

Implant Retained Auricular Prosthesis- A Case Report

Ahmed Amin Moselhy, DDS, MS, PhD a, and Nasser Aly, DDS, MS, PhD

Abstract: Statement of the problem: A 30-year-old man who partially lost the right external ear as a result of trauma.

The purpose: This case report describes the clinical and laboratory procedures for fabricating an auricular prosthesis.

Material and Methods: In this case report, an auricular prosthesis was fabricated for a patient who lost the right external ear as a result of trauma. This article describes Extraoral implants with bar-and-clip retention for the retention of the auricular prosthesis.

Conclusion: Implants provide patients with a safe and reliable method for anchoring auricular prostheses that enable restoration of their normal appearance and offer improved quality of life.

Keywords: Auricular prosthesis, Prosthetic rehabilitation, implant-retained prosthesis.



1 Introduction:

Causes of facial tissue loss are known to often be acquired or congenital. The acquired cases include, infection neoplastic or trauma. Facial defects can cause not only functional problems, but also some serious psychological problems that could cause the individual to avoid social contact.¹ The maxillofacial defects can be repaired by prosthetic restoration and/or cosmetic surgery. The recent advances in materials and equipment developed the art of this science than ever before.² Auricular reconstruction is a challenging task for surgeons since it is a field of facial plastic surgery in which a wide array of reconstructive options often must be considered.³ The amount of soft tissue and cartilaginous or osseous support available is sometimes insufficient for a reconstruction.⁴ Moreover, conventional autologous grafts for auricular reconstruction may produce inconsistent results, and revi-

sion of failed grafts has been often unsatisfactory. Prosthetics have become available and have been developed into functional and esthetic alternatives to plastic and reconstructive surgery.⁵ A successful rehabilitation with facial prosthesis depends on knowledge concerning principles of facial form and anatomy, color matching and sculpting mixture, adaptation, retention, prosthesis weight, durability, and biocompatibility. A properly fabricated prosthesis precisely replaces the lost structure and will not draw the attention towards the replaced one, characteristics are directly related to material selection.⁶⁻⁸

This case report describes the clinical and laboratory procedures for fabricating an implant retained auricular prosthesis for a man with a right ear defect resulting from trauma.

2 Case report:

A 30-year-old man who partially lost the right external ear (Fig. 1) as a result of trauma was

referred by his plastic surgeon to the Prosthodontic Clinic at Kobry El Kobbba Military Hospital,

Cairo, Egypt. The patient sign the consent form. Impression of the intact ear (Fig. 2) and surgical template for insertion implants. Two implants (Direct Legacy 3.7 mm D and 6 mm L) were replaced in the temporal bone, according to surgical stent made before placing the implants to ensure that the position of the implants was behind the ear. After a healing period of 3 months and osseointegration is confirmed, second stage surgery was done to expose the two implants (Fig. 3). The subcutaneous layer of the skin above the implants was thinned to reduce the mobility of the skin above the implants. Along healing collars were placed to ensure the projection of abutments through the skin (Fig. 4). After a healing period of 15 days, the suture was removed and the patient was ready for the impression of the defect site. Impression of the auricular defect was made with polyvinyl siloxane impression material (Virtual, Ivoclar Vivadent, Schaan, Liechtenstein). The impression is boxed and poured in die stone. A custom made bar was used to splint the implants and provide retention by means of a clip attached (Fig. 5). Try in the clip and bar attachment for passive fit. Acrylic resin was placed to fabricate the substructure that housed the clips. Impression of the defect side with the bar and the acrylic substructure.⁹ Wax sculpting of the defected ear to be a mirror image of the intact side. Wax elimination, ensure the acrylic substructure in the optimum place. The obtained stone cast was used for carving the wax pattern. A trial wax ear matching the natural ear was made. The wax prosthesis was tried on the patient (Fig. 6) and evaluated for the correct

fit on the tissue, correct horizontal alignment with the contralateral ear, projection of the ear in relation to the side of the head and integrity of the margins during simple jaw movements was checked.

Once the trial wax ear was approved by the patient, it was invested in the flask and dewaxed, the flask must be higher to accommodate the waxed ear (Fig. 7). After dewaxing, separating medium supplied by factor II for silicone was applied and 40 mg of transparent silicone elastomer (A-RTV-30, Factor II, Lakeside, USA), was mixed on the weight jar which was colored intrinsically (Intrinsic Coloring Kit Factor II, Lakeside, USA). The mixture was divided into 4 increments and color matching was done in the front of the patient according to manufacture's instructions. Packing of silicone inside the flask was done. The flask was kept at room temperature for 24 hours for a complete set of silicone. After processing, deflasking, trimming and finishing (Fig. 8). Excess flash from the anterior margin of the prosthesis was cut. The remaining excess was trimmed after the prosthesis was evaluated on the patient. The final corrections were made, and the silicone prostheses were colored extrinsically (Factor II Extrinsic Coloring Kit, Lakeside). Extrinsic coloring must be carried out at the fitting appointment and should be kept to a minimum (Fig. 9). Color match must be satisfied for the patient and aesthetically acceptable. Fitting the prosthesis and instructions (Fig. 10). Follow up periods, after one week, one month, and every three months for one year.

3 Discussion:

Loss of external ear can be congenitally missing or, acquired due to accidental trauma or malignant disease. Maxillofacial defects can prevent a patient from returning to normal daily activities. Many patients with these defects have been rehabilitated. Successfully with prosthetic restorations.² Secondary mechanical factors (tissue undercuts), skin adhesives, and implants can provide retention.¹⁰ The patient presented in this article had a right missing ear as a result of trauma. The defect directly affects the patient's social and psychological well being. Acceptable aesthetics in restoring malformed ear is a challenging task for maxillofacial prosthodontist. Surgical reconstruction of ear results in morphology that is less similar to the opposite side because of its complex nature and it is considered to be one of the most demanding challenges for the plastic surgeons.¹¹ The commonly followed the technique in making the wax pattern is to make an impression and a cast of the contra-lateral ear to be used as reference while sculpting the wax pattern. Recent advances in the field of maxillofacial prosthetics for the wax pattern

fabrication like 3D rapid prototyping had enabled the clinicians to provide quality health care to patients in need.^{12,13} The extrinsic and intrinsic coloration of maxillofacial silicone elastomers has always been a challenge for clinicians in obtaining a perfect color match with the surrounding skin tissues.¹⁴ The available options to retain the ear prosthesis are, implant retained, adhesive retained, magnetically retained, hair band retained and spectacle retained prosthesis, implant retained is though superior.¹⁵⁻¹⁸ In this case report, a custom made bar-clip attachment was used for retention of the auricular prosthesis.

5 Summary:

Communication and education is the key factor for the acceptance of the prosthesis. Patient acceptance, aesthetics, compatibility, durability and prosthetic considerations like availability of materials, ease of processing, ease of duplication lead to the success of treatment and making the prosthesis look life like and giving the patient social confidence

REFERENCES:

- 1- Reisberg DJ, Habakuk SW. Nasal conformer to restore facial contour. *J Prosthet Dent* 1990;64:699–701.
- 2- Lemon JC, Kiat Ammay S, Gettleman L, Martin JW et al. Facial prosthetic rehabilitation: pre-prosthetic surgical techniques and biomaterials. *Cure Opin Otolaryngol Head Neck Surg.* 2005; 13:255-62.
- 3- Pham TV, Early SV, Park SS. Surgery of the auricle. *Facial Plast Surg.* 2003; 19: 53-74
4. Miles BA, Sinn DP, Gion GG. Experience with cranial implant-based prosthetic reconstruction. *J Craniofac Surg.* 2006; 17:889-97.
5. Volkenstein S, Dazert S, Jahnke K, Schneider M, Neumann A. Epithetische Versorgung von Gewebedefekten in Kopfbereich [Prosthetic supply of tissue defects in head and neck surgery. *Laryngorhinootologie.* 2007;86:854-60.
- 6- Beumer III J, Marunick MT, Esposito SJ. Maxillofacial rehabilitation: prosthodontic and surgical management of cancer relate acquired, congenital defects of the head and neck, 3rd edn. Quintessence Pub., p 276.
- 7- dos Santos DM, Goiato MC, Pesqueira AA, et al. Auricular prosthesis with osseointegrated implants and quality of life. *J Craniofac Surg.* 2010;21:94–96.
- 8- Goiato MC, dos Santos DM, Gennari-Filho H, Zavanelli AC, Dekon SF, Mancuso DN. Influence of investment, disinfection, and storage on the microhardness of ocular resins. *J Prosthodont.* 2009; 18:32–35.
- 9- Lemon JC, Kiat Ammay S, Gettleman L, Martin JW et al. Facial prosthetic rehabilitation: pre-prosthetic surgical techniques and biomaterials. *Cure Opin Otolaryngol Head Neck Surg.* 2005; 13:255-62.
10. Beumer J, Curtis TA, Marunick MT. Maxillofacial rehabilitation Prosthodontic and Surgical Considerations, ed 2. St Louis: Ishiyaku Euroamerica, 1996:40

- 11- Wang RR, Andres CJ. Hemifacial microstomia and treatment options for auricular replacement: a review of literature. *J Prosthet Dent*. 1999; 82:197-204.
- 12- Peter L, Jonathan G, Noorberto R. Designing and manufacturing an auricular prosthesis using computed tomography, 3- dimensional photographic imaging and additive manufacturing: a clinical report. *J Prosthet Dent*. 2011; 105:78-82.
- 13- Suman Thotapalli. Fabrication of mirror image prosthetic ears - a short review. *Anaplastology*. 2013; 2:120-23.
- 14- Ciocca L, Gentile L, Scotti R. New aesthetic results with auricular prosthesis: two case reports. *Minerva Stomatal* 2003; 52:435-440
- 15- Ajay Singh, Shounak G, Sumankar, Imran Ahmed. Silicone prosthesis for a patient with unilateral ear defect: a clinical case report. *Eur J Gen Dent*. 2013; 2:315- 19.
- 16- EL Charkawi HG, EL Sharkawi AG. A simplified technique for orientation of a bone anchored auricular prosthesis: a clinical report. *J Oral Maxillofac Res*. 2012; 3: 1-7.
- 17- Robin WC Chung, Adam SC Siu, Frederick CS Chu, Tak W Chow. Magnetically retained auricular prosthesis with an implant supported composite bar: a clinical report. *J Prosthet Dent*. 2003; 89:446-49.
- 18- Kasim Mohamed, Anand Kumar V, Umamaheshwari Mani, Yadharth B, Padmanabhan TV. Rehabilitation of an auricular defect using spectacle retained silicone ear prosthesis and ear stent. *Int. J Prost Rest Dent*. 2012; 2:29-33.

FIGURES

Fig. 1. The defected ear.



Fig. 2. Stage two surgery.



Fig. 3. Acrylic plate to compress the tissues around the implant'analogue.



Fig. 4. The custom made bar attachment.



Fig. 5. Wax pattern, try in.



Fig. 6. Wax pattern flasking.



Fig. 7. Wax pattern deflasking.



Fig. 8. Extrinsic coloration.



Fig. 9. Implant retained auricular prosthesis.



^a Lecturer in military medical academy. Department of Maxillofacial Prosthodontic, Kopyri El Koba military hospital, EGYPT

^b Lecturer in Faculty of Oral and Dental Medicine, Nahda University, Egypt

IJSER