

Prosthodontic rehabilitation of patient with orbital defect

Clinical Report

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ABSTRACT

Eyes are vital organs not only for vision but also as an important component of facial expression. Loss of an eye due to trauma or disease resulting in facial defect has a crippling effect on the patient's psychology. The placement of a good artificial prosthesis serves as a great psychological, social, and cosmetic benefit in rehabilitation of the patient.

This article discusses prosthetic rehabilitation, in an elderly female patient with a massive orbital defect on the left side of the face, using room temperature vulcanizing silicone material.

KEY WORDS: Orbital Defect, rehabilitation, room temperature vulcanizing silicone

INTRODUCTION

Extraoral maxillofacial defects may be due to congenital or acquired factors.^[1] A congenital defect or any acquired factors like disease, trauma, or surgery can cause facial disfigurement leading to a great psychological trauma to the patient; words are not enough to describe the agony.

Reconstructive plastic surgery can be done to restore the defect. However, in certain situations, age, medical condition or financial constraint of a patient does not permit surgery. The alternative to mask the defect is fabrication of an artificial prosthesis. It is no doubt challenging for a prosthodontist to replace a moving organ with a static prosthesis. However, when prosthetic rehabilitation is done it serves as a great achievement for the patient as well as the prosthodontist. This article describes a clinical procedure for an orbital defect restored with an orbital prosthesis.

CASE REPORT

A 69-year-old female was referred for prosthetic rehabilitation of left exenterated orbit. Clinical examination was done, especially of the defect area, to ascertain the extent and post-operative healing. The defect was oval with medio-lateral and supero-

inferior diameters of 4.6 and 3.3cms respectively. The defect extended approximately 1cm above the supra-orbital margin, 0.5 cm inferiorly below the infraorbital margin, 0.5cm medially towards the midline of the face from the medial margin of the orbit, and 2cms laterally beyond the lateral margin of the orbital into the temporal region.

The skin over the defect appeared normal except for an area on supra-orbital margin where healing was not satisfactory. The patient was undergoing radiotherapy. This hampered healing period which was unusually long. It would have been ideal to wait for the tissues to completely heal before any prosthetic treatment planning was made but considering the age, clinical condition, and life expectancy of the patient, a decision was made to rehabilitate her with an orbital prosthesis at the earliest so that she could lead a normal and confident life.

The procedure and the limitations were explained to the patient, her motivation was determined, and consent taken.

Technique

Facial Moulage

The first and foremost step was to make an impression of the defect to obtain a facial moulage. Several

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materials have been advocated to obtain the moulage impression. The material of choice depends on size and location of the defect.^[2] Irreversible hydrocolloid (alginate) was preferred as the defect was large. Moreover, it can be mixed in large quantity and easily applied in layers over the skin as compared to other impression materials.

Prior to making of the impression, the patient was asked to look straight. Two vertical lines were drawn with an indelible pencil; one in the midline of the face and another through the center of the pupil of the remaining eye and horizontally between the pupil of the remaining eye. Distances between the two lines were measured with the help of a divider and scale. The same symmetrical measurement was marked and a line was drawn, vertically, on the side involving the defect [Figure 1]. On making the impression, these lines would get transferred to the cast that would subsequently help in orienting the selected stock acrylic eye shell.

A separating medium (vaseline) was applied on the eyelashes and eyebrows. A wax frame was fabricated defining the area of the face to be included in the impression to limit the flow of alginate. One inch plastic tubes were positioned in the nostrils to facilitate respiration during the impression procedure.^[1]

To adjust the flow properties of the alginate, water: powder ratio from 1.25 to 1.5 times the normal amount of water was used. After mixing, the alginate was applied to the skin with a round-end mixing spatula in layers.^[2] A layer of gauze was placed on the semi set alginate and a fast setting plaster was mixed and poured over it to a thickness of about 0.25 inch to provide adequate support to the alginate impression to avoid tearing and distortion of alginate on removal from the undercuts.^[2]

On setting, the impression was carefully removed and inspected for completeness and any voids or distortion. Type III dental stone was poured on the impression and the facial moulage was obtained [Figure 2]. The lines drawn with the indelible pencil were transferred on to the cast for orientation of the eye shell.

Selection of Stock Acrylic Eye Shell

A stock acrylic eye shell was selected matching the color, size and shape of the unaffected eye.

Fabrication of Wax Pattern

At the desired position the selected eye shell was incorporated in the wax pattern with the help of the measurements transferred onto the cast.^[3] Subsequently, positioning and the central axis were confirmed on the patient's face [Figure 3]. After

complete verification, final wax carving and contouring was done to simulate the patient's remaining eye and surrounding tissues.

LABORATORY PROCEDURE

After finalizing the pattern, flasking and dewaxing were done in the conventional manner. Room temperature vulcanizing (RTV) silicone material was manipulated following manufacturer's instruction; subsequently, packing was done with a curing time of 48 hours. After complete curing, the silicone prosthesis was carefully retrieved from the flask and the residual flash was trimmed back to the margins with a sharp scissor. The silicone prosthesis was placed on the working cast to ensure proper adaptation and tried on the patient for the same [Figure 4]. On satisfactory evaluation, final coloring was done with extrinsic stains to match the patient's skin color to provide a realistic appearance [Figure 5].

Insertion of Orbital Prosthesis

A commercially available silicone adhesive was advised for retention of the prosthesis. A pair of spectacles was selected to mask the borders of the prosthesis and disguise the fact that there is no movement in the prosthetic eye [Figure 6]. Instructions were given for maintenance and care of the prosthesis; and it was finally delivered to the patient.

DISCUSSION

An orbital prosthesis is extremely helpful in effectively restoring the defect, improving the esthetics and instilling tremendous confidence to face the society with dignity.

The art of making artificial eyes has been practiced since ancient times. Several maxillofacial materials have been used in the past like acrylic polymer, silicone elastomers, polyurethane etc. The ideal material for maxillofacial prosthesis is yet to be achieved. Presently, the most commonly used material is acrylic and silicone.^[4] RTV silicone being soft, light weight, and comfortable was preferred over acrylic for our patient.^[4] However, the only dilemma was regarding choice of means of retention.

Retention of extraoral maxillofacial prosthesis can be achieved by adhesives, anatomic undercuts, magnets, implants, accessories like spectacles, and cap. Osseointegrated implants are an ideal method of retention,^[1] but it was contradicted to perform surgery since the patient was undergoing radiotherapy. Therefore, the best means of retention for this patient was to use silicone adhesives. Adhesive irritation



Figure 1: Facial Measurements made to Aid in Orientation of Stock Acrylic Eye Shell Prior to Impression Making

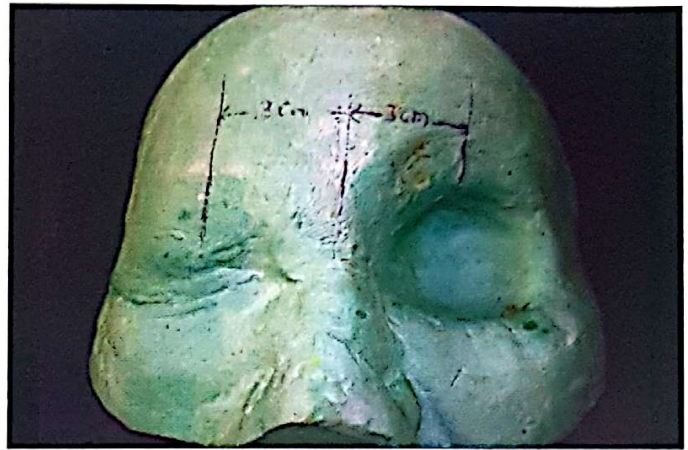


Figure 2: Facial Moulage



Figure 3: Wax Pattern Trial in Patient

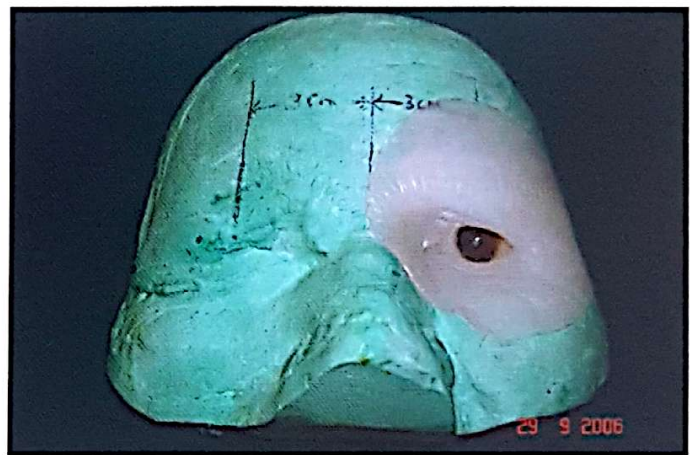


Figure 4: Silicon Prosthesis Prior to Extrinsic Coloration

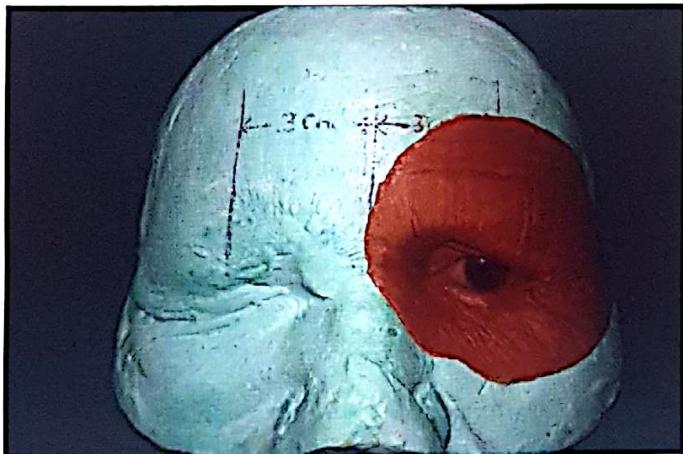


Figure 5: Final Silicone Prosthesis



Figure 6: Orbital Prosthesis on Patient with Spectacles

posed a major concern; inadequate support would have complicated the fit and the appearance of the prosthesis.^[5] Hence the patient was advised not to apply the adhesive on the part of the prosthesis that would contact the unhealed tissue on wearing of the prosthesis.

In this patient, the prime reason to use spectacles

was to mask borders of the prosthesis. However, the defect being large, the spectacles were unable to hide the superior borders of the prosthesis, despite that it still aided in camouflaging the defect and escape recognition from a casual viewer.

Realistic coloration of the prosthesis is important to

achieve esthetically pleasing results which should be done in a precise manner so that the casual observer notices nothing that would draw attention to the prosthetic reconstruction. Coloration can be done intrinsically or extrinsically. The base color of RTV silicone being white makes intrinsic staining difficult. Hence it was planned to stain the prosthesis extrinsically with fabric paint.

CONCLUSION

An orbital prosthesis, in this case, not only improved esthetics but also contributed immensely to the physical and mental well being of the patient. As Jean Cocteau has rightly said, *"If there is a defect in the soul it cannot be corrected, but if there is a defect on the face and one corrects it, it corrects the soul"*.

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