Case Report

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OCULAR PROSTHESIS MADE EASY: A CUSTOMISED APPROACH

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ABSTRACT

Loss of eye causes psychological trauma because it leads to facial disfigurement which is associated with loss of facial structures. By rehabilitating with ocular prosthesis helps to overcome this psychological trauma by means of restoring lost facial structure and esthetics of patient, helping the individual in leading a norma life. Although prefabricated ocular prostheses are available, because it has various qualities like: better adaptation, comfort and esthetics custom-made ocular prosthesis is more preferred when compared to prefabricated stock shells. This article describes a simplified approach to fabricate custom-made ocular prosthesis.

KEYWORDS: Ocular prosthesis; evisceration; enucleation; characterization of prosthesis

INTRODUCTION

The loss of an eye has psychological trauma on various aspects life of an individual.[1-3] Loss of eye can occur due to various reasons like trauma, congenital malformation and surgical removal of ocular tissue.[4] On the basis of severity there are various surgical modalities of management such as: exenteration, evisceration, or enucleation. Evisceration is surgical method where some portion of intraocular contents of globe is removed, leaving sclera conjunctiva, extraocular. muscles and optic nerve of eye intact in this method. Enucleation is surgical removal of globe and a portion of optic nerve from orbit. In the method of Exenteration an en bloc removal of entire orbit is performed, which involving partial or total removal of the eyelids and is performed mainly for removal of malignant orbital tumors.[5] Ocular prosthesis is advised in order to restored defects caused by evisceration or enucleation. Ocular prosthesis can be generally classified such as custom made and stock shell. Custom-made ocular prosthesis shows close contact with surrounding tissue, and has capability of distributing pressure equally as compared to stock shell and also scores over other alternative in decreasing conjunctival abrasion. The advantage of close tissue contact to surrounding tissue improves tissue health by reducing fluid accumulation in tissue prosthesis interface. Fluid accumulation has disadvantage of tissue irritation and increased bacterial growth.[6] In this case report a simplified procedure to fabricate an acrylic custom-made ocular prosthesis is described for an eviscerated ocular socket.

CASE REPORT

A 65 year-old male patient came to the Department of Prosthetics, Crown Bridge and Implantology, with chief complaint of facial disfigurement due to shrunken eyelids of the left eye. On taking history reveals a injury with sharp instrument of left eye due to an accidental fall from a tree before 20 years. The patient was diagnosed with large hematoma and swelling in region of left eye. Ocular tissue which was damaged along with left eye ball were surgically removed by surgeons in order to relieve pain from hematoma. Immediate ocular prosthesis was not given during last 20 years. On examination of patient, it was established that patient had evisceration type of defect and intraocular tissue bed was healthy with adequate depth beneath upper and lower fornices for prosthesis retention (Fig. 1). A customised acrylic resin ocular prosthesis was planned for the patient. An informed consent was obtained from the patient prior conduction of procedure. 2% lignocaine hydrochloride topical gel was applied 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

Fig. 1: Preoperative photograph

Fig. 2: Impression procedure of ocular defect by 2mm disposable syringe using impression material

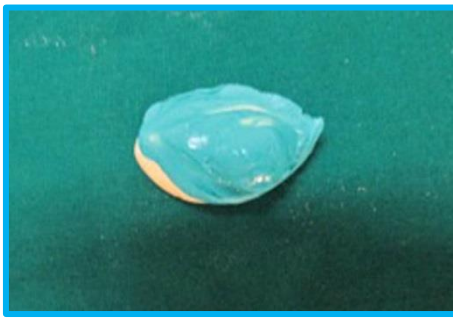

Fig. 3: Impression is made

Fig. 4: Wax up of defect

Fig. 5: Trial Done

Fig. 6: Final Ocular Prosthesis

solution and dried with cotton pellets. Eyebrows and eye lashes on the defect side were lubricated with petroleum jelly. Patient seated in a semi reclined position. A 2 ml disposable syringe was attached on the center of the tray (plastic spoon with adhesive and holes was made on centre of tray (Fig. 2 & Fig. 3). The tray extensions were adjusted in the ocular socket. Fast-setting vinyl polysiloxane impression material was injected into the eye socket through the hollow plastic tube and impression was recorded under functional movements of the ocular muscles (Fig. 3). The impression was poured in die stone. Wax pattern was made in cast with modeling wax (Fig. 4). The wax pattern s blank was tried in the ocular socket and fullness of the eyelid adjusted (Fig. 5). An imaginary vertical line was drawn on the right side of the face which passes through the pupil of right eye. Now this wax pattern was invested. A heat cure clear acrylic was used to cure it using compression molding procedure. Finally, the prosthesis was tried in the orbital socket to compare with contralateral eye for eyelid fullness, iris size, color and its position in the sclera blank. Small quantity of auto polymerizing. 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. An imaginary vertical line was drawn on the right side of the face which passes through the pupil of right eye. Similarly, second vertical line was drawn on the left side of the face keeping the equal horizontal distance from the midline. Position of pupil and diameter of the iris was marked in acrylised prosthesis.To characterize the

prosthesis, 0.5 to 1 mm of acrylic resin over the sclera surface was trimmed off leaving the iris intact. Now fabric colors was used to paint pupil and iris. A contact lens was sticked over painted part in order to provide natural appearance. The characterized prosthesis inserted into socket (Fig. 6). The patient was comfortable and satisfied with the prosthesis. The easy steps of placement and removal of the prosthesis was demonstrated to the patient. Instruction for periodic removal and cleaning of prosthesis as well as tissue bed was given to the patient. Follow-up was done after 1 week, 1 and 3 months.

DISCUSSION

The disfigurement of eye associated with the loss of ocular tissue keeps a person away from social and professional activities. Maxillofacial Prosthodontist plays a vital role in bringing back such patients to a normal social life by restoring the lost ocular tissue with artificial substitutes. Literatures have suggested many procedure for the fabrication of ocular prosthesis such as stock eye shell, relining stock eye shell or custom ocular prosthesis is different types of prosthesis which are used by clinicians.[7-8] 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.[10] 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 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. PMMA resin is commonly used for ocular prosthesis fabrication. The custom ocular prostheses are more preferable than stock eye prosthesis because of its improved fit, less fluid accumulation in tissue prosthesis interface, better comfort and esthetic result. Techniques reported in literature for custom ocular prosthesis include black iris disk or painting on iris disk, and paper iris disk with digital photography. Painting on iris disk requires more laboratory time and demands a clinician with high artistic skill and good knowledge about color while expensive equipments and knowledge about advanced computer software are needed for digital photography method. Ocular implant placed in the orbit provides attachment for the rectus muscle which aids in the motility of ocular prosthesis similar to natural eye. Movement of ocular prosthesis provides muscular stimulation for orbital growth in a growing child. High cost and long treatment time are the major disadvanges of ocular implants.

CONCLUSION

In this case report, PMMA iris disk with similar color, size and shape of contralateral natural eye was fabricated and color matched with contralateral iris disk, as it provides better esthetics and comfort to patient. Advantages of this method is simple, less time-consuming, though artistic skill and knowledge about color and combinatirequire. This technique does not require expensive equipments. Ocular implant being costly and advanced age is also a factor, ocular implant was not used in this patient.

CONFLICT OF INTEREST & SOURCE OF FUNDING

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