

Ocular Prosthesis: Simplified Custom Made Technique- A Case Report

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ABSTRACT

The eye plays a vital role as one of the six senses in humans. From vision to expression it has its various functions. The loss of the facial structures can have a physical, social and psychological impact on those affected. Treatment includes implant retained or a custom made acrylic ocular prosthesis. A custom-made ocular prosthesis is a good alternative as implant retained may not be advisable in all patients due to economic factors. A case-report of a custom-made ocular acrylic prosthesis is presented here, which had acceptable fit, retention, and esthetics.

KEYWORDS: Ocular Prosthesis, Simplified Custom Made Technique

INTRODUCTION

The trauma associated with the loss of an eye can cause significant physical, psychological as well as social problems (Lubkin & Solan, 1990). The rehabilitation of a patient who has undergone the mental trauma of an eye loss requires a prosthesis that will provide the optimum aesthetic and functional results. Thus, the replacement of the lost eye is a necessity to enhance physical and psychological healing of the patient and to improve his/her social appearance.^{1,2}

Reasons for an eye loss can be innumerable ranging from congenital defect, tumor, irreparable trauma, sympathetic ophthalmia to the need for histological confirmation of a suspected diagnosis.^{3,4} Surgical procedures for the removal of an eye can be broadly classified as: evisceration (where the contents of the globe are removed leaving the sclera intact), enucleation (most common, where the entire eyeball is removed after severing the muscles and the optic nerve) and exenteration (where the entire contents of the orbit including the eyelids and the surrounding tissues are removed).^{1,2,3,4}

In such cases role of a maxillofacial prosthodontist and an ophthalmologist comes into play wherein their combined effort leads to the replacement of the lost natural eye with an aesthetically and functionally acceptable artificial one.^{5,6,7}

Today a majority of patients all around the world use artificial eye made of acrylic.⁵ Several techniques have been documented for fabrication of eye prosthesis, however, modifying a stock eye by making an impression of the ocular defect (Taicher et al. 1985), and the custom eye technique (Benson, 1977) are the most commonly used techniques.

The fabrication of a custom acrylic resin eye provides more esthetic and gives precise results as the contours of the defect of every individual patient can be recorded accurately.^{1,3,8,9}

CASE REPORT

A 25-year-old male patient reported to our outpatient department with the chief complaint of a defect in the left eye. Case history revealed that the patient had to undergo enucleation due to traumatic injury six years back. A careful examination revealed healthy conjunctival lining and absence of infection and healing also. The treatment plan was to fabricate a custom made ocular prosthesis and procedure was explained to the patient, and a written consent was obtained. Rehabilitation team included a prosthodontist and an ophthalmologist.

Procedure: Patient was asked to tilt the head backward on the dental chair. Irreversible hydrocolloid (Algitex, DPI) material was injected into the left eye socket with help 30 ml disposable syringe (Fig:1). A hollow cylinder made of modelling wax was used to cover left eye to confine the flow of alginate. After initial setting of alginate, a small piece of cotton gauze was placed over it and after final setting dental plaster was poured into the hollow cylinder to support the impression.(Fig:2)

After obtaining a good impression of the eye socket, it was invested in Type-II dental stone. Stone mould was partially split after setting, and impression of the socket was removed. The impression obtained in the mold was filled with melted wax and carving was done on margin so that wax trial for the conformer would be easy. Now investing of the wax pattern of conformer in heat cure acrylic resin was done by compression moulding

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Fig:1 Preliminary impression made with irreversible hydrocolloid



Fig:3 Vents made on the conformer to allow for the excess material to come out during final impression procedure.



Fig:2 Plaster poured into the hollow cylinder to support the impression.



Fig:4 Final impression made with light body addition silicone impression material

technique. After curing conformer was obtained, trimmed, finished & polished. Vents were made on the conformer so that excess material would come out during final impression procedure.(Fig:3)

A small hollow syringe needle cap was attached to the conformer to provide a channel for the flow of impression material inside the socket. Now trial for the coneformer was done, and final impression was made with light body addition silicone material. As the impression material was injected through the hollow tube, the head was kept in the vertical position and the patient was instructed to move his eyes right, left, up and down. This allowed the impression material to flow and the anatomic details to be recorded precisely. Patient was asked to look at a distant spot at eye level with his gaze maintained in a forward direction.(Fig:4)

The final impression (Fig:5) thus obtained was poured in Type – IV dental stone. Again the wax pattern was



Fig:5 Final impression

made on this final cast. A prefabricated ocular disc (with a stem in the center) iris was purchased from the market, and matching was done with patient's working eye. Wax pattern was reduced to a depth sufficient enough to incorporate the black ocular disc which was attached to it. The size of the iris of the natural eye was measured using a millimeter measurement gauge or an optical scale.

Wax pattern trial was done and its position determined by using the contralateral eye as the reference when the patient gazes straight with his head erect. Wax sclera with iris trial pattern was removed and was ready for the investment.(Fig:6)



Fig:6 Wax sclera with iris trial pattern removed and ready for the investment

The lower portion of the ocularist flask was filled with dental stone, the posterior tissue surface of the wax pattern was laid on it, and the dental stone was allowed to set. Separating media were coated over the stone, and the upper half of the flask was filled with dental stone and assembled with the lower half. After dewaxing(Fig:7), investing was done by compression moulding technique with clear heat cure acrylic with small amount of zinc oxide added to it for shade matching of the sclera in relation to the working eye. After curing final prosthesis was obtained, trimmed, finished & was highly polished.(Fig:8)



Fig:7 After Dewaxing.



Fig:8 Final prosthesis trimmed, finished, highly polished and delivered.

DISCUSSION

A correctly placed ocular prosthesis should restore the normal opening of the eye, support the eyelid, restore a degree movement, be adequately retained and aesthetically pleasing. With the advent of some newer material like heat-polymerised acrylic resin, it was possible to fabricate prosthesis with a life-like appearance. Acrylic resin is superior in relation to other ocular prosthetic materials with regard to tissue compatibility, aesthetics, durability and stability of color, adaptability of form, cost, and availability^{4,5,6}. Now a day's silicon instead of acrylic resin has advantages such as reduced treatment time, light weight prosthesis and increased simplicity which makes this method an alternative for fabricating ocular prosthesis^{1,2,4}.

Numerous impression techniques have been described in literature. Few of them are:

- 1) Direct impression / external impression technique
- 2) Stock ocular tray impression technique.
- 3) Stock ocular tray modification.
- 4) Impression with custom ocular tray.
- 5) Impression using stock ocular prosthesis.
- 6) Ocular prosthesis modification.
- 7) Wax scleral blank technique.

However, the simplified custom made technique described here is easy, economical and adjustable. This technique provides better results functionally as well as aesthetically.

Preliminary impression of the socket was made using alginate which was in accordance with the impression technique used by Ravi Shankar Y et al. and Adarsh N et al.¹⁰

After an acceptable impression of the eye socket had been obtained, it was invested in Type-II dental stone. Stone mould was partially split after setting and impression of the socket was removed. The impression obtained in the mold was filled with melted wax and carving was done

on margin. This was in accordance with the procedure followed by Adarsh N et al.¹¹

A small hollow syringe needle cap was attached to the conformer to provide a channel for the flow of impression material inside the socket. Now trial for the coneformer was done, and final impression was made with light body addition silicone material. As the impression material was injected through the hollow cap, the head was kept in the vertical position and the patient was instructed to move his eyes right, left, up and down. This allowed the impression material to flow and the anatomic details to be recorded precisely. Patient was asked to look at a distant spot at eye level with his gaze maintained in a forward direction. This step was based on the procedure followed by Kirti S et al.¹²

The final impression thus obtained was poured in Type – IV dental stone. Again the wax pattern was made on this final cast. A prefabricated ocular disc (with a stem in the center) iris was purchased from the market, and matching was done with patient's working eye. Wax pattern was reduced to a depth sufficient enough to incorporate the black ocular disc which was attached to it. The size of the iris of the natural eye was measured using a millimeter measurement gauge or an optical scale. This procedure was in accordance with the one followed by Kirti et al.¹², Ravishankar Y et al.¹⁰ and Mallikarjuna R et al.¹³.

Wax pattern trial was done and its position determined by using the contralateral eye as the reference when the patient gazes straight with his head erect. Wax sclera with iris trial pattern was removed and was ready for the investment.

CONCLUSION

An alternative and simple approach to fabrication of ocular prosthesis is presented here in this case report. Stock eye prosthesis has numerous disadvantages including poor fit and infection of the tissue bed. In comparison, the custom fabricated acrylic prosthesis is precise, has good fit and aesthetically superior. Simplified custom made technique provides better results functionally as well as aesthetically.

A well fitting and esthetic ocular prosthesis definitely restores patient's self-esteem and allows him to confidently face the world.

REFERENCES

- 1) Nafij BJ, Theerathavaj S, Mohammad KA. A Complete Procedure of Ocular Prosthesis: A Case Report. *International Medical Journal*. 2013; 20:729 -730.
- 2) Kaur A, Pavaiya A, Singh SV, Singh RD, Chand P. A simplified approach to fabrication of an ocular prosthesis: a case series. *Indian J Dent Res*. 2010; 21: 615-617.
- 3) Fernandes AU, Goiato MC, Batista MA, Santos DM. Color alteration of the paint used for iris painting in ocular prostheses. *Braz Oral Res*. 2009; 23:386-392.
- 4) Sandeep C, Gopinadh A, Kavya R, Phani PB, Sampath K, Krishna CA. A time saving method to fabricate a custom ocular prosthesis. *Journal of orofacial research*. 2013; 3: 42-45.
- 5) Doshi PJ, Aruna B. Prosthetic management of patient with ocular defect. *J Ind Prosthodont Soc* 2005; 5: 37-38.
- 6) The glossary of prosthodontic terms. *J Prosthet Dent*. 2005; 48-49.
- 7) Artopoulou II, Montgomery PC, Wesley PJ, Lemon JC. Digital imaging in the fabrication of ocular prostheses. *J Prosthet Dent*. 2006; 95: 327-330.
- 8) Kohli D, Mehta S, Makawana P, Choudhary S. An Ocular Prosthesis: A Case Report. *Pravara Med Rev*. 2011; 3.
- 9) Nidhi DS, Aruna JB, Gangadhar SA. Fabrication of custom ocular prosthesis using a graph grid. *Pravara Med Rev*. 2009; 4.
- 10) Shankar Y. Srinivas K. Manmeet Singh. Anuj Wangoo. A New Procedure for the Fabrication of Custom Ocular Prosthesis. *DJAS* : 2011;1:14.
- 11) Adarsh.N, Pradeep, Suresh.B. S, Yogesh.R.B, Rachana.K.B. Ocular Prosthesis Made Easy A Case Report. *INTDC*: 2011;3(1):105-106.
- 12) Kirti Somkuwar, Robin Mathai, Panambily Jose. A custom-made ocular prosthesis. *People's Journal of Scientific Research*. 2009 July Vol. 2 (2).
- 13) Ragher M, Chatterjee A, Sanketsopanpatil, Chatterjee D, Mallikarjuna DM, Swetha V, et al. Ocular Prosthesis- A Simplified Technique. *Austin J Clin Case Rep*. 2014; 1(12): 1061.

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