

## An ingenious approach for retrieval of scleral wax pattern: ocular prosthesis - A Case Report

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**Abstract:** Ocular prosthesis is an artificial replacement of the eye which improves patient's psychological status as well as his confidence. An acceptable ocular prosthesis is that which improves comfort and matches with that of adjacent natural eye. Fabrication of custom made ocular prosthesis is a tedious task and may cause distortion at various steps especially during scleral wax pattern contouring and its retrieval. A sequence of steps for fabrication of custom made ocular prosthesis is outlined in this case report with an emphasis on ease of scleral wax pattern retrieval with minimum distortion.

**Keywords:** custom ocular prosthesis, scleral wax pattern, stock eye shell

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### I. Introduction

Every human being has sensory organs to interact with the environment. Among those sensory organs are eyes which provide sight and personify the beauty of the face.<sup>1</sup> Congenital deformity, malignancies, irreparable trauma leads to loss of eye ball which needs surgical intervention. Depending on the extent and severity of the involved part surgical procedures can be of three types; evisceration, enucleation, exenteration.<sup>2</sup> Severe psychological distress occurs due to ocular disfigurement as it lowers the quality of life and self-confidence and gradually leads the patients to depression.

### II. Case Report

A 38 year old patient reported to Department of Prosthodontics with a defect in right eye **figure 1**. The defect was caused due to an injury during rice milling leading to infection of the eye ball after which an evisceration surgery was performed. On examination it was seen that only the socket and eyelids were intact indicative of a physical eye.

The patient was using stock eye prosthesis for last five years which frequently fell off during various eye movements so after careful examination the option available to the patient was a customized ocular prosthesis. The procedure was explained to the patient and informed consent was obtained.



**Figure 1**

### **Method of Fabrication**

#### **Customizing of an impression tray**

An acrylic impression tray was fabricated over the eye part of the facial mould over which an inlet was build up for the attachment of syringe .This tray was then customized by trimming according to adaptability in patients eye socket and numerous perforations were made over the tray .The tray was placed in the socket and light body was injected into it through a syringe attached into the inlet .The patient was then asked to perform eye movements in all directions to allow light body to flow completely into enucleated socket as well as on the outer surface to record the lid movement. **Figure 2**



**Figure 2**

Accuracy of impression was examined and split cast technique was used for pouring the impression. The first pour was made incorporating the inlet upto the height of contour. Orientation grooves were made over the set first pour and petroleum jelly was applied as a separating media over the whole cast surface. The second half was then poured covering the remaining impression

#### **Making wax pattern**

The cast surface was marked indicating the medial ,superior and inferior portions of the ocular impression. The technique was then modified here to allow easier retrieval of wax pattern without any distortion which may be caused by the eyelid portion of the cast.

For this a putty index of the impression was made and later the portion of cast extending which would act as an undercut and hinder proper removal of wax pattern was trimmed off .Two perforations were made on the putty

index and petroleum jelly was applied all over it. Light body impression material was then injected over the putty index and it was again seated back into the cast. **Figure 3**



**Figure 3**

The excess of the light body which remained inside the ocular portion of cast was trimmed such that only the eyelid portion which was duplicated with the light body was retained. This method thus allowed to remove the wax pattern without any distortion as after duplication this part became flexible and therefore created no hindrances in wax pattern removal. **Figure 4**

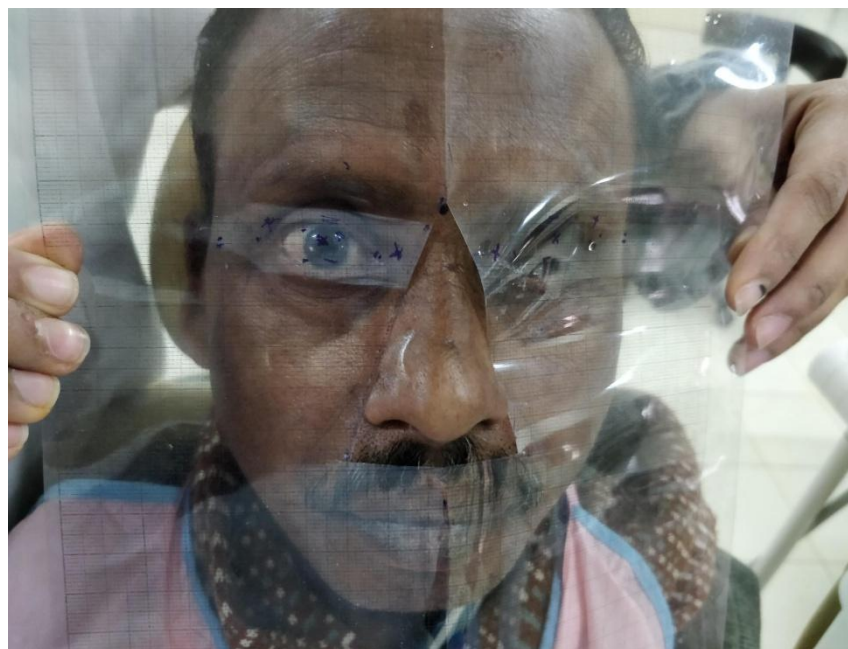


**Figure 4**

Liquid modelling wax was then poured into the cast. Once the wax pattern cooled the pattern was retrieved by separating the two halves of the cast. The fit of the scleral wax pattern was evaluated by observing the extension into the fornices and by asking the patient to move his eye in various directions. Any excess wax was trimmed off.

### **Orientation of iris**

Stock eye shell matching with the patient's iris was trimmed so as to just obtain the iris button. Orientating the iris makes use of a transparent graph grid. A point on the glabella was marked on the graph as point which assisted in positioning the template subsequently. Likewise points corresponding to outer canthus, inner canthus, superior and inferior limits of eye and the midpoint of iris were transferred onto the graph template by placing it on patients face. These markings were then transferred onto the defected side .**Figure 5**



**Figure 5**

The iris button was evaluated with the graph template and it was placed onto the scleral wax pattern accordingly. The position was again verified in the patient **Figure 6**



**Figure 6**

### **Acrylization of wax pattern**

The wax pattern was flaked and dewaxed .To simulate capillaries characterization was done with red colored veined acrylic fibres and using ceramic stains. The mould was then packed with heat cure tooth coloured acrylic resin which matched the shade of the scleral portion of contralateral eye. After curing the prosthesis was retrieved from flask for finishing and polishing. **Figure 7**



**Figure 7**

After polishing a layer of bonding agent was applied and then light cured for 30 sec to provide a smooth and glossy surface like that of a natural eye. The ocular prosthesis was then placed in the right eye socket and checked for esthetics and retention during various eye movements. **Figure 8**



**Figure 8**

The method of prosthesis removal and insertion was explained to the patient. Follow up was done every week for the first month. The patient was quite happy and satisfied with the prosthesis.

### **III. Discussion**

Eye loss due to cancer, trauma or congenital defects has its deep psychological impact on patient's self confidence and causes him social embarrassment.

Recent Advances in the field of maxillofacial prosthetic treatment have changed the mode of rehabilitation of an ocular defect from the use of traditional stock shells to custom-made ocular prosthesis<sup>4,5</sup>. This technique simplifies the fabrication of custom made ocular prosthesis with the materials that are readily available and are used regularly by Maxillofacial Prosthodontists.

Moreover the scleral wax retrieval from the mould could be tedious because of the eyelid portion of the cast<sup>6,7</sup> as it may get distorted during its removal. The adjustment of the contours of scleral wax pattern would then become more inaccurate and time consuming when checked in during scleral wax try in.

The technique was then modified here to allow easier retrieval of wax pattern without any distortion .It allowed to duplication of the eyelid portion of the cast in light body elastomeric impression material so that it becomes flexible and causes no hindrance in wax pattern removal.

#### **IV. Conclusion**

Newer ideas and evolving techniques make the previously followed methods much easier to implement and suit patient's need. The method described here is undemanding allowing easier and undistorted retrieval of wax pattern. The resulting eye prosthesis fabricated by this method is aesthetically pleasing and stable.

#### **References**

- [1]. Raflo, G.T., 1995. Enucleation and evisceration. *Duane's clinical ophthalmology*, 5, pp.1-25.
- [2]. Parr, G.R., Goldman, B.M. and Rahn, A.O., 1983. Surgical considerations in the prosthetic treatment of ocular and orbital defects. *Journal of Prosthetic Dentistry*, 49(3), pp.379-385.
- [3]. Lubkin, V. and Sloan, S., 1990. Enucleation and psychic trauma. *Advances in ophthalmic plastic and reconstructive surgery*, 8, pp.259-262.
- [4]. Patil, S.B., Meshramkar, R., Naveen, B.H. and Patil, N.P., 2008. Ocular prosthesis: a brief review and fabrication of an ocular prosthesis for a geriatric patient. *Gerodontology*, 25(1), pp.57-62.
- [5]. John, A.V., Anilkumar, S., Rajesh, C. and Raghavan, S.M., 2016. A novel technique of custom ocular prosthesis fabrication. *Journal of Oral Research and Review*, 8(2), p.82.
- [6]. Sinha, N.D., Bhandari, A. and Gangadhar, S.A., 2009. Fabrication of custom ocular prosthesis using a graph grid. *Pravara Med Rev*, 4(1), pp.21-24.
- [7]. Bali, N., Dhall, R.S. and Singh, N., 2015. Various Steps Involved in Fabrication of an Ocular Prosthesis: AC ase Report. *Int J Dent Med Res/ JAN-FEB*, 1(5), p.93.

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