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Case Report

Custom-Made Eye Prosthesis- A Case Report

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Abstract

Purpose: Custom-made ocular (eye) prosthesis. It provides a better fit to the eye socket, better cosmetic results, and less discomfort to the patient. A custom-made ocular prosthesis fabrication has been done for a patient with an ocular defect in the left eye.

Case Report: For a patient of 38 years with congenital anophthalmic left eye, the preliminary impression was made using irreversible hydrocolloid alginate. A custom tray was fabricated from the molds obtained from the preliminary impression. A final impression was made using a light body and the addition of silicone from which the master model was obtained. Iris positioning was done using the graph-grid method and the wax trial was done. Processing was done using acrylic resin to match the patient's contralateral eye shade and esthetics.

Conclusion: Custom-made prosthesis allows better esthetic and functional results to the patient in comparison to stock prosthesis.

Key words: Addition polysilicone, Case report, Custom-made ocular prosthesis, Graph-grid, Ocular defect

INTRODUCTION

The eyes are usually the first features of the face to be perceived and play an important role in our daily lives.[1] Of all the sensory organs, the loss of an eye is the most painful, but unfortunately also the most common. It is only when an eye is partially or completely lost that its true value becomes clear. Such a misfortune can have an enormous emotional and psychological impact on the patient with functional loss.[2,3] A tremendous psychological impact can be a traumatizing emotional consequence for the patient resulting from such disfigurements. Prosthetic rehabilitation of such individuals in the form of an ocular prosthesis serves as a modality to restore the lost or deformed eyeball.[4]

There are two types of ocular prostheses, a standard prosthesis and a customized prosthesis. Typical standard ocular prostheses are available in a range of standard sizes, contours, shapes, and colors. They can be used for a temporary or an immediate post-operative period.[5] Ocular prostheses may be referred to as artificial eyes, molded eyes, cosmetic contact shells, cosmetic contact lenses, or spectacle prostheses.[6] This case report presents the custom-made ocular prosthesis of the left eye.

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CASE REPORT

A 38-year-old female patient, a resident of Hingoli referred to the Department of Prosthodontics, Hedgewar Smruti Rugna Sewa Mandals Dental College and Hospital Hingoli came for placement of an ocular prosthesis. The patient gave a history of congenital anophthalmia with the left eye. The patient was reported to the Department of Prosthodontics, and the condition was identified as congenital unilateral anophthalmia. Patient with left eye defect [Figure 1].

Step-by-step Procedure

Prosthetic rehabilitation of ocular defect was planned for the patient's right eye. A preliminary impression was made using irreversible hydrocolloid material alginate [Figure 2].

The custom tray was made by adapting self-cure resin over the wax pattern which was obtained from the primary

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Figure 1: Patient with left eye defect

Figure 2: A preliminary impression was made using irreversible hydrocolloid material alginate

impression molds. An extension of cold cure acrylic was made on the syringe to record the final impression [Figure 3].

The mold space obtained between the two halves of the master cast was then filled with molten wax to fabricate a wax pattern. When satisfied with the contour and fit of the wax pattern, iris positioning was done. For this, the iris was selected by shade matching from a set of stock eyes. The selected stock eye was grounded to just obtain the iris portion. The iris positioning was done using the graph-grid method [Figure 5].

To verify the proper fit and contouring of wax blank, try in the wax pattern after iris positioning was done in the patient's eye [Figure 6].

Different intrinsic and extrinsic stains were used to match the shade with the natural eye of a patient and obtain an appropriate result of the prosthesis. The final prosthesis was then delivered to the patient [Figure 7].

Figure 3: Final impression

Figure 4: Final impression cast

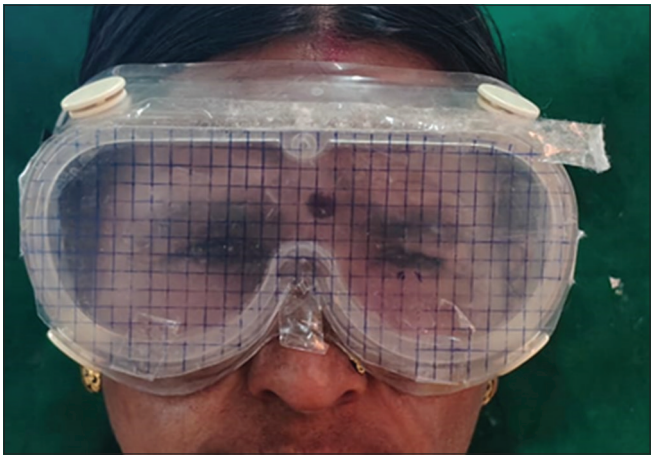

Figure 5: Iris positioning was done using the graph-grid method

Patient and guardian were taught how to insert and remove the prosthesis and its home care protocol which includes (Ahmad *et al*., 2009; Deshmukh *et al*., 2016):

- Prosthesis should be handled with care and with clean hands
- Removal of acrylic prosthesis during night is ideal and it must be stored in water.

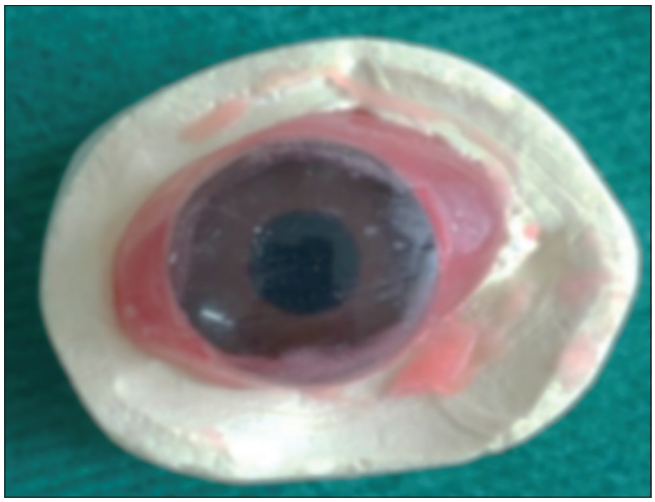

Figure 6: Wax pattern after iris on cast

Figure 7: Final ocular prosthesis

It must be rinsed every day with commercially available antiseptic solution and water.

Routine polishing of prosthesis should be done every year to prevent deposition of protein and bacteria [Figure 4].

DISCUSSION

Eye defects represent a major maxillofacial defect requiring prosthetic replacement.[7,8] In the absence or loss of an eye, the prosthodontist is a person who provides the patient with an artificial eye to overcome the anguish of eye loss.[1,9] One of the pioneers of the modern artificial eye was the Frenchman Ambroise Pare (1510–1590). In 1575, Pare produced artificial eyes made of glass and porcelain. During the two world wars, the supply of glass eyes from Germany to the United States was halted, and in 1943 the United States Army and Navy began searching for a replacement. They focused on plastics and eventually developed an acrylic lye. By 1945, the Army had 30 plants in operation and thousands of artificial acrylic lyes were produced. Today, the vast majority of patients around the world wear an acrylic eye prosthesis.[10,11] Although a custom-made eye prosthesis has proven to be the most satisfactory eye replacement, it requires the services of a skilled artist to duplicate the iris and sclera and is a costly and time-consuming procedure. However, with the advances in dentistry, custom-made acrylic resin ocular prosthesis has shown almost equivalent results to custom-made ocular prosthesis with the following advantages: (1) the fitting may be done without the help of an artist or someone trained in the art of iridal and scleral painting, (2) the prosthesis may be made quickly and positioned to serve as a comfortable and esthetic prosthesis for the patient while they wait for their custom-made ocular prosthesis, (3) the prosthesis may be fabricated using materials and equipment normally found in any dental office and laboratory, with the exception of the stock eye, and (4) the prosthesis may be used as a conformer or stent immediately after surgery to support tissue regrowth and reorientation in the surgical area.[11,12] A standard ocular prosthesis comes in standard sizes, shapes and colors.[11] Mathews *et al*. reviewed the literature on such techniques for molding and fitting ocular prostheses.[13,14] The technique described in this case report for the fabrication of ocular prostheses is a combination of various techniques described in the literature, yet is "simple", "safe" and "requires only one appointment." In this technique, modified wax used for the rim impression and secondary impression was used as an alternative to other impression materials, as it has the advantage of allowing sufficient time to take the rims and impression, is readily available, and can be remolded. This makes the technique of customizing standard ocular prostheses faster and easier. However, as this material was used for the 1st time, further studies are required. During processing, a putty-indexed mold (consisting of silicone with putty viscosity additive) and a proportionate amount of clear and tooth-colored self-polymerizing methyl methacrylate resin in the appropriate color were used, as these are readily available in a clinic. Therefore, the method described here is simple, undemanding, and can be performed in a very short time. It provides good results in terms of esthetics, acceptance, and patient satisfaction. Subjective errors can occur when checking the centralization of the iris of the ocular prosthesis, which is a limitation of the procedure described here. However, it is possible for other prosthodontists to verify the reliability of this procedure by comparing it with other techniques.

CONCLUSION

Defects of the eye result show esthetic discomfort to the patient. This results in the patient becoming visually,

esthetically, and psychologically handicapped. Restoring the defect with a custom-made prosthesis not only restores esthetics but also gives back the lost confidence to the patient.

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