A Simplified Approach for Customized Esthetic Acrylic Ocular Prosthesis: A Case Report

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The disfigurement associated with loss of an eye can impact patient physically, socially and psychologically. Rehabilitation of this defect requires an individualized design of the technique for each patient. Replacing the missing part with a maxillofacial prosthesis will restore the defect, improve esthetics, and thereby improve the morale of the patient. The progress in the field of maxillofacial prosthetic treatment has paved the way for a custom-made ocular prosthesis, which is superior compared with the traditional empirical method. This article describes a simplified technique to fabricate an acrylic custom ocular prosthesis for an enucleated ocular socket. The procedure used here is simple and easy. This method has provided excellent results from patient esthetics, acceptance, and satisfaction point of view.

Keywords: Artificial eye, Custom ocular prosthesis, Maxillofacial prosthesis, Prosthetic eye

INTRODUCTION

“The eye is the jewel of the body.” An important component of facial expression, the vital organ of vision, has been given a paramount status for beauty. The loss or absence of the eye leaves a person grappling not only with a functional disability, but also the discouraging effect of impaired facial esthetics.¹ Rehabilitation of this defect is a complex task. Since every socket differs in size and shape, an individually designed prosthesis, is needed to provide maximum comfort and restore full physiologic function of the eye.² A maxillofacial prosthodontist can help replace the missing part with a prosthesis that will restore the defect, improve esthetics, and thereby improve the morale of the patient.³⁴

Frenchman Ambroise Pare, a pioneer of maxillofacial prosthodontics was the first to use both glass and porcelain eyes. During and after the World War II, artificial glass eyes were replaced by acrylic. Unlike glass eyes, an acrylic resin eye was easy to fit and adjust, unbreakable, inert to ocular fluid, esthetically sound, long lasting and easier to fabricate.⁵⁷

Ocular prosthesis can be classified as stock shell and custom-made prosthesis. Custom-made ocular prosthesis improves tissue health by reducing fluid accumulation in tissue prosthesis interface which can cause tissue irritation and increased bacterial growth because of close contact with the tissue bed, distributes the pressure more equally and decreases the incidence of conjunctival abrasion as compared to stock ocular prosthesis.⁸⁹ In this case report a simplified technique was used to fabricate an acrylic custom ocular prosthesis for an enucleated ocular socket.

CASE REPORT

A 58-year-old female reported to the Department of Prosthodontics, Yenepoya Dental College and Hospital with a chief complaint of unsatisfactory esthetics and poor retention of her stock ocular prosthesis. According to the reports from the ophthalmic surgeon, she had undergone the enucleation of her right eye 10 months ago and had been rehabilitated with a stock ocular prosthesis in Yenepoya Medical College and Hospital.

On examination, it was observed that the whole eye ball was surgically excised, but the muscles at the base of the socket were intact (Figure 1). A direct impression was registered with light body impression material; a hollow plastic cap of a 2 ml disposable syringe was attached to it. Boxing of the outline of the eye was done with modeling wax. Thin mix of alginate was poured, and a piece of gauze placed over it.
and then plaster of Paris for reinforcement. While making impression, patient was first asked to move her eyes up and down to facilitate the flow of impression material into all aspects of the socket, and later to look directly at a fixed point 6 ft away at the level of the eye to allow the flow of impression material on the site with muscles in a neutral gaze position.

The impression was poured using split-cast (three piece) procedure. Later scleral wax pattern was fabricated and was made free of sharp edges and then polished and inserted. Pressure points were relieved. Eyelid was checked for complete closure and was made sure that contours and palpebral fissure resembles the adjacent natural eye.

Apart from proper impression making, iris positioning is an important aspect in achieving the facial esthetics. To mark the position of the iris, midline of the patient’s face and another line passing through the center of the iris of the contralateral eye were marked. The distance between two lines was measured using a digital caliper, and the measurement was transferred to the right side (Figure 2). A close-up photograph of the patient’s natural eye was taken to determine the color of the iris, and this was matched with the stock ocular prosthesis and the iris was cut off from stock ocular prosthesis. The iris was then placed on the pre-determined position in the wax pattern such that the margins of the iris were in the flush with the wax pattern and try in was done (Figure 3).

The wax pattern was invested in an ocular flask. Processing was done in a similar manner as the denture processing. The selected scleral shade was matched with the heat cure acrylic resin. Before packing with heat-cure acrylic resin, a thin layer of heat-cure clear acrylic resin was placed around the iris and on the scleral region to get a natural glossy appearance. Red colored silk threads were added to mimic the blood vessels. The acrylized prosthesis was then trimmed, finished, polished and was inserted (Figures 4 and 5). Post insertion instructions were given.
DISCUSSION

In the conventional methods for replicating the iris like the paper iris disk technique and the black iris disk technique, the iris is painted on the ocular disk using oil paints. Dos Reis et al. had evaluated the color stability of painted iris colors on ocular prosthesis and concluded that the colors degraded as a function of time. Artopoulou et al. suggested the use of digital photography to replicate the iris of the patient. In this case report, a stock prosthesis having an iris of similar size and color was selected, and the iris was cut off from it using acrylic trimmer. The iris was then placed on the pre-determined position in the wax pattern such that the margin of the iris was in flush with the wax pattern. This technique is simple and easy.

A custom ocular prosthesis is a good option when reconstruction by plastic surgery or the use of osseo integrated implants is not possible or not affordable.

The prosthesis being custom made offer the following advantages:
1. Retains the shape of the socket
2. Prevents the collapse of the eyelids
3. Provides proper muscular activity of the eyelids
4. Prevents the accumulation of fluid in the cavity
5. Maintains palpebral opening similar to the natural eye
6. Has a gaze similar to the natural eye
7. Mimics coloration and proportions of natural eye
8. Conversational gazes can be achieved by maintaining precise interpupillary distance.

Correct procedure and attention to every detail are necessary to bring out a satisfactory result. This case report describes the fabrication of an orbital prosthesis for a female patient after enucleation of the eye. Advantages, such as reduced treatment time and increased simplicity make this technique an alternative for fabricating ocular prosthesis.

REFERENCES


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