

Prosthetic Rehabilitation of a Post Evisceration Patient with Custom Made Ocular Prosthesis: A Case Report

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Abstract It is the god given right of human being to appear human, and the face is a person's visiting card. We can hide everything but we can't hide our face. Eyes are generally the first feature of the face to be noticed and the presence of a pair of eyes is quite essential to maintain the balance and the esthetics of the face. Loss of eye has a crippling effect on the psychology of the patient. The aim of all ocular prosthetic procedure is to enable rehabilitation of the patient in the society with a normal appearance and self esteem. This article describes a clinical report of rehabilitating post evisceration patient due to glaucoma of right eye with custom made artificial prosthesis using stock eye shell that can create esthetically pleasing results.

Keywords Custom made · Ocular prosthesis · Evisceration · Stock eye shell

Introduction

Eyes are the first feature of the face to be noticed. Loss of the eye either due to trauma, tumor or any other condition not only cause loss of sensory function but also there is unaesthetic look and has a psychological effect on the

patient. Thus, prosthesis should be provided as soon as possible to raise the spirits and ease the mind of the afflicted.

The indication for the surgical removal of an eye are irreparable trauma like bomb explosion, fights, infections, tumor, blindness, pain in the eye, the need for histological confirmation of a suspected diagnosis, possible prevention of sympathetic ophthalmial and cosmetic reasons [1]. Surgical procedures adapted for the removal of an eye are classified into three categories: evisceration, enucleation and exenteration [2, 3].

Patients requiring treatment with custom ocular prosthesis are those who have lost ocular structure through orbital evisceration or enucleation. Evisceration is the removal of the contents of the globe, but leaving the sclera and on occasion the cornea in place [4].

The fabrication of a definitive ocular prosthesis should begin as soon as the socket has healed. Prosthetic rehabilitation is enhanced if an implant can be placed in the orbit to provide an attachment for the Rectus muscles which can impart motion coordinated with natural eye. However, the placement of an ocular implant is not always possible or feasible. Patients in this situation can be treated with custom made ocular prosthesis that have been adapted to accommodate specific situations [5, 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]. Methylmethacrylate resin is superior to other ocular prosthetic materials in tissue compatibility, esthetic capabilities, durability, color permanence, adaptability of form, cost and availability [6]. This clinical report demonstrates the use of stock ocular prosthesis to fabricate the custom ocular prosthesis for rehabilitation of post evisceration patient.

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Clinical Report

A 65 year old female patient was referred to department of Prosthodontics and Maxillofacial prosthesis of Sri Ramachandra Dental College and Research institute, Chennai from the department of Ophthalmology. On history it was found that the patient was suffering from Glaucoma of the right eye and the eye had to be eviscerated. So surgery was done and the eye was eviscerated. After healing found satisfactory patient was referred for the prosthetic management of the loss. On examination there were no signs of any adhesion or dehiscence of conjunctiva and tissue bed was free of inflammation to start with the impression procedure for fabrication of ocular prosthesis.

Treatment Plan

Ocular prosthesis can be either readymade (stock) or custom made. Custom made eye have some advantages including better mobility, even distribution of pressure due to equal movement thereby reducing incidence of ulceration, improved fit, comfort and adaptation, improved facial contours and esthetics. Also, custom eye enhance tissue health by reducing potential stagnation space at the prosthetic tissue interface [3, 8, 9]. So, considering all these benefits it was decided that a custom made ocular prosthesis would be the best prosthetic option to meet the needs of the patient. Also to get better esthetics and color matching without following the conventional, cumbersome and technique sensitive method of iris button painting, use of matching stock eye shell was planned for this particular case.

Procedure

- (1) Patient was explained about the procedure and petroleum jelly was applied to the eyebrows for the easy removal of the impression material after it sets.
- (2) An impression was made of the ocular defect using a disposable syringe; stock ocular tray and non-irritating impression material i.e. light body elastomeric impression material, Dentsply, DETREY GmbH, 78467 Konstanz, Germany.
- (3) During the procedure, the patient was seated in an upright position with the head supported by the head rest. This position allows the natural positioning of the palpebrae and surrounding tissue relative to the force of gravity.
- (4) The stock tray was placed into the defect before making the impression to determine the proper orientation and fit without overextension. The tray

was oriented to support the lids in a similar position to the lids of the natural eye. The tray was then removed from the defect.

- (5) Elastomeric impression material of light body consistency, Dentsply, DETREY GmbH, 78467 Konstanz, Germany, was mixed and loaded in the syringe, and sufficient material was injected to fill the concavity of the tray slowly to avoid incorporation of air bubble. The tray was then reinserted and reoriented in the defect; sufficient material was injected to elevate the lid contour similar to the normal side.
- (6) After the material had set, the assembly was removed and the impression was examined for defects and voids (Fig. 1).
- (7) After obtaining an acceptable impression, it was reproduced in auto polymerizing clear acrylic resin, DPI, The Bombay Burmah Trading Corporation, 9, Wallace street, Mumbai-400001, INDIA, to act as conformer. The acrylic scleral pattern should be highly polished and free from dust, debris and irritating monomer before placing it in the ocular defect.
- (8) A protective blepharospasm occurred when the acrylic conformer was first placed in the socket. Patient was asked to relax for several minutes till the irritation subsides.
- (9) After this fit of conformer was observed by gently lifting the lids and observing the extensions into the fornices. Areas of under extension were corrected by adding wax.
- (10) The support and soft tissue contours afforded by the scleral pattern was compared visually with the patient's eye open and by bimanual palpation with the eyes closed. Wax was added or acrylic was trimmed from the conformer until satisfactory



Fig. 1 Close up view of impression



Fig. 2 Selected prefabricated eye shell

contour of the eyelids were achieved both in the open and closed positions.

- (11) Once this done, a prefabricated eye shell whose iris button color was matching with the contra lateral eye was selected (Fig. 2). Iris button was obtained by trimming all the scleral part of prefabricated shell. An iris button approximately 0.5 mm smaller than the actual measurement of the contra lateral side was produced, allowing for the magnification of the iris button by the superficial clear acrylic layer.
- (12) Now objective was to fix this lens button to the scleral pattern in a manner such that the apparent gaze of both natural and artificial eyes should be on the same object, or parallel to one another and in the same plane.
- (13) For this patient was seated comfortably in an upright position without the back or head supported. The operator was standing directly in front of and at eye level with the patient. The patient was instructed to fix the gaze of the natural eye on an object 3 feet in front of and at eye level with the natural eye.
- (14) The position of the iris-pupil area of the natural eye in relation to the inner canthus and the upper and the lower lids was then transferred to the conformer. Conformer was then removed and space was created by removing acrylic for iris button attachment with wax.
- (15) Conformer with iris button was then replaced in ocular defect and the position was checked. Once final position of iris button was achieved, assembly was carefully removed from the socket without movement of the lens. Wax was flowed all around to seal lens at its place (Fig. 3).
- (16) The finished pattern was then flaked in a small two piece brass flask. Flasking was done taking care that the iris button should secured to one counter of the

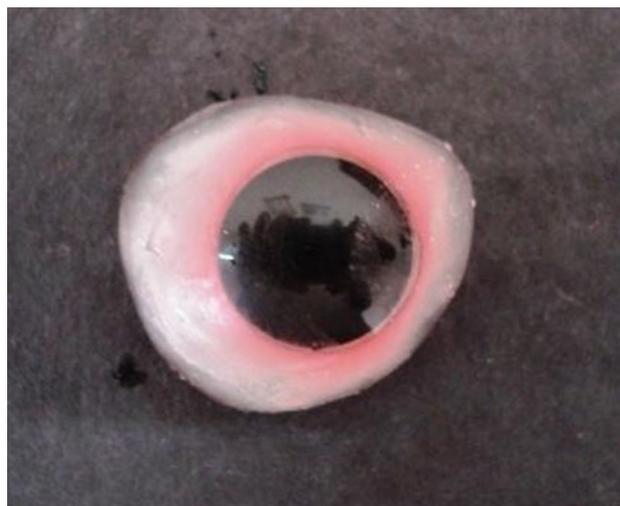


Fig. 3 Iris button attached to conformer

flask and remaining part in the other portion of the flask (Fig. 4). To achieve this acrylic stalk was attached to iris button before flasking. This acrylic stalk will ensure exact positioning of iris button. After dewaxing, packing was done with the selected heat cure tooth color acrylic resin whose shade was matching with the sclera of contra lateral eye.

- (17) The sclera of the prosthesis was tinted using CAMEL oil colour, Camel Limited, Mumbai-400059, INDIA, to compare favorably with the sclera of the natural eye. Veining was added by attaching red-dacron fibers to the prosthesis using the monomer-polymer syrup (Fig. 5). The pattern and type of vessels of the opposite eye was reproduced as close as possible. Care was taken to cover the rayon threads with the clear syrup before applying the colors as color of the vessels might change [10].



Fig. 4 Afer dewaxing iris button attached to one part of flask

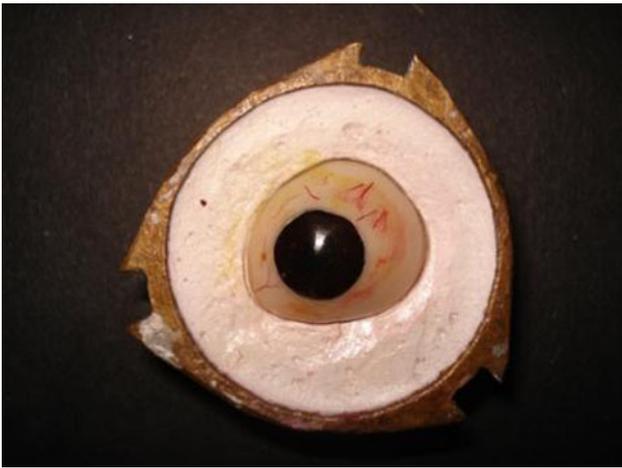


Fig. 5 Eye shell after characterization

- (18) A thin layer of processed clear acrylic resin, Trevalon Clear, Dentsply India Pvt. Ltd., Gurgaon-122016 (HR), INDIA must be applied over the surface of the painted sclera to seal in pigments and vascular fibrils as well as to replace any adjustments. For this, a sheet of modeling wax was adapted over the frontal surface of the scleral block, but not on to the tissue surface or posterior surface (Fig. 6).
- (19) Scleral blank was again flaked and wax was removed by dewaxing. Separating media (cold mould seal), ISOLANT, Dentsply India Pvt. Ltd., Gurgaon-122016 (HR), INDIA, was applied to the mold cavity and mold was then packed with clear methyl methacrylate resin and polymerized by slow boiling for 2 h. The polymerized ocular prosthesis was finished and carefully polished to preserve all the important form modifications (Fig. 7).
- (20) Final prosthesis was inserted in ocular defect and patient was asked to relax for at least 10 min to



Fig. 6 Reflasking with wax layer to create space for clear acrylic



Fig. 7 Finished final prosthesis



Fig. 8 Patient without prosthesis



Fig. 9 Patient with prosthesis

allow orbicular muscles to relax, to permit critical evaluation (Figs. 8, 9).

- (21) Patient was instructed on how to remove and place the prosthesis. She was instructed to wear the prosthesis day and night, and asked to wash the prosthesis with mild soap once every 1 week. More frequent cleaning would be indicated if particularly dusty or dirty conditions were encountered. Patient

was examined 1, 3 days and 1 week after prosthesis insertion. Patient was fully adapted to the prosthesis 1 week post insertion and no further modification in prosthesis was done.

- (21) Patient is kept on regular follow-up and 1 year follow has been done and no modification was required.

Discussion and Summary

So many techniques have been used in fitting and fabricating ocular prosthesis. Empirically fitting a stock eye, modification of stock eye by making an impression of the ocular defect [11], and fabrication of a custom ocular prosthesis [12] are the most commonly used techniques. The fabrication of a custom acrylic eye provides more esthetic and precise results because an impression establishes the defect contours and the iris and the sclera are custom fabricated [13]. Prosthetic rehabilitation of post evisceration patient has been explained in this case report. This article explains some of the basics principles associated with the fabrication of the custom ocular prosthesis. A properly fitted and acceptable custom ocular prosthesis has the following characteristics:

- Retains the shape of the defect socket.
- Prevents collapse or loss of shape of the lids.
- Provide proper muscular action of the lids.
- Prevents accumulation of fluid in the cavity.
- Maintains palpebral opening similar to the natural eye.
- Mimics the colorations and proportions of the natural eye.
- Has a gaze similar to the natural eye [4].

Conclusion

Fabrication of the custom ocular prosthesis is described using prefabricated stock eye shell. Using prefabricated iris

button makes procedure less technique sensitive and faster with more predictable results. The main disadvantage of this technique compare to traditional iris button painting technique is that, there are more chances of getting better esthetics in our final prosthesis. Although patients can't see with such prosthesis but it can definitely help patients to live life with self confidence and respect, without being starred by people.

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