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An Alternate Impression Technique for Ocular Prostheses

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Abstract

This article describes an alternative two-step ocular prosthesis impression technique that employs two materials of different consistencies. The method is intended to provide better adaptation to underlying tissues, increased mobility of the prosthesis owing to improvements in facial contours, and improved esthetics, as well as offering the patient greater comfort and security. These advantages and this prosthesis' relative ease of fabrication mean it should be considered as the first step in the management of untreated anophthalmic sockets.

A fundamental objective in restoration of an anophthalmic socket with an ocular prosthesis is to enable the patient to better cope with the difficult process of rehabilitation.[1] The United States Navy is credited with the development of custom acrylic resin ocular prostheses.[2] After conducting extensive research into various aspects of ocular prosthesis manufacturing, Navy investigators concluded that each enucleated eye socket is individual in nature, and that, therefore, it is critical to obtain an accurate impression of each site to be restored.[2] To meet their suggested criteria for acceptability, an impression should include accurate records of the posterior wall, the position of the palpebrae in relation to the posterior wall, and the greatest extent of the superior and inferior fornices of the palpebrae.[2]

A number of techniques have been advocated for achieving optimal fit of ocular prostheses, such as the direct impression/external impression,[3-5] use of a stock ocular tray,[6-10] modification of a stock ocular tray,[10-13] use of a custom ocular tray,[7,14] an impression using a stock ocular prosthesis,[7,15,16] ocular prosthesis modification,[1,7,17] and the wax scleral blank technique.[7,18-20] However, we have observed that clinically all these techniques cause discomfort for the patient during the fitting process. Moreover, many patients are frightened by the syringes and instruments commonly used in some of these impression techniques.

The purpose of this article is to describe the suitability of an alternate impression technique for ocular prostheses, an approach that allows the patient to feel more comfortable and secure during the fitting process.

Technique

1. Lubricate (Lacril, Allergan, São Paulo, Brazil) the patient's anophtalmic cavity.[7]
2. For anesthesia, use an ophthalmic anesthetic collyrium (Oxinest Colírio, Latinofarma, Cotia, Brazil), placing it in the residual cavity in those cases where sensitivity is present, thereby facilitating more comfortable manipulations subsequently.
3. During the impression procedure, the patient should be seated in a dental chair with his/her torso and head in a normal axial relation and with the operating chair placed at an incline of more than 90°.
4. In the first step of the two-step impression technique, a portion of vinylpolysiloxane (VPS) impression material hand-mixed putty (Express; 3M ESPE Dental, Saint Paul, MN) is manipulated and adapted to the patient's anophthalmic cavity (Fig 1) until a superior and inferior palpebral outline similar to that of the contralateral eye is obtained. Instruct the patient to move his or her orbicularis muscles from one side to the other, while opening and closing his/her eyes.
5. After the impression has been made with the first material, withdraw the impression by distancing and pressing on the superior palpebra in the direction of the advancing opening, while at the same time lowering the inferior palpebra until the impression has been fully removed.
6. For the second step, using an automix dispenser, inject low-density VPS (Express) onto the internal part of the

Figure 1 Making an impression of the anophthalmic cavity with putty VPS impression material.

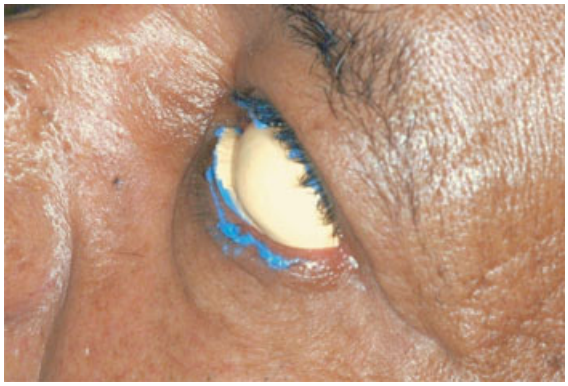

Figure 2 Making an impression of the anophthalmic cavity with light VPS impression material.

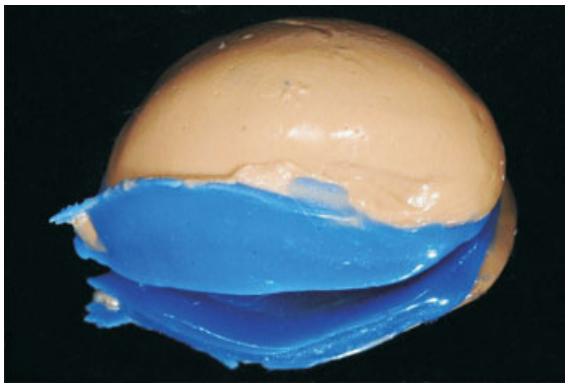

Figure 3 External impression of anophthalmic outline.

existing impression, which is in contact with the muscle (Fig 2). Then ask the patient to again move the orbicularis muscle.

7. After the definitive impression has been made, remove the fitting and verify the precision of the impression with respect to the anophthalmic cavity (Figs 3, 4).

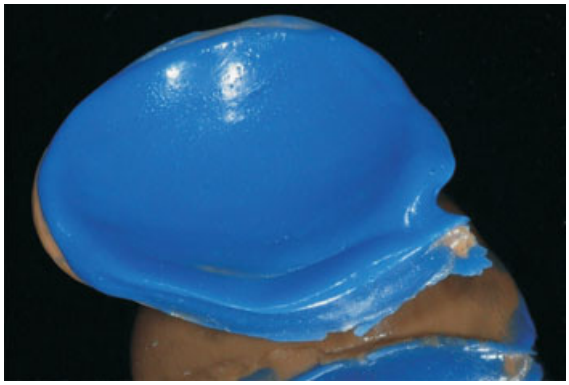

Figure 4 Internal impression of anophthalmic outline.

Figure 5 External views of the artificial sclera.

Figure 6 Internal views of the artificial sclera.

8. Finally, place the impression in a muffle, fabricate the artificial sclera (Figs 5, 6) and iris bud to complete construction of the prosthesis, and insert the prosthesis (Figs 7, 8).

Discussion

The effectiveness and desirability of the various existing impression and fitting methodologies generally depend on the patient's presentation, operator experience, and the available materials and equipment. The impression technique described

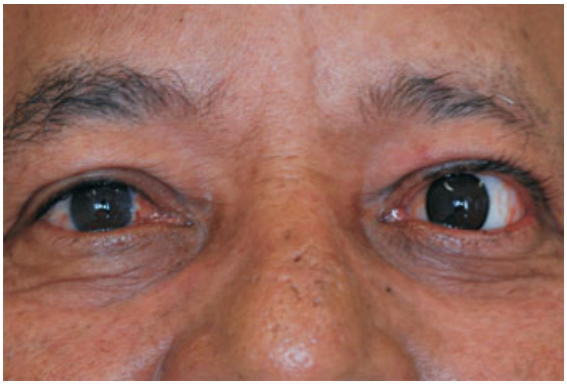

Figure 7 Front view of the patient with an ocular prosthesis produced as described in this paper.

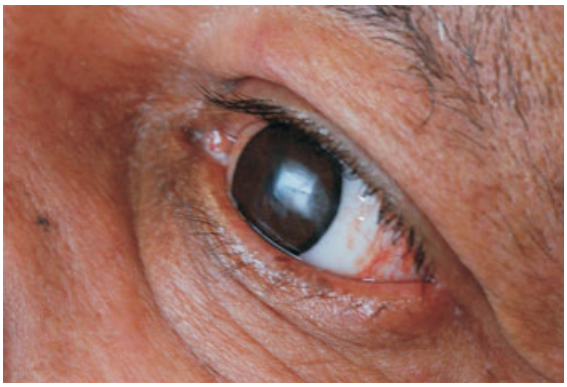

Figure 8 Lateral view of the patient with an ocular prosthesis produced as described in this paper.

above has proven to be very satisfactory in the rehabilitation of anophthalmic patients. This technique not only facilitates the correct adaptation of the prosthesis to the remaining structures of the globe and/or muscle tissue, giving the prosthesis mobility, but also makes close contact between the prosthesis and surrounding tissues possible, thereby reducing the risk of accumulation of secretions and microorganisms in the cavity.

The impression technique proposed in the present study has several advantages when compared with other techniques. It is simple to perform and less time-consuming with no necessity to fabricate and fit a custom-made tray into the anophthalmic cavity.[6-13] This technique leads to absence of irritation of the soft tissue when compared with the wax scleral blank technique,[7,18-20] and absence of discomfort, fear, and anxiety for the patient when compared with techniques that use syringes to perform the impression.[3-10] The physical and chemical properties of the impression material lead to insignificant dimensional change of the mold. Finally, the technique facilitates the adaptation of the sclera into the anophthalmic cavity and provides great comfort to the patient. On the other hand, this technique would be difficult to perform in the case of atresia of the anophthalmic cavity. Additionally, it is contraindicated when the orbit is reconstructed with hydroxyapatite implants,[21] whereby a stock ocular prosthesis is indicated.

Summary

The technique described in this paper involves a two-step alternative impression technique for ocular prostheses using two materials with different consistencies. It is an alternative way of making ocular prostheses that has the advantages first of allowing for correct adaptation of the prosthesis to the patient's surrounding tissues, and second, of providing the patient with greater comfort and security.

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