

PROSTHETIC REHABILITATION OF A PATIENT WITH ACQUIRED AURICULAR DEFECT
USING SILICONE BIOMATERIAL -A CASE REPORT.

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ABSTRACT: Auricular defects may be congenital or acquired and are the second most common craniofacial malformation. There are two main treatments: surgical reconstruction or prosthetic rehabilitation. The former is as great a challenge to surgeons because of the complex shape and size of the human ear. On the other hand, rehabilitation with a prosthetic ear matched to the contra lateral ear provides a better morphologic result. Presented in this article is a case report of a patient with an acquired auricular defect managed with a prosthesis made of elastic silicone material.

KEYWORDS: *Prosthetic Rehabilitation, Silicone Material, Medical Grade Adhesive.*

INTRODUCTION

Craniofacial defects may result from congenital conditions, surgical intervention, trauma and pathology. The ear, orbit or mid-face may be affected which can cause esthetic, functional and psychological problems.^{1, 2}

Rehabilitation can be accomplished either surgically, prosthetically or both together. The choice of method depends upon size and location of the defect and age and esthetic concerns of patient. The prosthetic approach is superior to the surgical approach if the defect is large or the blood supply to the area is compromised.³ In restoring auricular defects, the surgical reconstruction becomes a great challenge to surgeons because of the complex shape and size of the human ear.⁴ On the other hand; rehabilitation with a prosthetic ear provides a better morphologic result and patient acceptance.

The most common maxillofacial prosthetic materials in use are the acrylics, and silicone elastomers.⁵ It is important to use prosthetic materials with properties that include color stability, ease of fabrication, dimensional stability, edge strength, flexibility, low thermal conductivity, biocompatibility and surface texture. Today, silicones are the most widely used materials for facial restorations.

Extra oral prosthesis are retained by using tissue undercuts, magnets, implants, mechanical retentive aids

(spectacles, head-bands, etc.) and medical-grade adhesives and tapes.

Presented in this article is a case-report of a patient with an auricular defect, rehabilitated with silicone prosthesis; secured using medical grade adhesive.

Case Report:

A 33 year old male reported complaining of facial disfigurement due to loss of his right ear (**Fig.1**). A history of trauma of the right ear followed by surgical resection was recorded.

On examination, there was loss of large part of external ear and part of temporal bone. The defect site had healed but some surface scars were present.

Treatment options were explained and discussed with the patient. The patient was explained about the prosthetic replacement of the missing ear using acrylic/silicone material, and its retention using magnets, implants or medical adhesives. Considering the complications involved in the surgical procedures for placing implants and magnets, a custom-made silicone prosthesis to be secured using medical-grade adhesive was planned.



Fig.1. Normal left ear of the patient; right side defect area.



Fig.2. Impression procedure for the defect area.



Fig.3. Verification of the finished wax-pattern on the patients' face.



Fig.4.Mould preparation for the silicone prosthesis.



Fig.5.Finished and polished final silicone ear prosthesis.



Fig.6. Front and side view of the patient on delivery of the prosthesis and subsequent recall and follow-up.

Procedure

1. An impression of the defect area was made (**Fig. 2**).The boundary for the impression was outlined and confined using impression compound; light petrolatum was applied. Impression was made using alginate; reinforced with gauze and dental plaster and cast poured in Type III dental stone.
2. A family member whose ear matched to the patients' contralateral ear was selected to make wax patterns.
3. The impression of volunteer's ear was also made as mentioned above.
4. Molten wax was poured into the set impression, cooled, retrieved and adapted onto the working cast. It was then carved to make it an individualized one to suit the patient.
5. After modifications, the wax pattern was verified on the patients' face to finalize its position (**Fig. 3**).
6. The final wax pattern was acrylised in heat cure resin.
7. This acrylic replica gave us the liberty to remake the prosthesis (if required) without repeating the cumbersome task of making another.
8. The acrylised replica was invested in a soap-dish using alginate. Sprue holes were made to facilitate the flow of silicone material (**Fig. 4**).The two halves of the soap-dish were separated after complete set of alginate and the acrylised replica removed. The impression was reassembled and held together by rubber bands.
9. *Silastic* silicone (Dow Corning Corporation) was used to make the prosthesis. Adequate amount of base and curing agent were vacuum mixed, color added to match with the patients' skin and then poured into one of the sprue holes until it flowed out from the other.
10. Material was allowed to polymerize completely. The prosthesis was retrieved and initial trial done. To orient the prosthesis to its correct position, an extension was made into the opening of the ear.
11. The prosthesis was correctly positioned and rubber base putty impression was made of the anatomy of the auditory orifice. The whole assembly was removed and the underside of the prosthesis was poured with Type III stone. The putty was removed and with the prosthesis still in place, RTV silicone was flown into the opening and an extension was made that engaged the anatomical undercut.

12. The prosthesis was retrieved, cleaned, finished and polished (**Fig.5**).
13. Medical grade adhesive (Secure medical adhesive) was used to attach and retain the prosthesis in place.
14. Patient was trained in placing and removing the prosthesis. Home care instructions were given. Regular follow ups were carried out to evaluate the serviceability of the prosthesis (**Fig.6**).

Discussion

Ablative surgical procedure incurs major financial, medical, surgical and esthetic constraints and hence the patient may seek a prosthetic treatment. Therefore, selection of a reasonable maxillofacial prosthetic material and economically feasible retentive aid should be the goal of rehabilitating such patients.⁶

Silicones prosthesis is soft, smooth, flexible and less abrasive. Silicones closely approximate the skin consistency and offer exceptional cushion and comfort. Silicones resist bacterial growth and are bio-inert.⁷ It's a very durable material with better marginal adaptation and is easy to clean.^{8, 9}The disadvantages are longer time of fabrication and expense involved.¹⁰ The edges of this type of prosthesis are very thin so care must be taken when handling it.

Retaining of maxillofacial prosthesis plays an important role in the success of treatment. Osseointegration concepts for retaining these prosthesis are well documented.¹¹⁻¹³ Because of financial constraints, patients, in general, do not always opt for the implant-retained prosthesis. Modern prosthetic replacements are secured with adhesives that are readily available, easily applied and cleaned, produce no by-products and provide satisfactory retention; though for a limited period of time. However, continual use of adhesives may cause allergic response or irritation.¹⁴

The advantage of the presented method is the use of silicone elastomer, which has better marginal adaptation and is lightweight, retained with medical grade adhesive which is easy to apply and use.

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