Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/9125
DOI URL: http://dx.doi.org/10.21474/IJAR01/9125
ISSN NO. 2320-5407

RESEARCH ARTICLE

FABRICATION OF ORBITAL PROSTHESIS: A CASE REPORT.

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Manuscript Info

Manuscript History
Received: 24 March 2019
Final Accepted: 26 April 2019
Published: May 2019

Abstract

Orbital defects occurs due to malignancy, trauma, and congenital anomalies. These defects causes functional and psychological disturbances. Rehabilitation of an orbital defect with maxillofacial silicone and shade matching can provide satisfactory aesthetic outlook. This case report describes the fabrication of an orbital prosthesis using maxillofacial silicone in a patient who has undergone surgical exenteration due to tumour.

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Introduction:-

Loss of an eye, along with contents may result from surgery due to tumour, trauma, or burns. It can be *Evisceration* – removal of internal eye contents without the extraoccular muscles and scleral shell, *Enucleation* – detaches the extraocclular muscesla nd removal of eye ball and *Exenteration* – removal of the eye ball including the eyelid, fat, muscles, and nerves[1]. This may negatively affect the wellbeing of the patient. In such situations an orbital prosthesis retained by conventional method or implant may be indicated to restore the defect . For patients who cannot afford implant supported prostheses, Silicon Orbital prostheses retained by spectacles, or adhesives, are faceable treatment options[2]. This case report describes the procedure for fabricating silicone orbital prosthesis in a patient who has undergone orbital exenteration due to tumour.

Case report

A 67 year old female patient visited the department of prosthodontics with the chief complaint of facial defacement due to loss of left eye(figure 1). History revealed exenteration of the eye was done 6 months back due to Basal cell carcinoma. On examination of the defect it was observed that there was a communication of size 2 * 3 mm between the lateral wall of the eye and nose. Healing was satisfactory.

Figure1:-Before prosthesis

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An informed consent was taken by elucidating all the necessary steps, pros and cons of the treatment, in the beginning of the procedure. Following this, patient was given options such as implant retained, mechanical and anatomical retained orbital prosthesis. Patient chose the prosthesis retained by anatomical methods due to financial constrains

Materials

- Technovent maxillofacial silicone M511
- Technovent sealer
- Intrinsic and extrinsic stains:Technovent
- stock ocular prosthesis
- Modelling wax
- Alginate
- Dental stone (type IV)
- Dental plaster
- Petroleum jelly
- Separating medium

After evaluation and inspection of the anophthalmic socket and defect region, it was cleaned using saline and wet gauze. The diameter of the iris and pupil on the intact side was measured using a calliper. For the proper orientation of the pupil of the defective side, equal measurements from the centre of the pupil to the medial and lateral canthus, and the superior and inferior borders, of the contralateral eye were considered. The measurements were then transferred to the defective side to estimate the midpoint of the prosthetic pupil. These markings were made using an indelible pencil.

1. Before making impression, the communication between the eye and nose was closed with putty
2. Petroleum jelly was applied around the peripheral tissue to prevent adhesion of alginate to the skin .
3. Alginate was mixed in thin consistency and poured until it covers the entire defect.

In order to provide mechanical retention between alginate and plaster gauze pieces were placed over the alginate before it sets(figure 2). Dental plaster was applied over the impression to provide strength(figure 3).

Figure 2:-impression with alginate

Figure 3:-plaster reinforcement

4. After setting of the plaster, impression was gently removed. The impression was poured using dental stone.
5. A prefabricated eye conformer (stock ocular prosthesis) was selected according to the size and colour of the contralateral eye. Wax pattern of orbital prosthesis was fabricated on the cast and trial was done(figure 4).Taking the contralateral eye as reference the position of the stock eye was verified in three planes, mediolateral ,anteroposterior, and superioinferior

Figure 4:-wax try in

6. After wax trial, the pattern was sealed in the cast(figure 5). A fiber tube was attached to ocular shell using cynoacrylate to maintain the orientation of ocular shell in the mold Separating medium was applied for easy separation of shell from the counter flask. Flasking was done followed by dewaxing

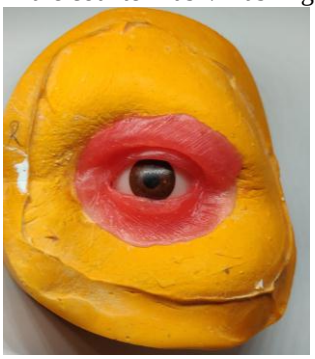

Figure 5:-wax pattern sealed in cast **Figure 6:** fiber tube attached to stock eye

7. Color matching was done using trial and error method by taking skin adjacent to the defect as reference. Silicone material was mixed as per the manufacturer instructions. Intrinsic stains were added to achieve shade matching. Packing of silicone was done, and the prosthesis was deflasked following polymerization after 24 hours (overnight curing).
8. Discrepancy in the shade matching was compensated by using extrinsic shades. A sealer was applied after the stains set. Finishing was done and the prosthesis was delivered to the patient ensuring proper adaptation of the prosthesis borders
9. Patient was educated regarding the placement and removal. Instructions were given regarding maintenance and hygiene .
10. Retention was obtained through mechanical undercuts of defect, and skin adhesives .A spectacle was given to conceal the margins of the prosthesis.

Figure 7 & 8:-Final prosthesis

Discussion:-

When fabricating an orbital prosthesis many parameters need to be considered such as durability, weight of the prosthesis, economical feasibility, and most importantly retention and esthetics. A proper amalgamation of all these factors is what determines the success of the prosthesis. The presence of such facial defects often causes a decrease in the patient's confidence and self esteem. It reduces their willingness to socialise and demoralizes them.

In such conditions, these maxillofacial prosthesis often aids in improving and building their self esteem to improve and build their confidence, thereby boosting their way of living. Osseointegrated implants gained popularity in the recent past as a retentive aid in maxillofacial prosthesis. But this mode of treatment may not be applicable to all patients due to patient factor and economic status .In such situation retention can be derived from undercuts or adhesives. There are various materials available for the fabrication of maxillofacial prosthesis. For many practitioners,silicone became the material of choice due its biocompatibility, marginal adaptation and life like appearance. However, refabrication of the silicon prosthesis may be required at every 2 year interval because of its poor colour stability[3] .

More accurate and satisfactory aesthetic appearance can be best achieved by custom made ocular prosthesis[4]. However in the present case pre-fabricated stock eye was used due its availability in varying shades and size. The orientation of the stock eye should resemble the contralateral eye in all the three planes. This remains an important challenge in the fabrication of orbital prosthesis as the orientation of the stock eye may change during dewaxing. This can be prevented by sealing the stock eye to a template

Conclusion:-

A good interaction between the prosthodontist and the surgeon makes the surgical site more favourable for prosthetic rehabilitation. The limitations of treatment such as immobility of eyelid and eyeball should be explained to the patient well in advance in order to prevent unrealistic expectations

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