

Case Report

Prosthetic rehabilitation of anotia: a sense of emotional relief

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ABSTRACT

Microtia is the abnormal development of the external ear that results in a malformed auricle. The deformity that results can range from mild distortion of the anatomic landmarks to the complete absence of the ear which is anotia. An otolaryngologist can expect to be called on to evaluate this defect several times in the average career. Although not every otolaryngologist will perform the complex surgical reconstruction of these malformations, one should be familiar with the aetiology, anatomy, medical management, and nonsurgical options available. The loss of an ear has a considerable psychological impact on an individual. Maxillofacial prostheses replace the lost body parts by using the silicone materials in order to alleviate these problems, prosthesis may be fabricated. This clinical report portrays a method to fabricate silicone auricular prosthesis for a patient who had congenital anotia. These prostheses support the patients physically as well as psychologically enhancing their confidence and social acceptance.

Keywords: Anotia, Auricular rehabilitation, Prosthesis, Silicone

INTRODUCTION

Any deformity, especially with the face affects the psychology of the patient and a major functional deficiency. Although, advances in surgical sciences in the form of micro vascular reconstruction have helped to save many severely injured and traumatically amputated auricle.¹ Reconstruction of acquired or congenitally absent facial structures such as ears, eyes, the nose and other structures is a challenging task for the reconstructive surgeon.

Often, inadequate soft tissue, cartilaginous, or osseous structure exists for a reconstruction which is both functional and aesthetic and is achieved with a reasonable effort on the part of the surgeon and patient.² But all cases doesn't turn out to be aesthetically pleasing every time. However, prosthetic rehabilitation remains as one of the most economical and lucrative treatment options.²

A maxillofacial prosthesis restores and replaces the lost body parts using artificial substitutes.³ The fabrication of auricular prosthesis is as much an art as it is a science. The form of prosthesis, shade matching and texture must be as indiscernible as possible from the surrounding natural tissues.

The ideally constructed prosthesis must duplicate the missing parts to as normal as possible. The most commonly used materials for this purpose are room temperature vulcanizing silicones (RTV silicones). The advantages of RTV silicones include chemical inertness, flexibility, elasticity, long term color stability, easily molded and colored.^{4,5} This report describes the fabrication of silicone auricular prosthesis for a patient who had congenitally missing ear. Retention was achieved by passive vacuum fit and adhesives. Such treatment avoids costly procedures and is the cost-effective choice for patients with financial constraints.

CASE REPORT

A 46-year-old male patient reported to the Department of Otorhinolaryngology, ESIC hospital, Baddi, with a chief complaint of missing left ear and wanted replacement for the same (Figure 1).



Figure 1: Preoperative frontal view of patient.

History revealed that patient congenitally missing left ear. On examination of the affected site it was seen that pinna was absent, external auditory canal was present and patent. On otoscopic examination, tympanic membrane was normal. Hearing test were performed and was normal bilaterally. There was no sign of infection or swelling. There were no undercuts present and the overlying tissue was mildly compressible (Figure 2).



Figure 2: Preoperative lateral view of the defect.

The advantages and limitations of the treatment was explained to the patient before start of treatment procedure and consent was obtained.

Fabrication of the prosthesis

- Making the impression and working model of the affected site- a rubber bowl was chosen. The base of the rubber bowl was cut off. It was tried on the affected site for adequate clearance of the margins and proper alignment. Regular setting alginate (COLTENE, Mumbai) was mixed and poured into the container (Figure 3). The Impression was poured

in type III dental stone (DENTSPLY, Mumbai) and working model was made.

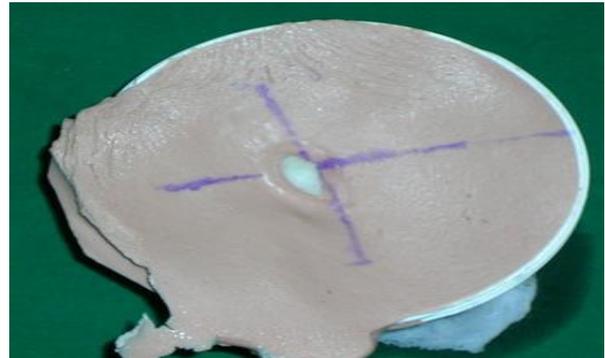


Figure 3: Hydrocolloid impression of left side made.

- Making impression of the normal side- hydrocolloid impression of the right ear was made (Figure 4) and poured in a dental stone.

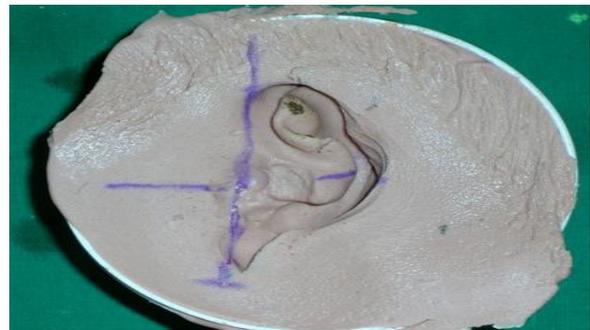


Figure 4: Hydrocolloid impression of right ear made.

- Selection of a donor finger and making wax patterns- a donor ear for making the wax pattern was essential to avoid the laborious task of sculpting. Based on the measurements of the patient's right ear, a donor ear was searched from the outpatient department. Impression of the donor's left ear was made by PVS Putty impression material (3M ESPE, Sweden) and poured with modelling wax (DPI, Mumbai).
- After the wax cooled down, it was retrieved from the impression and tried on the working model of the patients left side. Final carving and adjustments were made to blend the margins with the working model (Figure 5). The completed wax pattern was then finally tried on the patient's missing ear (Figure 6).
- Flasking- The wax pattern was then flanked using two pour technique in a varsity flask. Dewaxing was carried out and two-part mould was obtained (Figure 7).
- Shade matching- Cosmesil series materials (TECHNOVENT, USA) and stains were used (Figure 8 and 9). These materials are supplied in two components (part-A and part-B). Part-A consist

of base material and part-B consist of curative. The base colour was matched by mixing the intrinsic stains with the silicone (Figure 11 and 12). The color was matched and characterization was incorporated, part-B was mixed and packing was done. The material was allowed to cure at room temperature for 24hours under bench press. The prosthesis was retrieved after 24hours (Figure 13). Prostheses was finished using silicone finishing bur. To better match the skin colour external staining was also carried out.



Figure 5: Wax pattern made on working model.

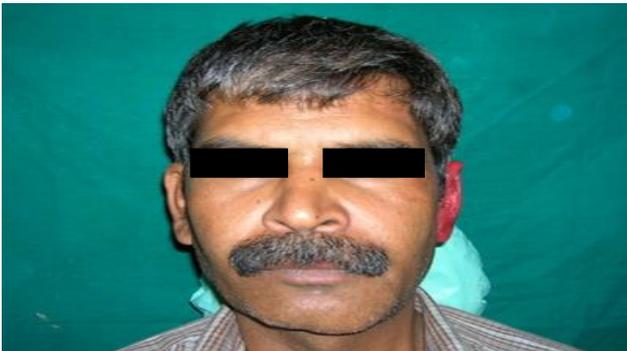


Figure 6: Wax pattern tried on patient.

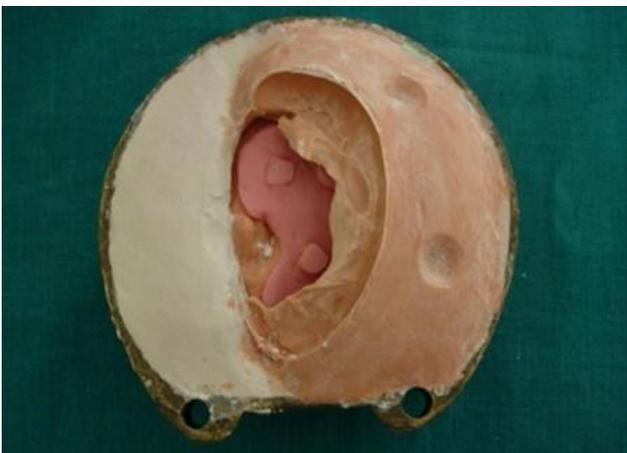


Figure 7: dewaxing of the wax pattern done.



Figure 8: Cosmesil series material.



Figure 9: Cosmesil intrinsic stains.

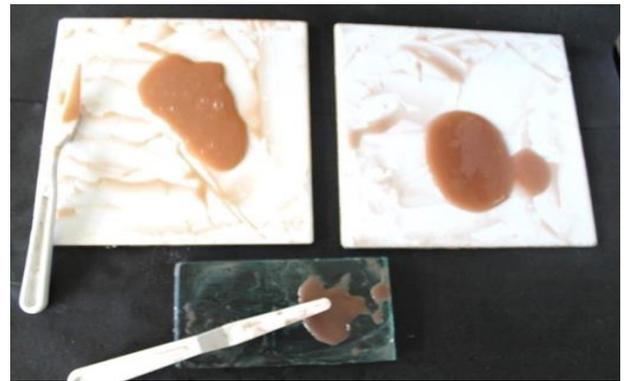


Figure 11: Color matching done.



Figure 12: Silicone material packed in mould.

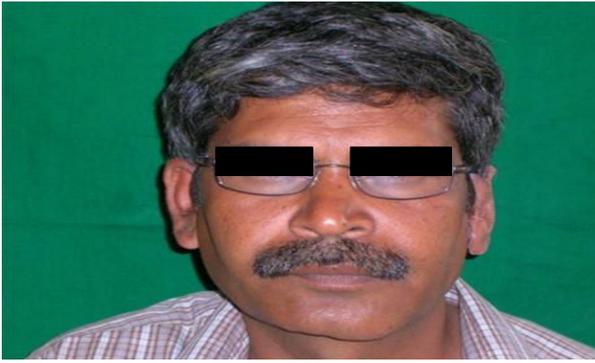


Figure 13: Postoperative frontal photograph.



Figure 14: Postoperative lateral photograph.

- Final prosthesis- The final step was the placement of the prosthesis on the missing region. The patient was given proper instructions to use and maintain the prosthesis (Figure 14, 15 and 16).



Figure 15: Postoperative photograph.

DISCUSSION

Prosthetic rehabilitation of the patients with missing body parts has always been a challenging task. However, it is responsibility of the concerned doctor as well as prosthodontist to make the best use of the available materials and techniques to provide the cost-effective treatment modalities. In case of Microtia and Anotia,

there presents a serious risk of social dysfunction for the patient. Many injuries and traumatic amputations of ear can be corrected by microsurgery through reconstructions the 3 treatment options for microtia are surgical reconstruction, prosthetic restoration and the choice of no treatment. All 3 options have advantages and disadvantages and none should be dismissed without consultations with specialists from each area of expertise.

However, in some cases it may not be advisable or not possible in some, such as the patient's unwillingness or factors such as cost. In such cases, prosthesis can be provided and it can offer great psychological aid. This prosthesis also restores a part of the functions.^{6,7} Prosthetic reconstruction is indicated in the cases such as failed autogenous reconstruction, severe soft tissue hypoplasia, low or unfavorable hairline, post traumatic or post ablative auricular defects. Nevertheless, prosthetic reconstruction is a valuable technique. The primary indication is the acquired deformity, generally a result of trauma or ablative surgery. The four indications described represent situations in which the results from autogenous reconstruction are limited, making prosthetic reconstruction a reasonable alternative.^{8,9}

Over time, various materials have been used and have been developed further. Wood, leather, polyurethane and polyvinyl chloride (PVC) have been used to produce maxillofacial prosthesis but silicone rubber has proved to achieve the desired life like effects.¹⁰ Customized silicone prostheses are accepted widely, owing to their comfort, durability, and stain resistance, which are far superior to any other extra oral maxillofacial materials.¹¹ Additional functional benefits of silicone prostheses are desensitization and protection of the painful hypersensitive tissue at the amputation site by exerting constant gentle pressure over the affected area. Various methods of retention are available such as scraping grooves into the positive model, creating separate vacuum chambers by using medical grade adhesives, and Osseo integrated implants. In this case, medical grade adhesive was used for retention of the auricular prosthesis. A lubricant should be used to lubricate the skin to facilitate donning and doffing of the prosthesis.

CONCLUSION

For most patients, the aesthetic appearance plays a more important role than function. With the advancement in skill, technology and materials available today, the rehabilitation of case of anotia or microtia is no more aesthetically challenging. Rehabilitation of any missing part of the body simulating to the natural color, shape, size and texture is the primary responsibility and intention of a clinician. Fabrication of the prosthesis in a conventional manner has its own limitations as long as the esthetics and function are concerned.

Despite that providing the best to the patients should be the aim. When fabricated with immense care, they can be

made life like and as natural as possible. A well fabricated aesthetic prosthesis can help in providing the patients with psychological support.

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