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Case report

Rapid fabrication of silicone orbital prosthesis using conventional methods

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ABSTRACT

Restoration of orbital defects with silicone prosthesis has been a well-documented and accepted treatment option. Adhesive retained prosthesis offer the patients with adequate retention and treatment satisfaction. However, marginal breakdown and discoloration are common problems associated with these prostheses, necessitating their refabrication. Fabrication of a silicone orbital prosthesis is time consuming and requires multiple clinical and laboratory procedures. This technical article describes simple and cost effective steps for rapid fabrication of a silicone prosthesis using conventional methods.

Introduction

Exenteration of the eye can lead to a debilitating defect that can negatively affect patient's quality of life. To minimize these effects, exenterated orbital defects are rehabilitated using facial prosthesis, which mimic the patients' normal anatomy. Silicone elastomers are the most widely used material for prosthesis fabrication due to their acceptable color integration and texture [1]. However, they have to be refabricated every 1.5–2 years due to the damaging effects of weathering and regular wear and tear [2].

The conventional method of silicone prosthesis fabrication requires several clinical settings and laboratory hours to be completed. Computer-aided design and computer-aided manufacturing technologies (CAD–CAM) have helped to reduce this time significantly [3] but they are not readily accessible to most clinicians primarily due to high equipment cost and lack of technical expertise. The objective of this article is to describe clinical and laboratory steps to duplicate patient's existing prosthesis in order to fabricate a new one in a relatively short period of time, reducing the patient's burden of multiple visits to the clinic.

Technique

(1) Take chair-side impression of the defect side using polyvinyl siloxane impression material (Multisil Epithetik soft and hard form; bredent GmbH & Co. KG, Senden, Germany) (Fig. 1). Use wooden sticks as a matrix for the impression material.
(2) Fabricate a working cast of the defect side by pouring the impression with Type IV dental stone (Nok Stone; Lafarge, Thonburi, Thailand) (Fig. 2).
(3) Mix irreversible hydrocolloid impression material (Kromopan; Lascod SpA, Firenza, Italy) and place it on the lower half of a metal flask (Varsity Flask; Hanau, NY).

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Fig. 1 – Impression of the defect side with polyvinyl siloxane impression material with wooden sticks matrix.

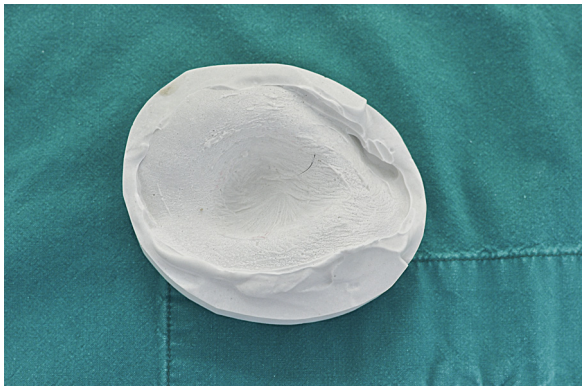

Fig. 2 – Type IV dental stone cast of the orbital defect.

Remove the ocular prosthesis from the existing silicone orbital prosthesis. Place the orbital prosthesis in the impression material such that the cameo surface of the prosthesis faces downwards and the margins of the silicone prosthesis are submerged in the impression material.

(4) After the impression material sets, place the upper half of the flask. Mix irreversible hydrocolloid impression material and pour it into the flask to adequately cover the intaglio surface of the prosthesis.

(5) Separate the upper and lower halves of the flask, after the impression material sets. Carefully remove the silicone orbital prosthesis from the flask.

(6) Using a circular hollow tube of 10 mm diameter remove the irreversible hydrocolloid impression material from the upper part of the flask to create a channel which can access the mold space formed after removal of the orbital prosthesis (Fig. 3).

(7) Place the upper and lower halves of the metal flask together. Heat baseplate wax (Cavex TT 100 Soft; Cavex, Haarlem, Netherlands) at 60 °C in a water-bath (Hanau Low Temperature Water Bath; Teledyne Hanau, NY) and pour the molten wax through the channel into the mold space (Fig. 4).

(8) Separate the upper and lower halves of the metal flask after the wax solidifies to obtain a wax replica of the existing orbital prosthesis (Fig. 5).

(9) Remove wax from the intaglio surface of the wax replica until the space for the ocular prosthesis is reached.

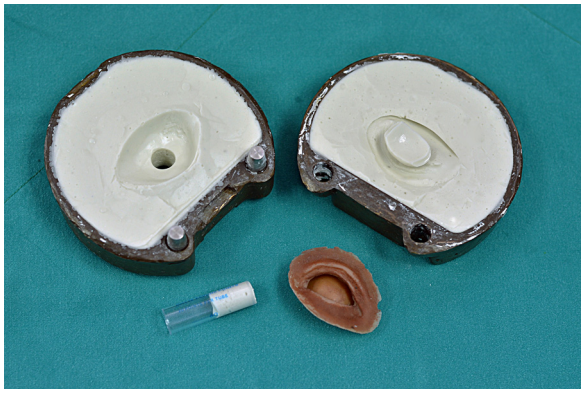

Fig. 3 – Duplication of the patient's existing prosthesis with irreversible hydrocolloid impression material.

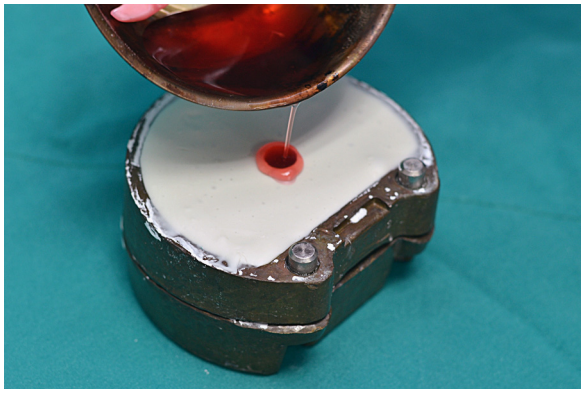

Fig. 4 – Molten baseplate wax poured through the channel into the mold space.

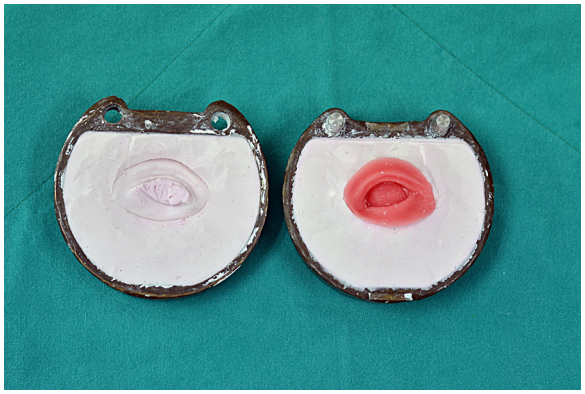

Fig. 5 – Wax replica obtained after solidification of the baseplate wax.

(10) Place the patient's existing ocular prosthesis in the wax replica using an intaglio approach and seal with baseplate wax (Fig. 6).

(11) Clinically evaluate the wax replica in the patient and verify the position of the ocular prosthesis (Fig. 7).

(12) Adapt the margins of the wax replica on the new working cast and perform necessary adjustments on the wax-up to replicate the patient's non-defect side.