



(CASE REPORT)



Rehabilitation of Post Evisceration patient with ocular prosthetic: A clinical report

Rudy Effendi and Agus Dahlan *

Department of Prosthodontics, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, East Java, Indonesia.

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Abstract

The role of eyes in human body is very important, the dysfunction or loss of eyes can lead to some psychological and emotional behavioural issues. It's getting worse when this condition leads to a decrease in quality of life. The use of ocular prosthetic is highly suggested, it may replace the entire eye or the part of damaged eye such as outer scleral portion, and make the eye looks like before the damage. Custom-made acrylic resin ocular prostheses according to the shape and size adapted to the ocular socket of a patient can provide close adaptation between the prosthesis and the ocular base tissue leading to a more even distribution of pressure than factory stock eye prostheses with more inexpensive cost than stock eye prostheses.

Keywords: Ocular prostheses; Artificial eye; Evisceration; Medicine

1. Introduction

The role of eyes in human body is very important, the dysfunction or loss of eyes can lead to some psychological and emotional behavioural issues. It's getting worse when this condition leads to the decrease in quality of life [1]. The loss of eyes can be caused by several causes such as trauma, malignancy or congenital defects. This condition can also lead to aesthetic defect. The aesthetic defect often leads to psychological issues in life, to prevent this happen, the substitution prosthetic is needed. The use of ocular prosthetic is highly suggested, it may replace the entire eye or the part of damaged eye such as outer scleral portion, and make the eye looks like before the damage [2].

The procedure to make ocular prosthetic needs multidisciplinary approach [3]. Although the need of artificial eye can be fulfilled by some stock prosthesis that are inexpensive. Every socket is different, in order to make the precise size and shape, the prosthodontists should make ocular prosthetic individually by custom-made ocular prosthesis which is made from the impression of the socket and other procedures to make a precise ocular prosthetic aesthetically [4].

In this case report will be explained the step of fabricating sinistra ocular prosthetic of for a post-evisceration patient.

2. Case Report

A 39-year-old male patient came to Prosthodontics Department, RSGM Universitas Airlangga, requesting for left eye prosthesis. He had been using conformer since the last surgery and that made him lack confidence. The patient experienced Intraocular Foreign Bodies trauma while working (fig 1). After thorough examination with an ophthalmologist, the diagnoses of endophthalmitis and orbital cellulitis occurred after a week. Antibiotic therapy was given for approximately 1 week but the response was not good, so evisceration was performed. The patient had no history of systemic disease.

* Corresponding author: Agus Dahlan

Department of Prosthodontics, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, East Java, Indonesia.

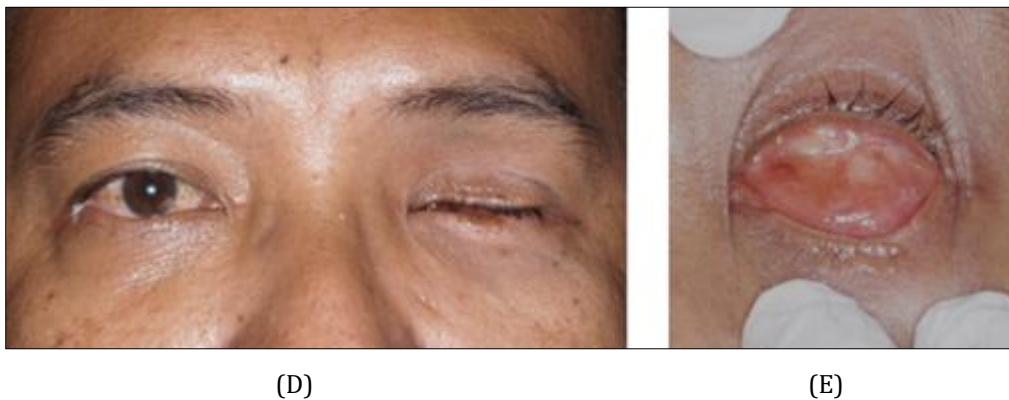


Figure 1 Patient profile left side view (A); front view (B); right side view (C); patient's maximum eye opening (D); and patient's eye defect (E)

2.1. Fabrication method

First, individual tray was checked for fitting in the eye socket of patient (fig. 2). An impression of the eye sockets were taken using individual tray and light body consistency of polyvinyl siloxane (PVS) impression material (Silagum, DMG, Hamburg, Germany). The impression material was applied using a mixing gun through the connecting tube in the coronal of the tray, until it was evenly distributed throughout the socket and the patient was instructed to close his eyes (Fig. 3).



Figure 2 Individual tray to perform impression in eye socket

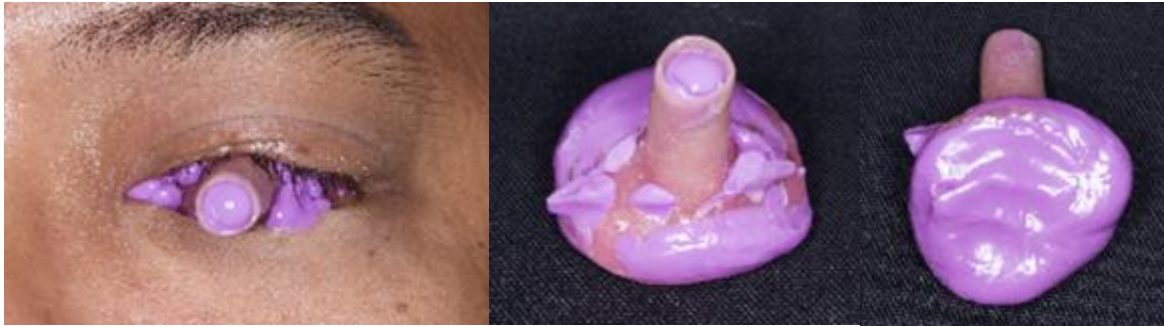


Figure 3 The impression of eye socket (A); the result of impression (B)

The eye sockets were implanted into a cuvette that had been given type III gypsum to obtain a mold to make a wax pattern. After the setting time, a mold was obtained that fit the eye socket of the patient (Fig. 4). The mold obtained was filled using the melted modeling wax (Cavex, Holland BV) and waited until it hardened. The wax pattern was then polished (Fig. 5).



Figure 4 The result of implanting eye socket impression into the cuvette

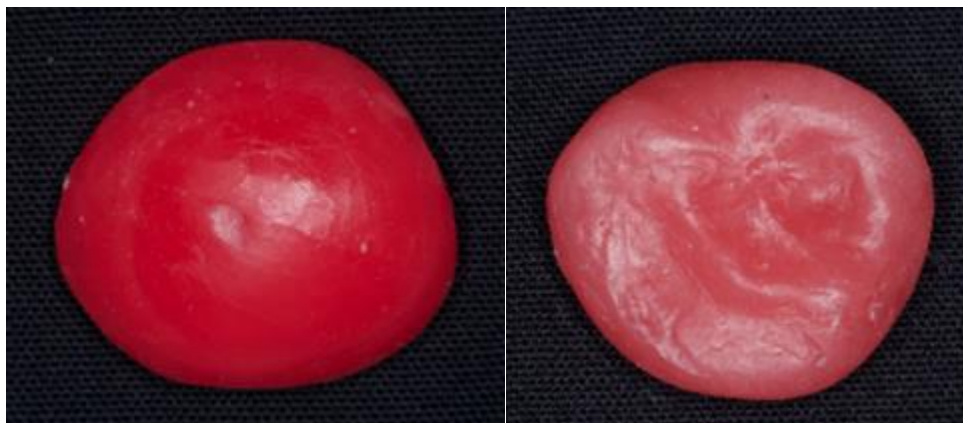


Figure 5 The result of wax pattern

The next step was try-in of the wax pattern. Minor corrections were made for the volume and convexity of the prosthesis, as well as the comfort of patient when using the wax pattern. Once the patient was comfortable, the focal point and diameter of the iris was marked on the wax pattern according to the right healthy eye, along with the determination of the iris' colours (Fig. 6). The wax pattern was then invested into a cuvette containing type II gypsum and wax was removed to obtain a mold for making the sclera (Fig. 7).



(A)



(B)

Figure 6 Try-in process of wax pattern on patient (A), measure the diameter of iris and determine the iris focal point (B)

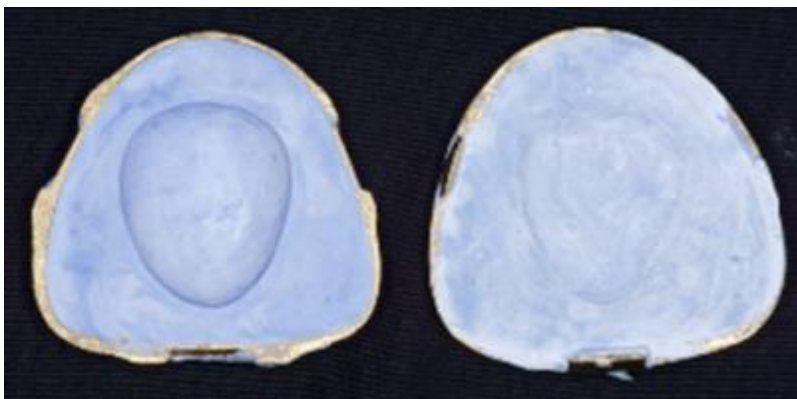


Figure 7 The impression to make a sclera

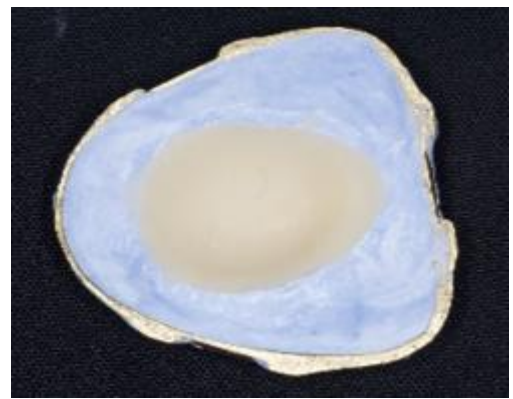


Figure 8 The process of making a sclera pattern

A scleral pattern was created based on the previous mold using self-cure acrylic material (Stellon) (Fig. 8). When performing a trial of the scleral pattern, corrections were made to the size and convexity of the prosthesis, as well as patient comfort when using the scleral pattern. Adjustments of the focal point and iris's diameter had also been made (Fig. 9). The scleral pattern was then cut according to the predetermined iris diameter width (Fig. 10).



Figure 9 Try-in the sclera pattern



Figure 10 Perforate the scleral pattern according to the width of the iris diameter

The scleral pattern then covered with a thin layer of modeling wax for the future heat-cured clear acrylic resin (Fig. 11). The wax-coated scleral pattern was invested into cuvette filled with gypsum. After the gypsum setting, the cuvette was opened and the wax was removed (Fig. 12). The blood vessels-like were added to the scleral pattern using a red thread (Fig. 13).



Figure 11 Scleral pattern that has been coated with a thin layer of wax

The next step was covered the scleral pattern with clear acrylic. Cold mold seal (CMS) was first applied on the gypsum surface. The clear acrylic layer was using heat-cured acrylic from Probase Hot, Ivoclar Vivadent. Powder and liquid acrylic were mixed in a ratio of 22.5:10. After reaching the dough phase, the acrylic was applied to the cuvette and coated with a layer of wet cellophane plastic. The cuvette was closed and pressed until the excess acrylic came out, then the cuvette was re-opened and the excess acrylic was cleaned. Then the cuvette was closed again and pressing was carried out without a cellophane plastic layer. Subsequently, heat polymerization was carried out in the water at a temperature of 100°C for 45 minutes. After cooling, the cuvette was opened and the prosthesis was removed.

The staining step was started with perforating the pupil as much as 1 mm according to the patient's focal point. Staining of the iris was performed using oil paints and referred to the normal eye color of the patient (Fig. 14). The posterior part of the prosthesis was covered using self-cure acrylic and the prosthesis was re-polished to a glossy finish (Fig. 15). Once all the surface was smooth, the prosthesis was inserted into the eye socket (Fig. 16). At the time of insertion (Fig.

17), an evaluation of the stability of the prosthesis and the comfort of the patient when using the prosthesis were carried out. The patient said he felt comfortable. In daily use, patients were trained on how to remove and insert the prosthesis, along with instruction to remove the prosthesis only when it is cleaned. The prosthesis should be cleaned at least once a week using liquid soap and running water. Patients were instructed for routine follow-up every 3-6 months (fig. 18).

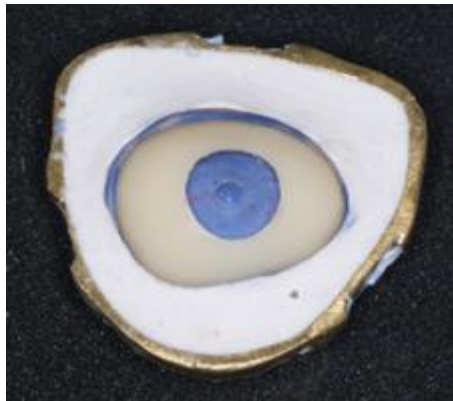


Figure 12 The result of sclera implanting and elimination of wax



Figure 13 Making the looks of blood vessels-like in the scleral pattern



Figure 14 The result of iris coloring



Figure 15 The final result of ocular prosthesis

Figure 16 The insertion of sinistra ocular prosthesis on patient

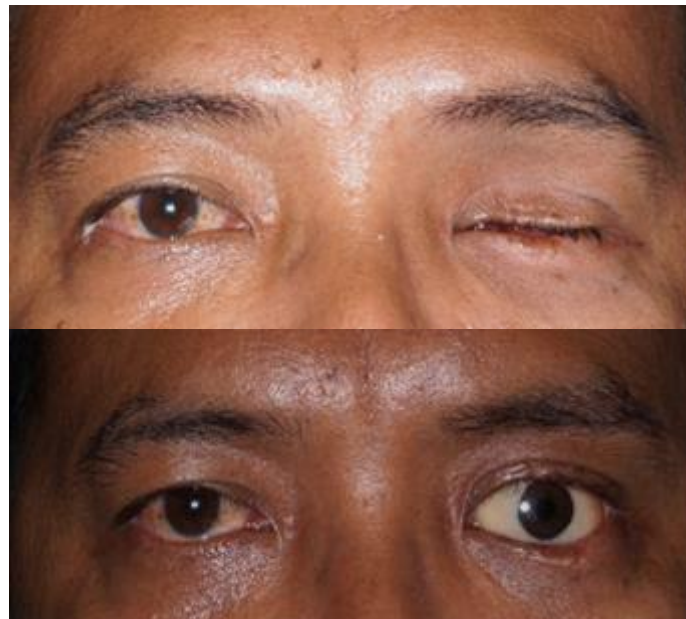


Figure 17 Before and after the ocular prosthesis treatment

3. Discussion

Retention of the ocular prosthesis is an important thing to be considered after the aesthetics reason so that the patient will feel comfortable and calm when wearing the prosthesis. Custom made acrylic resin ocular prostheses according to the shape and size adapted to the ocular socket of patient can provide close adaptation between the prosthesis and the ocular base tissue leading to a more even distribution of pressure than factory stock eye prostheses (2,4). The presence of this excess can minimize the possible risk of conjunctival abrasion or ulceration. Custom-made prostheses also improve tissue health by eliminating potential stagnation spaces on the tissue surface of the prosthetic base. The presence of stagnation spaces causes fluid to accumulate, which can trigger prosthetic instability and result in tissue irritation and bacterial growth. Making an ocular prosthesis that is made by duplicating according to the exact size, color and natural contour of the ocular socket will result in the shape and color of the prosthetic that looks more natural and symmetrical to the patient. From our procedure, we used anatomical retention obtained from anatomical undercuts, which were obtained from soft tissue structures around the eyes and eyelids [1,4].

Ocular prosthetic that precisely fitted and acceptable has several characteristics: preserves the shape of the damaged part or socket, prevents collapse or loss of eyelid shape, provides proper eyelid muscle action, prevents accumulation of fluid in the cavity, maintains the lid opening similar to the real eyes, mimic the looks, colors and proportions of real eyes. These characteristics make patient comfortable and satisfied with the result of prosthetic (5). Thus, the work of a prosthodontist is not only limited to making prostheses mechanically but also requires skills in interacting and increasing sensitivity towards patients to form interpersonal interaction, a good interaction can make patients more cooperative in receiving treatments [4].

4. Conclusion

Loss of an eye affects emotions and psychology and even worse affects the quality of life. Proper use of ocular prosthetics is needed to increase self-confidence, quality of life and reduce psychological issues. Making ocular prosthetics according to the sizes, shapes and looks of the real eye is very necessary so that it can improve aesthetics and make the patient comfortable and satisfied.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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