

Facial Rehabilitation of Traumatic Injury Using Spectacle Retained Orbital Prosthesis: A Case Report

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Abstract

Keywords

- orbit
- prosthesis
- rehabilitation
- silicon
- trauma

Facial abnormality rehabilitation is a challenging process that requires a technique-sensitive approach and a unique design for every patient. One's physical and emotional health might be severely disrupted by the disfigurement caused by eye loss. The primary goal of maxillofacial prosthetics is to restore the form and function of a missing or damaged segment of the face, mandible, or maxilla to ease psychological distress and facilitate reintegration into society. The main factors influencing the level of success are the type of deficiency, the prosthodontist's skill, and the characteristics of the materials utilized. We present the case of a 52-year-old man whose primary complaint was facial deformity due to loss of his right eye.

Introduction

The primary organ for seeing is the eye. The eye plays a major part in facial expression as well.¹ The intricate process of orbital rehabilitation necessitates a personalized technique for each patient. Lesions involving facial deformities necessitate prosthetic therapy since eye loss affects the patient on an emotional and physical level. After the eye has been enucleated by trauma, tumor, infection, cancer, or congenital abnormalities, an orbital prosthesis is placed. An orbital prosthesis should be aesthetically beautiful, durable, lightweight, affordable, and—above all—retentive.

Many materials, including silicone elastomer, polymethyl methacrylate, polyurethane elastomer, and urethane-backed medical-grade silicone, are used to make prostheses for orbital abnormalities. Osseointegrated extraoral implants, spectacle frames, or mechanical anatomical undercuts are the primary methods used for retention.^{2,3} The patient's cosmetic preferences, the size and degree of the deformity, their lifestyle, their financial situation, etc., all influence the type of retention device and the material utilized for creation.⁴

Case Report

A 52-year-old male patient reported to the Department of Prosthodontics, Guru Nanak Dev Dental College and Hospital, Sunam, Punjab, India, with the chief complaint of facial disfigurement because of the loss of his right eye. History of the patient revealed a trauma to the right eye, followed by infection, which led to the enucleation of the eye (► **Fig. 1**). A clinical examination revealed that the ocular socket was fully healed. The area of the defect did not exhibit any evidence of pain or discomfort. A treatment plan of constructing an orbital prosthesis for this patient was made keeping in mind the aesthetic needs. The entire procedure was explained to the patient and a written consent was obtained mentioning that the pictures and records of the patient shall be used for documentation and academic purpose in future. The following step-by-step procedure was performed for the desired results:

1. **Determination of the position of stock shell:** For this, the distance between the medial canthus of both eyes was

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Fig. 1 Missing right eye due to trauma.

- measured and then divided into two halves. An imaginary line (*blue colored*) was marked as 1. Another line depicting the medial canthus of the eye was marked as 2. The center of the pupil of the eye was determined and was marked as 3. The distance between lines 1 and 3 was measured with the help of a tongue blade and a caliper, which was used as a reference for the positioning of the stock eye (**►Fig. 2**).
2. **Custom shell placed in wax and impression made:** A custom eye shell was placed in wax and the position was verified clinically (**►Fig. 3**). Putty was used over the waxed-up eye to make the impression. Then, the whole assembly was removed, and the impression thus obtained was boxed and poured in type 3 dental stone (**►Figs. 4 and 5**).
 3. **Cast fabrication and carving:** A cast was fabricated and wax carving was done in accordance with the patient's facial profile, and a wax trial was done (**►Figs. 6 and 7**).
 4. **Making of the mold for the processing of prosthesis:** To make the mold, first the wax assembly with the eye shell was removed from the cast and indentations were made



Fig. 3 Custom eye shell placed in wax and the position verified clinically.



Fig. 4 Putty used over the waxed-up eye to make the impression.

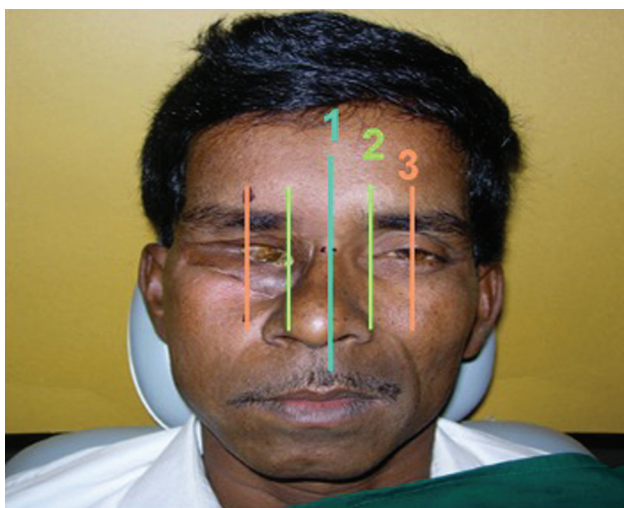


Fig. 2 Markings for determination of position of stock shell.



Fig. 5 Poured impression.



Fig. 6 Carving in progress.

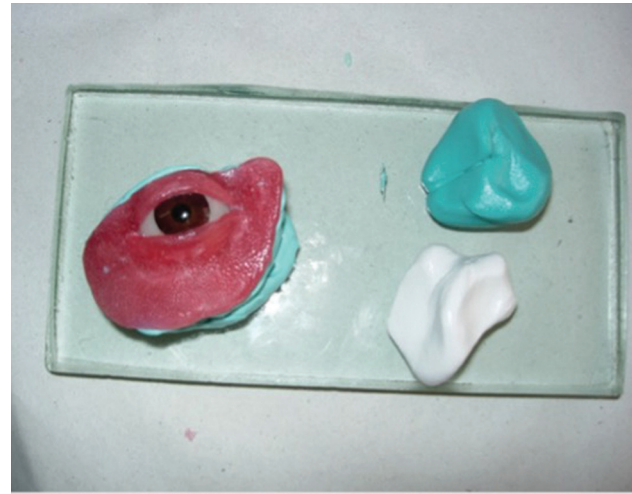


Fig. 8 Putty index made for the tissue surface of the shell.



Fig. 7 Wax trial on the patient's face.



Fig. 9 Putty removed from tissue surface.

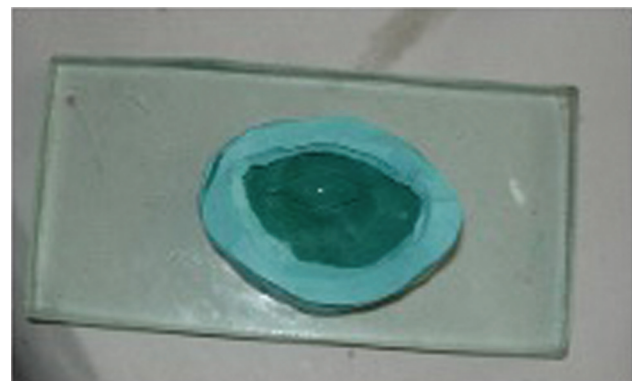


Fig. 10 Putty light body superstructure.

on the tissue surface of the eye shell with the help of a bur. A putty index was made for the tissue surface of the shell (►Fig. 8). A light body impression was made on the cameo surface of the wax pattern, which was reinforced with putty consistency addition silicone. Thus, both the tissue surface and the cameo surface were recorded in putty material. Following this, the wax pattern with the eye shell was removed and the mold was created (►Figs. 9 and 10).

5. **Shade selection and formation of acrylic piece:** Shade selection was done and the cold cure acrylic with the matched shade was poured into the light body putty superstructure (►Figs. 11 and 12). The acrylic eye piece fabricated by this procedure was fit checked on the patient and required adjustments were done (►Fig. 13).
6. **Attaching the eye shell with the acrylic eye piece:** The acrylic eye piece was trimmed to accommodate the eye shell and both were fixed with each other using the same cold cure acrylic resin material. The prosthesis was tried on the patient's face (►Fig. 14).

7. **The final outcome:** The final prosthesis was externally painted for optimum shade matching and was luted with the spectacle using the acrylic resin (►Figs. 15 and 16). The final outcome achieved was observed to be highly satisfactory both functionally and aesthetically (►Fig. 17).

Discussion

These days, orbital reconstruction with plastic surgery or osseointegrated implants is popular. However, a custom-



Fig. 11 Shade matching.



Fig. 14 Prosthesis trial for verification.



Fig. 12 Cold cure acrylic resin poured.



Fig. 15 Final prosthesis externally painted for optimum shade matching.



Fig. 13 The fabricated acrylic eye piece was fit checked on the patient.



Fig. 16 Prosthesis luted with the spectacle using the acrylic resin.

made silicon orbital prosthesis is always a viable choice if the patient does not want the above-said treatment or if it is not financially feasible for the patient to receive that. Following the

enucleation of the orbit and its contents, plans should be made for psychological and cosmetic rehabilitation. When local reconstructive techniques are unable to meet functional and aesthetic requirements, orbital prostheses offer a



Fig. 17 The final orbital prosthesis in position.

straightforward, attractive, and practical substitute. The current instance had a societal issue and a need for cosmetics, both of which an orbital prosthesis effectively addressed.

The aim of rehabilitation for these patients should be to choose a reasonable maxillofacial prosthetic material and an economically viable retentive aid. The most popular traditional technique for keeping orbital prostheses in place is the employment of anatomic retentive undercuts and spectacles.^{5–10} Since favorable undercuts that could be used for retention were present, to enhance the retentive property of the prosthesis, spectacles were used as an adjunct.

Conclusion

This case report describes the rehabilitation of a patient with an orbito-facial deformity. To conceal the orbito-facial prosthesis and strengthen the primary retention, it was held in

place by undercuts and spectacles. Every retention strategy that is appropriate for a given patient should be employed to improve retention. An orbital prosthesis undoubtedly contributes to a patient's sense of self-assurance after losing his or her eye.

Conflict of Interest

None declared.

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