

Prosthodontic Rehabilitation of a Patient with an Ocular Defect Using a Custom Ocular Prosthesis: A Case Report

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ABSTRACT

Background: The importance of an ocular prosthesis with acceptable aesthetics and reasonable motility in restoring the normal appearance in patients with an ocular defect has been recognized since long. The need for an artificial eye can sometimes be satisfied by stock ocular prosthesis that come in standard sizes, shapes and colours. These are relatively inexpensive and can be delivered quickly. Often, however, a custom-made ocular prosthesis is indicated. With the development of newer materials the socket can be finely recorded on which custom made ocular acrylic prosthesis can be fabricated with exact fit and aesthetics. Multidisciplinary management and team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient. This article describes the rehabilitation of an ocular defect using a customized ocular prosthesis, wherein retention has been achieved by a combination of anatomic undercuts and eyeglasses.

Keywords: Eye Enucleation, Maxillofacial prosthesis, Ocular Defect, Ocular Prosthesis.

INTRODUCTION

Eyes have often been called the windows to one's soul. All activities that a person performs require the ability to see and loss of one's eyes undoubtedly is a severe handicap. Restoration of vision, unfortunately, cannot be established once a person undergoes enucleation of the eyeball or exenteration of orbital contents. However, cosmetic rehabilitation is something that can be achieved to a very satisfying degree and the science of providing ocular prosthesis has seen innumerable innovations in terms of materials, techniques and the sophistication of the end result.¹

A stock eye shell, though inexpensive, can hardly ever provide an exact match to a natural eye and thus custom made ocular prostheses have been preferred by patients and maxillofacial prosthodontists alike.

Custom ocular prostheses provide definite advantages like improved adaptation to underlying tissues, accurately matched and created shades of the sclera and iris, improved gaze fixing etc.^{2,3}

CASE REPORT

A 70 years old male patient reported to the Department of Prosthodontics and Crown and Bridge, Nair Hospital Dental college complaining of unpleasant appearance due to his missing right eye. The patient gave a history of having his right globe enucleated due to an injury about 15 years back and had never sought treatment before. On examination, a depressed socket could be seen with the upper and lower eyelid collapsed. The eyelids were separated and the socket examined. The socket was found to be lined with well hydrated, apparently healthy mucosa (Fig.1). For making the impression of the socket, a prefabricated conformer was used that had perforations to lock in the impression material. An inlet for the impression material was

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Fig 1: Patient with an ocular defect on the right side, right globe enucleated, depressed eye socket with collapsed eyelid.



Fig 2: Prefabricated conformer with an inlet for impression material and Propcaine eyedrops 0.5%.

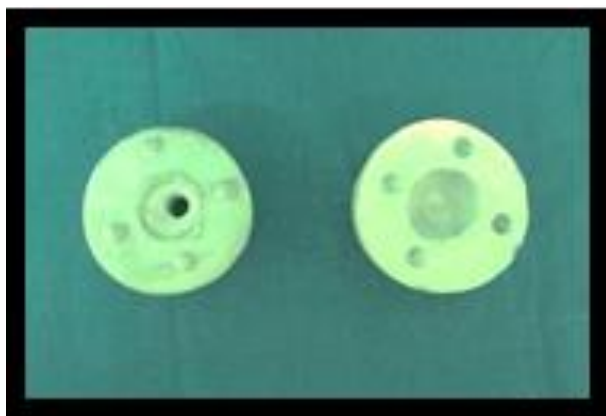


Fig 3: Working model.



Fig 4: Selection of iris button and placement on scleral wax-up.



Fig 5: Final ocular prosthesis in-situ.

created on the convex surface of the conformer using the plastic protective cover of a needle, that was cut to appropriate size. Two drops of an anesthetic eye solution (Proparacaine Hydrochloride Ophthalmic Solution, Cipla) were used before making the impression (Fig.2).

The impression was made using Ophthalmic alginate / Irreversible hydrocolloid mixed in a flowable consistency. The material after mixing, was loaded into a 5 ml syringe and was injected into the socket through the inlet attached to the conformer till a subtle resistance could be felt and evidence of support for the upper eyelid was apparent. The conformer was positioned within the socket with the inlet projecting out from between the eyelids. On setting, the impression was removed and a

working model poured. The working model was prepared by inverting the impression into dental stone, confined in a paper cup. (Fig.3)

After setting and removal of the impression material from the model, melted baseplate wax was poured into the space. Thus, on solidification, a wax pattern was obtained, that was tried in the Patient's socket. The pattern was adjusted to match the natural eye. The contour, projection of the pattern from the palpebral fissure, the eyelid support was examined and modified as required.

The size of the iris was determined using Exophthalmometer, keeping the natural eye as a reference. The position of the iris and fixing of gaze was done by asking the patient to focus on an object kept about 6 feet away at eye level. All the measurements were carved onto the wax pattern.

A stock eye shell was then selected that matched the requirements and the iris button was obtained by trimming off the sclera portion of the eye shell. This was then incorporated onto the wax pattern to fit within the carved portion. The wax pattern, with the iris button, was again tried in the patient's socket and the gaze was verified (Fig.4).

The pattern was then invested in a varsity flask. Before counter flasking, the iris button was fixed in position using a Dowel pin. Dewaxing was carried out and the base and counter flasks were separated, with the iris button incorporated in the latter.

A layer of baseplate wax was applied onto the walls of the cavity in both halves of the flask. Three uniformly separated indexing points were created onto the base flask cavity by scraping off the wax. Addition silicone in putty consistency was then manipulated and introduced into the base flask cavity such that it extended into the indexing points. A putty index was thus produced.

Dewaxing was carried out again to ensure complete removal of any wax from the mold cavity. The Shade matched using Shade Tabs. Acrylic resin was then mixed and introduced into the base flask, the putty index was then positioned in its place and excess resin removed. Resin was also introduced in the counter flask and adapted lightly onto the walls of the cavity. On curing, the putty index was removed and salt was added in its place. The two halves of

the flask were then approximated and curing was done.

Once the cured prosthesis was procured from the flask, a small vent was created on the postero-superior aspect. Warm water introduced through this vent helped dissolve the salt and, in this way, a hollow ocular prosthesis was created. The vent was subsequently closed with a tiny amount of acrylic resin.

After thorough finishing and polishing, the prosthesis was inserted and slight modifications notwithstanding, a comfortable but aesthetically pleasant prosthesis was delivered (Fig.5).

DISCUSSION

Stock eye shells may be a preferred option by some since they can do not require undertaking of technique sensitive procedures. However elaborate modifications were always required to make the prosthesis fit as closely as possible in a patient's eye socket. Absence of a close fit makes eye movement difficult and leads to an unnatural appearance. Abrasions and ulcerations may also result.⁴

Custom ocular prosthesis, while providing superior appearance, adapt much better, have a more uniform pressure distribution and thus promotes tissue health⁵.

Although the basic steps in lubricating an ocular prosthesis remain the same, various experimentations have been done over years to improve patient acceptance and experience. In this case, a hollow bulb ocular prosthesis was lubricated, on the lines of a hollow bulb palatal obturator or a hollow denture. Although the socket is a non-pressure bearing area, hollowing out of the prosthesis was thought to aid in better and easier acceptance, since the patient was at an advanced age⁶.

CONCLUSION

The rehabilitation of the orbital defect is a complex task. A custom ocular prosthesis is a good option when reconstruction by plastic surgery or the use of osseointegrated implants is not possible or not desired. Systemic conditions and financial constraints may limit their use.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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