ORIGINAL RESEARCH PAPER

Medical Science

MANAGEMENT OF OCULAR DEFECT- A CASE REPORT

KEY WORDS:

Dr Manu Verma Senior Lecturer Chhattisgarh Dental College And Research Institute Rajnandgaon Chhattisgarh.

Dr Brajendra Dubey* Senior Lecturer, Vananchal Dental College And Hospital Garwa Jharkhand. *Corresponding Author

ABSTRACT

The disfigurement associated with loss of eye can cause emotional and mental trauma. Various treatment modalities are available for the replacement of missing eye and orbit like with the help of implant or using mechanical undercuts for retention. Although implant has superior outcome it may not be advisable for all patient due to economical factor. The present article describe the prosthetic management of ocular defect with a custom made ocular prosthesis.

INTRODUCTION

The loss or absence of an eye may result from a congenital defect, irreparable trauma, a painful blind eye, sympathetic ophthalmic, or the need for histologic confirmation of a suspected diagnosis.[1,2]

Two surgical procedures are generally used one is evisceration, which is removal of content of globe leaving the sclera and on occasions the cornea is in place and the other procedure is enucleation where the eyeball is completely removed.

An ocular prosthesis is the artificial replacement of bulb eye (bulbous oculi and eye ball). The eye ball or organ of sight is contained in the cavity of orbit, where it is protected from injury and is moved by ocular muscles. When the entire content of orbit (including muscle, fascia, eyelid, conjunctiva and the lacrimal apparatus) are removed, the artificial replacement is called as an orbital prosthesis.[1]

The lost orbital volume resulting from removal of the globe can be replaced by integrated or non-integrated orbital implants.[3, 4] The placement of a conformer minimizes the changes in the socket size, maintains the shape of the conjunctival fornices and prevents scar contractures during tissue healing.[4] The replacement of the lost eye, as soon as possible after recovery from an eye enucleation procedure, is necessary to promote physical and psychological healing for the patient and to improve social acceptance. Therefore, immediately after tissue healing is complete, the conformer is replaced by a permanent ocular prosthesis. A multidisciplinary management and team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient.[5]

Accurate alignment of the artificial eye is one of the major prerequisites for aesthetic success of orbital prostheses. Even a slight positional discrepancy is discernible to the casual observer. Facial measurements[5, 6] and various devices have been proposed for orienting the ocular portion of orbital prostheses. Templates to accurately transfer the ocular component from the master cast to the face during the trial fitting have also been used.[5, 6] A unique facial moulage with an open eye was found helpful.

A well-fitting ocular prosthesis enhance esthetics, improves fascial contour and helps the patient to overcome psychological trauma. Ocular prosthesis are either readymade (stock) or custom made. The stock prosthesis is usually advocated when time is limited and cost is a consideration. No special skills or materials are required for its fabrication but the use of custom made prosthesis give better result as esthetics, size and comfort.

Case report- A 34 years old patient reported to department of prosthodontics, Chhattisgarh dental college Rajnandgaon with the chief complaint of poor esthetics and missing eye. [Figure 1] He gave history of trauma and infection in his left eye 4-5years back. On examination intraocular tissue bed was healthy with adequate depth between upper and lower fornices for retention of ocular prosthesis.

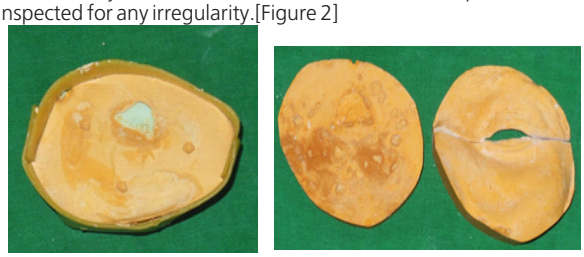
FIGURE 1- PRE-OPERATIVE

TECHNIQUE

A custom tray with stem was fabricated by making the impression of the closed eye with help of irreversible hydrocolloid material (Neocolloid, Zhermack) which was then adjusted according to the patient's socket and relief holes were prepared.

FIGURE 2- IMPRESSION MAKING

Irreversible hydrocolloid material (Neocolloid, Zhermack) was used for making impression of the left atrophied socket. Hydrocolloid is mixed with in thin consistency with cold water and 3 ml syringe was filled with thin mixed irreversible hydrocolloid. Material was injected from the syringe which flowed into the socket of the patient and then tray is loaded with thick consistency irreversible hydrocolloid and placed in position. Patient was asked to make the movements like looking up, down, right and left so as to record all the borders of the socket. After the material was set, custom tray was carefully taken out of the socket and the impression was inspected for any irregularity.[Figure 2]



Two pour technique split cast

FIGURE 3- POURING OF IMPRESSION

MAKING OF WAX PATTERN

the impression was poured with two pour technique with help of type IV dental stone and cast was obtained notches were made in cast for proper orientation. [Figure 3] Red modelling wax was flowed in the cast so as to obtain wax pattern.[Figure 4] After the wax was completely set, the wax patterns were retrieved from the cast, modified and tried on patient. Addition and removal of wax was done until the desired bulge and contours were obtained in both the open and closed positions of the eyelids.[Figure 5]

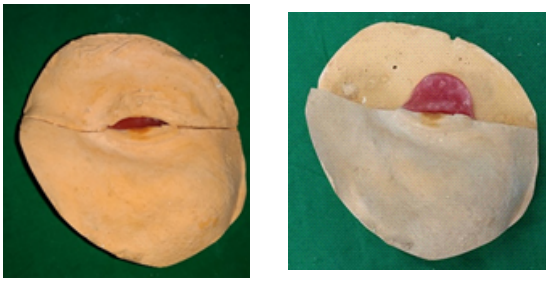


FIGURE 4 - MAKING OF WAX PATTERN

WAX PATTERN TRIAL

The smoothened and finished patterns were tried for proper fit, contour, orientation and adaptation. Three lines were marked on the patient's face. One in centre of forehead between the eyebrows, second on the outer canthus and third on the middle of the two lines. Same lines were marked on the contralateral side also. These lines helped to mark the middle of the pupil of the eye which helped in iris orientation. During this marking, patient was asked to look straight. Patient was then asked to close the eyes passively and any discomfort on closing the eyelids was noted and corrected and bilateral symmetry was checked and compared with normal eye.[Figure 5]

FIGURE 5- RELINING OF WAX PATTERN AND PLACEMENT OF IRIS

Iris Orientation and positioning: It was done by attaching the iris buttons to wax pattern in desired position which was marked previously. Irish was taken from a colour and shade matched prefabricated eye shell which was available in market. Irish was cut in desired size and round shape with the help of metallic bur. Iris orientation was done such that the the buttons should point 100° medio-inferiorly to the middle of the eye while patient tried to look straight in upright position and also compared with the normal eye for position.[Figure 5]

FLASKING AND PACKING OF WAX PATTERNS

The finished wax pattern after iris orientation with the iris buttons in place was invested in flask using dental stone (Kalstone type III, Kalabhai) after applying appropriate separating media between the two pours. Dewaxing was performed in usual manner as done for complete denture fabrication.[Figure 6] Heat cure tooth coloured polymethymethacrylate material (DPI, India) was mixed according to manufacturer's instructions and packed in the flask and left for bench curing overnight to enable complete polymerization and prevention of any excess unreacted monomer. Long curing cycle (1000°C for 8 hours) was used so as to prevent the presence of any residual monomer in the prosthesis which is very essential. It prevents any untoward irritation or sensitivity to tissues and thereby rejection of the prosthesis by the patient.

FIGURE 6 - FLASKING AND DEWAXING

CHARACTERIZATION:

The cured ocular shells were retrieved from the flask, finished and polished.some charactarizatin was done during the curing process. [Figure 7] Then extrinsic characterization was done on these finished shells using the coloured fibres from high strength heat cure acrylic material (Lucitone, Dentsply), which mimicked the blood vessels of the eye. These fibres were retained using a thin layer of clear autopolymerising resin monomer liquid, (DPI, India) which was applied over these fibres and was left to dry. [Figure 8]

FIGURE 7- IRISH POSITIONING AND CHARACTERIZATION

FINISHING AND POLISHING

Eyes are very sensitive to irritation. Any irregularity in eye prosthesis would lead to discomfort and can affect the patient compliance. So, finishing and polishing was done giving it a glass like finish and taking care no irregularity exists on intaglio and polished surface. [Figure 8] It was inserted in the eye socket carefully by reflecting the eyelids and all the contours were verified and analyzed for any areas that required any adjustment.

Patient was able to make left to right and up down movements with the prosthesis without any discomfort.[Figure 9] Periodic recall appointments on second and fifth day after insertion and once in every month for six months were scheduled. Patient was trained to insert and remove the prosthesis. Post insertion instructions were given to the patient as well as the care taker regarding the wearing, removal and care of prosthesis at home:

- Prosthesis should be handled with care and with clean hands.
- The prosthesis should be removed during night.
- For surface disinfection, the prosthesis should be dipped in antibacterial solution.
- To prevent protein and bacterial deposition, routine polishing of the prosthesis should be done.

FIGURE 8- FINAL PROSTHESIS WITH CHARACTERIZATION

FIGURE 9- FINAL OCULAR PROSTHESIS

DISCUSSION

An accurate alignment of artificial eye is one of the major prerequisites for esthetic success of the ocular prosthesis. Facial measurements and various devices has been proposed for orienting Irish of ocular prosthesis. [5,6]

Prosthetic rehabilitation of lost eye can be done with use of prefabricated and custom made eye prosthesis. In this case report, custom made eye prosthesis was chosen over prefabricated one as it has better fit, adaptation and patient comfort.[2] Customised eye prosthesis have become a predictable mode of treatment with advent of newer impression materials and processing techniques which can be fabricated with exact fit and aesthetics. Although, retention of eye prosthesis can be enhanced with the use of implants, but they are not always possible or feasible due to surgical and financial constraints.[6] In this case report, successful prosthetic rehabilitation of patient was done using customized eye prosthesis.

REFERENCES

1. Goiato MC, Mancuso DN, Marcal Mazza Sundefeld ML, Da Motta Gabriel MB, Murakawa AC, Guiotti AM. Aesthetic and functional ocular rehabilitation. OralOncology EXTRA. (2005);41:162–64
2. Aeran H, Kumar V, Dhami R. The characterized occular prosthesis-An innovative approach. Clinical Dentistry. 2015;6(9):20-26.
3. Aggarwal A, Sharma A, Singh K, Gupta A. Scleral prosthesis: An eye for an eye: A case report. Indian Journal of Dental Sciences. 2013;5(5):63-65.
4. Somkuwar K, Mathai R, Jose P. Ocular prosthesis: Patient rehabilitation. People's Journal of Scientific Research. 2009;21(2):21-26.
5. Chalian VA, Drane JB, Standish SM. Maxillofacial prosthetics: multidisciplinary practice. Williams & Wilkins Company; 1972.
6. Beumer J, Curtis TA, Marunick MT, editors. Maxillofacial rehabilitation: prosthodontic and surgical considerations. Ishiyaku Euroamerica; 1996.