

Ocular Prosthesis: A Reconstructive Approach

¹Dr. Prasad Adhasure, ²Dr. Vivek Jadhav, ³Dr. Jitendra Shinde, ⁴Dr. Sejal Shinde Tambake

¹Reader, Dept. of prosthodontics, Crown and Bridge and Implantology, C.S.M.S.S. Dental college, Aurangabad.

²Associate Professor and PG Guide, Dept. of prosthodontics, Crown and Bridge and Implantology, C.S.M.S.S. Dental college, Aurangabad.

³MDS Prosthodontics, Aurangabad.

⁴PG Student, Dept. of prosthodontics, Crown and Bridge and Implantology, C.S.M.S.S. Dental college, Aurangabad .

Correspondence Author: Dr. Sejal Shinde Tambake, Dept. of prosthodontics, Crown and Bridge and Implantology, C.S.M.S.S. Dental college, Aurangabad . , India.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

The ocular and orbital disorders require surgical intervention that may result in defects. The associated psychological effect of these defects on the patient requires immediate management and rehabilitation. In the present case, a patient reported to our department with the chief complaint of facial deformity due to missing left eye. There are two different methods to restore enucleated socket, viz., prefabricated ocular prosthesis (stock eye shell) and custom-made ocular prosthesis.

This article aims at describing a simplified technique to fabricate semi-customized ocular prosthesis. In the present case, the iris of prefabricated and custom made sclera was used for the fabrication of the prosthesis. Through this, precisely selected stock iris fulfills the demand for artistic skill and reduced time consumption for painting. The customized sclera met the esthetic and functional requirement.

Keywords: Ocular prosthesis, eye socket, ocular flask, scleral wax pattern.

Introduction

The eyes are the first features of the face to be noted. The unfortunate absence of an eye may be result of trauma,

tumor, malignancies or by sympathetic ophthalmia. These situations can be managed by one of the three approaches: Evisceration, enucleation, or exenteration¹. As per the Perman KI, the principle of evisceration is the removal of the contents of the eye leaving only the scleral shell, enucleation involves removal of the whole intact eye by cutting the six extraocular muscles, and transecting the optic nerve and exenteration is entire orbital contents down to the bone are removed².

Indications for ocular prosthesis

1. After Enucleation and Evisceration with or without implant
2. Over Pthysical eyes
3. Blind eye with scarred Corneas
4. Congenital anophthalmia /microphthalmia

Rehabilitating patient with ocular defect is crucial as it has psychological impact on patient life, apart from causing functional impairment. This case report describes the simple technique for fabrication of ocular prosthesis for a young patient.

Case Report

A 6-year-old male patient reported to our department with the chief complaint of a missing left eye since 5 years.

The history revealed that the patient had undergone enucleation procedure for the same (fig. 1), and on examination, the eye socket displayed a healthy conjunctiva with no signs of infection or inflammation (fig. 2). It was decided to replace the missing eye with a semi-customized ocular prosthesis with stock iris and custom made sclera. A complete medical history was elicited before starting the treatment procedure. All the routine investigations including a "patch test" for acrylic were done. The procedure and its drawbacks were explained to the patient to determine the motivation of the patient towards the treatment.



Fig.3:intraocular special tray



Fig.4:simulated the size and shape of normal eye



Fig.1 preoperative photograph.



Fig. 2: Examination of eye

Procedure

1) An intraocular special tray was fabricated with impression compound. The convex surface of the pad of a thumb of the left hand of a volunteer was used as an index for the fitting surface, to simulate the convexity, size and shape of a normal eye(fig. 3,4).

2) Perforations were created over the impression compound custom tray. The custom tray was tried in the patient's socket and adjusted for a passive fit.

3) Alginate impression material (Neocolloid, Zermack) was loaded in syringe and injected into the socket (Fig 5). Patient was seated in erect position with the head tilted backwards at 45 degree angle while the socket was filled with impression material. The patient was asked to move his eyes both up and down. This facilitated the flow of the impression material into all aspects of the socket (fig. 6).

4) Later the patient was asked to look directly at a fixed point 6 feet away at the level of the eye. This allowed impression of the site with the muscles in a neutral gaze position. ⁴



Fig.5:Alginate injected into socket



Fig.6:Impression making

5) The impression was used to pour a two piece split cast mold⁵. After the stone had set, the two parts of the split cast were separated and the impression material along with the tray was removed.(fig. 7,8,9,10)

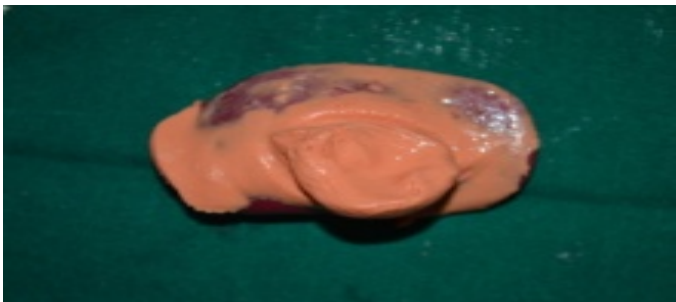


Fig.7:completed impression



Fig.8:split cast mold



Fig.9:separated split cast



Fig.10:assembled split cast

6) In order to prepare the wax pattern for the scleral prosthesis, the inner surface of the mold was coated with separating medium. Modelling wax was heated and molten wax was poured into the mold. Additional wax was poured to compensate for the wax shrinkage.

7) Wax pattern was retrieved from the mold. (fig.11)Wax sprue and sharp edges were removed and recontoured into a smooth hemispheroid. The wax pattern should be highly polished and free from dust and debris before placing it in the socket.

8) At the time of try- in of scleral wax pattern, care was taken to check for any area of discomfort or pressure points and were relieved. The eye contour and lid configuration from different angles were evaluated, with the patients eyes open and by manual palpation with the eyes closed. Height of convexity was centered over the pupil, usually slightly medial to the midline between the inner and outer canthi. Eyelids should close completely over the wax pattern. The contours and palpebral fissure of the prosthesis were made to resemble the adjacent natural eye. Fit of the wax pattern was observed.

9) The size of the iris was determined and marked on the wax pattern using the normal eye as a guide⁷. A close-up photograph of the patients natural eye was taken to determine the colour of cornea.

10) A stock prosthesis having a cornea of similar size and colour was selected and the cornea was cut of it using acrylic trimmer^{7,8}. This cornea was then placed on the pre-determined position(fig. 12)

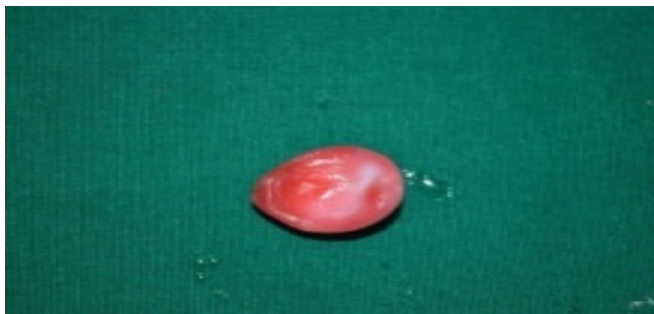


Fig.11: wax pattern



Fig.12:stock prosthesis



Fig.13:Try in

Such that margins of cornea were flushed with the wax pattern and the wax pattern was tried in again.(fig. 13) It was then relined using fluid wax. Shade selection of the sclera was done using the natural eye as a guide. The patient had a diffused redness in the normal eye showing more veins than usual, which needed to be duplicated in the prosthesis.

11) Later the waxed up prosthesis was invested in an ocular flask (fig. 14). To stabilize the corneal button into plaster, a small handle of autopolymerizing acrylic was attached to it, which prevented its displacement during dewaxing. Processing was done in a manner similar to the

normal denture processing using a long curing cycle with heat cure tooth coloured resin.

12) The acrylized prosthesis was then retrieved from the flask and trimmed to remove the acrylic handle and all irregular and sharp surfaces (fig. 15). On the final appointment the prosthesis was inserted into the patient's eye socket. (fig. 16)



Fig.14: invested waxed up prosthesis.



Fig.15:Acrylised prosthesis

Instructions to the patients: The patient (for a child – the parent) was taught the proper method of removal and insertion.

Removal is done by pulling the lower lid down, gazing overhead and engaging the lower margin of the prosthesis with one finger so that it is expelled downward in to hand.

Insertion is done by lifting the upper lid with the thumb and forefinger, sliding the prosthesis with other hand as much as possible under the upper lid and pulling the lower lid down to allow the prosthesis to slip into the socket.

The patient was instructed to wear the prosthesis day and night, removing and washing it with a mild soap once a

day. To improve the movements of the eyelids and to get a sparkle on the surface of the prosthesis, use of an ophthalmic silicone liquid was advised.⁶



Fig.16: Post operative photograph

Conclusion

Rehabilitation of child patients who have suffered the psychological trauma of an ocular loss require a prosthesis that will provide the optimum cosmetic and functional result as early as possible in life. The custom made ocular prosthesis is recommended as an effective alternative form of treatment. Ocular prosthesis produced by this method are the most aesthetic, cost effective and comfortable.

References

1. Putanikar NY, Patil AG, Shetty PK, Nagaral S, Mithaiwala HI. Prosthetic rehabilitation of a patient with ocular defect using semi-customized prosthesis: A case report. *J Int Oral Health* 2015;7:81-4.
2. Perman KI, Baylis HI. Evisceration, enucleation, and exenteration. *Otolaryngol Clin North Am* 1988;21:171-82.
3. Beumer J, Curtis TA, Firtell DN. Maxillofacial rehabilitation: prosthodontic and surgical consideration. Los Angeles: Mosby; 1979.
4. Ocular prosthesis: art meets science ISSN 1807-5274 *Rev. Clín. Pesq. Odontol., Curitiba*, v. 6, n. 3, p. 287-292, set./dez. 2010 Licenciado sob uma Licença Creative Commons.

5. Brown KE. Fabrication of an ocular prosthesis. *J Prosthet Dent.* 1970;24(2):225-35.
6. Parr GR, Goldman BM, Rahn AO. Post insertion care of the ocular prosthesis. *J Prosthet Dent.* 1983;49(1):220-4.
7. Benson P. The fitting and fabrication of a custom resin artificial eye. *J Prosthet Dent.* 1977;38(5):532-8.
8. Firtell DN. Coordination of iris sizes in ocular prostheses. *J Prosthet Dent.* 1975;34(4):334-5.