

Fabrication of Eye Prosthesis Using Facial Moulage : Case Report

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Abstract:

Success of a prosthesis does not depend mainly on the skills of a dentist but also on the accuracy of the prosthesis and the methods he uses for making it. The main challenge while making eye prosthesis is the placement of the iris portion in proper alignment in relation with the center of the socket. An error in any step can cause an unesthetic effect in the final delivery of the prosthesis. Various methods are used for proper orientation of the iris. Methods include use of a grid for placement of the iris and also a facial moulage to guide the placement. This case is rehabilitated for eye prosthesis using a facial moulage.

Key words: eye prosthesis, iris positioning, facial moulage .

Introduction:

“The mind sees what the eyes can’t see”

This statement is true when you observe a patient who has lost his eye in an accident or due to tumor of the eye. The psychological state of a person is seen by way he reacts to people in general. They are shy and avoid meeting people, because they are embarrassed with their look. This later makes them avoid going to crowded places and meeting people. As a Prosthodontist it is one of the challenges to regain their social state, because they not only have to restore the missing eye with prosthesis but have to reach up to their demands for esthetics.

Loss of eye can be caused by either trauma or tumor with the eye. If the entire viscera of the eye is removed then the procedure is called as evisceration. If the eye

ball is removed then the procedure is called as enucleation and if the entire eye ball with the content is removed then the procedure is called as exenteration. These procedures are carried out depending on the degree of injury to the eye or extent of tumor spread in the socket. Surgical removal of an eye is inevitable in situations like irreparable trauma, malignant orbital tumors, painful blind eye, and sympathetic ophthalmia. Orbital prosthesis is required to rehabilitate patients following exenteration of eye as this surgical procedure involves en bloc removal of the entire orbit, usually involving partial or total removal of the eyelids.

Case history:

A female patient aged 23 years, reported to the Department of Prosthodontics, Rural Dental College, Pravara Medical Trust, Loni for the replacement of her exenterated right eye. She was referred by department of ophthalmology for prosthesis with right eye. Patient lost her eye 2 years ago in a road accident. Evisceration was performed in the right eye. On examination, a well healed surrounding tissue was seen. The patient did not complain of any pain or discomfort.

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Treatment plan:

The patient required orbital prosthesis to restore her facial defect. Rehabilitation options for orbital defects are numerous and the decision rests in the hands of the operator. The operator has to formulate a treatment plan taking into consideration pertinent factors like the health and cooperation level of the patient, tissue health of the surgical site, the financial constraints of the patient and the operator skill.

Fabrication of any facial prosthesis involves the following treatment sequence:

1. Primary impression
2. Final impression
3. Recording the facial moulage
4. Iris poisoning
5. Fabrication of final prosthesis

1-Primary impression:

It was recorded with alginate loaded in a thin consistency in a 5 cc syringe. The alginate was injected over the tissue bed to record the total tissue coverage(fig:1)

2- Final impression:

After the primary impression the cast was poured with dental plaster and was used to make a special tray. This special tray was made of wire gauge placed over the cast and pressure was applied over the gauge. Then the gauge was cut 0.5 m short of the extensions of the tissue bed region on the cast .the edges was covered with putty and a straight guttaperchapont was placed 90 degrees to the tissue surface.(fig:2)

The final impression was recorded with light body. The tray was placed in the eye below the eyelids and the movements were recorded as the final impression.(fig:3)

3- Recording the hemi facial moulage:

Accurate facial impression is essential for the construction of a well-adapted prosthesis. Various materials, including impression compound, plaster of Paris, hydrocolloids and elastomeric impression materials have been used in making facial impressions. Irreversible hydrocolloid was used to make the facial impression for this patient because

it is static, easy to manipulate, fast setting, non-irritant, elastic with reasonable dimensional accuracy and detail reproduction. To study the case in detail, a half facial impression from forehead region to nose was made with the patient in an reclined position and the remaining left eye passively closed. The area was boxed with modelling wax (The Hindustan Dental products, Hyderabad, India) and irreversible hydrocolloid (Tulip–Cavex, Haarlem, The Netherlands) was mixed and painted gently into the defect area and over the closed left eye. Further mixes were made and the entire boxed area was filled. Care was taken to maintain the thickness of the impression material to a minimum to avoid tissue compression. Wet gauze was placed over the hydrocolloid as it was reaching its final set. Dental stone was mixed and applied over the gauze to stabilize the impression during the cast pouring procedure. Throughout the entire period of impression making uninterrupted nasal breathing was maintained through hollow plastic tubes inserted through the nostrils of the patient. The facial moulage was prepared with type III gypsum product (Gold Stone, Asian Chemicals, Gujarat, India). This was used as the *working model* (fig4)

4- Iris poisoning :

Iris placement was done with grid placement at first and then with the help of the moulage the iris was finally placed. The grid placement is where a transparent grid is placed in front of the eye the outer cantus line and the inner canthus lines were marked and the pupil of the left eye was marked. The pupil markings were transferred on to the right eye. Now with the help of the moulage the wax try in is placed in the right eye region and the iris is placed. This gives a confirmatory result as the placement of iris in the defect region is checked and rechecked.

5- Fabrication of final prosthesis:

Fabrication was done after wax try in with the iris placed in position is relined with light body. The shade matching was done by matching the shade with the left eye. The fabrication was done with heat cure acrylic. Proper polishing and finishing was done. The prosthetic eye was placed in water for 24 hours so that the excess monomer will leached out.

Discussion:

The challenges faced during constructing an orbital prosthesis are; obtaining a satisfactory working model without tissue compression, proper orientation of the ocular portion in harmony with the remaining eye, reproducing the contour and anatomy of the periorbital tissues, determining proper gaze and interlid opening and obtaining a satisfactory colour match. The other important issues to be addressed are material and method for prosthesis fabrication and the mode of retention of the prosthesis.

The problem of orienting the eye shell in the defect and in harmony with remaining eye was solved using facial measurement. Inverted anatomic tracing technique helped in copying the periorbital tissue details of the remaining eye. The tracing when inverted served as the blue print for carving the wax pattern for the orbital prosthesis.

The eye shell was stabilized during processing using posterior indexing method. It was preferred over anterior indexing as the later mostly results in damaging the corneal surface of the eye shell.

In the present case, the sectional design of the prosthesis helped in engaging the naturally occurring undercut. The mechanical lock provided by the undercut and magnets offered good prosthesis retention and prevented accidental removal by dislodgment.

To remove the speculations regarding the residual monomer content in the acrylic prosthesis that can elicit tissue reaction, the prosthesis and the stent was stored in water for 3 days before insertion to reduce the residual monomer content .

Conclusion:

Loss of an eye is a very traumatic experience for an individual. Rehabilitation of such patients both emotionally and prosthetically is really a phenomenal task. Attention to detail is mandatory in each and every step to bring out a satisfactory end result. This clinical report details fabrication of a sectional orbital prosthesis for a female patient following enbloc removal of her left eye. The techniques employed greatly helped in reducing the chair time.



(fig:1 primary impression of the eye with alginate)



(fig:2 custom tray for final impression)



(fig:3 final impression with putty and light body)



(fig:4 facial moulage)

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