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Ocular prosthesis: a clinical case report

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Abstract

The partial or total loss of an eye impairs the patient's visual function and results in a noticeable deformity. It may have a severe emotional and psychological impact on the patient. A prosthesis should be provided as early as possible to raise the spirit and ease the mind of the afflicted. Treatment should be aimed to improve patient's esthetics, restore and maintain health of the remaining structures, and consequently provide physical and mental well-being. This case report shows the fabrication and delivery of a customized ocular prosthesis.

Keywords: Ocular prosthesis, Customized eye prosthesis, maxillofacial prosthesis, eye defect.

Introduction

The absence of an eye has a far-reaching impact on facial aesthetics and psychological statement of the patient. Rehabilitation through ocular prosthesis will provide sustained function of that space besides repairing the patient's self-esteem, self-confidence and psychosocial comfort. Ocular prosthesis are broadly classified on the basis of availability. They are of two types:-

1. Stock Eye Prosthesis
2. Customized Eye Prosthesis

Stock prostheses are usually advocated when time is limited and cost is a consideration.[1]

The use of stock ocular prosthesis of appropriate contour, size and color can provide an acceptable aesthetic result [2]. Customized eye prosthesis is for an accurate fitting and well tissue adapted restoration of an eye deformity.

This case report advocates the technique of customized eye prosthesis for the restoration of an ocular defect by impression technique using custom ocular tray.

Case-Report

A male patient, aged 64 years, reported to Bharati Vidyapeeth Dental College & Hospital (Navi-Mumbai), Department of Prosthodontics, with the chief complaint of missing left eye.Past medical history revealed that he sustained chemical burns due to which he lost his left eye

(Fig. 1a). On examination, an atrophic ocular cavity was seen (Fig. 1b).

Procedure

Primary Impression of the ocular cavity: Patient was instructed to gaze directly forward at a fixed point atleast 6 feets away inorder to record the impression of the muscles at a neutral position. The petroleum jelly (Vaseline) was applied to the surrounding tissues and the ocular cavity. The irreversible hydrocolloid (Alginate) was manipulated and syringed into the ocular cavity (Fig 2a). After the final set of the impression, it was picked by bended 21 gauge orthodontic wire (Fig 2b).

Primary cast and custom tray fabrication: The primary impression was boxed and poured in dental stone to obtain primary cast. After retrieving, the cast was marked with four sides each: medial, lateral, superior and inferior (Fig 3a). The ocular cavity of the cast was covered with spacer wax 4mm short of the borders. The custom tray was fabricated using clear cold cure acrylic resin and had vent holes on it inorder to retain final impression material (Fig 3b).

Border molding and final impression: Tray adhesive was applied on the custom tray.The border molding was done using Monophase impression material and the patient was asked to do eye movements whilst recording the peripheral borders of the ocular cavity (Fig. 4a). The border molded tray was used in taking final impression with Light body impression material (Fig. 4b).

Pouring of final impression and split cast mold: The final impression was poured using dental die stone to obtain split cast mold[3]. The impression was poured upto the height of contour to obtain lower half of the split cast mold and four vents were designed for re-orientation of the second half of the mold (Fig. 5a). After the die stone was set, separating medium was applied and second half of the impression was poured covering the entire impression (Fig 5b). After the die stone was set the two halves were separated and the final impression was retrieved to obtain a mold space for fabrication of scleral wax pattern.

Scleral wax pattern fabrication and try-in:

The cavity surface of the split cast was lubricated with separating medium. The molten modeling wax was poured into the defect and the cast was reassembled. After the cooling of wax, the two halves of the cast were separated and the wax pattern was retrieved (Fig. 6a). The wax pattern was polished and disinfected before proceeding to wax trial. The wax pattern was tried in the eye socket and the contours were evaluated in order to mimic the contours of the natural eye (Fig. 6b).

Iris button selection and centralization: Using the natural eye as a guide, the shade and size of the iris was selected. The iris was obtained using commercially available stock eye. The patient was asked to sit upright and look at a fixed point. Centralization was done by marking the midline of the face and pupil of the right eye (Fig 7a). The distance was calculated using a divider and scale. The same measurement was used to mark the point for the pupil for the left eye. The marks were transferred to the wax pattern (Fig 7b). The selected iris button was embedded in the wax pattern (Fig. 8a). The iris was adjusted according to the horizontal and vertical axis. The entire assembly was inserted and patient was asked to perform various eye movements and checked in harmony with the adjacent natural eye (Fig. 8b).

Scleral shade selection and processing: Scleral shade guide was used to select the shade of the sclera (Fig. 9a) It was matched with the sclera of adjacent natural eye. The processing of the finished scleral wax of done. The base of the flask was filled with dental plaster and the wax pattern was embedded in it to the height of curvature (Fig. 9b). The process was followed by counter flasking and then

dewaxing (Fig. 9c). The process was followed by packing with clear heat cure acrylic resin. After curing of the prosthesis, it was trimmed, finished and polished (Fig. 9d)

Characterization: The sclera was characterized to match a natural eye of the patient. The red woollen strands were used to mimic the blood vessels. They were incorporated using cold cure resin. The fine finish and glass like polish was obtained (Fig 10a).

Placement of final prosthesis: Before inserting, the prosthesis was washed thoroughly with water and soap solution. After insertion, the prosthesis was evaluated for its movements and esthetics (Fig. 10b). The patient was instructed regarding insertion, removale and maintenance of the prosthesis. Recall was done in 1 day, 3days, 1week and 1 month. The fit was to be evaluated every 6months[4].

Discussion

The custom ocular tray is based on the patient's existing anatomy, and therefore conforms accurately to the socket and helps in obtaining accurate impression of the eye socket[6]. This results in intimate adaptation of the stock eye prostheses to internal tissue surface of the socket. A well made customized prosthesis maintains its orientation while patient does eye movements. This instills a sense of self confidence in the patient while addressing the esthetic needs (Fig. 1a, 10b).

Conclusion

Customized ocular prosthesis is of a benefit for the patients who cannot afford implant prosthesis. It not only restores a facial defect but also restores the lost hope, thereby enhancing the self-confidence of the patient. I feel quite fortunate to be able to provide an eye to the patient that is regarded as the mirror of the soul.

Acknowledgment: would like to thank Dr. Mridula Joshi (Associate Professor) for supervising and guiding throughout the case.

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Legend Figure

Fig. (1a) Pre-operative photograph

Fig. (1b) Atrophic ocular cavity

Fig. (2a) Syringed Alginate in ocular cavity

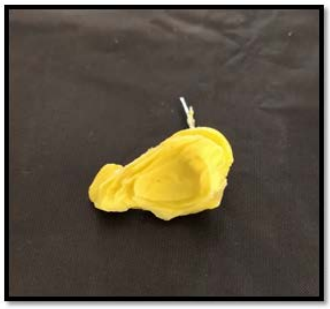

Fig (2b) Primary Impression of ocular cavity

Fig. (7a) Centralization

Fig. (7b) Markings on wax pattern

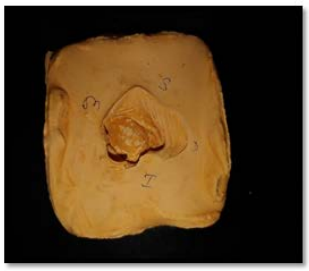

Fig. (3a) Primary Cast

Fig (3b) Custom tray

Fig. (8a) Iris embedded in the wax pattern

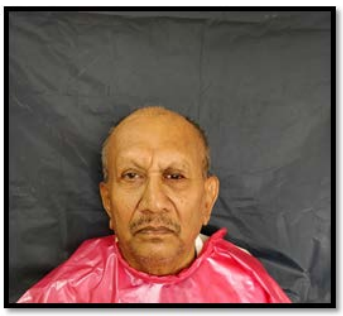

Fig. (8b) Iris try-in

Fig (4a) Border molded custom tray

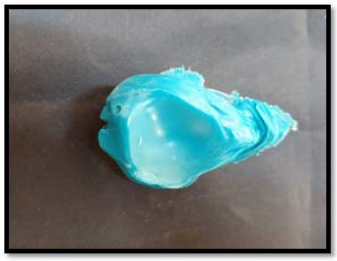

Fig (4b) Final Impression

Fig. (9a) Sclera shade guide

Fig. (9b) Flasking

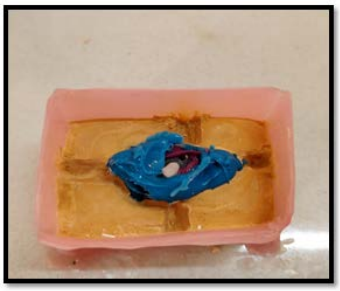

Fig. (5a) Lower half of split mold

Fig. (5b) Split mold

Fig. (9c) Dewaxing

Fig. (9d) Finished prosthesis

Fig. (6a) Wax pattern fabrication

Fig. (6b) Wax try-in

Fig. (10a) Characterized prosthesis

Fig. (10b) Final outcome

Fig. (1a) Pre-operative view

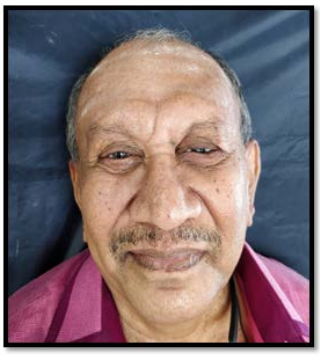

Fig. (10b) Post-operative view