

PROSTHETIC REHABILITATION OF PATIENT WITH SUBTOTAL MAXILLECTOMY AND ORBITAL EXENTERATION

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ABSTRACT

Orbital exenteration presents a unique challenge to the maxillofacial prosthodontist. Prosthetic rehabilitation of the orbit is often complicated by the extent of resection, tissue response and the method of retention. Loss of an eye due to trauma or disease resulting in facial defect has a crippling effect on patients psychology. The placement of good prosthesis serves as a great psychological, social and cosmetic benefit in rehabilitation of the patient. The article discusses the prosthetic rehabilitation in an elderly male patient with orbital defect.

KEY WORDS: : Orbital exenteration, rehabilitation, orbital defect.

INTRODUCTION:

The restoration of orbital defects presents a challenge in maxillofacial prosthesis. A prosthetic rehabilitation of a patient suffering from complete exenteration of orbit and surrounding will be greatly enhanced if the prosthesis is placed in it.¹ An aesthetic prosthesis is difficult to fabricate and in some patients it may not be possible to duplicate the appearance and contour of the remaining normal eye and adjacent structures. Facial measurement devices have been proposed for orienting the ocular position of orbital prosthesis.² Although conventional techniques have proved suitable for fabrication of the prosthesis, the use of optical impression technique based on three dimensional optical data acquisition system holds more advantages.³ This clinical report describes the rehabilitation of a patient with a subtotal maxillectomy with exenteration of the orbit.

Case report:

A 63year old male patient visited the department of prosthodontics, D A P M R V Dental College, with the chief complaint of missing eye due to a surgery. On examination it was found that he had squamous cell carcinoma of right maxilla for which he underwent a surgery(right subtotal maxillectomy) and orbital exenteration.(Fig.1)

Materials and method:

Materials used:

- Petrolatum jelly
- Alginate powder (3 preweighed packages or 75grams)

- Cold water
- Flexible mixing bowls and/or quart size vacuum mixer
- Elastomeric impression material
- Four mixing spatulas
- Fast set plaster
- Gauze squares
- Breathing tubes
- Boxing wax

Impression Procedure:

The patient was seated on the dental chair facing up and parallel to the floor. The eyebrows and eyelashes were coated with petrolatum jelly. The patient was instructed to close his remaining eye and was cautioned to be relaxed during the impression procedure.

An impression of the defect and surrounding structures was made with an irreversible hydrocolloid material mixed with twice as much water as the proportion recommended. After mixing, the alginate was applied to the impression area taking care not to incorporate air. When the area was covered, the opened gauze squares were applied over the entire surface using light pressure to imbed some of the gauze into the alginate.(Fig.2). This provides mechanical retention for the rigid plaster backing necessary for removal of impression without distortion. Alginate adhesive may also be applied after the alginate has set.⁴



Fig.1a. Frontal wall defect



Fig.1b. posterior wall defect

A quick setting plaster of Paris reinforcement was laid over the impression material blocking out extreme undercuts.⁵ The plaster was spread over the entire impression surface to a thickness of about 0.25inch. This will provide adequate strength yet minimal weight that might distort the impression on the soft tissue.⁴ The reinforced impression was gently removed from the patient's face, keeping in mind the location of undercuts. After removal, the accuracy of the impression was evaluated and a dental stone was prepared, poured slowly in the impression

Enough stone was added to properly cover the impression. After the stone has set, the impression was gently separated from the cast, then a working cast was obtained.

Wax block out of the orbital defect and acrylic custom tray was fabricated. (Fig.3 and 4). Border moulding is done using silicon putty, final impression was made with light body silicon impression material with the special tray.(Fig.5). Dental stone is poured and master cast was obtained from the final impression. Notches were made on the borders of the superior surface of the cast. A wax pattern for the hollow acrylic bulb is made and placed onto the cast, the hollow region was poured with die stone and the base is made with yellow stone. The master cast and base made of yellow stone was made as a flask(Fig.6) and dewaxing was done. Following dewaxing

heat cure acrylic is mixed, placed into the mould space and cured to obtain the hollow acrylic orbital bulb.(Fig.7).

The sharp edges of the hollow acrylic orbital bulb were trimmed and the bulb was seated on the patients face.

Sculpting:

At the following appointment, sculpting of the periorbital tissues was made. Lid contours and periorbital tissues was shaped as those of the normal eye as closely as possible. All details were faithfully reproduced using wax and molds, shaping the wrinkles and opening according to the contour of the remaining eye.

The artificial acrylic resin stalk eye was positioned and final wax sculpting of orbital prosthesis was made. A finely smoothed stick is positioned into the wax pattern to facilitate easy removal from the master cast without its distortion (Fig..8). The wax pattern is then placed onto the hollow acrylic bulb and tried onto the patients face. The assembly was placed into the orbital defect and the ocular section should be such that it matches the gaze of the normal eye when the patient was starring directly at a point at eye level at least 6 feet away.⁴ After which the wax pattern was sealed to the hollow bulb with self cure acrylic.(Fig.9)

The wax pattern was processed with clear acrylic (Fig.10), and the acrylized pattern was placed into the hollow bulb. After extrinsic coloring of the orbital prosthesis, repositioning of the artificial eye into its housing was done and spectacles were used to concealing the margins and also it can be sealed with silastic medical adhesive type a (Dow Corning, Midland, Mich). (Fig.11)

The orbital prosthesis was then placed and the patient was instructed about the care and use of the prosthesis.

Discussion

The rehabilitation of maxillofacial defects is a challenging task as it requires an accurate prostheses. The material used in this work has been found to be acceptable to most patients treated. The technique utilising the elastic property of the soft autopolymerizing acrylic enable the usage of undercuts in the defect primarily for retention.

As observed by Shifman et al, the prosthesis is light, yet rigid enough to retain its form and not collapse.⁶ The use of this resin prosthesis easily allows the maxillofacial prosthodontist to modify and replace it at a relatively low cost, as observed by Shipman and Bader.⁷ Comparing the soft autopolymerizing acrylic resin to the poly methyl methacrylate resin, largely used in maxillofacial



Fig 2. Alginate impression of the defect.

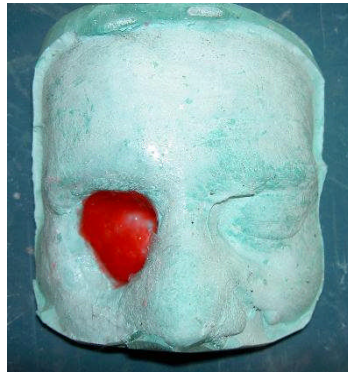


Fig 3. Facial impression and wax block out.

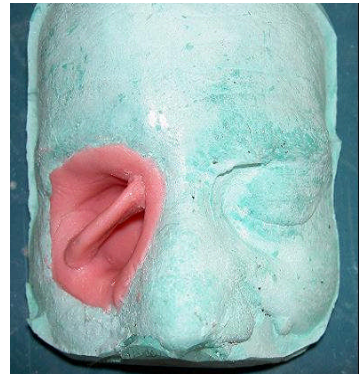


Fig 4. Custom tray fabrication

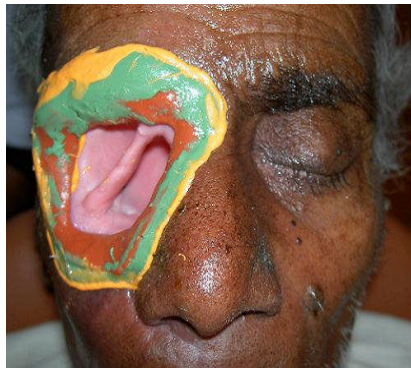


Fig 5. Border moulding and final impression made.



Fig 6. Master cast

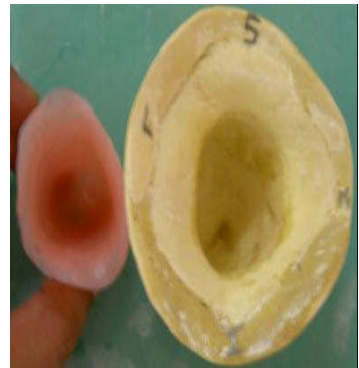


Fig 7. Hollow acrylic orbital bulb.

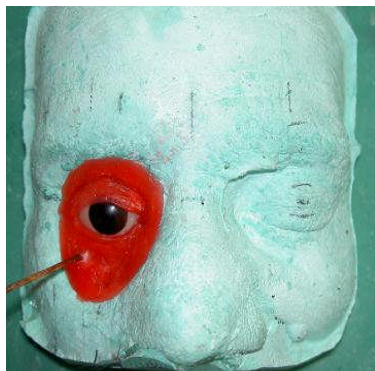


Fig 8. Sculpturing of the wax pattern.



Fig 9. Try in of the wax pattern.

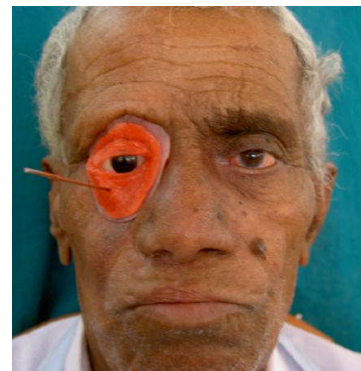


Fig 10. Acrylization of the wax pattern.

prosthodontics, it was observed that the first one presents the following advantages:

1. The prosthesis is light and aesthetically acceptable, because it matches to the skin shades.
2. The softness gives to the orbital prosthesis a natural appearance.

As disadvantages it was observed that the soft autopolymerizing acrylic resin should not be highly polished, because it has pores and it is a soft material. This in fact, may be responsible for organic residue accumulation and growing of microorganisms, in case that the orbital prosthesis is not properly kept clean⁸.

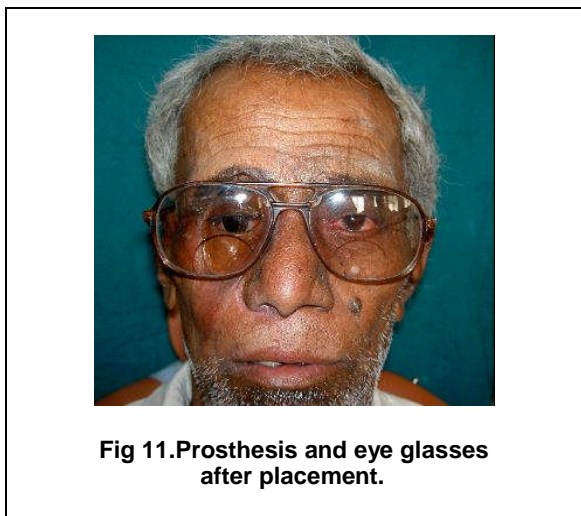


Fig 11. Prosthesis and eye glasses after placement.

Silicone elastomers demonstrate poor bond strength with adhesives and provide unpredictable periods of retention throughout the day. Furthermore, the adhesives tend to degrade the prosthetic material, especially at the margins where the material is thin, and replacement of the facial prosthesis is required. Acrylic resins are employed for specific type of facial defects, particularly those in which little movement occurs in the tissue bed during function. Use of spectacles and autopolymerising acrylic resin for retention of orbital prosthesis in this patient provided an adequate way for rehabilitation⁹.

CONCLUSION:

This article presents an effective way of rehabilitation of an orbital defect. The ideally constructed prosthesis must duplicate the missing facial features so precise execution of impression, sculpturing, processing and extrinsic colouring should be done.

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