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Ocular Prosthesis – Case Series

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ABSTRACT

Eyes are generally first features of the face to be noticed and most vital organ of the body. loss of eye due to any reason affect the psychology and appearance of the patient. Ocular prosthesis is an artificial replacement of the eye. After enucleation, evisceration and exenteration of the eye, the goal is to replace the missing tissues with an artificial prosthesis and restore the facial symmetry and normal appearance of the anophthalmic patient.

This is a case report presenting simplified approach of the fabrication of ocular prosthesis in a cost effective manner with a unique impression technique.

Key words: *Ocular Prosthesis, custom made Ocular impression, Maxillofacial prosthesis*

INTRODUCTION

Eye is a vital organ not only in terms of vision but also as an important component of facial expression.¹ Loss of eye has a major psychological effect on patient other than loss of vision. The fabrication of ocular prosthesis is more of an art with knowledge of science. According to Scoll (1982)² enucleation is a surgical procedure in which the eyeball and the attached portion of the optic nerve are excised from the orbit.

Evisceration is removal of the contents of eyeball while leaving the sclera and extra ocular muscles intact. Exenteration is the most radical of the three procedures and involves removal of the eye, adnexa, and the part of the bony orbit.¹ Any prosthesis must have life like appearance which can be achieved through seamless visual integration with the surrounding tissue.³ Fabrication of an ocular prosthesis is a combination of art and science by virtue of which

the affected individual regain the lost confidence. This article describes prosthetic rehabilitation through ocular prosthesis in two cases of enucleation followed by trauma.

CASE REPORT -1

A 56 years old male reported to department of prosthodontics, Chhattisgarh dental college and research institute, Sundra-Rajnandgaon with a chief complaint of missing left eye (Fig 1). Patient gave a history of road traffic accident a year back. For which he was admitted in government hospital and due to serious injury with left eye, complete eyeball was enucleated during surgery. Three months after the surgery patient reported to department of prosthodontics. Medical history revealed no history of major illness and no history of any other facial injury except enucleation of left eye ball. Clinical examination of face revealed that underlying mucosa of defect and muscle contraction around lost eyeball was normal. Anatomy of orbital cavity in defect area was absolutely healthy without any pain and inflammation. Right eye appeared to be normal with coordinated activity and movement. But patient appearance was not very pleasant and patient was psychologically depressed. Treatment option for this case was chosen to replace lost left eye wall with conventional ocular prosthesis since presence of sufficient undercut to retain prosthesis and muscles responsible for eye ball movements were preserved.

FABRICATION PROCEDURES

STEP I

Preliminary impression was made for defect of left eye with irreversible hydrocolloid material (Alginate). Later Impression was stabilised with the help of gauze pieces which was reinforced with plaster of Paris to provide support for alginate impression. Finally Impression was poured by using type III dental stone (**KALABHAI-ULTRASTONE**)

STEP 2

FABRICATION OF SPECIAL TRAY (FIG 2)

-A layer of wax is placed as a spacer (Modelling wax, **HINDUSTAN DENTAL PRODUCTS LTD.**) An self cure special tray was designed and fabricated over the primary cast to made final impression of defect related to left eye socket. Special tray was made in such a way that it can record final impression of defect and escape holes were made over the tray for mechanical holding of irreversible hydrocolloid (**Neocolloide-ZHERMACK-ITALY, ISO 1563**)

STEP 3

Final impression (FIG 3) was made using special ocular tray with irreversible hydrocolloid alginate (Neocolloide) by injecting it in the defect area first and then loaded tray with same material was positioned over the defect area of left eye. Thixotropic Neocolloide impression material was allowed to set as instructed by manufacturer and then retrieved. After examination of final impression for any defect including air intrapment, final impression was poured in two parts (Fig 4-A,B). Final impression was boxed with the help of modelling wax. First the upper half of the impression was immersed in mixed

type III dental stone. After the stone had set three triangular shape small cuts were made on intaglio surface of ocular impression for orientation of lower half during packing procedures. Significance of pouring in two parts gave us the advantage to avoid problems of undercuts and easy removal of wax pattern from the mould.

STEP 4

Selection of Iris from readymade eye shell was done from available eye shell box. Later it was trimmed and positioned over the wax pattern made with help of two piece mould made from final impression using right eye as a guiding factor. For orienting iris position first facial midline of patient was marked then patient was asked to sit upright and look in front at a one fixed point.

STEP 5

After that the distance between glabella and centre of right intact eye iris was measured and using same amount of distance marked on a supra orbital margin of left eye. Wax sclera pattern with iris was made and trial was done. Now after trial, the ocular prosthesis was fabricated by conventional method following sequence of flasking, dewaxing and packing of heat cured tooth coloured acrylic resin (**STELLON, DENTAL PRODUCTS OF INDIA LTD.**) of appropriate shade.

STEP 6

During packing mould characterization of ocular prosthesis in the sclera area was done with

required stains and veins were added to give a more natural appearance of the artificial eye

STEP 7

Final Ocular prosthesis (Fig 5) was retrieved from flask and finished and polished.



Fig 1 – Front View of Face Showing Defect With Left Eye



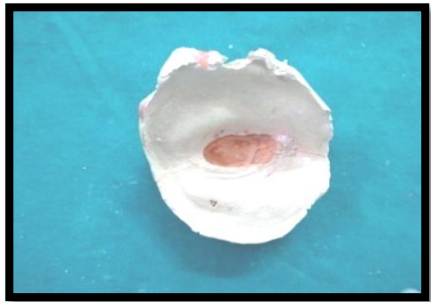
Fig 2- Tray Fabrication



Fig 3- Final Impression Made By Using Neocolloide Impression Material With Special Tray



(A)



(B)

Fig 4 (A, B)- Pouring of Final Impression With Sectioned Two Piece Mould



Fig 5 - Final Ocular Prosthesis

CASE REPORT -2

A 21 year old female reported to department of prosthodontics, Chhattisgarh dental college and research institute, Sundra-Rajnandgaon with a chief complaints of missing right eye. Patient gave a history of trauma when she was two month old. For which she was admitted in government hospital and due to serious injury with right eye,

complete eyeball was enucleated during surgery. Medical history revealed no history of major illness and no history of any other facial injury except enucleation of right eye ball.

In this case treatment procedure was quite similar as in case -1.

Fig 7, Fig 8 shows preoperative & postoperative picture of successful ocular prosthesis of case 2



Fig 6 - Post Operative-Front View of Face Showing Ocular Prosthesis In Situ With Excellent Esthetic Results.



Fig 7 – Preoperative Photograph



Fig 8 - Final Ocular Prosthesis

POST INSERTION INSRTUCTION³

- Always use clean hands when handling the prosthesis.
- Check the surrounds to make sure the prosthesis won't be damaged or lost if it is accidentally dropped.
- Too much handling can cause irritation and excess drainage, remove the prosthesis only as directed.
- Always close eyelids and wipe toward nose, wiping outward may dislodge the prosthesis.
- Try to position the face toward the person you are conversing with. Practice moving your head not just your eyes while looking at certain object.
- Do not clean the prosthesis with any solvents, hand sanitizer or alcohol, as these chemicals may damage the prosthesis and cause irritation to eye socket. Wash with a mild soap and room temperature water occasionally.

DISCUSSION

The rehabilitation of the orbital defect is a complex task. Custom ocular prosthesis is a good option when reconstruction by plastic surgery or the use of osseointegrated implants is not possible or not desired⁴. Systemic conditions and financial constraints may limit their use. In past artificial eyes were made of enamel, metal or painted clay and attached to cloth and worn outside the socket^{5,6}. In the 15th century, the first in-socket artificial eye was made using gold with colored enamel. Recently with the advent of some newer

materials like Heat-polymerized acrylic resin, as being used here, it is possible to fabricate prostheses with a life-like appearance⁷. By rehabilitating a patient with an ocular defect by a custom-made ocular prosthesis, we are improving the facial appearance and by relining technique, the fit of the prosthesis can also be enhanced.

CONCLUSION

The use of custom made heat cure ocular prosthesis is better & less expensive treatment options available .The procedure used here is cheaper, affordable and can be carried out in a day to day clinical work.

This method has provided good results from patient esthetics, acceptance, and satisfaction points of view. Prosthetic rehabilitation of eye defects are advantageous as it is relatively quick, reversible, medically uncomplicated and allows the surgical site to be closely monitored. The custom-made ocular prosthesis has desired esthetic results and socially acceptable and comfortable for patients with an ocular defect, resulting in improvement of psychological well being and personality of the patient.

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