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A Comprehensive Guide to Ocular Prostheses: From Creation to Maintenance

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Abstract

The human eye is one of the most significant aspects of facial aesthetics. The loss of an eye can have a negative impact on the patient's physical, social, psychological, and general outlook on life. Human eye loss can be caused by surgical treatments such as enucleation, evisceration, or exenteration, which are used to treat malignancies, congenital abnormalities, sympathetic ophthalmia, irreversible injuries, underlying infections, phthisical eye, and other conditions. There is requirement for an ocular prosthesis following surgical treatments. An ocular prosthesis can be made using a variety of materials and processes. This case study describes the creation of a semicustomized ocular prosthesis using a stock iris shell.

Keywords: malignancies, aesthetic abilities.

INTRODUCTION

A lost organ can have a serious impact on one's psychology, particularly if it is an important element of one's looks. A missing eye always causes physical, social, and psychological alterations in a patient's way of thinking and self-esteem. Surgical techniques to remove eyeballs are roughly split into three categories: evisceration, enucleation, and exenteration.[1] Enucleation is the total removal of the globe and a portion of the optic nerve, which may or may not include muscles. Evisceration, on the other hand, is a more conservative surgery that entails the removal of the globe's intraocular contents, which may include the cornea. (2) Enucleation is often performed under general anesthesia, however it can also be done under local anesthetic using a retrobulbar block (3).

In rare circumstances, a considerable piece of the optic nerve is removed to limit the chance of any residual malignant tissue. Orbital exenteration is a more extreme surgery that involves the removal of the orbital contents, including the periorbita and eyelids. (4)

An ocular imperfection caused by surgery impairs an individual's functional and aesthetic abilities. Rehabilitation of an eye impairment with a custom-made ocular prosthesis increases the individual's social acceptability, psychology, and self-confidence. Prosthodontists play a critical role in the creation and fitting of ocular prostheses, which are artificial eyes designed to replace a missing or damaged eye. And in reproducing the natural color, size, shape, and orientation of an ocular prosthesis to give it a lifelike look.

Acrylic resin ocular prostheses are classified into three types: (i) custom-fitted ocular prostheses created from socket impressions, (ii) stock (prefabricated) ocular prostheses, and (iii) stock ocular prostheses modified using various procedures.[5] This article outlines a simple yet time- and cost-effective approach for creating personalized ocular prostheses with an iris inserted from a stock eye.

CASE REPORT

A 33-year-old male patient presented to the Department of Prosthodontics with a main complaint of appearance. The patient described a severe injury to his right eye with shattered sharp glass sustained in an accident in 2022 and wants an artificial eye built. [FIG 1]

Upon inspection, the socket had healed and the surrounding tissues seemed normal. A little irritation was detected. The muscular function of both the upper and lower eyelids appeared normal. The fornices had acceptable depth, which will be

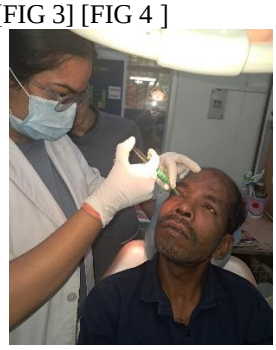
used to improve prosthesis retention. A semicustomized ocular prosthesis was designed using a stock iris shell, a custom created sclera, and a custom built ocular tray. The patient was educated for the entire procedure.

PROCEDURE

1. Duplicate the stock scleral shell into a custom ocular tray made of clear acrylic autopolymerizing resin (DPI RR Cold Cure, Dental Products of India). Attach a needle cap to inject light body consistency polyvinyl siloxane (PVS) material (Aquasil, Dentsply) during impression making.[FIG 2]

2. The ocular tray was tested in the patient's ocular cavity, and any abnormalities and interferences in movement were trimmed.

3. Petroleum jelly was placed on the eyelids before the imprint was taken, as well as 2-3 drops anesthetic eye drops was put in the socket .
4. The PVS light body imprint material was loaded into a disposable syringe and injected into the previously installed ocular tray in the orbit. The patient was instructed to perform motions during the operation that resulted in a functional impression. [FIG 3] [FIG 4]

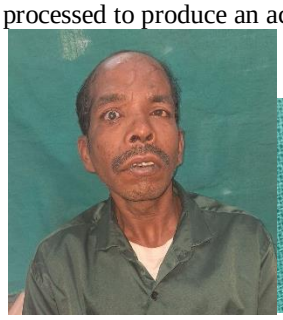


5. After the material was set, it was pulled out and checked for any air bubbles or imperfections, then poured with the dental stone.
6. Impression were then beaded and boxed. Type IV dental stone was used to create a main cast. [FIG 5]

7. The stock ocular prosthesis was customized by selectively grinding and shortening it by 2 mm all around the primary cast boundary. The impression was then formed by applying wax to the proximal portions of the shell and taking motions.
8. To ensure perfect fit and contouring of the wax blank, insert the wax pattern after the iris has been positioned in the patient's eye. Centralization of the iris was tested by requesting the patient to stare straight ahead to a distant object, bearing in mind the symmetry with the iris of the patient's neighboring unaffected left natural eye.
9. His eye motions were assessed for symmetry and function, and it was discovered that the wax pattern moved and synchronized with the patient's natural eye movements. The shell's intaglio surface was then putty indexed, and a cast was formed. [FIG 6] [FIG 7] [FIG8]



10. The trial wax design was processed to produce an acrylized, custom-made ocular prosthesis. [FIG9] [FIG 10]




Patient and guardian was taught how to insert and remove the prosthesis and it's home care protocol which includes

Following instructions were provided to the patient

1. Never wipe or wet your artificial eye with rubbing alcohol since it will shatter and ruin the ocular prosthesis.
2. Remove the ocular prosthesis as directed and preserve it in water or a soft contact lens saline solution. This prevents deposits from drying on the surface.
3. To clean your prosthesis, apply antibacterial soap. Wash the eye with your fingers.
4. Rinse out the socket with sterile saline using a bulb syringe.
5. Any eyedrops can be used while the fake eye is in situ.
6. You should get your ocular prosthesis examined, cleaned, and polished at least once a year, if not more often.

DISCUSSION

Prosthetic rehabilitation can provide both aesthetic and psychological needs for patients, without restoring eyesight. A properly positioned ocular prosthesis should maintain.

Its orientation is when the patient looks straight ahead. It should restore normal eye opening, support the eyelid, allow for some mobility, be well-retained, and visually beautiful. Accurate impressions are important for developing a well-fitting extraoral prosthesis.

The ocular prosthesis, made to order of acrylic resin, is in intimate contact with the tissue bed [6]. The semicustomized ocular prosthesis has certain advantages over stock eyes, including better contouring, color matching, and synchronized movements with the contralateral eye [7]. Customizing the iris requires the operator to commit more time and skill.

Semicustomizing the prosthesis with the stock iris and customized sclera will provide benefits from both stock and custom prostheses. This procedure is not indicated when the color, shape, and arrangement of the stock iris do not sufficiently match the patient's contralateral natural eye[8].

CONCLUSION

The custom-made ocular prosthesis looked significantly better than the ordinary ocular prosthesis. The methodology presented in this case history is a straight forward and easy procedure that results in a more esthetically acceptable and accurate prosthetic output. Although the patient cannot see with the ocular prosthesis, it has significantly improved his self-esteem and allowed him to face the world with confidence. The use of an ocular prosthesis has significantly enhanced the patient's social life and confidence.

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