selected. A thin layer of heat-cured clear acrylic was spread evenly in and around the iris and characterization was done to give it a natural lifelike appearance. Mold was packed with heat cured tooth-colored acrylic resin. The prosthesis was finished and polished; fit of the prosthesis was evaluated. The patient was satisfied with the prosthesis (Figs. 6 and 7). The method used for insertion and removal of the prosthesis was demonstrated to the patient.



Figure 7: Finished ocular prosthesis in place

DISCUSSION

Ocular prosthesis is an artificial replacement of the bulb of the eye. Multidisciplinary management and a team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient. Therefore, combined efforts of the ophthalmologist, oral and maxillofacial surgeon, plastic surgeon, and the maxillofacial prosthodontics are essential to restore the patient's quality of life. In literature, many techniques have been suggested for fabrication of ocular prosthesis. Currently, some of the techniques used are stock eye shell, relining of stock eye shell, and custom-made ocular prosthesis.[4,5] Stock eye prosthesis was advocated by Laney and Gardner.[6] In comparison to custom ocular prosthesis, stock prosthesis has several disadvantages, for example, poor fit, constant tissue irritations due to bacterial growth in the accumulated fluid in tissue prosthesis interface and compromised esthetic outcome.[7-10] Relining a stock eye shell can improve the fit of the prosthesis to underlying tissue, while sclera contour and iris position would still be compromised.[9] Whereas custom ocular prosthesis provides good fit, enhanced esthetics, proper eyelid fullness, accurate sclera contour, and iris color match and positioning. As reported in various articles,

custom tray was fabricated over which final impression of eye socket is made, but in this case report, impression material is directly injected into the eye socket. This direct impression has certain advantages, i.e. it prevents the irritation caused by custom tray in the eye socket and also reduces the number of appointments. Iris with similar shade of contralateral eye was cut from stock eye shell and was used to fabricate ocular prosthesis. This method is simple, non-invasive, less time consuming, and cost-effective.

CONCLUSION

The procedure used here is simple and cost-effective. A properly fabricated custom-made prosthesis enhances the patient's comfort and confidence by increased adaptiveness and natural appearance, and also maintains its orientation when the patient performs various eye movements.

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