

Fabrication of Ocular Prosthesis – A Case Report

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Abstract

The loss of part of the face will have a physical, social, and psychological effect on those affected. Beauty rehabilitation with custom-made maxillofacial prosthetic gadgets gives such individuals expert social popularity and relieves problems. Custom-made prosthesis, in assessment to inventory prosthesis, offers better a match to the eye socket, higher beauty effects, and less discomfort to the patient in the long-term. The objective was to fabricate eye prosthesis in 20-year male patient. A suitable stock eye shell was modified to fit the eye socket, followed by relining with low fusing compound and making a final impression with polyvinyl siloxane impression material (Ivoclar, vivadent). The impression was poured in die stone, stock eye shell was positioned in flask, and it was packed with clear acrylic for final processing and finishing. The ocular prosthesis was inserted, esthetic appearance, iris symmetry with the contralateral eye, the palpebral openings, and patient's comfort were reassessed. Additional follow-up is necessary to check the condition and fit of the ocular prosthesis in such patients.

Keywords: Iris disk, Maxillofacial prosthesis, Ocular prosthesis.

INTRODUCTION

The injury to part of the face can have a physical, social, and psychological impression on those affected. Maxillofacial prostheses, which re-establish and replace stomatognathic and associated facial structures with artificial substitutes, aim to recover the patient's esthetics, restore and maintain health of the remaining structures, and consequently provide physical and mental well-being.^[1] Depending on the importance of the condition, the surgical procedure can include evisceration, enucleation, or exenteration. Evisceration and enucleation surgeries are very traumatic and result in eyeball removal with subsequent serious corporal image alterations. Such alterations change the form in which the patient interacts with the others in everyday life.^[2] A multidisciplinary management and team approach are important in providing accurate and effective rehabilitation and follow-up care for the patient. Thus, the efforts of the maxillofacial prosthodontist are essential to restore the patient's quality of life. The importance of an ocular prosthesis with suitable esthetics and reasonable motility in restoring normal appearance in patients with anophthalmia has long been recognized.^[3] The acrylic resin ocular prosthesis attains intimate contact with the tissue bed. The close adaptation of ocular prosthesis tends to distribute pressure more equally as compared to prefabricated ocular

prostheses. The rehabilitation efforts can only be effective when a patient can appear in public without fear of attracting unwanted attention. This technical procedure describes an impression procedure and wax pattern try-in in the same appointment and also the detailed laboratory procedures for fabrication of an ocular prosthesis.^[4] Several methods 3–5 have been described to position the iris portion of an ocular prosthesis accurately. Recently, Guttal *et al.* and Jain *et al.* recommended the use of the facial midline as a reference point to orient the iris. Previously, Roberts proposed the use of a pupillometer for proper placement of the pupil, and Joneja *et al.* described the use of window light or light reflection viewed symmetrically in both eyes.^[5,6] Custom made prosthesis, in comparison to stock prosthesis, provides better a fit to the eye socket, better cosmetic results, and less discomfort to the patient in the long-term. Moreover, custom-made acrylic resin eye gives a better fit to the superior sulcus and better cosmetic results in the socket with cicatricial bands.^[7,8]

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CASE REPORT

A 20-year-old male patient presents to the Department of Prosthodontics, Hazaribag College of Dental Sciences and Hospital with the chief complaint of congenitally missing left eye.

Treatment procedure

The procedure was started by application of topical anesthesia with 0.5% tetracaine HCl ophthalmic solution to increase the comfort during impression procedure. Patient was instructed to be seated in an upright position with head supported by head rest (allows natural positioning of palpebral and surrounding tissue relative to force of gravity). After the left eye socket inspection, primary impression was taken with irreversible hydrochloride (Zelgan plus irreversible hydrochloride). Fabricated special tray was attached to tip of disposable syringe through which secondary impression material was dispensed. After inspection of lid contour and impression mobility, patient was asked to look right, left, up, and down. The movement of tray follows pupil of natural eye with proper extension and orientation. A fast-setting vinylpolysiloxane impression material (Ivoclar, vivadent) was loaded in disposable syringe through which the material was dispensed in special tray and final impression was made as shown in Figure 1. Attach stem of impression tray to a wood stick with sticky wax, assembly suspended over a small medicine cup. Pour room temperature vulcanizing silicone mold material into the cup to completely cover the impression. Mold is cut and spread apart to remove impression tray, mold is replaced in the cup, molten wax filled through the hole made by stem of impression tray and cut the sprue and wax pattern removed and smoothened (Figure 2). A scleral wax pattern was made with red wax and tried in the patient's eye socket for fullness retention and stability. After the try in (Figure 3) of the scleral wax pattern, flasking, and dewaxing (Figure 4), stock eye was selected in a way that it is dimension color of iris complex and sclera resembled closely to the contralateral eye. Positioning of the iris began with the help of repeated orientation verification with the contralateral iris. The position of iris and the size of the palpebral openings

were compared with those of the normal eye. The patient was instructed to look infinitely. The stock eye shell was modified by trimming its periphery with acrylic trimmer to fit the eye socket and was oriented to the dried visual axis. The stock eye selected according to the shade of the natural contralateral eye. After verification and orientation of stock eye shell, it was positioned in flask and it was packed with clear acrylic for final processing and finishing. Once the ocular prosthesis is inserted, esthetic appearance, iris symmetry with the contralateral eye, the palpebral openings, and patient's comfort are reassessed. There should not be any discomfort to the patient while he asked to look in different directions. Period of wear – artificial eye need not be removed for cleaning each day, the patient can wear the prosthesis as long as it remains comfortable and non-irritating regardless whether it is a day, week, a month, or more.

DISCUSSION

Fabrication of ocular prosthesis presents several advantages compared to the other iris painting technique. This provides acceptable esthetic results because it closely replicates the



Figure 1: Final impression using polyvinyl siloxane impression material

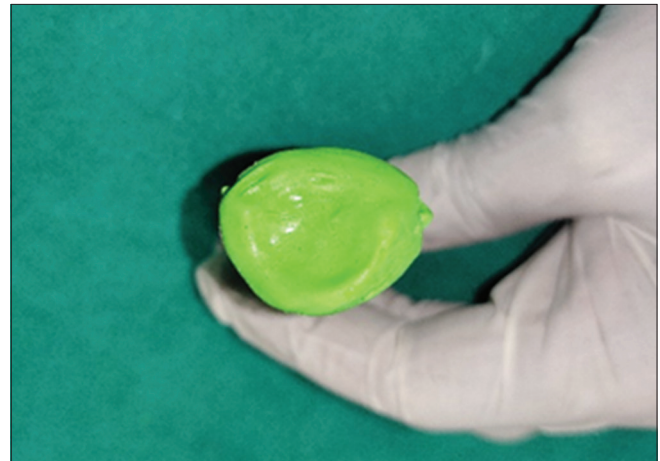


Figure 2: Completed final impression of the eye



Figure 3: Wax blank try in

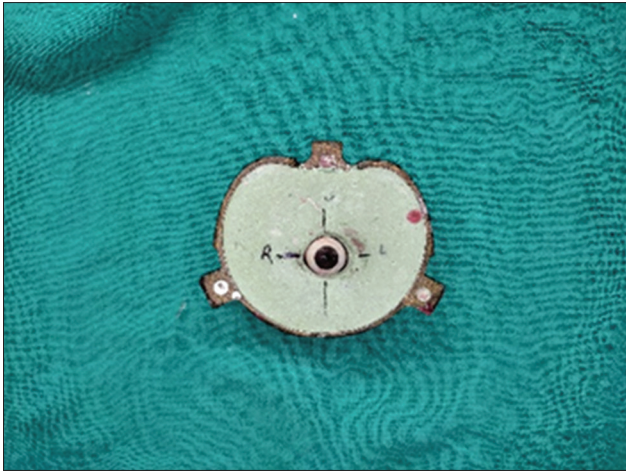


Figure 4: Flasking procedure. Poured impression invested in the lower half of the flask. Outer surface of the stock eye shell wax on the tissue surface. After dewaxing, stock eye shell repositioned in the upper half of the flask

patient iris with minimal color adjustment and modifications. The described technique is simple, decreases treatment time, and requires minimal artistic skills, which are necessary in fabrication of ocular prosthesis.

The making of prosthetic iris is a challenging and critical stage during the construction of ocular prosthesis. It might be accomplished with various techniques and artistic resources available. Several variations exist in the fabrication technique of prosthetic iris methods. An accurate iris reproduction in the fabrication of ocular prosthesis provides esthetic results replicating the natural iris. Numerous techniques have been indicated in fitting and fabricating prosthetic artificial eyes. The prosthesis used to improve esthetic results in the orbital region can be classified as orbital and ocular prosthesis. There are methods in fabrication of ocular prosthesis as seen in the study done by Cevik *et al.* They cover the contact lens iris with water-resistant spray used for artwork and attaching it to the ocular disc space might allow color stabilization. This technique provides that natural iris convexity with contact lenses also supported with scleral clear acrylic resin with auxiliary convexity.^[7]

The necessities of iris reproduction in the fabrication of custom-made ocular prosthesis are the proper choice of the color and scleral shell with the eyeball convexity. Hand painting using different shades of color for a natural look includes both artistic skills and science of color.^[7]

Although, special digital photography equipment's and settings, as well as, computer software that allows for image adjustment are required. Moreover, research is required to evaluate the long-term color stability and aging of ocular prosthesis.

CONCLUSION

A step-wise procedure for acquiring an ocular impression using a stock eye shell as an impression tray is defined, in which, the wax pattern try-in was completed at the same appointment. An improved laboratory procedure used for fabrication of ocular prosthesis which further decreases the number of appointments and provides better esthetic at reduced number of visits to the dental office.

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