

"A MIRAGE TO THE REAL EYE" - CUSTOM MADE ORBITAL PROSTHESIS

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Introduction:

The art of reconstruction of the defects by non-living substitutes is the heart of maxillofacial prosthodontia¹. Reconstruction of any facial defect is a challenging task as a clinician. The prevalence of the eye defects has been reported to be about 60%, majority of which have been amongst the males.² The loss of an eye may be due to a congenital defect, tumour, trauma. Rehabilitation of such complex defects requires a customised approach for the successful outcome of the prosthesis².

Peymen et al. has classified the surgical management of the removal of eye as: evisceration, enucleation and exenteration. Rehabilitation of the orbit with lost volume can be done either by a surgery or with the help of a prosthetic device³. A craniofacial prosthesis that replaces the eyeball is an orbital prosthesis whereas the one which replaces the surrounding periorbital tissues is an ocular prosthesis. An accurate management for a successful rehabilitation involves a multidisciplinary approach⁴.

This case report presents a practically convenient procedure for the construction of a customised orbital prosthesis that is aesthetically pleasant, retentive, and cost-effective. Here, the management following an en bloc removal of an eye was done using an adhesive retained silicone prosthesis.

Case report

A female patient aged 38 years, reported to the Department of Prosthodontics, complaining of a missing left eye with a history of low-grade adenocarcinoma of left maxilla. After correction of post maxillectomy defect, she presented with ectropion of left eyelid and plate exposure along the infraorbital margin which was reconstructed. She then underwent left eye enucleation (fig:1). Enucleation is the removal of the entire globe by cleaving all blood vessels, nerves along with muscles adhered to the orbit³.

On Clinical examination, a left side orbital defect was seen. The defect did not have any definite hard and soft tissue undercuts to aid in retention or

the prosthesis. The treatment involved rehabilitation using medical grade silicone retained with an adhesive.

Fabrication of prosthesis

The operator can choose from myriad options available for rehabilitation. However, the prime factors for an organized treatment plan include patient's health, financial stability, involved tissue conditions and the technical skill.

The fabrication involves the following sequence:

1. Recording of impression
2. Decision on mode of retention
3. Acclimatization of the eye shell (stock)
4. General contouring and wax try-in for pattern
5. Selection of appropriate material and processing technique



Fig 1: Enucleated defect



Fig 2: Trial of wax Pattern



Fig 3: Relining of wax pattern for proper adaptation



Fig 4: Cured prosthesis



Fig 5: Final Prosthesis

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6. Finishing, polishing and insertion of final prosthesis.

Impression making

After the initial examination and inspection of the defect, the socket was cleaned by irrigating with saline. The eyebrow and eyelashes were lightly lubricated prior to impression making. Primary impression of the defect area was made using an irreversible hydrocolloid (Tropicalgin, Zhermack). Modelling wax was placed around the defect for boxing (The Hindustan Dental products, Hyderabad, India). Alginate was then painted lightly and carefully into the area of the defect. Then the boxed area was entirely filled with alginate. The positive replica of the defect was made using type III Gypsum (Gem Stone, Shruti Products, Gujarat, India).

Retention modes of the prosthesis

Various modes of retention for maxillofacial prostheses include magnets, spectacles, tissue undercuts, adhesives and osseointegrated implants⁵. Since the bone density was less and the bone quality was inadequate, an adhesive retained prosthesis was the preferred option. The silicone used in the prosthesis had a life like appearance and had precise margins which could easily merge into the patient's skin⁶.

Orientation of the stock eye shell

Orientation of the stock shell was done while involving the right eye in a conversational gaze (fig. 2). The contralateral eye was used as a guide to select and match the prefabricated eye shell. The required landmarks were ascertained by positioning the iris and the patient such that he had a straight line of vision. After the initial orientation, layers of wax strips were appended to imitate the contralateral eye giving it life like appearance. The interlid space, wrinkles and the upper and lower eyelids were precisely sculpted and contoured.

Wax try-in for pattern

The pattern in wax was then assessed on patient appraising the position of the eye shell, aperture width of lids, and final adaptation. The wax pattern was then relined for precise margins and adaptation (fig :3).

Pattern processing

Following the wax try-in, it was reverted to the working cast which was then invested. To prevent the displacement of the eye shell, it was carefully secured with acrylic indexing. Flasking and de-waxing was done meticulously for the retrieval of the eye shell without any damage. Uncoloured RTV medical grade Silicone (A-2186, factor II INC. Lakeside, USA) and liquid catalyst was weighed on a weighing machine. The required amount was then mixed thoroughly to prevent entrapment of air. Some intrinsic stains (Functional Intrinsic Skin Colors, Factor II, AZ, USA) were added at the time of packing for enhanced shade matching. Silicone was then packed in layers and cured for 48 hrs. After deflasking, the final prosthesis was retrieved followed by the incorporation of some extrinsic stains (fig:4). The vignette of this prosthesis was achieved by positioning the artificial superior eyelashes giving it an authentic and graphic appearance.

Prosthesis Insertion

The prosthesis was placed, and the patient was instructed on the procedure of insertion for the prosthesis by footing the orbital prosthesis in its position (fig:5). This prosthesis came about to be satisfactorily retentive as well as up to her wonted appeasement. The spectacle frame was used as an aid for additional retention and stability. Instructions regarding the maintenance and the follow up care was clearly explained to the patient.

Conclusion

Unacceptable facial disfigurement following an orbital defect could be traumatising to a patient. Its thereby essential to boost the patient's morale by combating the psychosocial trauma. A multidisciplinary approach should be followed to successfully rehabilitate such patients using the appropriate material, retentive aids, and based on the functional and aesthetic requirements of the patient. Here, an adhesive retained orbital prosthesis was delivered to the patient to restore the confidence to face the world.

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