ORIGINAL RESEARCH PAPER

Volume-8 | Issue-5 | May-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

AN EYE THAT FEELS: A CASE REPORT

Dental Science

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ABSTRACT

An ocular prosthesis is an artificial substitute for an enucleated eye ball. Eyes, besides being an essential sense organ, are the beauty of the face. The disfigurement associated with the loss of an eye can cause significant social and psychological consequences. The prime requisites of eye prosthesis include a convincingly normal appearance and more significantly a comfortable fit which will motivate the patient to use the prosthesis. The ocular prostheses are either ready-made or custom-made and are produced from either glass or methyl methacrylate resin. Glass is not the material of choice as it is subject to damage and surface deterioration from contact with orbital fluids, leading to reduced usable life expectancy.

KEYWORDS

Enucleation, Monopoly syrup, Characterization of prosthesis, Occular prosthesis, Stock iris

INTRODUCTION:

Eyes, besides being an essential sense organ, are the beauty of the face.[1]The disfigurement associated with the loss of an eye can cause significant social and psychological consequences. Thus, replacement of the lost eye at the earliest possible is necessary to promote physical and psychological healing for the patient and thus overall improvement in the quality of life[2]. An ocular prosthesis which gives attention to the accurate duplication of natural color, contour, size and ocular orientation will provide realism and symmetry for patients who need it.[3] Prosthetic rehabilitation may probably be the only alternative available to such patients to help restore their confidence and self-esteem.[4]The requirements of iris reproduction in the fabrication of custom-made ocular prosthesis are the proper selection of the color and scleral shell with the eyeball convexity.[5]Custom eyes have several advantages including better eyelid movements, even distribution of pressure due to equal movements, thereby reducing incidence of ulceration, improved fit , comfort, and adaptation improved facial contours and enhanced esthetics gained from control over the size of iris, and sclera.[6]

CASE REPORT:

A 22 year old male patient reported to the Department of Prosthodontics, Institute of Dental Sciences, Bareilly, U.P., with chief complaint of missing left eye for 6 months (Fig.1). The patient gave a history of trauma 6 months ago which was followed by enucleation of left eye. On clinical examination, it was established that patient had healthy intraocular tissue bed and adequate depth beneath upper and lower fornices. Thus customized acrylic resin ocular prosthesis was planned for patient. An informed consent was obtained from patient prior to conduction of procedure.

Impression technique:

Patient was seated on a dental chair, and chair position was adjusted. Eyebrows and eyelashes on the defect side were lubricated with petroleum jelly. The impression was taken with low-viscosity alginate using direct impression technique with 5ml syringe (Fig.2).The impression was evaluated for adequate extensions. Primary cast was poured with dental stone. Adaptation of spacer was done, and customized impression tray was fabricated from autopolymerizing acrylic resin. Pupil location on resin tray was assessed and a perforation of 3-4 mm diameter hole was made. 5mL syringe was used for supporting the tray, and to carry final impression material. Side of the syringe tip were roughened and wedged into pupil perforation hole and sealed from external surface with autopolymerising acrylic resin. For final impression, addition silicone light body impression material was mixed and injected into socket. Patient was instructed to tilt the head backwards and perform normal eye movements in all direction to allow material to flow into all areas of enucleated socket as well as onto trays outer surface to record lid movements. Once filled, the head was moved back to the vertical position and the patient was directed to move his eyes up and down to facilitate the flow of impression material to all areas of socket.[7] While patient gazed upwards, the cheeks were pulled down and inferior portion of impression was rotated out of the socket. Impression was checked for accuracy and excess material trimmed. (Fig.2).Two mold dental stone was made. The lower part of impression was poured using type 4 dental stone. Four side indexing was done for proper orientation. Second part was poured with type 3 dental stone. Markings were made on all four sides of cast for proper orientation.[8](Fig.3).

Fabrication of wax pattern and try in:

Wax pattern was fabricated by pouring molten wax into the cast. The wax was properly contoured and carving of the eye was done. Try in of wax pattern was done to check wax pattern for size, support from tissue, extensions of eye movement and eyelid coverage. Position of iris was located with the help of millimeter grid placed on patient's face. Patient was instructed to fix the gaze of natural eye on an object at least 3 feet in front of eye level. Position of iris-pupil area of the natural eye in relation to outer and inner canthus was marked on grid. Same markings were transferred on defect side. Stock eye with iris closely matching to patient's natural eye was selected. The iris portion of stock tray was carefully removed from scleral shell and fixed on wax pattern according to predetermined markings. Try in was done (Fig.3).

Wax pattern was flasked and dewaxing was done. A small stick of autopolymerising resin was attached to iris to secure position of iris while flasking. (Figure 10: Dewaxing of wax pettern). Customized heat- cure tooth colored acrylic(DPI Mumbai-Shade-C) was used for packing. A long curing cycle(8 h at 165 degree F) was recommended for acrylization.

Delivery of ocular prosthesis:

The prosthesis were finished and polished with pumice. Prosthesis was tried in the eye to evaluate for proper extensions. Characterization was done by taking the right normal eye as the standard option and guide. Acrylic paints and red silk fibers to stimulate the veins were used. (Fig.4). The characterization of the sclera and around the iris was done with acrylic paint. The silk fibers were secured in place with monopoly syrup[8]. (Syrup was made by combining 10 parts of heat cure acrylic resin monomer to 1 part of clear acrylic resin polymer by weight. The monomer was poured into beaker and placed in a pan of boiling water. When the monomer was warm, the polymer was added slowly and stirred with glass rod continuously till the solution obtained the viscosity of light oil. After it cooled to room temperature, it was poured to dark bottle and refrigerated). Final try-in was done. A thin sheet of 0.2 mm wax was adapted over the final try-in prosthesis. The prosthesis was flasked. This was followed by application of clear heat-cure acrylic over it and cured with short curing cycle (74°C for 1½ h followed by 100°C for 1 h).The final prosthesis was finished and polished. Insertion was accomplished by lifting the upper eyelid with the thumb and forefinger, sliding the ocular prosthesis as far as possible under the upper lid, and pulling the lower lid down to allow it to slip into the socket. Minor adjustments were made according to the patient's comfort and esthetics (Fig.4).

Patient was instructed to wash it once a day-or more often if mucus accumulates with pure (Ivory) soap and tepid water, scrubbing it well between thumb and fingers and rinsing it well before reinsertion.[9]

DISCUSSION:

An ocular prosthesis is an artificial substitute for an enucleated eye ball[13]. It is a good option when reconstruction by plastic surgery or the use of osseointegrated implants is not possible or not desired. The custom-made ocular prosthesis conforms accurately to the socket as the prosthesis is fabricated based on the existing anatomy of the patient. This improves adaptation, movement of the eye ball, and the exact match of the iris position as that of the adjacent natural eye.[12] Prosthetic rehabilitation fulfils aesthetic as well as psychological requirements for a patient. A correctly placed prosthesis should restore the normal opening of the eye, support the eyelid, adequate retention and aesthetically pleasing. 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 availability.[10]

CONCLUSION:

The use of custom-made ocular prosthesis has been a boon to the average patient who cannot afford the expensive treatment options available. A properly fabricated custom-made prosthesis enhances the patient's comfort and esthetics by increased adaptiveness and natural appearance, and also maintains its orientation when the patient performs various eye movements. A custom-made ocular prosthesis enhance the patient's rehabilitation to a normal lifestyle even though it is not functional.

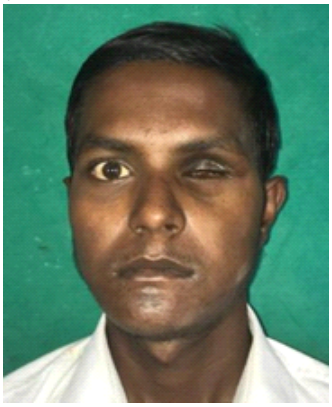

Figure 1: Patient with missing left eye

Figure 2: Primary Impression & Final Impression

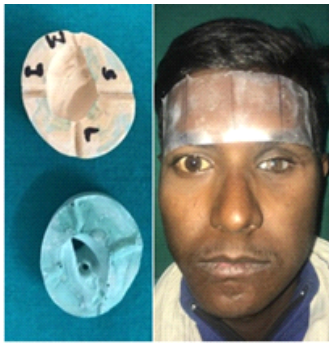

Figure 3: Master Cast with indexing & Wax Pattern Try In

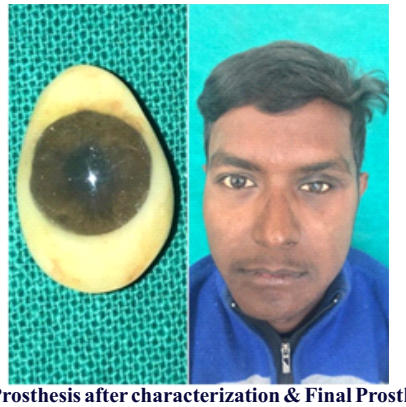

Figure 4: Prosthesis after characterization & Final Prosthesis

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