Fabrication of a magnetic holder for the removal of ocular prosthesis

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INTRODUCTION

Incidence of evisceration and enucleation of the eyeball is increasing in India, and it has necessitated a similar increase in the need for ocular prosthesis.[1] Eyeball surgery in India is mainly due to pathology whereas in western countries, trauma precedes.[2] Ocular defects are restored either with prefabricated or after custom made eye shells.[3-4] Recent times have witnessed an overwhelming popularity in the fabrication of ocular prosthesis possibly due to the availability of newer esthetic materials and increased avenues of advanced training.

A well-fitting ocular prosthesis, while fulfilling the esthetic requirements, adds a biologic dimension to it by retaining the shape of the socket and preventing the prolapse of the fornices. The eyelids get adequate movement and muscular action because of the prosthesis, eventually favoring flow of tears. Retention of the ocular prostheses is usually anatomical where the sulcular fornix retains the prostheses. Commonly, patients use their fingers for the placement and retrieval of the prosthesis.[5-6] Another method available is the use of silicone vacuum cups. Although the silicone vacuum cups are effective, these are not easily available in rural India. Moreover, the efficiency of the suction cup lasts only for a limited period. In general, patients find it difficult to remove the prosthesis with fingers. Very often, the direction of the eye shell is changed during the insertion. This article describes an innovative and simplified technique for the fabrication of a device that helps easy insertion and removal of the ocular prosthesis.

CASE REPORT

A 60-year-old female patient reported to the Department of Prosthodontics, Vishnu Dental College, Bhimavaram,
Andhra Pradesh, seeking a prosthetic replacement for the missing left eye [Figure 1]. The patient gave a history of surgical removal of the eye due to infection. Examination revealed evisceration of the eye with healthy intraocular tissue bed [Figure 2]. Upper and lower fornices had sufficient depth to provide retention for the ocular prosthesis. Hence, it was decided to fabricate a custom ocular prosthesis and a magnetic holder for the retrieval of the prosthesis after taking an informed consent from the patient.

1. Custom-made ocular prosthesis is fabricated.
2. The prosthesis was delivered to the patient and was instructed on the home care. The patient was instructed to report back after 4 weeks [Figure 3]
3. On reporting for checkup, the patient has expressed difficulty in removing the prosthesis with fingers. Hence, it was decided to incorporate a metallic disc in the prosthesis and to fabricate a magnetic holder
4. A putty index of the tissue surface of the prosthesis was made, so that it will serve as a conformer in the later stages to maintain the contour [Figure 4]
5. A stainless steel disc of dimension 8 mm × 0.5 mm (Stainless Steel alloy 316 LVM) was placed in a prepared recess of dimension 9 mm × 2.5 mm on the tissue surface of the prosthesis in the iris region. This ensured a cover of acrylic resin with a thickness of 2 mm on the tissue surface. The thickness of resin on the external surface including the iris was 7 mm. The disc was totally embedded with acrylic resin. The contour of the tissue surface was maintained with the putty index [Figure 5]
6. After curing, the prosthesis was trimmed and polished [Figures 6 and 7]
7. The finished prosthesis was splinted in plaster and was subjected to pressure pot curing
8. A magnetic holder was then custom fabricated. Two cylinder-shaped neodymium magnets (Technotone Electronics, Mumbai) were enclosed in an acrylic cylinder. The magnetic holder when brought near the custom-made prosthesis attracted the metallic disc kept inside the eye shell and thus facilitated removal of the ocular prosthesis [Figures 8 and 9]
9. The patient was trained to remove the ocular prosthesis using magnetic holder [Figure 10].

DISCUSSION

Ocular defects constitute a major portion of maxillofacial defects, which require prosthetic replacement. Customized ocular prosthesis in the long run provides the most satisfactory results by maintaining faithful tissue contact and providing superior retention. Patients with high-grade manual dexterity may be able to insert and remove the ocular prosthesis with their fingers. However, old-aged individuals with limited manual dexterity will find it difficult to place and remove the ocular prosthesis. Hence, the customized magnetic holder was fabricated. Two
cylindrical neodymium magnets were enclosed in an acrylic cylinder, which could attract the metal disc embedded in the ocular prosthesis and facilitates in the easy retrieval of the prosthesis. Although the design is very simple, it is very effective and helpful to patients in advancing ages who have limited neuromuscular coordination. Application of a magnetic holder in the removal and insertion of ocular prosthesis has never been reported in the literature. The technique is simple and can be practiced in any dental clinic using locally available materials.

CONCLUSION

A simplified method of fabricating a magnetic ocular shell holder is described. This is a custom-made prosthesis, and it enjoys the biologic superiority.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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