

# OCULAR PROSTHESIS AN ASSURED TREATMENT MODALITY FOR EARLY AESTHETIC REHABILITATION OF AN ENUCLEATED EYE SOCKET IN A CHILD PATIENT – A CASE REPORT

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## Abstract:

*The loss of an eye in a child patient has a psychological impact on the growth and social acceptance. Replacement of the lost eye as soon as possible is necessary in such cases to enable the patient to cope better with the difficult process of rehabilitation. Here is a ten-year old child patient, who had undergone enucleation of her right eye due to carcinoma. After the enucleation patient was not using any prosthesis for a period of five years. Hence, initially the enucleated eye socket was restored with a modified stock ocular prosthesis followed by its replacement with more definitive custom-made ocular prosthesis. Thus emphasizing that, cosmetic rehabilitation with the help of ocular prosthesis of an appropriate size, colour and contour can prove to be of value functionally as well as aesthetically. The prosthetic eye promotes physical and psychological healing for the child patient and improves the social acceptance.*

**Key words:** Ocular prosthesis, eye prosthesis, maxillofacial prosthesis

## Introduction

The disfigurement associated with loss of an eye can cause significant physical and emotional problems.<sup>1</sup> The importance of an ocular prosthesis with acceptable aesthetics and reasonable motility in restoring normal appearance in patients with anophthalmia has long been recognized. Most patients experience significant stress, primarily due to difficulty in adjusting to the functional disability caused by the loss of eye and to societal reactions to the facial impairment.<sup>2</sup> The loss of an eye in a child patient has more psychological impact on the growth, development and social acceptance. Replacement of the lost eye as soon as possible is necessary in such cases to enable the patient to cope better with the difficult process of rehabilitation.

The aetiologies of eye loss include malignancy, infection and trauma.<sup>3,4</sup> In case of malignancies enucleation of the affected eye may be required. Enucleation is the surgical removal of the globe by severing all muscles, nerves, and blood ves-

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sels attached to it and a portion of the optic nerve from the orbit. Enucleation is often considered the treatment of choice for primary intraocular malignancies, because it permits histopathologic examination of the intact globe, as well as determination of intra neural or extrascleral spread of the disease.<sup>5</sup>

Treatment for enucleated eye socket consist of ocular prosthesis. The ocular prostheses are either readymade (stock) or custom made. A definitive technique for fabricating artificial eye using acrylic resin was developed by the United States Naval Dental and Medical Schools and was published in 1944.<sup>6</sup> Now several methods for the fabrication of ocular prosthesis have been described in the literature. Methyl methacrylate resin is the material of choice as it is superior to other ocular prosthetic materials in tissue compatibility, aesthetic compatibilities, durability, colour permanence,

adaptability of form, cost and availability.<sup>7</sup> A multidisciplinary management and team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient. Therefore, the combined efforts of the ophthalmologist, the plastic surgeon and the maxillofacial prosthodontist are essential to provide a satisfactory ocular prosthesis.<sup>8</sup> The aim of the article is to present a case report of pediatric patient who was rehabilitated with ocular prosthesis for her enucleated right eye.

## Case Presentation

**Case history and Etiology:** A ten year old female patient was referred to the Department of Prosthodontics from a private ophthalmologist for the replacement of her missing eye. Patient gave history of enucleation of her right eye for the treat-



Figure 1. Preoperative Patient Photograph



Figure 2. Preoperative Contracted Eye Socket



Figure 3. Patient with Stock Ocular Prosthesis



Figure 4. Postoperative Enlarged Eye Socket



Figure 5. Stock Eye Prosthesis After 3 Months

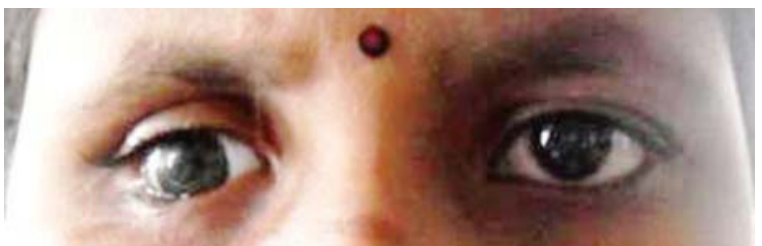


Figure 6. Patient with Custom Ocular Prosthesis

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ment of carcinoma five years ago. Patient was not aware of the type of carcinoma/malignancy due to which the enucleation was performed. The records could not be traced as the surgery was done somewhere else. The ophthalmologist was planning for another surgery as there was lesser space available due to postsurgical soft tissue contracture, making any prosthetic replacement difficult. But the child's parents were not willing for any kind of surgical intervention. Thus the ophthalmologist had provided her with a stock conformer two months back before referring her to the department. Patient was using the conformer sparingly due to discomfort and pain on insertion.

**Clinical evaluation:** On examination, The eye lashes looked drooping and even the eye brows looked unsupported because of the lost tissue support. The child was unable to open or close, and perform any kind of movement with affected eye. There was a gross facial deformity easily recognizable due to the lost eye. [Figure 1] The socket looked depressed compared to the normal eye. Though it was healed and the surrounding tissues appeared normal, but the socket indicated a soft tissue growth on the lateral canthus region. And the depth of the socket was less for rehabilitation with the ocular prosthesis. [Figure 2] This could be attributed to not replacing the socket with any kind of conformer or prosthesis to maintain the space of enucleated tissues, since past five years after the surgical procedure.

## Treatment

**Fabrication of the ocular prosthesis:** Though custom made prostheses are ideal for many cases, a stock modified ocular prosthesis was chosen initially for this case due to the lack of space. The patient was explained the procedure for fabricating the ocular prosthesis and consent obtained from her parents. For the impressions, the patient was positioned in semi supine position in the chair and trained in maintaining a fixed gaze on a point directly in front of her and in a midline position. A piece of tape placed on the wall at the

desired spot aided the patient in maintaining the correct line of vision. The patient was instructed not to move the eye or blink during the setting of the impression material. The light body addition silicone syringe material was loaded and injected in the enucleated socket. When the impression material was hardened it was gently removed, checked for air bubbles and a cast was poured. Using the cast a wax pattern was made and a stock eye was trimmed appropriately and centred on this wax pattern, and tried in the socket. After the try-in of the wax pattern the ocular prosthesis was invested, processed and finished. The prosthesis was polished to a high gloss, thoroughly cleansed with a brush, mild soap and water.<sup>9</sup>

The prosthesis was inserted in the patient's enucleated eye socket and examined for esthetic appearance. [Figure 3] The iris colours were matching and the patient did not experience any difficulty in the socket. The patient was quite happy with her restored aesthetics. Patient was given instructions on the use of the prosthesis. The parents were also instructed how to remove and insert the prosthesis manually. Patient was instructed to wash the prosthesis with pure soap and tepid water, scrubbing it well between thumb and fingers and rinsing it well before reinsertion. The patient was evaluated three days after the insertion and she did not have much difficulty with the use of the prosthesis. She was instructed for regular recall visits.

In regular recall visits over a period of 3 months patients restored eye socket was evaluated for increase in its dimension in terms of depth and width due to the insertion of stock ocular prosthesis. And it was found that considerable changes took place in socket size due to the continuous use of the prosthesis. [Figure 4] Hence when the socket size increased adequately and stock ocular prosthesis became loose fitting, decision was made to fabricate a new ocular prosthesis. [Figure 5] At this stage because of presence of adequate space in the socket, custom ocular prosthesis was fabricated with the similar impression procedures mentioned

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above. Once the wax pattern was prepared, this time only the iris portion of the stock eye was trimmed and positioned in the centre of the wax pattern and trial insertion was done. Fabrication procedures were followed as mentioned above.

## Outcome and Follow-Up

Newly fabricated prosthesis was custom made hence, it had a better adaptation and because of the increased size of socket aesthetic outcome was excellent compared to the earlier prosthesis. [Figure 6] As the growth of the child continues and socket continues to increase in size, fabrication of such ocular prosthesis has to be repeated after every 6 months to 1 year duration.

## Discussion

Enucleation results in enophthalmos and sulcus defects. A fundamental objective when restoring an anophthalmic socket with an ocular prosthesis is to enable the patient to cope better with the difficult process of rehabilitation.<sup>10</sup> Hence, a temporary conformer to prevent tissue contraction will maintain proper contours. Early replacement of the conformer by an ocular prosthesis allows for cosmetic rehabilitation and improved quality of life.

Empirically fitting a stock eye, modifying a stock eye by making an impression of the ocular defect and the fabrication of custom eye are the most commonly used techniques. Though a custom ocular prosthesis has several advantages such as intimate contact between the prosthesis and tissue bed, and equal distribution of forces, it is contraindicated when an undue change in socket volume has taken place such as microphthalmos or tissue shrinkage due to non compliance in the use of ocular prosthesis by a growing child. Hence socket expansion with the use of stock ocular prosthetic device of progressively larger size over an extended period of time gives promising results. The stock ocular prostheses can be easily modified in the dental office with available materials.

If fabricated properly the prosthesis can provide satisfactory fit and esthetics to the patients. In case of pediatric patients such prosthesis would be of immense use due to its easy fabrication and limited number of visits required.

## Conclusion:

- Proper diagnosis and treatment planning are important for predictable prognosis.
- Socket expansion with the use of ocular prosthesis of progressively larger size over an extended period helps considerably in the complicated process of rehabilitation of a growing child.
- Ocular prosthesis filling the ocular cavity simulate facial growth, and symmetry thereby improving the esthetic, anatomic and physiologic growth of child.
- Rehabilitation of the defected eye helps the child psychologically and allows her to be reinstated in society without being discriminated for her differences.

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## PATIENT'S PERSPECTIVE

I have lost my one eye from long time, eye specialist had given me an artificial conformer to wear in the lost eye but I did not use it because it used to hurt. In my school also other kids used to tease me, even they used to point the finger towards me. My teachers also keep asking me how I lost my eye, hence I was reluctant to go to school. But when I got artificial eye, many people could not recognize that I don't have one eye. Even my school friends could not recognize which one is the artificial eye and which one is the natural eye. I use artificial eye regularly and now I am habitual to wearing it and removing it on my own.