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Case report

Prosthetic management of ocular defect: A case report

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ABSTRACT

It is quite usual for a person to have a natural eye removed as a result of trauma, congenital abnormality or disease such as infection or a tumor. Eye is a vital organ, not only in terms of vision, but also being an important component of facial expression. The disfigurement associated with eye loss can cause significant physical and emotional disturbance. An artificial prosthesis is probably the only alternative in such cases to help rehabiltate such patient

The present article is an illustration of a case report of a patient treated with custom-made ocular prosthesis of left eye using putty index as a guide for fabrication of the wax pattern.

Key words: Custom-made ocular prosthesis; Putty index.

INTRODUCTION

Sensory organs play a major role in our daily lives. The most tragic, yet, unfortunately, the most commonly occurring loss of these sensory organs is that of the eyes. Eyes are generally the first features of the face to be noticed and the presence of a pair of eyes is quite essential to maintain the balance and the aesthetics of a face. The goal of any ocular prosthesis procedure is to enable rehabilitation of the patient in with a normal appearance and reasonable mobility of the prosthetic eye[1].The disfigurement associated with eye loss can cause significant physical and emotional disturbance[2].

Case report

A 35-year-old man reported to the Department of Prosthodontic,s Rural Dental College, Loni, with a missing left eye .The patient gave a history of road traffic accident and evisceration of the left eye performed four months prior.

Evaluation of patient ocular defect

In case of evisceration, the extraocular muscles were left intact and hence good mobility of the prosthesis was possible. In accord with the standard procedure, the palpebral fissure was observed both in open and closed position to rule out any abnormality. Evaluation of the muscular control of the palpebrae and the internal anatomy of the socket in resting position and full excursive movement was performed. A scar was seen running from medial angle of the left eye downwards. An asymmetry was seen with the inner canthus of the eyes. Mobility of the posterior wall of the ocular defect was assessed, condition of the conjunctiva, depth of fornices and presence of cul-de-sac was noted. The internal anatomy was healthy to receive an eye prosthesis[fig a -b].

MATERIALS AND TECHNIQUES

Impression Technique:-The impression of the anophthalmic eye socket was sought by mixing irreversible hydrocolloid alginate

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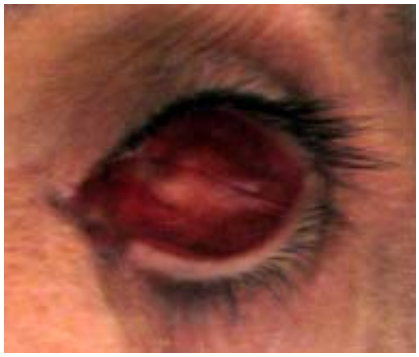
Fig. 1(a) Patient with ocular defect on left side

Fig. 1(b). Close up view of the defect



(Zelgan, Dentsply India) impression material with excess cold water until it was very free flowing, sacrificing strength to avoid tissue distortion and fill in the mix in a disposable plastic syringe which was introduced in the socket and projecting it out between the lids.(Fig 2).

Once the material was injected, a bent wire loop was then inserted gently into the flowing material in order to retrieve the impression after setting.Patient was asked to do various eye movements and then look straight so as to record the functional impression and remove the excess material[3].

Putty index and try in of the wax pattern

After the impression material was set, the impression was removed and the putty index was made with Rubber base impression material (Aquasil Regular Body Dentsply India).Wax pattern was then fabricated by

Fig. 2. Impression recorded in irreversible Hydrocolloid (Alginate) impression Material.

Fig. 3(a). Putty index

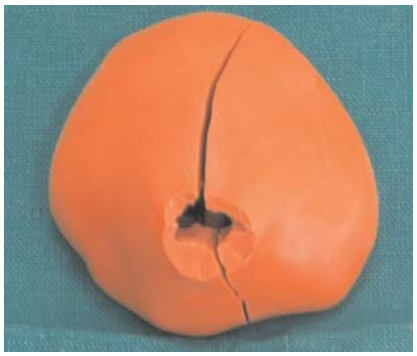
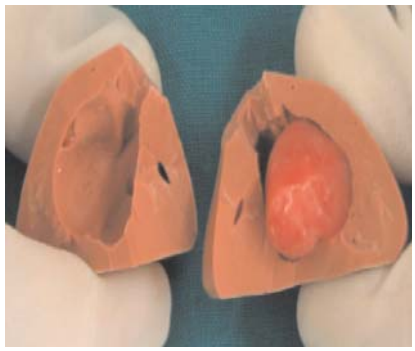


Fig. 3(b). Putty index with molten wax



pouring modeling wax into the putty index. [Fig a - b].

Wax pattern was trimmed from the basic sclera pattern until satisfactory contours of the eyelids was achieved in open and closed positions.

Technique of the iris disc placement

1. Transparent graph grid was used to attach iris disc.

Fig. 4(a). Markings from A to H on x axis and 1 to 7 on y

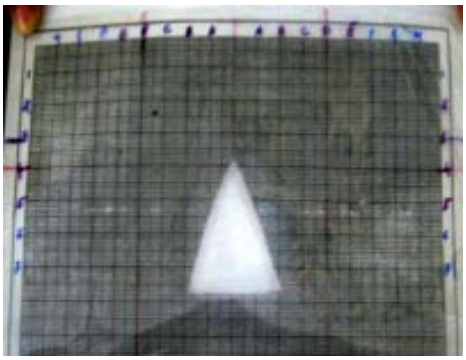
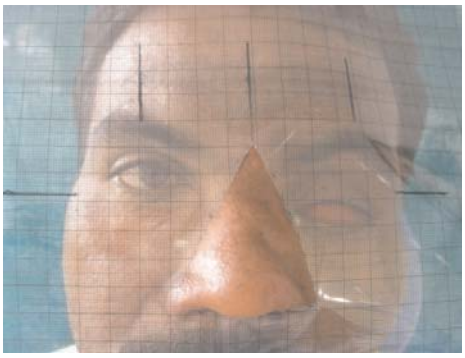


Fig. 4(b). Showing grid in place Axis



2. Certain guidelines were marked on patient's face.

3. The facial markings were transferred to grid by placing it on patient's face.

Transparent graph grid

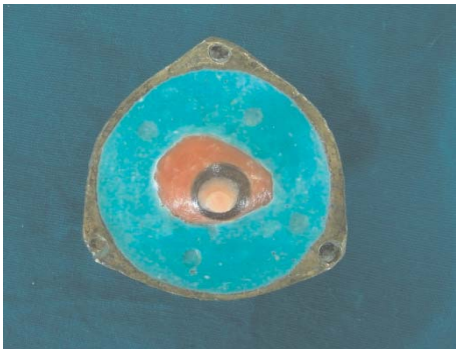
Markings were made on grid template on x-axis from A to H; similarly from on y-axis 1 to 7 on left side. The distance between each markings was 1 cm on both x and y axes[2]. [Fig a and b].

Guidelines on patient's face

A vertical midline was marked passing through the forehead, glabella, tip of the nose and chin. The distance from the right eye medial canthus to the midline and left eye medial canthus to the midline was measured. This distance standardized the midline marking and was used to reposition the grid template each time during the try-in-visit (Fig 5).

Fig. 5. Try-in of the wax pattern

Fig. 6. Acrylic stent attached to iris



Evaluation with grid placement

The patient was asked to gaze straight at an object kept 4 feet away. The operator then marked the vertical lines coinciding with the medial and distal extremities of the iris of the natural eye. Similarly horizontal lines referring to the centre, inferior and superior limits of the iris were marked. The facial margins were transferred to the grid template by placing it on the patient's face. These markings were transferred to the side of the defect. and then transferred to the sculptured wax pattern and the iris button was attached to it.

Investing, Dewaxing, and Packing

The finished pattern was invested in a crown two-piece brass flask. (Fig 6) .

A two-part mold was obtained by the prototype ocular prosthesis by using dental gypsum in a two-piece brass flask,The anterior portion of the mold was invested, A separating medium was applied and the posterior portion

of the flask was separated [4].The iris disc was shade matched with the adjacent eye and cut out from a stock eye. The color of the sclera was selected using tooth color acrylic shade guide.(Fig 7).

Rayon thread fibrils were used to simulate vasculature, by monomer polymer syrup method [5] .The selected shade of the sclera was matched with the heat cure resin, which was then packed into two piece flask. The flask was kept for curing for a period of two hours and 30 minutes to avoid any residual monomer.The prosthesis was recovered, finished and polished.[8]

Placement of ocular prosthesis

The patient was instructed on the aspect of insertion and easy removal of the prosthesis. (Fig. 8)

Fig. 7. Dewaxing of the prosthesis

Fig. 8. Finished prosthesis in place

Fig. 8. Finished prosthesis with eye glass

Patient follow up

The patient was asked to return on day 1, 2 and 7 for follow ups after the prosthesis insertion .Thereafter 6 month follow up was done for prosthesis evaluation and adjustments.[9]

DISCUSSION

The custom –made acrylic resin ocular prosthesis replicates the orientation, natural color, contour, and size of the pupil and iris, providing realism and symmetry to the patient's face. In addition , it improves the fit of the prosthesis by gaining the intimate contact between prosthesis and tissue bed. The close adaptation of custom –made prosthesis tends to distribute pressure more equally than does a stock eye prosthesis .This helps to reduce the incidence of abrasion or ulceration. It also enhances tissue health by decreasing potential stagnation spaces at the prosthetic tissue interface. A custom ocular prosthesis is a good option when reconstruction by plastic surgery or the use of osseointegrated implants is not possible or not desired[6,7]. The putty index method used in this article is an innovative technique; it saves extra patient's appointment and helps in fabrication of wax pattern at chair side.

CONCLUSION

The use of custommade ocular prosthesis has been a boon to the average patient who

cannot afford the expensive treatment options available. The procedure used here is cheaper, affordable and can be carried out in a small clinical set up. This method has provided good results in relation to patient aesthetics, acceptance and satisfaction point of view. In the case, Eye glasses that were used concealed the background effect and enhanced psychological comfort[10].

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