ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 10 | October - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CUSTOM-MADE OCULAR PROSTHESIS: A CASE REPORT

Prosthodontics

Dr. Meshi Longdo* Post Graduate Student , Department Of Prosthodontics , Maulana Azad Institute Of Dental Sciences , New Delhi , India *Corresponding Author

Dr. Akshita Mehta Post Graduate Student , Department Of Prosthodontics , Maulana Azad Institute Of Dental Sciences , New Delhi , India

Dr. Rekha Gupta Head Of Department And Professor Sag , Department Of Prosthodontics , Maulana Azad Institute Of Dental Sciences , New Delhi , India

Dr. Shubhra Gill Professor Sag , Department Of Prosthodontics , Maulana Azad Institute Of Dental Sciences , New Delhi , India

ABSTRACT

Ocular prostheses are essential for helping people who have lost their sight through acquired or congenital defects to regain both the appearance and functionality of their eyes. Treatment includes implants and acrylic eye prosthesis. Although implant eye prosthesis has superior outcome, due to economic factors it may not be advisable for all patients. Therefore, a custom-made ocular prosthesis was fabricated in this case report for a patient with an enucleated left eye. The outstanding visual fit, increased comfort, and boosted confidence of the patient were all made possible by the custom-made prosthesis, which eventually resulted in an improved quality of life.

KEYWORDS

Custom Made Ocular Prosthesis, Iris Painting

INTRODUCTION

The eyes are the primary sensory organ for vision which is crucial for most daily activities. They provide essential physical, anatomical, functional, emotional, and social support, facilitating our interaction with the world around us. Unfortunately, not everyone is fortunate enough to experience the full spectrum of vision due to various conditions that lead to the irreversible loss or defect of one or both eyes.

Fig 1 : Custom Tray made with Polyvinylsiloxane Putty with Light Body wash

Loss of the eye could be because of trauma, a congenital defect, malignancies, or sympathetic ophthalmia.[1] Depending on the severity, surgical management includes one of the three approaches: evisceration, enucleation, or exenteration.[2]

The replacement of such a defect is vital for restoring an individual's sense of self-worth. An ocular prosthesis that is fabricated to match the shape, size, and color of the natural eye, serves this critical function. These prostheses are meticulously fabricated to fit the affected socket, aiming to provide both cosmetic and functional benefits. The development and refinement of ocular prosthetics are essential in enhancing the quality of life for individuals affected by eye loss, enabling them to regain a sense of normalcy and reintegrate more fully into their social and emotional spheres. This case report describes the technique to fabricate a custom-fitted ocular prosthesis using an impression of a patient's socket.

Procedure

A 28-year-old male patient with a history of enucleation of the right eye reported to the Department of Prosthodontics, Maulana Azad Institute Dental Sciences for rehabilitation of the defect. An examination of socket was done, which was healed satisfactorily and mucosa was healthy. The sulcus depth and volume were

sufficient to hold and support the prosthesis. The muscles of the upper and lower eyelids seemed to be operating normally. The decision was made to use direct impression technology to create a custom-made ocular prosthesis for the patient's rehabilitation. Comprehensive treatment plan was formulated and entire treatments steps were explained to the patient with its limitations and his consent was obtained.

Impression

An impression of the ocular defect of the right eye was first obtained. The patient was made to sit comfortably on the dental chair and the impression procedure was carefully explained. An ophthalmic topical anesthesia was applied to make the impression procedure comfortable. Firstly, the impression was made using low-viscosity alginate for the defect. However, due to a lack of a self-supportive body and inaccurate recording of finer details of the defect, it could not be utilized for further steps. Therefore, polyvinyl siloxane impression material (Fig 1) of the heavy body consistency was used to make the impression of the defect. Because of its high viscosity, material is self-supportive and with great mouldability. Impression material was moulded in the form of a tray and directly placed into the socket. Once the material completely filled the socket, the patient was advised to close the eye and perform various ocular movements until the material sets. Direct impression without using any type of tray eliminates interferences in the closure of lids while making an impression. Heavy-bodied polyvinylsiloxane impression was used as a custom tray upon which light body final impression was made to record final details. Therefore, two appointments were combined into one. After the complete setting of the material, the impression was carefully retrieved.

Wax Shell Try In

A silicone putty index was made from the impression. Once it set, it was cut open and a light yellow wax was flown through it. Upon hardening, the wax pattern was gently retrieved, cooled in cold water, and smoothened with the help of a carver and gauze. At this point, the tissue/fitting surface of the wax design was left unaltered. The patient's eye was then tested with the wax pattern to ensure proper fit, comfort, bulkiness, drape, and eyelid mobility. Necessary adjustments were made thereafter.

Iris Positioning

It was done using the Inverted Anatomic Tracings method wherein lines were marked on the face and orbital anatomy was traced and transferred to the acetate sheet. (Fig 2). It was then inverted over the defect and the iris was oriented. Following this , aluminum button was selected and was placed in wax shell followed by various eye movements to verify its position.

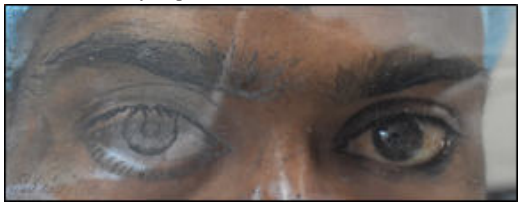

Fig 2 : Inverted Anatomic Tracing for Iris Positioning

Investing of the whole assembly, including the wax template with attached aluminum button, is done in a mix of plaster of Paris. Following dewaxing, the aluminum button is carefully replaced with an iris button in the mould space. Acrylization was completed with white acrylic and a conformer was obtained.

Iris Painting

The selected iris button is painted with acrylic-based pigments to match the basic colour and tint of the other eye. It is checked for colour accuracy against the natural eye by placing a drop of water over the painted surface.

Scleral Painting

After iris painting, to replicate fine details of the sclera as in th contralateral eye; scleral painting was done which was followed by a water bath for to enhance the color of prosthesis. (Fig 3 & 4)

Fig 3 : Scleral Painting

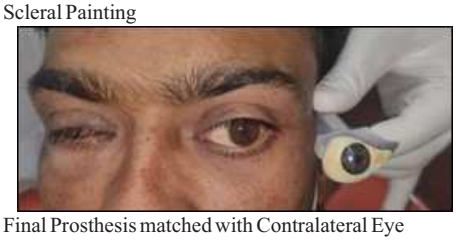

Fig 4 : Final Prosthesis matched with Contralateral Eye

DISCUSSION

It is challenging to replace an anatomic structure by artificial means especially in the facial region. The replacement must blend with the adjacent tissues as well as replace the missing structures. A team work with inter-disciplinary interaction is mandatory to face this challenge.[3,4]

Ocular prostheses are either ready-made or custom- made. Fitting a stock eye, modifying it by making an impression of the ocular defect and the custom eye technique[5] are few of the methods adopted. While stock acrylic resin prostheses allow for quick manufacture, it might be challenging to include custom, naturally-looking aesthetics. Therefore, personalized acrylic resin eye fabrications are favored because they offer greater mobility, control over cosmetic variables, and better tissue adaption that results in attractive shapes. Thus custom acrylic resin eye fabrications is preferred as it provides better adaptation to the tissues resulting in good contours, control over aesthetic factors, and also increased mobility .

The literature and various textbooks suggest multiple methods for fabricating ocular prostheses, with custom-made prostheses being recognized for providing the most reliable outcomes aesthetically, physically, financially, and psychologically. [6] In this research, a custom-made ocular prosthesis was fabricated using polyvinyl siloxane impression material. This material was chosen for its ability to capture the finest details of the ocular socket in its functional state. Following the impression, conformer was fabricated and rigorously tested for fit, comfort, material bulkiness, and eyelid mobility. The process was completed with meticulous iris painting and finalization of the prosthesis.

Custom-made ocular prostheses offer several significant advantages. They are known for their durability, biocompatibility, color adaptability, cost-effectiveness, and mechanical properties such as retention. Despite the technique-sensitive nature of this approach, the results successfully duplicated the natural contralateral eye, providing a highly satisfactory outcome for the patient. [7] This study underscores the importance of personalized ocular prostheses in restoring the patient's appearance and confidence, contributing to their overall quality of life**.**

CONCLUSIONS

The ocular prosthesis plays a vital role in restoring the quality of life for individuals who have suffered the loss or defect of one or both eyes. Among the various fabrication methods, custom-made ocular prostheses stand out for their superior properties amongst the rest. This case report highlights the profound impact of personalized ocular prostheses in not only restoring appearance but also significantly enhancing the overall well-being and social reintegration of individuals affected by ocular loss.

REFERENCES:

1. Clinical Ophthalmology,vol. 5 Phildelphia: Lippincott-Raven; 1995. pp. 1–25.
2. Parr GR, Goldman BM, Rahn AO. Surgical considerations in the prosthetic treatment of ocular and orbital defects. J Prosthet Dent 1983;49(3):379–385. DOI: 10.1016/0022-3913(83)90281-0.
3. Bartlett SO, Moore DJ. Ocular prosthesis: a physiologic system. J Prosthet Dent 1973;29:450-59
4. Guerra LR, Finger IM, Echeverri J, Shipman B. Impression making, sculpting, and coloring o f orbital prostheses. Adv Ophthalmic Plast Reconstr Surg. 1992;9:287-96.
5. Benson P. The fitting and fabrication of a custom resin artificial eye. J ProsthetDent1977;38:532-38
6. Chaudhary R, Kumar D, Khattak A, et al. Ocular Prosthesis with an Art: A Case Report. Int J Experiment Dent Sci 2019;8(1):26–31.
7. Colvenkar S, Thushara S, Maheshwar Reddy G, Shamili S, Vijay L. Custom Ocular Prosthesis: A Case Report. Cureus. 2023;15(6):e41176.