

Prosthesis for a Case of Subtotal Orbital Exenteration

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Abstract

Aims and objectives: To rehabilitate a patient with subtotal orbital exenteration defect.

Case description: A 32 year old male with history of carcinoma of ethmoid, treated surgically with subtotal orbital exenteration presented with a defect communicating with the pharynx. He was rehabilitated with a prosthetic eye.

Conclusion: A two piece cast with a removable part containing the defect made it very easy to fabricate the prosthesis. Patient was happy with the appearance and expressed satisfaction.

KEYWORDS: Orbital exenteration, Prosthetic eye, Orbital rehabilitation.

Introduction

Deformities resulting after a cancer surgery can be a tragic experience for a patient. Though the diseased portion has been removed, patient is low on self-esteem because of his deformed looks. Owing to the large size of the defect it may not always be possible to manage it surgically. This is when a maxillofacial prosthodontist steps in for rehabilitation. We can restore the patient to almost life like appearance and improve the quality of life of the patient. We can make the patient feel more confident and more accepted in the social circle.

Orbital exenteration, first described by George Bartischcin in 1583, is a radical procedure consisting of removal of the orbital contents, including orbital fat, conjunctival sac, globe, and part or all of the eyelids. This psychologically and anatomically disfiguring procedure is reserved to treat potentially life threatening malignancies or relentlessly progressive conditions unresponsive to other treatments.^[1]

After the surgery, a large hollow is visible on the face. Even though vision of the eye cannot be restored, a natural looking prosthesis can be fabricated. This will atleast have a positive effect on the patient.

This report discusses an orbital prosthesis retained by spectacles, for a subtotal exenteration defect.

Case description:

A 32 year old male, reported to the department of prosthodontics, KLE institute of dental sciences, Bangalore. He had a history of carcinoma of the ethmoid, which was subsequently treated surgically. Patient presented to the department of prosthodontics after 3 months of surgery with a bandage strapped to his left eye. On examination, it was seen as a defect communicating with the pharynx. The skin flap approximated by the surgeon was insufficient to cover the entire defect. (Fig 1 and 2). This resulted in a taut approximated skin distally and an open defect mesially. Patient was advised for a muscle flap, free flap or tissue transfer to close the defect.^[2] However due to financial constraints, patient chose to opt for these options at a later date.



Figure 1: Frontal Photograph of the patient



Figure 4: Secondary impression of the defect



Figure 2: Close up view of the defect

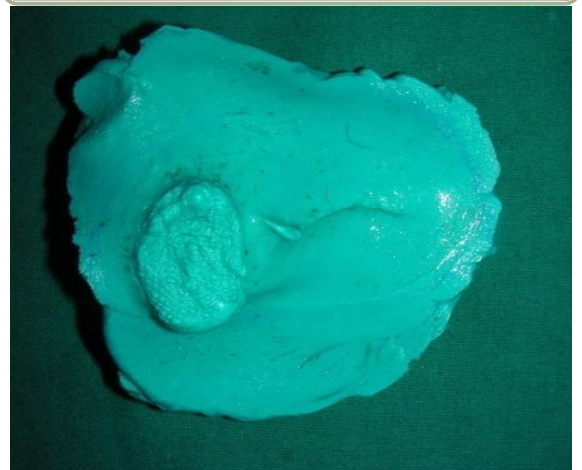


Figure 5: Secondary impression of the defect



Figure 3: Primary impression of the defect

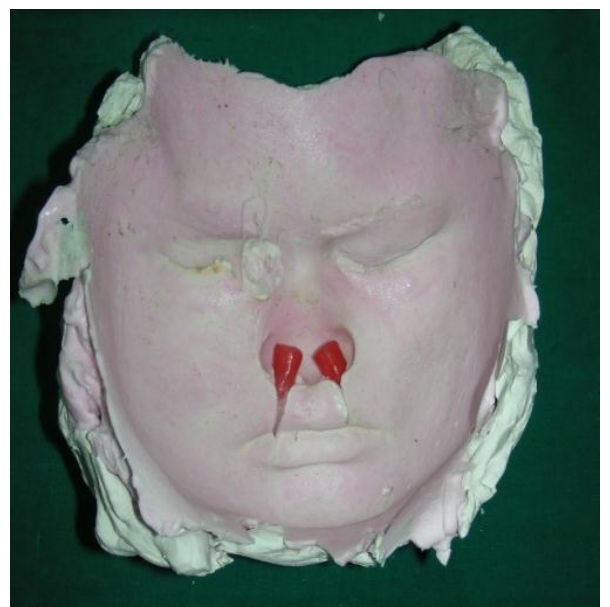


Figure 6: Facial Moulage

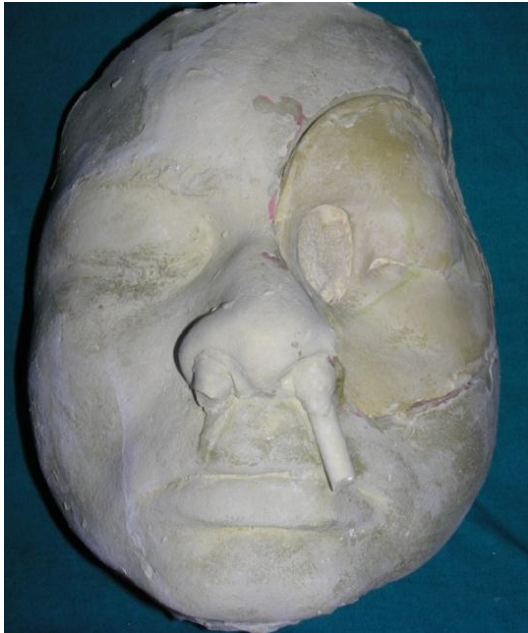


Figure 7: Facial Cast



Figure 8: A two piece facial mouldage



Figure 9: Prosthesis in place without eyeglasses



Figure 10: Final Prosthesis

It was subsequently decided to fabricate an orbital prosthesis to close this subtotal exenteration defect. Now, the problems faced were the external communication and the insufficient depth distally to place an artificial eye.

Patient's treatment was started with a primary impression. The external communication was closed with wet gauze. Primary impression of the defect was made with irreversible hydrocolloid. (Fig 3). It was backed by dental plaster. Subsequently a primary cast was obtained. The defect was outlined with a pencil and a custom tray was fabricated 2mm beyond the marking. In the next appointment, after closing the defect with a wet gauze a final impression was made with addition silicone. (Fig 4 and 5).

Type III dental stone was poured in the impression. The base poured was made convergent.

Now, facial mouldage was made. Patient's normal eye was closed. Vaseline was applied on eyebrows. Two tubes were inserted in nostrils for breathing. Irreversible hydrocolloid was manipulated in runny consistency and was painted on the face. While it was setting paper clips, which were opened to L shape were incorporated to gain adhesion to the plaster applied subsequently. After the facial mouldage was completed, patient was asked to wrinkle his face to retrieve the impression. (Fig 6).

Separating medium was applied on the base of the defect cast. It was then placed in the facial mouldage. The rest of the impression was poured. After the gypsum had set, cast was retrieved. (Fig 7). The defect now could be easily removed from the cast, like a die. (Fig 8). Also it can be placed back on the cast for positional accuracy and the wax up can be matched to the rest of the face.

In the next appointment, position of the eyeball was copied from the normal side and wax up completed. The waxed up eye was a little protruded than the adjacent normal eye. This was because of the limited depth available on the distal side of the defect.

Investing of the waxed up cast was done. Upon dewaxing, patient was called. Shade matching was done. Pigments were incorporated in clear heat cure acrylic resin to obtain the shade. Pigments used for silicone prosthesis can be used for the same. The flasks were packed and subsequently processed. Prosthesis was finished and polished.

In the final appointment patient was asked to get dark and sufficiently large glasses to cover the margins of the prosthesis. The acrylic eye was then attached to the spectacles with cold cure acrylic and the prosthesis placed for the patient. (Fig 9 and 10).

Patient was recalled after a week. He was advised to maintain hygiene with the prosthesis and to report for check-ups once in three months. Patient was happy with the appearance and expressed satisfactory wearing. The prosthesis may need to be revisited after the surgical closure of the defect.

Discussion

Eye defects can be ocular or orbital. Ocular defects involve only the eyeball whereas orbital defects include periorbital tissue also. Orbital exenteration is classified as total when all orbital contents including the globe and periorbita are removed. Cases that include excision of adjacent bone are defined as extended exenteration. Total or extended exenterations are performed in cases when complete excision of the tumor with free margins is possible in an attempt to achieve cure. Subtotal exenteration is defined as a partial removal of orbital tissue with sacrifice of the eye. An eyelid-sparing procedure is preferred, with the exception of cases where eyelid was needed for tumor-free surgical margins.^[2]

During rehabilitation it is necessary to copy the exact position of the adjacent eye. Slightest discrepancy can be appreciated by a layman. Also careful attention is to be given to the colour of the iris, vascularity in sclera, eyelashes, colour of the eyelids and the adjacent skin. All these factors when managed can give a lifelike appearance to the prosthesis. Though it is also desirable to have movements with the prosthetic eye, it is not yet possible in orbital exenteration defects. Ocular prosthesis can be managed to have motility.^[3]

The defect managed here is a very unconventional subtotal exenteration. It was necessary to close the communication with external environment and mask the anterior position of the eye.

Accurate facial impression is essential to reproduce the defect for the construction of well adapted prosthesis. Various materials, including impression compound, plaster of paris, hydrocolloids and elastomers have been used in making facial

impressions.^[4-6] Here, only the impression of the defect was made as opposed to facial moulage employed popularly. Entire facial moulage requires clinical expertise. The irreversible hydrocolloid has to be in a runny consistency and excess water has to be used. This can alter the dimensional stability of the irreversible hydrocolloid. Manipulation has to be quick and precise. Careful consideration has to be given to not incorporate bubbles on the surface. Heat generated from the plaster and its water can distort the irreversible hydrocolloid beneath. This can alter the dimension of the defect on the cast on which prosthesis will be fabricated.

Addition silicone was selected because of its accuracy in capturing surface details and dimensional stability.

A two piece cast with a removable part assures accurate reproduction of the defect.^[7] This removable defect part of the cast makes it tremendously easy for subsequent wax up, as a small cast can be held in hand for the wax up, as opposed to the cast of the entire face. Investing also was simplified as the defect cast easily fitted in the normal flask.

The prosthetic material decided was acrylic as this was a temporary restoration till the patient closes his communication surgically. Also acrylic prosthesis suited the economy of the patient. A silicone prosthesis can be fabricated after surgery, if required

Dark glasses were chosen to mask the anterior positioning of the eye. It was impossible to prevent it because of the limited depth available. Paramount importance has to be given to the retention of the prosthesis. Spectacles are the most common modes of providing retention to the orbital prosthesis. Alternatively adhesives, implants, magnets can be used for retention. Adhesives are easy to use, but may cause irritation to the skin over long term use. Also the patient always has a fear of adhesive losing its effect on forceful movements like sneezing. Implants provide reliable retention, but not without added expenditure and a need for a surgery. Also it is not always possible to place an implant at the site of defect, owing to the removal of bone or its poor quality.^[8]

Conclusion

A subtotal exenteration with an external communication was managed with a prosthetic eye. A two piece cast with a removable part containing the defect made it very easy to fabricate the prosthesis. Retention was provided with eye glasses resulting in a satisfactory final outcome.

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