Case Report

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Prosthetic Fabrication of Scleral Shell for an Eviscerated Defect: A Case Report

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ABSTRACT

Background: The loss of an eye causes mutilation of the face and causes anxiety and depression in life. Maxillofacial prostheses which restore and replace stomatognathic and associated facial structures with artificial substitutes, aims at improving the patient aesthetics, restore and maintain health of the remaining structures and consequently provide physical and mental well being. Accurate customisation of these tissues facilitates a close edition of the custom prosthesis to the tissue bed resulting in better potential for normal activities of the patient. The endeavor of all ocular prosthetic procedure is to permit rehabilitation of the patient in the society with a normal appearance and confidence. The present case report describes a clinical report of rehabilitating post evisceration patient post accident of right eye with custom made artificial prosthesis that can create esthetically satisfactory fallout of the mutilated state in patients.

Keywords: Evisceration, custom made ocular prosthesis, maxillofacial prosthesis.

INTRODUCTION

The rehabilitation of patients with congenital or acquired defects of the eye is an ever testing job. Rehabilitation is to restore the patient's normal appearance, comfort along with rational functional movements. The loss of an eye can cause significant psychological, as well as social, consequences. A fundamental objective when restoring an ophthalmic socket with an ocular prosthesis is to enable the patient to cope better with the difficult process of rehabilitation after an enucleation or evisceration.[1]

The placement of an ocular implant provides additional anatomic support for the residual contents of the orbit, increases motility of the overlying ocular prosthesis, and provides muscular stimulus for orbital growth. The disfigurement associated with the loss of an eye can cause significant physical and emotional problems. The eviscerated globe provides excellent motility of the prosthesis as the extraocular muscles are intact. Increased sensitivity to the socket makes the fitting of the prosthesis difficult. With limited space within the fornices, the prosthesis is more difficult to fabricate. [2]

Surgical procedures adapted for the removal of an eye are classified into three categories: evisceration, enucleation and exenteration.[3,4] Evisceration involves removal of the contents of the globe, but leaving the sclera and sometimes cornea in place.[5]

Methylmethacrylate resin is superior to other ocular prosthetic materials in tissue compatibility, esthetic capabilities, durability, color permanence, adaptability of form, cost and availability.[6] Custom made ocular prosthesis could be of either glass or Methylmethacrylate resin. Glass is not the material of choice as it subject to breakage and surface deterioration from contact with orbital fluids.[7] The present case report illustrates fabrication of the custom ocular prosthesis for rehabilitation of post evisceration patient.

CASE REPORT

A 26 year old male patient was referred and registered in the prosthetic post graduate section of

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Fig 1: Eviscerated defect in right eye.

Fig 2: Absence of medial portion of the upper and lower eyelid and undercut on the medial portion of lower eyelid in right eye.

Fig 3: Alginate impression of the defect.

Fig 4: First pour with orientation grooves of the defect.

Fig 5: Split Cast and secondary pouring of the defect.

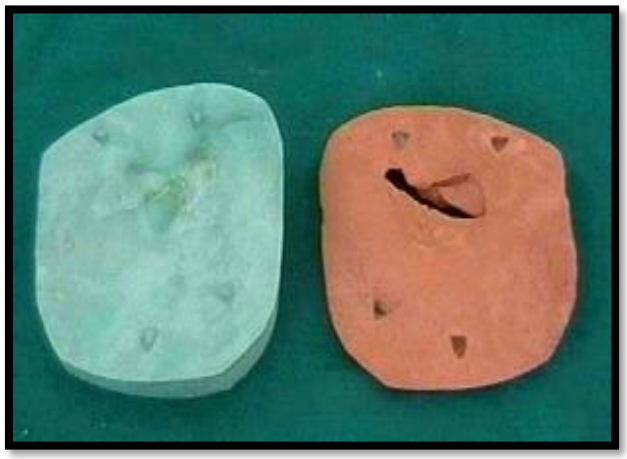

Fig 6: Flasking of the cast.

Fig 7: Processed Scleral Shell.

Fig 8: Trial of the scleral shell in eye socket.

A.B. Shetty Memorial Institute of Dental Sciences, Mangalore, India, with chief complaint of facial disfigurement and requisite to replace his right eye. On taking history reveals an automobile accident, seven years back which led to injury to the right eye and operated for the same. Since then, he reported loss of vision in right eye. Ocular tissue which was damaged along with right eye ball was surgically removed. Immediate ocular prosthesis was not given during last seven years. On examination of patient, it was established that patient had evisceration type of defect and presence of scar tissue on the sclera. **(Figure 1)** There was absence of medial portion of the upper and lower eyelid and absence of undercut on the medial portion of lower eyelid**. (Figure 2)** A customised acrylic resin ocular prosthesis was planned for the patient. An informed consent was obtained from the patient prior conduction of procedure followed by appiication of 2% lignocaine hydrochloride topical gel on ocular tissues of left eye in order to reduce tissue irritability of mucosa while making impression. The socket was cleaned by irrigating with saline solution and dried with cotton pellets. Patient seated in a semi-reclined position. Irreversible hydrocolloid (alginate) impression material was made for the eye socket through and impression was recorded under functional movements of the ocular muscles. The impression was poured in die stone. **(Figure 3)** Wax pattern was made in cast with modeling wax. The wax pattern s blank was tried in the ocular socket and fullness of the eyelid adjusted. An imaginary vertical line was drawn on the right side of the face which passes through the pupil of left eye. Now this wax pattern was invested. A heat cure clear acrylic was used to cure it using compression molding procedure**. (Figure 4,5,6)** Finally, the prosthesis was tried in the orbital socket to compare with contralateral eye for iris size, color and its position in the sclera which was bare. After polymerization, the prosthesis was removed carefully and the plaster mold was preserved. The prosthesis was polished, finished and final verification done inside the ocular bed. Final verification of the prosthesis in the ocular bed was done after finishing and polishing. **(Figure 7)** Position of pupil and diameter of the iris was marked in acrylised prosthesis. Fabric colors were used to paint pupil and iris. A contact lens was adhered over painted part in order to provide natural appearance. The characterized prosthesis inserted into socket. **(Figure 8)** The patient was comfortable and satisfied with the prosthesis. Instruction for periodic removal and cleaning of prosthesis as well as tissue bed was given to the patient. Follow-up was done after a week, 3 and 6 months.

DISCUSSION

Empirically fitting a stock eye, modifying a stock eye by making an impression of the ocular defect[8], and the custom eye technique[9]are the most commonly used techniques. The fabrication of a custom acrylic resin eye provides more esthetic and precise results because animpression establishes the defect contours also the custom tray fabricated in this

technique reduces thepressure being applied on the eye ball during impression making.

An ideal ocular prosthesis should restore the normal opening of the eye, provides support to the eyelids, restores a degree of eye movement, it should be adequately retentive and esthetically pleasing.[10,11] Many techniques have been documented in fabrication of an ocular prosthesis, a stock eye can be used for making an impression of the defect and a custom made prosthesis can be fabricated.[12,13] Several custom made techniques can be used for fabricating a prosthesis by making a special tray and obtaining an impression by injecting an impression material through vent made in the tray .[14,15]Merits of custom made prosthesis are that it retains the shape of the socket, prevent collapse of the lids, provides proper muscular activity of the lids, prevents accumulation of fluid in the cavity, maintains palpebral opening similar to natural eye, has a gaze similar to natural eye, mimics coloration and proportions of natural eye.[16]

Whereas custom ocular prosthesis provides good fit, enhanced esthetics, proper eyelid fullness, accurate sclera contour and iris color match and positioning, Polymethyl methacrylate resin (PMMA) and glass are generally used for custom ocular prosthesis fabrication. When compared to glass, PMMA has several advantages like easy availability, simplified fabrication method and less chance of breakage. The custom ocular prostheses are more preferable than stock prosthesis because of its improved fit, less fluid accumulation in tissue prosthesis interface, better comfort and esthetic result. [17]Stock eye prosthesis was advocated by Laney and Gardner.[18,19]

In comparison to custom ocular prosthesis, stock prosthesis has several disadvantages, for example poor fit, constant tissue irritations due to bacterial growth in the accumulated fluid in tissue prosthesis interface and compromised esthetic outcome. Relining a stock eye shell can improve the fit of the prosthesis to underlying tissue, while sclera contour and iris position would still be compromised. Whereas custom ocular prosthesis provides good fit, enhanced esthetics, proper eyelid fullness, accurate sclera contour and iris color match and positioning.[20]

CONCLUSION

Advantages of customized fabrication with acrylic resin method is simple, less time-consuming, though artistic skill and knowledge about color and combination is required. Rehabilitation of patients who have suffered the psychological trauma of an ocular loss require a prosthesis that will provide the optimum cosmetic and functional result as early in life as possible. Though the patient cannot see with the prosthesis, but can surely develop back the normal social sense of worth for his lifestyle.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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