ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 10, pp.39968-39971, October, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE STUDY

PROSTHETIC REHABILITATION OF AN OCULAR DEFECT WITH THE COMBINATION OF PREFABRICATED AND CUSTOM MADE PROSTHESIS

***Guruprasad Handal**

Department of Prosthodontics, SMBT Dental College, Sangamner

ARTICLE INFO

Article History:
Received 17th July, 2016
Received in revised form
25th August, 2016
Accepted 14th September, 2016
Published online 30th October, 2016

Key words:

Occular Prosthesis, Scleral blank, Iris.

ABSTRACT

Loss of an eye or a disfigured eye has a far-reaching impact on an individual's psyche. Additionally it affects one's social and professional life. Cosmetic rehabilitation with custom made prosthetic devices gives such individuals professional and social acceptance and alleviates problems. This paper describes prosthetic rehabilitation of a 60-year-old female patient having right ocular defect with a combination of prefabricated and custom made ocular prosthesis. The resultant prosthesis was structurally durable and aesthetically acceptable with satisfactory retention.

Citation: Guruprasad Handal, 2016. "Prosthetic rehabilitation of an ocular defect with the combination of prefabricated and custom made prosthesis", *International Journal of Current Research*, 8, (10), 39968-39971.

INTRODUCTION

Eyes are considered one of the most important and beautifying organs of the human body. Eyes unveil the entire outer world to our consciousness, gives life expression and dignity to the face. The loss or absence of an eye may be caused due to congenital defect, irreparable trauma, tumour, painful blind eye, sympathetic ophthalmia or the need for histological confirmation of a suspected diagnosis (Nafij *et al*., 2013). Surgical procedures in the removal of an eye can be broadly classified as: evisceration (where the contents of the globe are removed leaving the sclera intact), enucleation (most common, where the entire eyeball is removed after severing the muscles and the optic nerve) and exenteration (where the entire contents of the orbit including the eyelids and the surrounding tissues are removed) (Kaur *et al*., 2010). An ocular prosthesis is an artificial substitute for an enucleated eye ball. A prosthesis which adapts well improves the psychological state of the patient and also increases the patient's confidence level and the esthetic value. The rehabilitation of a patient with an ocular loss, not only requires a thorough knowledge but also skill and competence. An ocular prosthesis may be available readymade (stock ocular prosthesis) or can be custom made. Here we presented a case of occular prosthesis in which we used a combination of three techniques (paper iris disk technique, black iris disk technique and modified stock). We also focused on the diagnosis and treatment planning for patients requiring an ocular prosthesis. The various modifications available in ocular prostheses are also discussed.

**Corresponding author: Guruprasad Handal,*
Department of Prosthodontics, SMBT Dental College, Sangamner

Case Report

A 60 year old female reported to the department of Prosthodontics, with chief complaint of ugly look since 10 years. Past history revealed loss of eye due to trauma and subsequent evisceration (Figure 1).

Procedure of custom ocular prosthesis was carried out under following headings:

1. Patient evaluation
2. Socket evaluation (external, internal)
3. Preparation of the patient
4. Preparation of the socket

1. Patient Evaluation

Evaluation was carried out for physical and psychological appraisal of the patient, including the desires and expectations of the patient related to the proposed prosthesis. Patients was counseled regarding expected results, with specific emphasis on their role, both during the treatment phase and after completion of the prosthesis. Apart from the routine information the examination included determination of the following: i) Age of eye loss ii) Reason for the Loss of Eye.

Figure 1

Fig.1.Preoperative view

Figure 2 & 3

Figure 4 & 5

Fig.2,3,4 & 5. Primary Impression Making

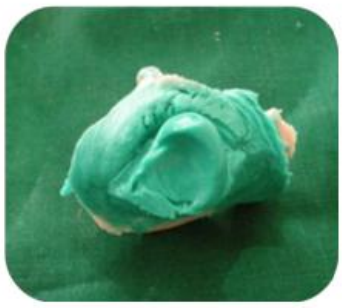

Figure 6 & 7

Figure 8, 9, & 10

Fig. 6. Fabrication of custom tray, Fig. 7. Final impression, Fig. 8,9 & 10. Fabrication of final cast

Figure 11

Figure 12

Fig. 11. Fabrication of wax pattern, Fig. 12. Try inn of Wax pattern

Figure 13 & 14

Fig. 13 & 14. Processing of scleral blank

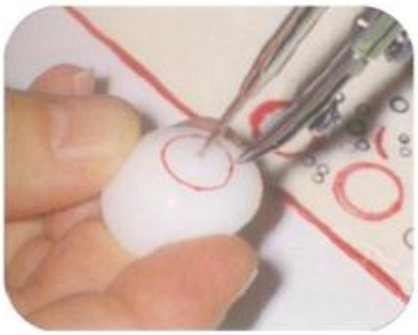

Figure 15 & 16

Fig. 15 & 16. Positioning of prefabricated iris in custom made scleral blank

Figure 17

Figure 18

Fig. 17. Try inn of prosthesis, Fig. 18. Characterization of the prosthesis

2. Examination of the Socket

- External evaluation was carried out for superior sulcus depression, Atonal defects in the orbicularis & levator muscles, Size and lid contour, Socket dimension, Lower eyelid laxity, Ptosis, Location of eye brows, Secretion of tears
- Internal evaluation was carried out for any inflammation, muscular control of the palpebrae, Condition of the conjunctiva, cicatrical bands, and Presence / absence of undercuts.

3. Preparation of the Patient :-Following points were considered before starting of impression making

a) patient was positioned erect, **b)**Patient was facing an area devoid of bright lights or reflections and coached in maintaining a fixed gaze on a point directly in front of him in a midline position. **c)** The patient was told to keep his gaze fixed on the point for approximately 4-6 minutes, **d)** The patient was told to blink as few times as possible during this step, **e)** Vaseline was applied to the eyelashes and eyebrows to prevent impression material sticking to them causing pain during removal.

4. Preparation of the Socket :- a) The eye socket and surrounding tissues were not lubricated, **b)** Anesthesia was not considered necessary and was not used, then impression making was carried out

5. Impression Making

Patient prepared for making primary ocular impression (Fig.1). Irreversible hydrocolloid was mixed to some thin consistency. Some of it was then loaded in 2cc syringe and injected into the defective socket. Remaining impression material was then loaded externally over it. It was then reinforced with pins and plaster. Impression was removed and poured with plaster (Figure 2,3,4 &5). Custom tray was fabricated and then final impression was made with light body silicone by same procedure (Figure 6 & 7). Final impression was poured by two pour technique and final cast was retrieved.

6. Fabrication of Wax Pattern

Modeling wax was then poured in socket space. Upper portion was then cut into two portion and was pattern was then separated. (Figure 11)

7. Try inn Of Wax Pattern

Wax pattern was then tried in patient for contour and all possible movements. (Figure 12)

8. Fabricating scleral blank :- Wax pattern was then flasked, dewaxed and packed with white self cure acrylic material. It was then finished. (Figure 13 & 14)

9. Positioning the Iris:- Position of the iris was then decided with the help of various methods like anatomical method, Vanier caliper, spectacles. It was then verified with adjacent normal eye. An iris matching the adjacent normal eye was then selected from readymade eye shells. The iris was then cut back from the prefabricated shell. A trench of respective size was made in sceral blank and iris was fitted in it. (Figure 15 & 16)

10. Prosthesis Trial :- The prosthesis was then tried in patient. Patient was asked to do movement of scera in various directions and checked for the movements of sceral blank and comfort. (Figure 17)

11. Characterization :- Sceral blank was then characterized similar to adjacent normal scera . The whole blank was then masked with clear acryalic to preserve the characterization. (Figure 18)

12. Prosthesis Delivery:- Prosthesis was then finished, polished and delivered to patient. Patient was given with instructions (Figure 19)

DISCUSSION

Several techniques have been used in fabricating and fitting artificial eyes. Empirically fitting a stock eye, modifying a stock eye by making an impression of theocular defect, and the custom eye technique are the most commonly used techniques (Artopoulou *et al*., 2006). Disadvantages of stock eye prosthesis are numerous starting from poor fit to infection of the tissue bed. In comparison the custom fabricated acrylic prosthesis is precise, has good fit and aesthetically superior. This is so as an impression of the tissue bed of the patient is obtained prior to fabrication (Artopoulou *et al*., 2006; Kohli *et al*., 2011; Nidhi *et al*., 2009; Nitai *et al*., 2013). Primary and secondary impressions of socket were made to fabricate customize sclera blank, then prefabricated eye shell with iris similar to adjacent normal iris was selected and it was then cutback to have only iris. The iris was then fitted into the previously determined positioned on the custom made scleral blank. Scleral blank was characterized similar to adjacent normal sclera. This technique is a combination of prefabricated iris and custom made scleral blank. With this technique it is not necessary to characterize iris which is quite difficult. Since we are making impression of the socket the fitting of scleral blank is better than prefabricated eye shell. This procedure conserves time making the fabrication of the ocular prosthesis a day procedure.

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