



Fabrication of a Non-Integrated Hollow Ocular Prosthesis Using Soap Spacer - A Case Report

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Abstract

Loss of an eye can be caused by cancer, trauma, or congenital defects. The rehabilitation of an ocular defect done by a custom ocular prosthesis provides a better fit, is more comfortable to use and it also gives better cosmetic results compared to a stock eye prosthesis. The main objective of this article is to describe a technique for fabricating a hollow ocular prosthesis with the help of a soap spacer.

Keywords: Hollow; Ocular prosthesis; Soap spacer

Introduction

Loss of an eye can be caused by cancer, trauma, or congenital defects [1]. Such a loss leads to severe emotional trauma which affects the social and professional aspects of the individuals' life. The term "anophthalmic socket" is defined as an orbit not containing an eyeball, but with orbital soft tissues and eye-lid structures [2]. In cases of large anophthalmic sockets, the use of a solid ocular prosthesis may lead to lower lid laxity and deep superior sulcus due to the weight of the prosthesis. A hollow ocular prosthesis would be lighter and yet large enough to occupy the evident residual ocular space [3].

Numerous techniques have been recommended to achieve weight reduction of ocular prostheses. Edias et al. [4] proposed a technique for making ocular prostheses for large anophthalmic cavities by introducing expanded polystyrene (Styrofoam) to the acrylic resin at the time of making the prosthetic sclera, aiming at reducing the weight of the prosthesis. The Styrofoam would be a part of the prosthesis; thus, adding some weight to the definitive prosthesis. Aggarwal et al. [5] described a two-step technique for acrylic resin packing with a wax spacer in between, which was later removed by lost wax technique. Kavlekar et al. [6] described a single-step, lost-salt technique to obtain a lightweight ocular prosthesis. Worrell [7] used sugar matrix (sugar mixture with egg white, i.e., caster sugar in the ratio of 1:5) to fill the hollow portion of an ocular prosthesis that was evacuated by immersing in hot water. Maskey et al. [8] described a technique using putty spacer and matchsticks to aid in creating a hollow cavity. This paper describes a single step technique to create a hollowed ocular prosthesis using soap spacer.

Case Presentation

A 42 Year old male was referred to the Department of Prosthodontics, Crown and Bridge, Goa Dental College and Hospital, with a discolored ocular stock eye prosthesis which he had been using since past two years.

The patient presented with a history of trauma 3 years back to his eye followed by surgical enucleation of the socket. On examination, the eyelids were intact, the tissue bed was healthy and adequate depth was present between the upper and the lower eyelids sufficient enough for the retention of an ocular prosthesis.

Procedure

- 1) A stock eye was selected which matched the iris color of the patient's eye.
- 2) A putty impression (Zhermack Elite HD+) of the stock eye was made to create a mold (Figure 1). A special tray was fabricated using clear auto polymerizing acrylic resin (DPI, India) in the putty mold (Figure 2). The borders of the tray were adjusted in the socket and vent holes were made. A mixing tip was attached to this tray which served as a handle and also allowed the flow of the light body addition silicone material (Aquasil Dentsply) to record the impression of the tissue bed (Figure 3 and 4).

OPEN ACCESS

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Received Date: 16 May 2020

Accepted Date: 15 Jun 2020

Published Date: 18 Jun 2020

Citation:

Khan F, Aras MA, Chitre V, Coutinho I. Fabrication of a Non-Integrated Hollow Ocular Prosthesis Using Soap Spacer - A Case Report. *Clin Case Rep Int.* 2020; 4: 1164.

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Figure 1: Putty mold made with stock eye.



Figure 2: Special tray.



Figure 3: Impression making.

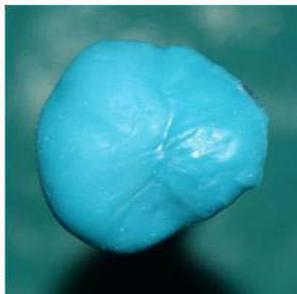


Figure 4: Impression of tissue bed.

3) A mold type III dental stone was obtained using a two pour technique.

4) Modeling wax (Modeling Wax, Deepti Dental Products of India Pvt. Ltd.) was poured in this cast to obtain a wax pattern which was modified on the patient to obtain proper contours (Figure 5).

5) The wax pattern was invested and de waxed.

6) To create a putty spacer two sheet thickness of modeling wax was adapted on the inner surface of the mould, putty was placed and the flask was closed (Figure 6).

7) During packing, the putty spacer was used during trial closure in-order to create a hollow space. Soap spacer made from melt and pour soap base (Melt and pour soap base, Soapy twist) was placed in the space created (Figure 7), which was flushed out after acrylization by using hot water through two holes which were created



Figure 5: Wax Pattern.



Figure 6: Putty spacer used to create hollow.



Figure 7: Soap spacer placed during acrylization.



Figure 8: Iris positioning.

on the tissue bed surface [9]. These holes were then sealed using clear auto-polymerizing resin.

8) The iris positioning was done on the scleral blank using vernier caliper [10] (Figure 8). The iris was transferred from the stock eye to the sclera blank to verify the iris positioning.

9) The tinting of the sclera was done using composite paints (SR Adoro Stains, Ivoclar Vivadent, Germany). A protective coating (G-Coat Plus, GC America Inc.) was applied after which a thin layer of wax was poured on the sclera. The prosthesis was re-invested, dewaxed, packed with clear acrylic resin. Processing was done and



Figure 9: Final prosthesis.



Figure 10: Delivery of final prosthesis.

the prosthesis was polished and finished (Figure 9) and delivered to the patient (Figure 10). The patient was happy with the esthetics and comfort of the prosthesis.

Discussion

The aim of any prosthetic treatment is to bring the patient back to the society with a normal appearance. Glass was the material of choice for fabrication of ocular prosthesis till 1940s. With the invention and development of polymers, Polymethyl Methacrylate (PMMA) became the material of choice [11]. Custom made ocular prosthesis using PMMA has various advantages such as- it is non brittle, better adaptation hence adding comfort to the patient, improved esthetics, longer serviceability, and easy to repair or polish.

Various impression techniques have been reported in literature such as direct impression/external impression technique, using stock ocular tray, impression with custom ocular tray, impression with stock ocular prosthesis, and wax scleral blank technique. Various impression materials like irreversible hydrocolloid, ophthalmic alginate, polyvinyl siloxane, tissue conditioners, and dental impression waxes can be used. For iris positioning different techniques using grid, glasses, facebow, vernier caliper, arbitrary marking have been reported. Light cure stains, paints, emax veneer, digital photography have been used to match the shade of the sclera [10-12].

In this case report, the impression is made with a custom ocular tray using polyvinyl siloxane impression material, a vernier caliper was used for recording the iris position and shade matching was done with acrylic paints. The use of a soap spacer which can be flushed out post acrylization makes the fabrication of a definitive hollow

prosthesis easier. The described technique improves the adaptability of the prosthesis and allows for customization of the sclera with artistic skills. The hollow prosthesis reduces the weight and improves the acceptance of the prosthesis [8,13].

Conclusion

The prosthetic rehabilitation of an anophthalmous eye is a challenging process. It is crucial to match the esthetics and also improve adaptability of the prosthesis. Hollowing out the prosthesis reduces the weight, improving patient acceptance towards the prosthesis. Painting the sclera allows full control of the prosthodontist to match the sclera of the natural eye.

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