

Technical procedure

Custom ocular prosthesis: Comparison of two different techniques

Dodamane Revanappa Prithviraj MDS*, Vikas Gupta BDS, MDS¹,
Ninad Muley BDS, MDS², Prema Suresh MDS³

Department of Maxillofacial Prosthodontics and Implantology, Government Dental College and Research Institute, Bangalore,
Victoria Hospital Campus, Fort, Bangalore 560002, India

Received 23 March 2012; received in revised form 27 June 2012; accepted 21 August 2012

Available online 5 December 2012

Abstract

Background: Loss of tissue, whether congenital or traumatic or resulting from malignancy or radical surgery, is accompanied by esthetic and psychological effects. Fabrication of an ocular prosthesis is a challenging and time-consuming procedure.

Patients and techniques: This article describes two different techniques of iris customization on two different patients. First technique describes the iris customization with the use of conventional paint on technique while second describes the photographic method of fabricating the eye prosthesis.

Discussion: A sequence of steps of construction of ocular prostheses is outlined, and the critical areas of fabrication and artistic techniques employed in the successful prosthetic treatment are described in this article. Conventional iris paint on technique and digital photographic technique to customize the iris are explained along with their advantages, disadvantages and indications.

Conclusion: In addition to decrease treatment time and increased simplicity, digital photography technique is particularly advantageous in cases requiring thin acrylic shell type of prosthesis.

© 2012 Japan Prosthodontic Society. Published by Elsevier Ireland. All rights reserved.

Keywords: Ocular prosthesis; Custom eye prosthesis; Digital photography

1. Introduction

The partial or total loss of an eye impairs the patient's visual function and also results in a noticeable deformity. It may have a severe emotional and psychological impact on the patient [1]. A prosthesis should be provided as early as possible to raise the spirit and ease the mind of the afflicted. Treatment should be aimed to improve patient's esthetics, restore and maintain health of the remaining structures, and consequently provide physical and mental well-being [2]. A multidisciplinary management and team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient. Therefore, the combined efforts of the ophthalmologist, the anaplastologist, the

plastic surgeon, and the maxillofacial prosthodontist are essential to restore the patient's quality of life.

The importance of an ocular prosthesis with acceptable esthetics and reasonable motility in restoring normal appearance in patients with anophthalmia has long been recognized. Numerous techniques for processing an ocular prosthesis exist [3,4]. Empirically fitting a stock eye, modifying a stock eye by making an impression of the ocular defect [5], and the custom eye technique are the most commonly used techniques. A definitive technique for fabricating artificial eyes using acrylic resin was developed by the United States Naval Dental and Medical Schools and was published in 1944 [6]. Acrylic as a material is lightweight, easy to fit and adjust, unbreakable, translucent, easily fabricated, had intrinsic and extrinsic coloring capabilities, and was inert to the socket secretions [7]. The dental-prosthetic influence in the development of this prosthesis accounts for the ocular prosthesis being fitted from an impression of the eye socket rather than by the traditional empirical method [8]. It provides more esthetic and precise results because an impression establishes the defect contours, and the iris and sclera are custom fabricated and painted [9]. Further in fabrication of custom eye prosthesis there are several

* Corresponding author. Tel.: +91 9620204727.

E-mail addresses: prithvidr@yahoo.com (D.R. Prithviraj),
dr_vikas.gupta@yahoo.com (V. Gupta),
ninad_muley20040312@rediffmail.com (N. Muley),
dr.prema.162@gmail.com (P. Suresh).

¹ Tel.: +91 8951886234.

² Tel.: +91 9740838546.

³ Tel.: +91 9480705481.

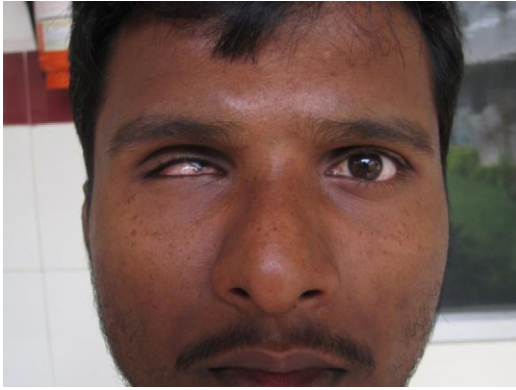


Fig. 1. Preoperative photograph.

techniques (different ovens, varying processing times, and various methods of assembling the parts of the prosthesis) [10]. The choice of technique is decided by the prosthodontist based on the condition of defective eye.

This article describes two different techniques that have been employed to fabricate custom eye prosthesis. First technique describes the iris customization with the use of conventional paint on technique while second describes the photographic method of fabricating the eye prosthesis.

2. Technique 1

2.1. Case presentation

A 30-year-old male patient was referred to the Department of Maxillofacial Prosthetics and Implantology, at Government Dental College and Research Institute (GDCRI), Bangalore, India for replacement of his missing right eye (Fig. 1). The patient gave history of evisceration of right eye after an accidental injury at a metal industry. On examination, the socket was atrophied with limited movements of eviscerated eye. Both the eyelids were intact with adequate potential to open and close the eyelids. A custom made acrylic prosthesis using paint on technique was planned, and the treatment procedure was explained to the patient.

2.2. Procedure

1. Before making impression thoroughly irrigate the defective area with chilled saline and lubricate the surrounding field (eyebrows and eyelashes) with petroleum jelly.
2. Try in the stock acrylic resin tray and check for overextension and proper orientation. Mix the irreversible hydrocolloid impression material (Hydrogum, Zhermack SpA, Italy) with recommended amount of water. Back load the 50 ml disposable syringe and insert the plunger. Seat the stock tray into the eye socket, attach the loaded syringe to stem of impression tray and inject alginate. Stabilize the tray by holding its stem while injecting impression material. During the process of setting instruct the patient to fix his gaze on a predetermined object placed at a distance and subsequently instruct the patient to perform eye movements. After the

setting of impression material remove and check the impression for any voids or under extended impression borders (Fig. 2A).

3. “Double alginate technique” is used to make wax trial ocular prosthesis [11]. Pour a new thin mix of irreversible hydrocolloid material into the empty plastic disposable cup (Fig. 2B). At the same time apply a thin layer of the same irreversible hydrocolloid material with a brush over the impression especially on the inner concave tissue surface (Fig. 2C). This will prevent the air entrapment while suspending the impression into the irreversible hydrocolloid material in the cup. With the help of stem of impression tray suspend the impression into non set irreversible hydrocolloid material in the cup (Fig. 2D). Hold the stem till this irreversible hydrocolloid material completely sets. Remove the alginate mold along with impression from the cup (Fig. 2E). Partially incise the alginate mold with sharp instrument with incision line crossing the stem of impression tray (Fig. 2F). Move both the incised fragment apart to facilitate the impression removal from the mold (Fig. 2G). This is made possible because different mixes of alginate will not adhere to each other.
4. The alginate mold can now be used to form the wax blank (wax pattern) (Fig. 2H). Replace the alginate mold into the cup (Fig. 2I), and pour molten modeling wax through the sprue hole created by the stem of the tray (Fig. 2J). Upon cooling, retrieve the wax blank from alginate mold (Fig. 2K). Cut off the sprue, and shape and polish the wax trial ocular prosthesis.
5. The fit of the wax pattern is evaluated by observing the extension into the fornices. The height of convexity of the wax pattern should be centered over the pupil and palpebral opening should be same as that of the natural eye.
6. Attach the aluminum button to wax pattern at position corresponding to the pupil of the natural eye (Fig. 2L). By asking the patient to see in all directions and observing the direction of the stem of aluminum button will help in accurate positioning of the button. Flask the wax pattern along with aluminum button. To prevent damage to mold during retrieval of aluminum button from the flask, apply petroleum jelly over the stem of aluminum button.
7. Measure the diameter of the iris and the pupil of the patient’s natural eye and select a clear ethylcellulose iris disk (iris button) of corresponding size. First paint the pupil and striations according to the patient’s natural eye (Fig. 2M). Over that paint a layer of iris color matching with the patient’s iris color (Fig. 2N).
8. Placement of the stem of painted iris disk in the mold space created by stem of aluminum button will help in accurately positioning of the iris disk. Place white heat-polymerizing acrylic resin to the remaining mold space. After curing trim the stem and 0.5 mm acrylic resin from anterior scleral curvature to create space for a thin layer of clear acrylic that is placed subsequently after scleral characterization.
9. Characterization of the sclera part of the prosthesis is done by using red woolen fibers as veins and stains are added in the sclera part with the help of colors mixed in monopoly

Download English Version:

<https://daneshyari.com/en/article/10167507>

Download Persian Version:

<https://daneshyari.com/article/10167507>

[Daneshyari.com](https://daneshyari.com)