

Fabrication of Custom Ocular Prosthesis – A Novel Approach

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Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

The human eye is a spherical body, also known as the eyeball, it plays vital role in one of the six senses. From vision to expression it has its varied functions. Loss of this organ severely damages not only the function of vision but also self confidence. A case report presented here describes simplified procedure for fabrication of a customized ocular prosthesis.

Keywords: Enucleation, elastomeric impression material, Irreversible hydrocolloid, Custom Ocular Prosthesis.

Introduction

Ocular defect may be caused due to congenital defect or acquired like irreparable trauma, tumor, painful blind eye, sympathetic ophthalmia or the need for histological confirmation of a suspected diagnosis. There are 3 kinds of surgical procedures, evisceration (where the content of globe are removed leaving the sclera intact), enucleation (where the entire eyeball is removed after severing the muscles and the nerve) and exenteration (where the entire contents of the orbit including the eyelids and the surrounding tissues are removed). In history, excavations of tombs have provided evidence of eye replacement using stones, copper, gold, in the shrunken socket. Until world war 2, the glass eye was the most popular prosthetic eye manufactured. The glass eye was however difficult to

manufacture and hazardous when it exploded. Ambrose Pare (1510-1590) also used glass and porcelain for fabrication of an orbital prosthesis. Later on methy methacrylate

prosthesis became popular since they offer superior strength and the shape and size could be modified. Recently flexible material such as silicone became advantageous when the defect extends beyond the orbital area and encounters movable tissue beds.^{1,2,5}

Case Report

A 25 year old male patient reported to department of prosthodontics, Patna Dental College and Hospital, Patna, Bihar with chief complaint of ocular defect. Past history revealed loss of the right eye due to trauma and subsequent evisceration. Examination of tissues revealed an intact muscle bed with residual movements present. Evaluation of the muscular control of the palpebrae and the internal anatomy of socket in resting position and full excursive movements was performed

Materials and Technique

The impression of the anophthalmic eye socket was taken, attaching a conformer to a syringe then light body silicone material injected into the defect and functional movements were performed (fig. 2). Impression was poured in irreversible hydrocolloid to obtain mould. Then modeling

wax melted and poured into the mould cavity to obtain a wax pattern. After 10 min. wax pattern was removed from the mould.^{6,7} Wax pattern was tried in the socket, any error noticed was corrected by trial and error method

Orbital Indexing

A vertical midline was marked passing through the forehead crease, glabella, tip of the nose and chin. The distance from right eye medial canthus to the midline was measured and used for orbital indexing, Then pre selected shade matched iris portion from stock eyeshell was trimmed and placed in the wax pattern. The outer countour were refined⁹. (Fig. 7)

Investing, Dewaxing, Packing, Characterisation

The finished pattern was invested in a small three piece brass flask, 3 resin tags were made on iris portion to stabilize the position during lab fabrication(Fig.8). One part was filled with gypsum type 3 dental stone and the pattern was invested, with iris portion pointing upward side. Separating media was applied and then rest part were invested using type 3 dental stone and type 2 dental plaster. Dewaxing was done(Figure 9) and packing done with PMMA (Shade C) heat cure resin, pink fibers from heat cure resin were used for characterization of the prosthesis.

Placement of Ocular Prosthesis and Follow Up

Patient was instructed on the aspects of insertion and easy removal of the prosthesis, and patient was asked to return on 1, 2 and 7 days for follow up.



Figure 1: Pre operative photo of ocular defect.



Figure 2: Impression making with silicone



Figure 3 : impression pour in irreversible hydrocolloid.

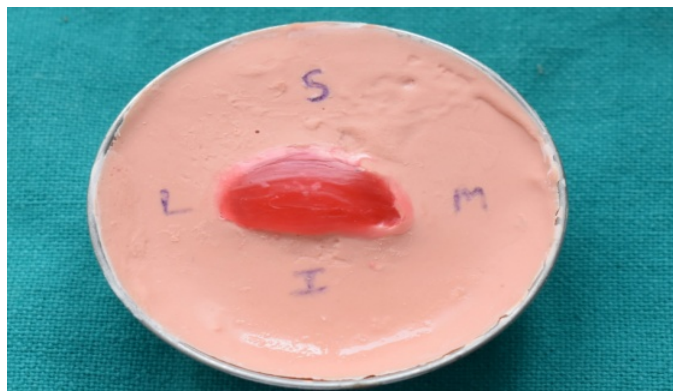


Figure 4: wax melted in the obtained Alginate mould.



Figure 5 :Wax pattern try in

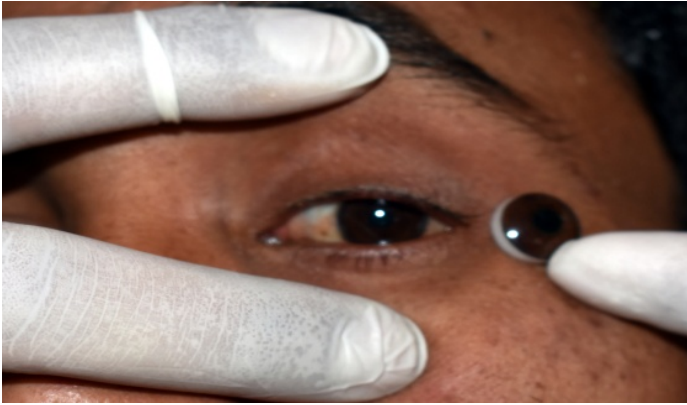


Figure 6 :Shade matching



Figure 7 :orbital indexing



Figure 8 : wax pattern invested with resin tags



Figure 9 : After dewaxing



Figure 10: Post operative

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