

CASE REPORT

Modified Impression Technique of a Custom Made Hand Painted Iris For an Ocular Prosthesis: A Case Report

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ABSTRACT

The enucleation of the eye due to variety of causes such as trauma, tumor and severe eye disease or infection has resulted to permanent defect of sight and aesthetic. Defects of the eye may include removal of a part of or the entire orbit which has affected patient's psychology. Restoring the defect with pre-fabricated or custom-made ocular prosthesis will restore aesthetics and improves patient's social confidence. This is a case report of construction a custom-made; hand painted iris of ocular prosthesis on a patient with missing left eye due to trauma using modified impression method. The case describes the process of constructing the custom-made ocular prosthesis with modification of impression technique to improve accuracy and fitting. It is aim to highlight the importance of custom-made prosthesis as compared to pre-fabricated ocular prosthesis on its property, fitting to eye socket, hygiene and aesthetic satisfaction.

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INTRODUCTION

Patient who suffered from trauma, tumor, severe infection, and congenital abnormality to the eye might experience of losing their eye. The removal of the entire eye globe with or without the optic nerve resulted from enucleation or evisceration is called anophthalmia (1). This condition has resulted to disfigurement thus compromise the patient's sight, physically and psychologically. Patient tends to prevent social interaction causing severe psychological effect (2). In order to overcome the physical and psychological effect, the ocular prosthesis is commonly provided so that social confidence and self-esteem will be improved.

There are a few types of ocular prosthesis which includes implant, pre-fabricated (ready-made) and custom made. However, due to high cost of implant or cosmetic unsatisfactory, allergy, ulceration, discomfort and difficulty to adapt to pre-fabricated ocular prosthesis (1,3) the custom-made type may be a more feasible option. The later type has to simulate the illusion of a natural look healthy eye and good adaptability to the surrounding tissues. Therefore, a correct technique and

method during impression, fabrication and fitting has to be properly performed. It is crucial to accurately produce natural colour, contour and size of the prosthesis. This case report presents a construction of a custom-made ocular prosthesis using hand painted iris method using modified special tray which has improved patient's satisfaction on fitting and aesthetic.

CASE REPORT

A 28-year-old female patient was referred to the Prosthodontics Specialist Clinic, Faculty of Dentistry, Universiti Sains Islam Malaysia requesting a replacement of her pre-fabricated ocular prosthesis of missing left eye. Her eye was enucleated ten years ago after being diagnose as severe eye infection. On clinical examination, the posterior wall of the anophthalmic socket was healthy and had good voluntary tissue attachment and movement. The pre-fabricated ocular prosthesis was ill-fitted and unaesthetics as it looks smaller than the right eye. A custom-made ocular prosthesis was suggested in order to provide better fit and aesthetic prosthesis by hand painted iris technique.

Procedure started with the try-in of modified ocular special tray made from self-cured acrylic to the most fitted size of the patient's ocular. The special tray was constructed in a few sizes and shape following common size and shape of the ocular socket of our

previous patients (Fig. 1a&1b). This is the applied modified impression technique that has produce better impression details thus improve accuracy of the ocular impression due to the used of well fitted special tray. This also helped to reduce visit by eliminating the primary impression step and prevent material waste as the material is only loaded on the tray that accurately followed the size of ocular.

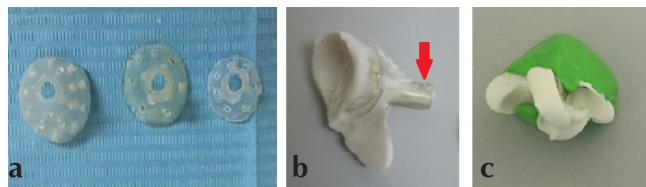


Figure 1: (a) Different standardize size of the special tray for ocular impression following common size of Malaysian's ocular size. (b) Arrow showed the sprue to be connected to the tip of a disposable syringe. (c) Putty silicone (green) is used as mould for wax pattern from impression.

Alginate was used as the impression material for easy handling with good dimensional stability and accuracy of the impression. Alginate was loaded onto the selected size of special tray then inserted in the ocular socket followed by further loading of alginate using 2ml disposable syringe connected to the special tray sprue and wait until it set.

Silicone putty impression was then moulded immediately on the set impression to form the index of the ocular socket wax pattern (Fig. 1c). The wax pattern was made by melted modelling wax poured into the putty index. After ten minutes, it was tried-in into the ocular socket for fitting and shaping. Direct adding and trimming of the wax pattern according to the shape, bulbosity and size of the ocular socket was done until satisfied. Then, the location and size of the iris was marked on the wax pattern by referring to the right eye. A coloured digital photograph and shade following the standard shade guide of the iris and sclera were taken as a reference for hand painted iris construction.

Hand painted iris was constructed in dental laboratory. The iris and pupil colour were a combination of two shades as the main colour (Fig.2) and was carefully painted by hand on the heat-cure acrylic disc by referring and mimicking from the photograph taken. A layer of clear acrylic was applied covering the painted iris before it was placed on the wax pattern for second try-in. This is to assess the correct colour, position, size and distance between two irises.

Once the assessment is satisfied, it was processed following the similar step of acrylic denture processing. The placement of red coloured thin silk thread is used to reflect distinct veins on sclera before another layer of clear acrylic resin was applied but on the ocular prosthesis for finishing. It will produce better bulbosity and convex glass-like surface hence mimicking natural effect of the eye. The ocular prosthesis was issued on

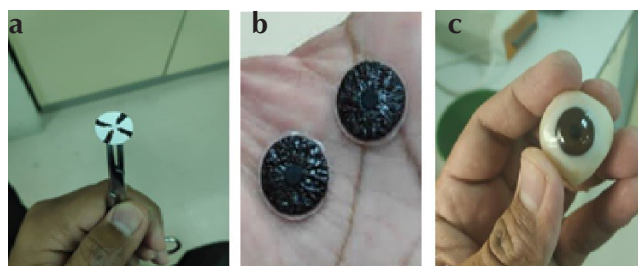


Figure 2: (a) & (b) The hand painted iris and pupil on the acrylic resin disc procedure until completed before placement on the ocular prosthesis base. (c) Final prosthesis before insertion.

the third visit assessing common eye movement and blinking to confirm the fitting and patient comfort. Glazing was done after minor adjustment during the insertion. Maintenance steps especially the frequency of cleaning and wearing full time as possible to prevent ocular socket infection and distortion of the globe size which can affect the retention of the prosthesis was instructed. Patient was really pleased with the outcome (Fig.3).



Figure 3: The ocular prosthesis before (left) and after (right) insertion on patient.

DISCUSSION

The aesthetically pleasant ocular prosthesis is important to improve patient social confidence. Thus, the innovative technique to construct an aesthetic custom-made ocular prosthesis with shorter clinical time, high accuracy and excellent adaptability to the ocular socket area may improve the outcome. This case has reported good technique to produce the ocular prosthesis with easier impression making technique, reduce the material and clinical time, easy clinical handling with special tray and produce good impression details. The accuracy and fitting of the ocular prosthesis is also achieved with cost effective material and technique.

Good accuracy and close adaptability of the ocular prosthesis will provide best comfort to patient when it allows eye movements naturally. This is eventually may be due to well fitted, smooth, rounded edges and high polished surface that has increased patient confidence when it is painless and no irritation to mucosal tissue during eye movement. Natural eye movement later has triggered normal lacrimal function furthermore reduce collection of mucus and debris underneath the ocular prosthesis thus less risk of infection. Close adaptation of the ocular prosthesis eliminates spaces and voids

between the prosthesis and ocular socket hence also lessen the risk of irritation and infection at the area of embedded mucus and debris (4).

It is important to provide a good detail and extension of the ocular prosthesis impression. The technique during impression taking has to be done properly and correctly to capture the exact shape of the ocular socket. In this case, the used of perforated special tray with correct fit and later loading material through the sprue during impression allowed better flow of the impression material to the entire socket area without producing air entrapment. Less voids and better detail and accuracy of the impression is captured and no waste of material. Furthermore, the used of alginate as the impression material facilitate easier material manipulation during impression making preventing irritation to the ocular soft tissue. The common setting time of alginate allowed ample time of handling and making the impression. The fabrication of putty index immediately and directly on the set impression has reduced dimensional changes and cost effective without the construction of stone model and needs for secondary impression. As a result, less visit, shorter clinical time especially during wax pattern try-in due to the accuracy of the wax pattern.

Patient who has experienced with pre-fabricated ocular prosthesis would found that custom-made ocular prosthesis has better aesthetic outcome too. This study showed a hand painting iris technique producing aesthetic pleasant iris which requires good artistic skill and ability of dental technician to manipulate the colours to produce a good outcome as reported in previous study (5). Even though it was suggested to apply digital imaging technique is simpler and easier method of iris fabrication, this study suggested that hand painting is still a cheaper method without the need of special technology and software as it is similar aesthetic outcome but more stable colour once the ocular prosthesis is being process.

Patient who had been given with custom-made ocular prosthesis is recommended to wear the prosthesis at whole time to maintain the ocular socket shape, stimulate the muscular functions of the lids thus prevents it from collapse and maintain palpebral opening (4,5). Due to this, it is important to give good prosthesis hygiene

instruction with regular saline flush in order to prevent ocular tissue infection. By having good ocular prosthesis hygiene, proper wearing time and maintenance method would increase good prognosis.

CONCLUSION

An accurate ocular prosthesis construction with correct selection of material, instrument and technique are factors to achieve cost effective and time saving procedures as well as good fitting and aesthetics outcome. This case report has suggested the simplistic method in order to achieve this. It shows that even though some modification for a simple yet cost effective method has been done, a satisfied outcome can still be produced.

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