



Rehabilitation with Ocular Prosthesis

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Abstract:

Introduction: Loss of an eye or a disfigured eye has a far-reaching impact on an individual's psyche. The fabrication of a definitive ocular prosthesis should begin as soon as the socket has healed. This clinical report demonstrates rehabilitation of a post-enucleation socket with an ocular prosthesis fabricated using stock iris and custom made sclera.

Procedure: A 52-year-old male patient reported to Department of Prothodontics, Govt Dental College Srinagar with a defect in the left eye. Case history revealed that the patient suffered from trauma to his left eye 10 years back followed by enucleation of the same. Impression was made with irreversible hydrocolloid and a split cast was fabricated. Wax pattern was fabricated and measurements were made for positioning of iris. A readymade iris button was used and characterization was done for the sclera. Wax pattern was then cured.

Conclusion: Restoration of ocular defect is an important aspect both for aesthetics and for psychology of the patient. This clinical report describes the rehabilitation of a post enucleation socket with a custom made prosthesis. Such prosthesis enhances the patient comfort and confidence and henceforth raises back the lost spirits of the affected to live a normal lifestyle.

I. INTRODUCTION

Loss of an eye or a disfigured eye has a far-reaching impact on an individual's psyche. Additionally it affects one's social and professional life. Cosmetic rehabilitation with prosthetic devices gives such individuals professional and social acceptance and alleviates problems. A prosthesis should be provided as soon as possible to raise the spirits and ease the mind of the afflicted. Orbital defects may be associated with congenital deformities, tumors, or acquired traumatic lesions and may affect the soft tissues within the orbital cavity or may include the surrounding muscles and bones². The loss or absence of an eye can be managed by evisceration, enucleation or exenteration. Evisceration is the surgical procedure involving the excision of the intraocular contents of the globe, leaving the sclera, and sometimes the cornea. Enucleation is the surgical removal of the entire globe and a portion of the optic nerve from the orbit. Exenteration is the en bloc removal of the entire contents of the orbit including the extraocular muscles³. There are several techniques documented in the literature for fitting and fabricating the artificial eye. It includes fitting a stock eye, modifying a stock eye on the positive replica of the ocular defect and the fabrication of the custom eye prosthesis. First two techniques are less time-consuming but often have the disadvantages like compromised esthetics and unreliable fit. Custom ocular prosthesis provides improved esthetics, and fit but usually are more time-consuming and complicated⁴. The fabrication of a definitive ocular prosthesis should begin as soon as the socket has healed. Prosthetic rehabilitation is enhanced if an implant can be placed in the orbit to provide an attachment for the rectus muscles, which can impart motion coordinated with the natural eye³. This clinical report demonstrates rehabilitation of a post-enucleation socket with an ocular prosthesis fabricated using stock iris and custom made sclera to provide functionally and esthetically satisfactory result.

II. CASE REPORT

A 52-year-old male patient reported to Department of Prothodontics, Govt Dental College Srinagar with a defect in

the left eye. Case history revealed that the patient suffered from trauma to his left eye 10 years back followed by enucleation of the same. On examination tissue bed was healthy and fornix depth was sufficient enough to retain the restoration. A well-centred orbital implant was placed with quiet conjunctiva and no granulomas. No blepharoptosis, eyelid mal-positioning or laxity was seen. Orbital implant exhibited synchronous movement on function. A custom-made ocular prosthesis was planned to meet the needs of the patient since it would result in better esthetics than a stock eye shell. Consent of the patient was taken for the procedure.

III. PROCEDURE

The patient was instructed to sit straight, relax and look in front. Petroleum jelly was applied to the eyebrows and skin around to prevent impression material from sticking to eyelashes. The impression of the enucleated eye socket was sought by introducing an impression material (irreversible hydrocolloid) into the eye socket using a disposable syringe and projecting it out between the lids. A very runny consistency of alginate was injected into the impression tray with a syringe through the inlet. It was slowly filled into the defect to prevent overfilling. A little amount flowing out through the inner can thus indicates adequate material filling of the socket. After setting, the impression was gently removed first by massaging the lower lid downwards and away from the nose first and then sliding the impression out from the upper eyelid (Fig 1). The impression was poured using type III gypsum and a two piece split cast was fabricated (Fig 2). Modelling wax was flown into the mould formed in the cast and the wax pattern was retrieved gently after cooling. Pattern was carved and smoothed with the help of a carver and moist cotton respectively. Wax pattern was then tried in patients eye for fit, comfort, contour, drape and mobility of eyelids (Fig 3, 4). Corneal prominence was checked by standing behind the patient, retracting his eyelids and by making him look down. Next the colour of the iris was noted using contra-lateral eye for comparison and a stock iris button of same shade was selected for the patient. After it was found

to be suitable for patient and his spouse, the procedure for marking of pupil and iris was done. For this a tissue tape was used to mark the inter-canthal distance, distance from pupil of healthy eye to midline of nose etc. The probable position of iris and pupil was marked over the wax pattern and the previously selected iris button was attached to the wax pattern at the marking. The pattern was again tried in the eye and iris positioning was reconfirmed. After checking the gaze and position of iris, the finished pattern was invested in a small two piece Brass flask (Fig 5). The flask was then placed in a dewaxing bath for 20min. The anterior and posterior portions of the flask were separated. The colour of the sclera was selected using tooth colour acrylic shade guide. Rayon thread fibrils were used to simulate vasculature, by monomer polymer syrup method. The selected shade of the sclera was matched with the heat cure resin which was then packed in the two piece flask. The flask was kept for curing for a period of two hours and thirty minutes to avoid any residual monomer. Prosthesis was then retrieved, finished and polished and finally covered by a layer of clear acrylic to give it a more lifelike appearance (Fig 6). Finally the prosthesis was inserted in the patients defect (Fig 7) and patient was taught all the instructions regarding handling and care. The patient was asked to return on day 1, 2 and 7 for follow-ups after the prosthetic insertion. Thereafter a 6 month follow-up was done for prosthesis evaluation and adjustment.

IV. DISCUSSION

The ocular prosthesis is an artificial replacement for the bulb of the eye. After the surgeon enucleates the eye, Prosthodontist is a person who comes into an act of providing the patient with an artificial eye to overcome the agony of losing an eye. A well-made and properly made ocular prosthesis maintains its orientation when patient performs various movements⁵. Ocular prosthesis can be classified into stock and custom prosthesis with the latter referring to tailor made prostheses. Material used in prosthetic devices are Glass, Poly methyl methacrylate (PMMA) and Silicone. Modern ocular prosthesis are fabricated using poly methyl methacrylate because of ease of moulding into any desired shape and its intrinsically inert nature making it the material of choice in fabricating ocular prosthesis⁶. In concern with the empirical fitting of an ocular prosthesis (stock prosthesis) where a prosthesis is tightly fitted as close as possible, most likely it leaves the vaulted spaces in the cavity and leads to pooling of the tears and mucous secretion. As day passes and the shell is on the cavity, patient starts feeling the heaviness in cavity and results in removing the prosthesis from the cavity, while a custom made modified impression based prosthesis provides the very close contact with the socket, thus fitted well in conjunction with orbital soft tissue and leaves no space or pooling to accumulate the tear fluid. Moreover the close contact with orbital tissue and provide the conditioning of the socket and henceforth reduce the mucous secretion from the cavity⁷.

V. CONCLUSION

This article describes a simplified approach for fabrication of a custom ocular prosthesis with readily available materials. Henceforth patient is provided with a more esthetic functional and physiologically acceptable prosthesis. Gaspare Tagliacozzi (1545-1599), an Italian surgeon who became famous for his skill in reconstructive surgery, once stated, "We restore parts of the face which nature has given but which fortune has taken away, not so much that they may delight the eyes, but that they may bring up the spirit and help the mind of the afflicted."⁸

VI. REFERENCES

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Figure 1



Figure 2



Figure 3



Figure 7



Figure 4



Figure 5



Figure 6