

Ear Prosthetics: A Case Report

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ABSTRACT

Background: The branch Prosthodontics, is not just confined to replacement of missing teeth but beyond one's scope. The fabrication of any extra-oral maxillofacial prosthesis presents the Prosthodontist with several exceptional challenges. Loss of facial organs in an individual may be acquired or developmental. The missing portion of ear, nose and face are considered as maxillofacial defects which can be reinstate by using prosthesis. This report describes a simple technique to rehabilitate patient with auricular defect considering both aesthetical and economical acceptance of the patient.

Keywords: Ear prosthesis, Rehabilitation, Auricular defect, Additional silicone.

INTRODUCTION

Maxillofacial prosthesis is been used for rehabilitation of patients with defects or disabilities that were present congenitally or acquired due to disease or trauma.^[1] Loss of external ear can be acquired or congenital due to accidents or malignant diseases. Anomalies by birth, of external ear may be termed as "microtia." This deformities account for three in every 10,000 births and bilaterally missing ears seen in fewer than 10% of all cases.^[2] Due to certain constrains surgical approach can not be a treatment of choice most of the time. Traditionally, the acrylic resin had been used as material of choice for fabrication of the auricular prosthesis, as it is an economically feasible treatment option, with recent progress in the field of maxillofacial prosthetics and the inclusion of the silicone based materials has let the clinicians to provide high quality health care to the patients in need.^[3] We report a case describing a simple technique to restore patient with auricular defect.

CASE REPORT

A 36-year-old male patient reported to the Department of Prosthodontics, Mansarovar Dental

College with unilateral auricular deformity on the right side. He gave a history of road accident two years back. Never made any surgical attempt to correct the deformity, nor had he ever made any prosthesis for the defect (fig:1).



Fig 1: Pre operative auricular defect..

Clinical examination revealed deformed helix, antihelix, concha, anti-helical fold, and lobules. However, lobular portions were present. The cartilaginous portions were completely missing.

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Only the dermis was present. Hearing was slightly affected. There was a 32% hearing loss, which was assessed by audiometry as evaluated by speech recognition tests and signals to noise ratio by an otorhinolaryngologist.

Patient education and counseling was carefully carried out regarding the nature function and limitation of the prosthesis prior to procedures. A written informed consent was obtained. Pre-operative photography were performed for assessment and evaluation. He was draped so that only the ear and a small area surrounding it was left bare.^[4] The external auditory canal was blocked with gauze to prevent entry of impression material. Vaseline® Original Pure Skin Jelly™ was carefully applied to the rudimentary ear and the skin surrounding it. Impressions of the auricular defect were made using irreversible hydrocolloid, (Septodont, Marieflex) following standard procedures(fig:2). A double side open cylindrical container of approximately 6.5 inches diameter, beaded with modeling wax was used to support the hydrocolloid impression material. The impression was then poured with Type III dental stone(Shruthi, Gem stone) and Type IV die material(Kalabhai, Kalrock) using the standard procedures^[5].



Fig 2: Impression of auricular defect.

Similar impression procedures were carried out for the contra lateral ear, in this case the left ear. A plaster cast model of the same was also prepared. A measurement of the patient's normal ear was done using calipers. The dimensions measured were the entire length of the ear, the antero - posterior dimension, the height of elevation of the pinna from the skin beneath the dorsal surface of the ear. The

shape and pattern of the helix, antihelix, concha, and lobule was also carefully observed and detailed photography was carried out. A donor ear of similar dimension was chosen. An addition silicone putty impression(Gc flexceed) of the donor ear was made. The mixed putty material was placed on the donor ear supported by a perforated customized acrylic cup. Molten modeling wax(Pyrax) was then poured into the donor ear impression and allowed to cool completely to avoid distortion. This would allow us to have a frame-work to work-up on for carving the ear for our patient(fig:3).



Fig 3: Wax framework for carving.

Two uniform layers of sodium alginate (Pyrax, cold mould seal) separating medium was applied on the cast of the defect, the wax pattern retrieved from the putty impression of the donor ear was carefully placed on the same. Free hand carving keeping the contra-lateral ear model as reference was carried out (fig:4) .



Fig 4: Fabrication of the prosthesis.

Then It was tried on the patient's face for proper orientation supero - inferiorly and antero -

posteriorly. A thorough assessment was carried out by carefully checking the prosthesis both from frontal and profile views. The wax pattern was optimally retentive and stable on his face (fig:5).



Fig 5: Try in of the prosthesis.

Final finishing of the wax pattern was performed on the cast of the deformed ear. The finished pattern was then sealed on the cast model. A three part flasking with indices marking the interlocking of the pieces was planned. The first part was the die of the rudimentary ear with its Type II gypsum base. Indices to aid repositioning of the counter parts were made on all sides of the base. Modelling wax was used to provide support to the second pour of type II gypsum for the flasking. Sodium alginate separating media was added and the middle part of the customized flask was poured. It was made sure that no gypsum flowed into any undercut of the wax pattern as this would cause a deformation of the pattern when removal of the middle part of the flask would be attempted. Following this another modeling wax supported pour of type II gypsum (Neelkanth, Dentco) was made covering the ventral surface of the auricular wax pattern. Dewaxing procedures were carried out.

Shade selection using intrinsic coloration procedures were decided. Intrinsic stains (MP Sai, Enterprise) provided with the room temperature vulcanizing (RTV) silicone (MP Sai, Enterprise) was used for shade matching. Basic colors used were yellow, white, brown, purple, and red. Small amounts of the base and catalyst pastes were mixed and incremental adding of the stains gradually was carried out with constant comparison with the skin of the approximating area and the contralateral ear. Nearest possible simulation was attempted to be

achieved by performing shade selection under different light sources, like incandescent, fluorescent and natural sun light sources.^[6] Packing of the tinted silicon material was carried out and the three parts of the flask were again reattached and seated carefully to ensure that all the margins were flushed together. The silicone prosthesis was then examined for defects and porosities prior to being trimmed and finished using a sharp pair of Parrot Beak scissors.^[7]

The final prosthesis was then tried on the patient (fig:6). Bio-adhesive (Topseal) was then used to attach the auricular prosthesis to the rudimentary ear.^[8]



Fig 6: Post-operative auricular prosthesis.

The patient was advised to use the prosthesis regularly and avoid exposure to direct sunlight due to the limitations of the silicone used for fabrication of the same. He was also instructed to regularly clean the prosthesis using a mild sodium lauryl sulphate solution. Use of strong detergent solutions and hard brushes for cleansing the prosthesis was discouraged. He was instructed not to wear the prosthesis while sleeping as accidental pressure would result in distortion or tearing of the prosthesis.

DISCUSSION

Regardless of the cause, abnormalities in size, shape, and position of facial organs are often perceived as looking wrong. This perception can subject the individual to depressions. Restoring of patients with auricular defects can either be done by reconstructive surgery or by prosthetics.^[9] There are numerous techniques for fabrication of ear prosthesis: conventional technique,

shaper/tracer technique, photocopying technique, computerised tomography (CT) scanning, magnetic resonance imaging (MRI), 3-D laser scanning, computer numerically controlled (CNC) milling, rapid prototyping, and stereolithography.^[10] The prosthesis made by CAD/CAM techniques is better than that fabricated by conventional methods. Unfortunately, considering the complexity and the high cost of the equipment needed, these advanced techniques can only be used in well-developed establishments which makes us depend on more conventional techniques for the fabrication of maxillofacial prosthesis.^[11] Because of effective retention & improved aesthetics the osseointegrated ear implants has changed the patient perception about facial prosthesis. However, it requires sufficient healthy bone at the defect site for implant placement, surgical intervention, cost involvement, and usually a time interval between implant placement and prosthetic rehabilitation. On the contrary, adhesive-retained prosthesis can be placed immediately on a healthy tissue bed, without surgery and is cost-effective.^[12]

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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