

A customized sinistra ocular prosthesis for a geriatric patient

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ABSTRACT

Geriatric patients have limitations such as lack of communication, finance, and limited visit time. Therefore, fabricated ocular prosthesis is preferred. On the other hand, fabricated ocular prosthesis have disadvantage of not being able to fit completely in the eye socket. To overcome this problem, the patients need an appropriate prosthesis to increase their quality of life. A 75-year-old male patient, came to RSGM UGM Prof. Soedomo, using fabricated ocular prosthesis, complained that his ocular prosthesis loose and there was discoloration. Clinical examination, there were no abnormalities in the eye socket. The treatment plan was making customized ocular prosthesis using acrylic resin. The treatment procedure comprises impressing the eye by using 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 to the eye socket, and then determining the location and iris diameter to draw the iris and pupil. The final process is by inserting the ocular prosthesis to the patient eye socket. One week after insertion, the patient felt comfortable and had no complaints. Ocular prosthesis helps to improve the patient's quality of life.

Keywords: customized ocular prosthesis, rehabilitation, geriatric

INTRODUCTION

The eyes are very important organs for seeing and facial expressions.¹ The eye consists of several parts, such as the sclera, pupil, iris, limbus, colla-rate, and eye muscles². 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

Rehabilitation due to loss of an eyeball can be divided into two types, namely orbital implants and ocular prosthesis.² Ocular prosthesis was divided into two categories, namely fabricated and customized ocular prosthesis. The advantage of fabricated ocular prosthesis is that they are minimally manufactured because they do not require any manufacturing steps in the laboratory.² Fabricated eye prosthesis come in three sizes and three iris colours. The disadvantage of this eye prosthesis is discomfort and infection due to the difference in size between the eyeball and its socket, which results in a water sac that becomes a breeding ground for bacteria. Other disadvantage is that the mismatched iris colour causes aesthetic problems.²

The purpose of this article is to describe the rehabilitation treatment with a customized ocular prosthesis.

CASE

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 (Fig. 1A). 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.



Figure 1A Pre-treatment, **B** study model impression

MANAGEMENT

For individual tray fabrication, the patient was asked to close his eyes. Afterwards an irreversible hydrocolloid impression material was poured around the eye (Fig. 1B). Then the cast was filled with dental stones (Fig. 2A). The hardened stone was used as a working model to make individual trays using a self-curing acrylic resin.



Figure 2A Study model, B functional impression

The impression procedure

A light body polyvinyl siloxane impression material was injected into the eye socket, to which an individual tray was attached. 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 obtain a functional impression of the defect (Fig.2B). After the material was set, the impression was removed from the socket and it was examined for completeness or any voids (Fig.3A). Boxing of the impression was done, and was poured in three parts to get a split cast by using type III dental stone (Fig.3B).

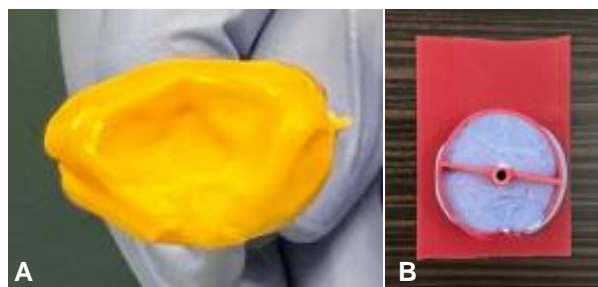


Figure 3A Functional impression, B work model

The wax sclera try-in

A wax pattern was fabricated by allowing molten modelling wax to flow into the mold (Fig.4A). 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 (Fig.4B). Furthermore, the sclera colour was recorded using photography of the patient's real eye. The smoothed sclera wax pattern and sclera colour notes were sent to the laboratory for packing.

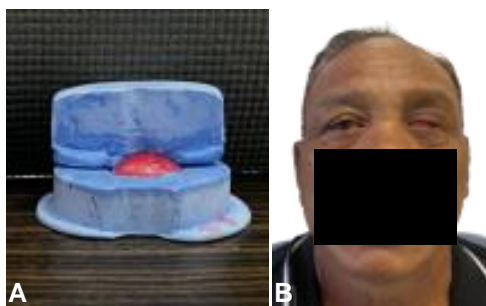


Figure 4A Wax pattern sclera, B wax sclera try-in

The acrylic sclera try-in and determine position of the iris

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 10 mm, 10.5 mm, 11 mm, 11.5 mm, and 12 mm.² The iris diameter was designed by direct measurement using a sliding caliper (Fig.5A). Then the acrylic sclera was sent to the laboratory for iris colouring.



Figure 5A Acrylic sclera try-in, B insertion

Insertion

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 (Fig.5B).

DISCUSSION

Ocular defects constitute an important maxillo-facial 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 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.

It is concluded that the key of effectively rehabilitating geriatric patients with ocular defects is giving professional treatment with attentive and sen-

sitive care. The use of customized ocular prosthesis can provide a good aesthetic result in the rehabilitation of geriatric patients. Additionally, it can help them reintegrate into society by enhancing their psychological well-being.

In addition to helping a minimal intervention geriatric strategy in the rehabilitation of geriatric patients, the adoption of a customized stock ocular prosthesis can provide an acceptable aesthetic outcome.

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