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CASE REPORT

OCULAR PROSTHESIS: CUSTOM OCULAR PROSTHESIS TECHNIQUE– A CASE REPORT

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ABSTRACT:

An eye for an eye is what the old saying goes. The eye plays a vital role as one of the six senses. From vision to expression it has its varied 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 economical factors. A case-report of a custom-made ocular acrylic prosthesis is presented here, which had acceptable fit, retention and esthetics.

KEY WORDS: Ocular Prosthesis, acrylic, case report

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 suffered the psychological trauma of an ocular loss requires a prosthesis that will provide the optimum cosmetic 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 appearance¹⁻². With the advancement in ophthalmic surgery and oral & maxillofacial prosthetics, an ophthalmic patient can be rehabilitated very effectively.

The art and science of making artificial eye dates back to 3000 B.C. from the days of the early Egyptians. In those days, artificial eyes were made of enamelled metal or painted clay and attached to cloth and worn outside the socket. Excavation of tombs have given the proof of artificial eye constructions by using copper, gold with coloured enamel, precious stones and earthenware. Ambrose Pare (1510-1590), a French man was the first to use both glass and porcelain eyes which could be worn inside the socket. By 1835 artificial eyes were manufactured on a large scale in Germany and were supplied to the United States during the two world wars. However in 1943 supply from Germany was halted and the US Army and Navy both undertook research to find a substitute. Research was concentrated on plastics which led to the development of acrylic eye. Then onward methyl methacrylate became popular because of its strength and ease of repair.⁴

Reasons for an eye loss can be innumerable ranging from congenital defect, tumor, irreparable trauma, sympathetic opthalmia to the need for histological confirmation of a suspected diagnosis.³⁻⁴ Surgical procedures in the removal of an eye can

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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).¹⁻⁴

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 one⁵⁻⁷.

Today a majority of unfortunate patients all around the world use artificial eye made of acrylic⁵. 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 accurately⁸.

Keeping the above mentioned points in mind we at the Department of Prosthodontics, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow successfully rehabilitated a patient in need of an ocular prosthesis of which the case report has been described as follows:

CASE REPORT

A 25 year-old male patient Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow 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. Fig-1

PROCEDURE

Patient was instructed 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. 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.

After an acceptable impression of the eye socket had been obtained, it was invested in Type-II dental stone Fig-2. 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 Fig-3. Now investing of the wax pattern of conformer in heat cure acrylic resin was done by compression moulding technique Fig-4. 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.

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A small hollow tube was attached to the conformer to provide a channel for the flow of impression material inside the socket Fig-5. Now trial for the cone former was done and final impression was made with light body addition silicone material. Once impression material was injected through the hollow tube, head was moved back to the vertical position and the patient was directed 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-6.

The final impression thus obtained was poured in Type –IV dental stone Fig-7. 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 contra lateral 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 Fig-8. Wax sclera with iris trial pattern was removed and was ready for the investment.

The lower portion of the ocular 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 Fig-9. After dewaxing, 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 contra lateral eye. After curing final prosthesis was obtained, trimmed, finished & was highly polished Fig-10.



Fig-1 Pre-operative Volume 6, Issue 1, 2017



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Fig-2 Preliminary Impression



Fig-3 Primary cast



Fig-4 Conformer



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Fig-5 Hollow tube with conformer



Fig-6 Final Impression



Fig-7 Final Cast



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Fig-8 wax up Trial



Fig-9 Flasking



Fig-10 Final Prosthesis

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DISCUSSION

Fabrication of ocular prosthesis has been known to human being since times immemorial. Prosthetic rehabilitation fulfils aesthetic as well as psychological requirements for a patient¹⁻². A correctly placed ocular prosthesis should maintain its orientation when the patient is looking straight ahead. A correctly placed prosthesis should restore the normal opening of the eye, support the eyelid, restore a degree movement, be adequately retained and aesthetically pleasing. Earlier artificial eyes were made of enamel, metal or painted clay and attached to cloth and worn outside the socket. With the advent of some newer material like heat-polymerised acrylic resin it was possible to fabricate prosthesis with a life-like appearance. Methyl methacrylate resin is superior to other ocular prosthetic materials with regard to tissue compatibility, aesthetic compatibilities, durability and permanence of color, adaptability of form, cost and availability⁴⁻⁵. 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 prosthesis¹⁻²⁻⁴.

CONCLUSION

Although the patient cannot see with the ocular prosthesis however, it has definitely restored patient's self-esteem and allowed him to confidently face the world. The use of ocular prosthesis has changed the patient's social life at a significant level and improved the confidence too.

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