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CASE REPORT

PRESS STUD FASTNER- AN INEXPENSIVE DEVICE TO RESTORE ORBITAL DEFECT CLINICAL STUDY

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ABSTRACT

The loss of an eye can be a very traumatic event in a person's life accompanied with physical problems, psychological trauma, and a poor quality of life. Prosthetic replacement is the treatment of choice owing to its acceptable lifelike appearance but the retention of the prosthesis is one of the key factors for the successful rehabilitation. This case report describes rehabilitation of patient with ocular defect by using press stud fasteners type of attachment to retain silicone orbital prosthesis.

INTRODUCTION

Acquired facial defects often present with extensive disfigurement, disability, social reaction to the functional impairment, and stress. Mutilation of a portion of a face can cause a heavy impact on the self-image and personality of an individual. Taylor has expressed that 'The psychology of an individual is a cumulative reflection of past and present experiences'.[1] Prosthetic rehabilitation is the treatment of choice when surgical reconstructive procedure does not show satisfactory results. Facial prostheses are important not only for rehabilitation and esthetic, but also for patient re-socialization.[2]

Surgical procedures adopted for the removal of an eye are classified by Peyman, Saunders and Goldberg (1987) into three general categories: enucleation, evisceration and exenteration. According to Scoll (1982) enucleation is a surgical procedure in which the globe and the attached portion of the optic nerve are excised from the orbit. Evisceration is removal of the contents of globe while leaving the sclera and extraocular muscles intact. Exenteration is the most radical of the three procedures and involves removal of the eye, adnexa, and the part of the bony orbit.[2] It is indeed impossible to reconstruct an exenterated orbit with autogenous material in an anatomic situation in which there is a total loss of the upper and lower eyelids along with the eye.

Orbital prosthesis is made from a variety of materials, such as polymethyl methacrylate, polyurethane elastomer, silicone elastomer, or urethane backed medical grade silicone.[2] They are mainly retained using mechanical means such as anatomical undercuts, spectacle frames, or by the use of osseointegrated extraoral implants.[3] Silicone prosthesis has been preferred to those made of acrylic resin, due to their consistency, resiliency and better marginal adaptation, which closely resemble those of human skin, in addition to the final esthetics and relative comfort of this material.

This clinical report describes the procedure of rehabilitating a patient using press stud fastner to retain orbital prosthesis fixed to the spectacle glass frame.

Case Report

A 65-year-old female patient reported to Department of Prosthodontics, Career Postgraduate Institute of Dental Sciences and Hospital, Lucknow, India with chief complain of

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loss of teeth. On extraoral examination, an orbital defect was found on left side of the face. Patient's left eye was surgically removed enbloc because of fungal infection (mucormycosis) **(Fig. 1)**. The patient was unaware of the facility to rehabilitate his defect. When she came to know about the available facility in our institution, she was motivated and consented to rehabilitate his defect. The intraoral examination revealed a completely edentulous maxilla and mandible which is rehabilitated by conventional complete denture.

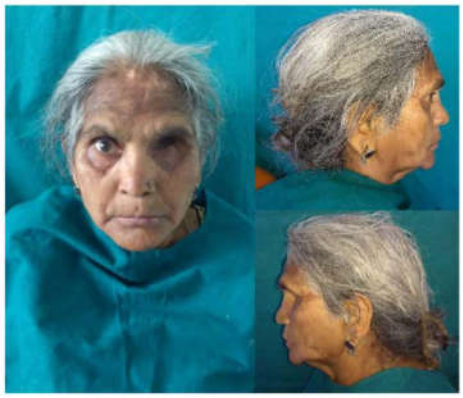

Figure 1 Patient's preoperative photograph

Procedure

Impression making

The patient was placed in the supine position and draped for impression procedures; the patient's eyebrows and eyelashes were lubricated with petroleum jelly (Fig. 2). Impression of the orbital defect was made using irreversible hydrocolloid (Zelgan2002, Dentsply) reinforced with gauze pads, which aid in the retention of the Plaster of Paris backing. After removal, the impression was cleaned and inspected for accuracy and details. After that the cast was poured in dental stone (Kala Stone; Kala Bhai Pvt. Ltd., Mumbai, India).

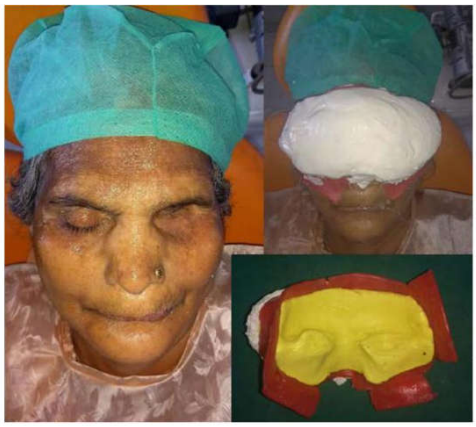

Figure 2 Impression making

Selection of stock acrylic eye shell

A commercially available stock acrylic eye shell matching the sclera and iris colour of the patient's right eye was selected from an array of stock acrylic eye shells. The ocular portion needed minor alterations to make it fit into the socket as the defect was relatively large.

Orientation of stock eye and Sculpting

The eye was then secured in position on a bed of sculpting clay according to the position gained using the measurements of the other eye with the help of Trubyte® Indicator (Dentsply Sirona Ltd) (Fig. 3).

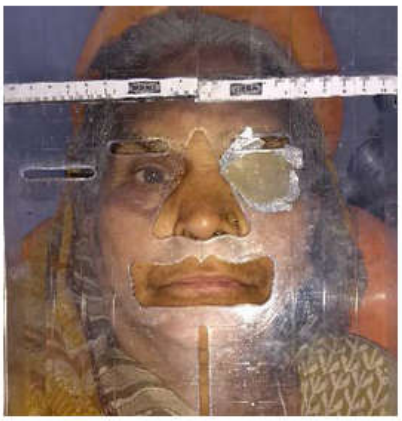

Figure 3 Orientation for stock eye with Trubyte® Indicator

The stock acrylic eye was adjusted anteroposteriorly, mediolaterally, and superioinferiorly in accordance with the contralateral eye. After adjusting stock eye, sculpting clay was added to the defected side of the face and sculpted by comparing the normal contralateral side of the face **(Fig. 4)**. Final surface contour and skin texture were established by carving in lines and wrinkles observed around the normal contralateral eye. The clay pattern thus formed was tried on the patient. The eye shell position, the lid aperture of the orbital prosthesis was assessed **(Fig. 5a)**. Once patient's approval was obtained, the pattern was transferred to the processing cast.

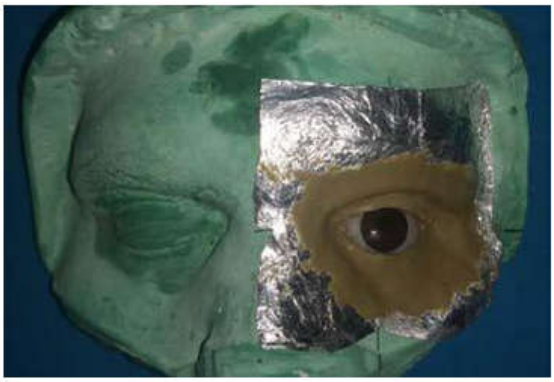

Figure 4 Sculpting and Clay pattern

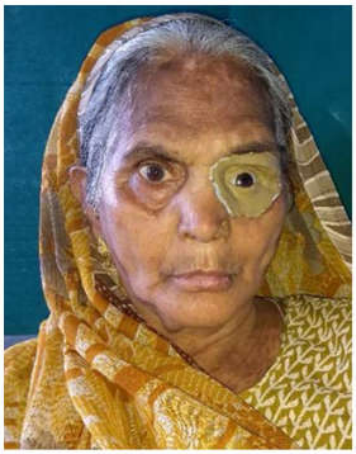

Figure 5a Clay pattern trial

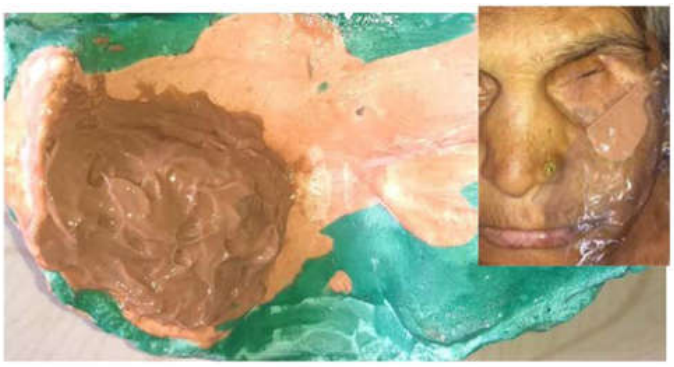

Figure 5b Shade matching and packing

Prosthesis processing

The clay sculpted prosthesis with the duplicated cast was flasked and dewaxed. Room temperature vulcanizing (RTV silicone, M.P Sai Enterprises, Mumbai, Maharashtra, India) medical-graded silicone material was mixed according to manufacturer's instructions. Pigment stains were blended into the base color of silicone for intrinsic staining at the time of mix to gain the approximate skin shade of the patient (Fig. 5b). After a close shade match with the patient, medical-graded silicone was packed into the mould and was left to cure at room temperature. Following polymerization the prosthesis was deflasked, retrieved and finished. Natural hair was stitched over eyebrow area and upper, lower eyelids of the silicone prosthesis.

Selection of spectacle frame and attachment of prosthesis

A well fitted, comfortable frame that blends with the personality of the patient and adequately covers the defect when viewed from the front, the sides, and above was selected. The eyeglass frame was placed *in situ.* The silicone layer was found to be covered on the medial extension of the resin base, which was cut and exposed. This facilitates the attachment of the eyeglass frame to the resin base. Cavities were prepared on the inner surface of the bridge of the spectacle frame using a carbide bur. The spectacle frame was placed *in situ* and checked for any interference of the press stud fastner housing (Fig. 6). Once the trial was found satisfactory, self polymerizing acrylic resin was used to secure the fastner attachments in the spectacle frame. (Fig 7)

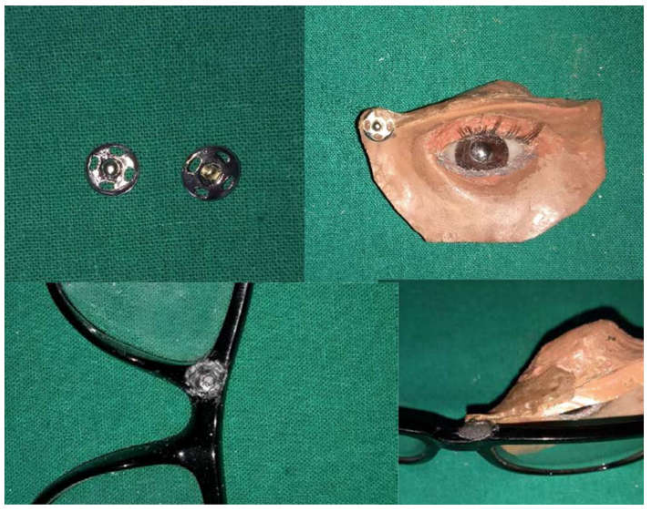

Figure 6 Complete prosthesis with attachment and acrylic shim on the spectacle

Figure 7 Pre-treatment and Post treatment with complete prosthesis

Patient instructions

The patient was taught the placement, removal, maintenance, and hygiene procedures for the prosthesis. She was cautioned to avoid contact with alcohol or solvents to protect the prosthesis from crazing of the acrylic resin.

DISCUSSION

The rehabilitation of the orbital defect is a complex task, and if reconstruction by plastic surgery is not possible or not desired by the patient, the defect can be rehabilitated by an orbital prosthesis, improving the aesthetics and instilling confidence to face the society with dignity. [5]

A dynamic combination of economical maxillofacial prosthetic material and feasible retentive aid can successfully rehabilitate such patients. Ablative surgical procedure and reconstruction is a major financial burden, compared to which prosthetic treatment is economical and hence an attractive option for patient. Silicone has superior marginal adaptation and life-like appearance but lacks chemical/mechanical bonding with the eyeglass frame posing retention problems in the prosthesis.[3]

The most commonly used conventional method to retain orbital prostheses is the eyeglass frames and anatomic retentive undercuts.[8] In the present case, naturally occurring undercuts were evident in the superior portions of the orbital rim and mechanical modes of retention was achieved by engaging these undercuts and further enhanced by using press stud fasteners with spectacle. As silicone prosthesis does not directly bond to the eyeglass. So, an acrylic shim was fabricated, which not only formed a steady base for the orbital prosthesis but also aided in the attachment of the silicone artificial eye to the spectacle.[9]

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