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CASE REPORT

Custom-Made of ocular prosthesis for post enucleation: A Case Report

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ABSTRACT

Ocular prosthesis is part of a whole rehabilitative treatment plan after surgery. Stock ocular prosthesis, are premade, come in a range of colours and sizes with a right and left standard shape, and inexpensive to manufacture. The disadvantage is not being able to fit completely in the eye socket. To address this issue, the patients require a suitable prosthesis to enhance their living standards. A 75-year-old male patient came to RSGM UGM Prof. Soedomo using a stock ocular prosthesis. Complained that his ocular prosthesis loose and uncomfortable. The treatment plan was making custom-made ocular prosthesis using acrylic resin. The treatment procedure comprises minting the individual eye by using an individual tray; making the model of wax sclera followed by trying on the wax sclera pattern to the patient eye socket and continuing the acrylic resin process of sclera followed by trying on the eye socket, and then determining the location and iris diameter to draw the iris and pupil. The final step is inserting the ocular prosthesis into the patient's eye socket. One week after insertion, the patient felt comfortable and has no complaints. Ocular prosthesis help improve the patient's quality of life. (IJP 2024;5(2):141-144)

Introduction

The lost of an eye through accident, from disease or from congenital causes is a major event that impacts on person's self-image and well-being. It also requires changes in routine associated with wearing and maintaining a prosthetic eye or scleral shell prosthesis.[1,2] The loss of eyeballs may lead to problems in function, psychology, and aesthetics. Loss or absence of the eyeballs can be caused by a congenital abnormality or trauma that requires surgical intervention.[3] Replacement of the missing eyeballs may be necessary to improve physical and psychological healing for the patient and to increase social acceptance.[1]

There are two types of prosthetic eye, stock and custom-made. Unlike custom-fit prosthetic eyes, stock eyes, wheter made from glass or PMMA, are premade and come in a range of colours and sizes with a right and left standard shape. The main advantage of stock prosthetic eyes is inexpensive to manufacture, provide large of selection, do not need to be fitted or adjusted by an ocular prosthetist. This is an important consideration in countries whose populations do not have access to custom-fit PMMA prosthetic eyes because of cost. The chief advantage of custom-fit PMMA prosthetic eyes is that they can be moulded and coloured for individual patients. This greatly improves the patient's prospects for receiving a comfortable and aesthetically pleasing prosthesis with optimum motility.

The purpose of this article is to describe the rehabilittion treatment with a custom-made ocular prosthesis.

Case Report

A 75-year-old male patient came to RSGM UGM Prof. Soedomo using a fabricated ocular prosthesis. The patient's history was a traffic accident 30 years ago. The patient had to undergo enucleation surgery. The patient complained that his prosthesis was loose and had become discoloured.

On objective examination, the eye socket was normal; there was no irritation; and there was no infection. The eyelid muscles were still in good condition, so the patient could open and close the eyelid. The eye socket was deep enough to allow for retention of the eye prosthesis figure 1. The first visit was for anamnesis, objective examination, and to take a photo of the patient's profile. The diagnosis was of loss of the left bulbus oculi due to trauma. The treatment plan was to make a customized ocular prosthesis with acrylic resin.

The patient was asked to close his eyes. Afterwards an irreversible hydrocolloid impression material was poured around the eye figure 2. Then the cast was filled with dental stone figure 3. The hardened stone was used as a working model to make individual trays using a self-curing acrylic resin figure 4.

A light body polyvinyl siloxane impression material was injected into the eye socket, to which an individual tray was attached figure 5. The patient was instructed to move his eye to the right and then to the left, then up and down, and finally, in a circular motion, to

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Figure 1. **Pre-treatment**

Figure 2. **Study Model Impression**

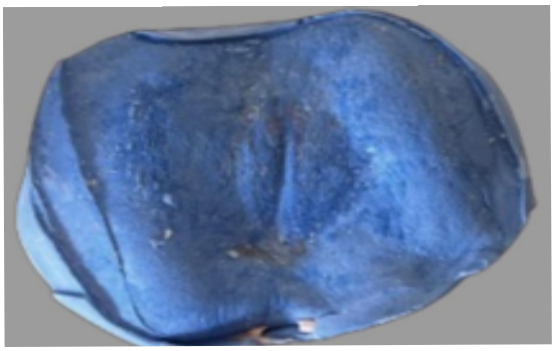

Figure 3. **The cast filled with dental stone**

obtain a functional impression of the defect. After the material was set, the impression was removed from the socket and it was examined for completeness or any voids figure 6. Boxing of the impression was done, and the cast was poured in three parts to get a split cast by using type III dental stone figure 7.

A wax pattern was fabricated by allowing molten modelling wax to flow into the mold figure 8. Afterwards, the wax pattern was tried in the patient's eye socket, and the patient was asked to move his eye to the left and right to check for comfort, stability, and retention figure 9. Furthermore, the sclera colour was recorded using photography of the patient's real eye figure 10. The smoothed sclera wax pattern and sclera colour notes were sent to the laboratory for packing.

The patient was instructed to look straight and keep all their facial muscles relaxed. The acrylic sclera was tried in the patient's eye socket, and the patient was asked to move his eye to the left and right to check for comfort, stability, and retention. Afterwards, the iris and the pupil were designed based on the other eye using a pencil. The iris diameters usually range from 10mm, 10.5mm, 11mm, 11.5mm, and 12mm2 . The iris distance measurement figure 11 and iris diameter was designed by direct measurement using a sliding caliper figure 12. Then design the diameter and midpoint of the iris figure 13 The acrylic sclera is tried on again on the patient figure 14 and then sent to the laboratory for iris colouring.

The prosthesis was inserted into the eye socket, and it was evaluated for aesthetics and patient comfort. The patient was educated to insert and remove the prosthesis figure 15.

Discussion

Ocular defects constitute an important maxillofacial deficiency which requires prosthetic replacement.[3] A few methods have been used, such as stock ocular prosthesis, modifying stock ocular prosthesis, and customized ocular prosthesis.[4] A stock ocular prosthesis has disadvantages such as a cavity gap, which can lead to an accumulation of tears and mucous secretion, creating heaviness in the cavity and resulting in the dislodgement of the prosthesis from the cavity. Moreover, the aesthetics are also compromised, as the shades of the sclera and the iris do not exactly match those of the contralateral eye.[4] Whereas the customized ocular prosthesis has advantage in

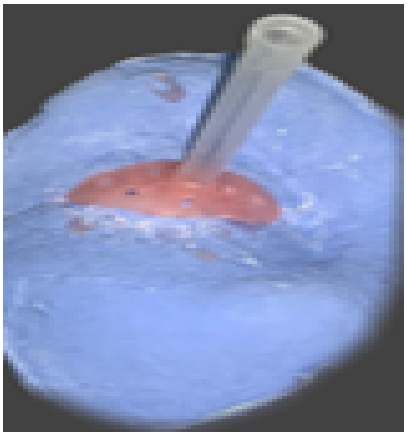

Figure 4. **Individual tray using self-cured acrylic resin**

Figure 5. **A light body polyvinyl siloxane impression material was injected into the eye socket**

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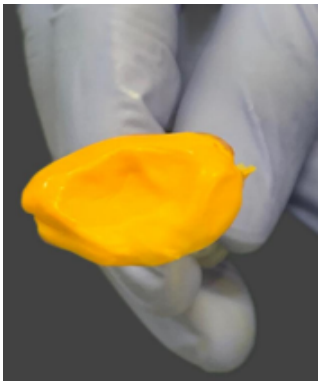

Figure 6. **Functional Impression**

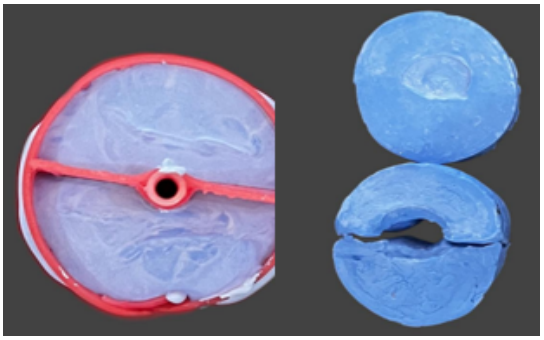

Figure 7. **Work Model**

Figure 8. **Wax pattern sclera**

Figure 9. **Wax sclera try-in**

resemblance of size and colour of the contralateral eye. This can help to maintain pressure balance around the eye socket, thus reduce the incidence of the conjunctival abrasion and ulceration. The customized ocular prosthesis provides more aesthetic results because the iris and the sclera are custom fabricated and painted. The iris painting is one of the important steps in the fabrication of a custom-made ocular prosthesis. This technique is complex, it increases the treatment time, and it requires artistic skills, which are necessary in the iris painting. Moreover, the age, systemic conditions and financial constraints may limit their use.

The protocol for managing mucoid discharge associated with prosthetic eyes suggests that prosthetic eyes should not be removed and cleaning more frequently than monthly and not less frequently than 6 monthly. Cleaning removes surface deposits, reduce the wettability of the prosthesis and reduce the ability of socket fluids to lubricate. Pine et al. suggest that prosthetic eye should be left undisturbed for at least one month. The socket and eyelid hygiene is maintained with daily washing and/or showering as it is with the sighted eye. If an episode of inflammation occurs, clean the socket without removing the prosthesis by syringing it with tepid eye wash solution or sterile saline.

Figure 10. **Recording the colour of sclera**

Conclusion and Suggestion

Ocular prosthesis is part of a whole rehabilitative treatment plan after surgery. The key of effectively rehabilitating patients with ocular defects is giving professional treatment with attentive and sensitive care. The use of customized ocular prosthesis can provide a good aesthetic result in the rehabilitation of patients. Additionally, it can help them reintegrate into society by enhancing their psychological well-being.

In addition to helping a minimal intervention strategy in the rehabilitative treatment plan after surgery, the adoption of a customized stock ocular prosthesis can provide an acceptable aesthetic outcome.

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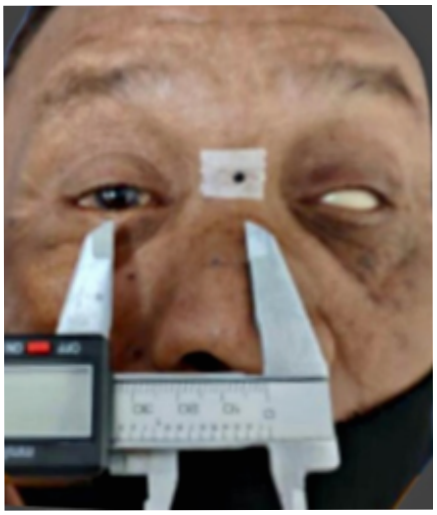

Figure 11. The iris distance measurement

Figure 12. The iris diameter measurement

Figure 13. The iris diameter and midpoint design

Figure 14. The acrylic sclera try-in

Figure 15. Insertion

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