Prosthetic Rehabilitation for Congenital Defect of the Ear

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ABSTRACT:
Maxillofacial Prosthodontics is defined as that branch of prosthodontics concerned with the restoration and/or replacement of the stomatognathic & craniofacial structures with prostheses that may or may not be removed on a regular or elective basis. (GPT-8)

Disfigured individuals lacking eyes, nose, or ears may not be socially acceptable. Loss or a congenitally missing body part can have both a social and psychological impact on those affected. Despite remarkable advances in surgical management; many defects, especially those of eyes, nose or ear cannot be satisfactorily repaired by a plastic surgery alone thus bringing in the role of a prosthodontist to work as a full member of the rehabilitation team.

Maxillofacial prosthesis aim to improve the aesthetics of patients and to restore, improve and maintain the health of the hard and soft tissues. The effective accomplishment of these objectives should expedite patients’ return to society.

This paper presents a case report of a patient with congenitally defective right ear treated with a custom made silicone auricular prosthesis in room temperature vulcanizing (RTV) silicone material.

Key words: Auricular prosthesis, Silicone prosthesis, Ear prosthesis

INTRODUCTION
The fabrication of an extraoral facial prosthesis is as much an art as it is a science. The form, coloration and texture of the prosthesis must be as indiscernible as possible with the surrounding natural tissues. The prosthesis must duplicate the missing facial features so precisely that the patient can appear in society without fear of attracting unwanted attention.

Auricular prosthesis is a removable ear prosthesis which artificially restores a part or the entire natural ear. The goal of prosthesis constructed in silicone material is to make them soft, flexible and unnoticeable to the casual observer.

Auricular prosthesis can be retained by anatomic retention, by use of skin adhesives, spectacles, cap, implants, or by using combinations of the above.
CASE REPORT

A 24-year-old male patient was reported to the Department of Prosthodontics, Rural Dental College, Loni, with a chief complaint of unaesthetic look due to partially missing right ear. On examination a congenitally malformed right ear was seen while the left ear was normal (Figure 1). After examining the patient thoroughly it was decided that a custom made auricular prosthesis in room temperature vulcanizing silicone (RTV) with anatomic retention would best satisfy the needs of the patient.

PROCEDURE

After careful examination of the defect area treatment was planned for custom made auricular prosthesis. The patient was explained about the procedure and its limitations. The construction of auricular prosthesis was done in four stages 1) Impression and working-cast fabrication 2) Sculpturing and making of the ear pattern 3) Mold fabrication and 4) Shade matching and processing of the silicone material with intrinsic coloration.

Positioning of auricular pattern is critical in relating it to the normal ear. Before making the impression of both, the defective ear and normal ear, a system of markings superiorly, inferiorly, anteriorly and posteriorly is used. A vertical line is made with an indelible pencil from above the helix, through the center of the external auditory meatus, and through and beyond the center of the lobe of the natural ear and a horizontal line from the helix through the center of the external auditory meatus and beyond the tragus of the natural ear. The same lines were then drawn on the defective ear side.

1) Impression and Working Cast Fabrication

The patient was draped and hair was protected by covering the head with disposable head cap. Facial hair was protected by light application of petroleum jelly. The patient’s head was placed on the padded table with the defective ear facing up. A ring of modeling wax was built around the area to be recorded. The opening was then placed over the patient’s ear, forming an effective barrier against undesirable flow of the alginate material. The alginate material was hand mixed with water/powder ratio of 1.5 times the normal amount of water. The alginate was then carefully applied to the skin surface of the defective area avoiding air entrapment with the help of a paint brush. After setting of the impression it was then carefully freed from the skin, removed (Figure 2) and poured in white colored dental stone to obtain a model with markings on skin transferred to it. (Figure 3) Similarly impression and cast of normal ear was also obtained (Figures 2 & 3). White colored dental stone was preferred because it is easier to determine intensity of characterization of colors during intrinsic coloring procedure. Impression of right normal ear of sibling whose ear shape and size matches with that of patient was also made and cast obtained.

2) Making of Ear Pattern

Impression of sibling’s model ear was made and poured in wax instead of stone. The resultant pattern was nearly complete with the exception of sealing down to the patient’s working cast. The tissue side of wax pattern was softened and adapted to the patient’s working cast and necessary changes were made. Try-in of the wax pattern was done for shape, size and fit and patient’s approval was taken (Figure 4).

3) Fabrication of Mold

Specially designed PVC flasks were fabricated for processing of RTV silicone. The mold for auricular prosthesis was constructed in three parts to allow removal of the prosthesis from the mold without tearing thin, convoluted areas. Prior to investing the cope, indentations were placed in the surface of the drag portion to ensure proper placement of the second part of the three-piece mold. Mixture of stone was prepared and placed from the surface of the drag to the height of contour of the helix around the entire posterior segment of the ear (Figure 5). After the stone had set, tin-foil substitute was applied and the cope section of the mold was poured. After the second pour of stone had set, dewaxing of the mold was done (Figure 6).

4) Shade Matching & Processing of the Silicone Material with Intrinsic Coloration

An appointment was fixed and patient was called on for mixing and evaluating color for the patient. First base color is formed by trial and error mixing method followed by laminar glazes. Laminar glazes are layers of color painted individually into the mold before packing the base color. Application of laminar glazes is an attempt to mimic the natural texture of human skin. Base color represents the overall skin tone minus skin characteristics and is lightest areas of skin. Base color can be identified on the underside of the forearm, along the hairline,
anterior to the tragus and at the base of helix. Base color makes up the bulk of the prosthesis. When the color of silicone approaches the desired base color, small amount of the colored silicone is placed in the center of a transparent cellophane paper to match the colour of silicone to that of skin (Figure 7). First the mold surface is characterized by localized application of color and then the mold is filled with base color and clamped under pressure at room temperature for 24hrs.

PROSTHESIS INSERTION

The silicone auricular prosthesis was retrieved from flask and trimmed & finished by means of scissor and silicone finishing burs. Finished prosthesis was then delivered to patient. The patient was also advised skin adhesives. The patient was shown how to place and remove the prosthesis and was also educated about its maintenance (Figure 8). The patient was recalled after 24 hrs and then at a monthly interval.

SUMMARY

Prosthetic rehabilitation is advantageous in that it is relatively quick, reversible, medically uncomplicated procedures to rehabilitate congenital defects and also allows the surgical site to be closely monitored. Silicone elastomers are probably the best and most widely used material for prosthetic rehabilitation. A clear to translucent silicone rubber is compatible with all the intrinsic and extrinsic coloring systems available. The custom-made auricular prosthesis is esthetically acceptable and comfortable for use in patients resulting in psychological improvement, social behavior and personality.

References: