CASE REPORT

Prosthetic rehabilitation of a patient with unilateral ear defect: A case report

Rupali Kamath1, D. L. Sarandha1, Anju Thomas1, C. Ramanna2

1Department of Prosthodontics and Crown & Bridge, Dr. Syamala Reddy Dental College Hospital and Research Centre, Bengaluru, Karnataka, India,
2Department of Oral and Maxillofacial Pathology, Dr. Syamala Reddy Dental College Hospital and Research Centre, Bengaluru, Karnataka, India

Abstract

Malformed body parts do not have the shape or form that they are supposed to, especially, when they have been like this since birth, and restoring such parts of their lost function and esthetics is done using various biocompatible materials. The congenitally missing ear is an esthetic problem, and its replacement is an art and science. This can be corrected either surgically or prosthetically, but the choice of correction depends on the patient. This article presents a case report of a young patient with a congenital unilateral auricular defect restored with silicone prosthesis. These prostheses provide a cost-effective means when compared to surgical reconstruction.

Keywords: Room temperature vulcanizing silicone, silicone prosthesis, spectacle retention

Introduction

Microtia is a congenital condition, wherein a person is born with a underdeveloped malformed ear. In 90% of patients, microtia affects only one ear. There are four stages of microtia. This case report presents a patient with grade 3 microtia. It is the most common stage of microtia characterized by small, underdeveloped ears with no ear canal.[1]

Ambroise pare is credited to making various contributions in the field of materials and techniques used in the maxillofacial prosthesis.[2] The shape, color, and texture of these maxillofacial prostheses must closely resemble the surrounding natural facial tissue. There are various methods used in the fabrication of a prosthesis which include traditional mechanically retained prosthesis, bioadhesive retained prosthesis, implant retained, and the recently developed rapid prototyping developed prosthesis.[3]

The acceptance of an auricular prosthesis depends on the retentive aids used. These include mechanical (retentive clips, eyeglass earpiece, and cast clasps magnets) tissue adhesives and osseointegrated implants.[4] This case report portrays the fabrication of spectacle retained silicone auricular prosthesis.

Case Report

The patient, aged 26 years, came to the Department of Maxillofacial Prosthothodontics, complaining of the malformed ear on the left side. On examination, it was found that he was found to have a normal ear on the right side with normal hearing. A small remnant of the ear was present on the left side with no auditory canal opening. He gave a history of a congenitally present rudimentary left ear [Figure 1]. Never had there been any surgical attempt to correct the deformity or any prosthesis made for the defect. The patient was diagnosed to have grade 3 microtia of the left ear.

Fabrication technique

Impression making

To make an impression, the patient’s head was tilted to the right side for adequate access, and the left auricular area is as horizontal as possible. Vaseline® Original Pure Skin Jelly TM was applied to the rudimentary ear, skin, and hair surrounding it. Irreversible hydrocolloid (Algitex, Dental Products, India) was used to make the auricular impression following standard procedures. For this purpose, a plastic cylindrical container open at both ends of approximately 5 inches diameter was used to support the hydrocolloid impression material [Figure 2]. Care should be taken so as not to compress the ear. The impression was then poured with Type III dental stone, using the standard procedures.

Similar impression procedures were carried out for the contralateral ear, in this case, the right ear. The external opening

Acknowledgments

This case study presents the fabricated silicone ear prosthesis which was fabricated in our department using the technique described above.

Ethical approval

This report was approved by the Institutional Ethics Committee of the dental college.

Conflict of interest

None declared.

How to cite this article:

of the ear canal was blocked with a cotton pellet. A stone cast model of the same was also prepared. The normal ear is used to guide in making the wax prototype of the malformed left ear.

**Fabrication of wax pattern**

The malformed ear was reproduced in wax using mirror image technique similar to the normal ear [Figure 3]. The projection of the ear was measured to achieve the correct distance. The wax ear was positioned to the defect to check for symmetry in all planes with the opposite ear. To simulate the appearance of the natural ear, stippling was done on the wax pattern using a hard brush during finishing and polishing. Shade matching was done during try in.

Try in of the wax pattern was done to check for symmetry in all planes and marginal integrity with the surrounding tissues.

**Investing and processing technique**

The margins of the wax pattern were thinned as much as possible so as to allow the silicone edges to merge into the natural skin. A three-part mold is necessary to for easy packing of silicone. Embed the mold in plaster up to the margins of the wax pattern. The middle section of the flask is added, and plaster is filled into the entire undercut section of the mold along the part line. After a suitable separating medium is applied, the remainder of the flask is filled with plaster and is closed. When the wax is boiled out of the flask, the three-piece mold is left behind.

Shade selection was done by matching with the patient's contralateral ear [Figure 4]. Intrinsic stains (MP Sai, Enterprise) supplied with the room temperature vulcanizing silicone (MP Sai, enterprise) were used for shade matching. Basic colors such as yellow, blue, red, and white were used. Small amounts of the base and catalyst pastes were mixed, and the stains gradually added in increments and constantly compared with the skin of the approximating area. Different shades were selected for the lobule, concha, helix, and antihelix to accurately replicate the patient’s natural ear.

After shade matching, the material was packed and cured, at room temperature for 48 h. The retrieved silicone prosthesis
was examined for defects and porosities and was trimmed and finished using sharp parrot beak scissors.

**Spectacle attachment**

In the final visit, the spectacle was attached using clear autopolymerizing acrylic resin with intrinsic stains added to it [Figure 5], confining to the external surface of the ear. The spectacle with the acrylic extension was then placed into position and secured using cyanoacrylate resin over the interface between the acrylic and the prosthesis in the back [Figure 6].

The patient was instructed to be cautious when removing the prosthesis to prevent tearing of the silicone margins and advised not to wear the prosthesis continuously to prevent bacterial and fungal growth. It should be stored away from sunlight to prevent discoloration.

**Discussion**

There are two main reasons for auricular defects are congenital and acquired. Microtia is a congenital deformity of the outer ear, where the ear does not fully develop during the first trimester of pregnancy. The word “microtia” is derived from the Latin words “micro” and “otia,” meaning “little ear.” Microtia ears can vary in appearance but are usually smaller in size, often only consisting of a tiny peanut-shaped lobe.

Acquired causes could be burns, trauma, or malignancies. The most common malignancies include basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. After surgical removal, it has to be restored. Surgical reconstruction using rib cartilage is very common but this requires multiple surgeries over a period of time, and the resulting structure might not closely resemble the contralateral ear. Silicone prosthetic rehabilitation can provide an anatomically correct and aesthetically pleasing result. Adhesive retained silicone prosthetic rehabilitation is a conservative and an economical treatment option. The disadvantages of using an adhesive-retained auricular prostheses are allergic reactions to the adhesive and difficulty to maintain. Implant-retained prosthesis may not be an ideal option in the majority of cases due to financial constraints and apprehensions for surgical interventions. Silicone elastomeric materials were used in this case because they provide better stability and good marginal adaptation. The color matching with intrinsic shades was a close match. The prosthesis was fitted with the help of a spectacle and the anatomical undercuts available from the remnants of the auricle on the left side. The anterior margins were strategically hidden by the hairline while the posterior borders merged well in shade to the skin. Overall, the patient expressed complete satisfaction in the auricular prosthesis.

**Conclusion**

The fabrication of an auricular prosthesis is as much an art and science. The retention of auricular prostheses is a major factor that influences the success of rehabilitative treatment. The advantages of spectacle retained silicone prosthesis technique are added retention, easy placement by the patient, prevention of micro movements of the auricular prosthesis compared to other retentive aids, and rendering more self-confidence.

**References**


