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Fabrication of Silicon Prosthesis for Bilateral Ear Defects: A Clinical Case Report

Dr.Shivani Parmar[1], Dr.AnkurGautam[2] ,Dr.Archana Nagpal[3], Dr.Rajeev Gupta[4], Dr.Parikshit Gupt[5]

[1](MDS Department of Prosthodontics and Crown & Bridge, Himachal Dental College, Sundernagar)
[2](Junior Resident, Department of Radiology, Dr.RPGMCTanda, Kangra)
[3](Professor and Head, Department of Prosthodontics and Crown & Bridge, Himachal Dental College, Sundernagar)
[4](Professor, Department of Prosthodontics and Crown & Bridge, Himachal Dental College, Sundernagar)
[5](MDS Department of Prosthodontics and Crown & Bridge, Himachal Dental College, Sundernagar)
Corresponding author: Dr.ShivaniParmar

Abstract: *Various bio-compatible materials can be used to restore the function and esthetics of any congenital or acquired defects. Proper assessment, examination, planning and rehabilitation of the distorted body parts has been the target of clinical maxillofacial prosthodontics. The aim of this article is to present a case report of fabrication of silicone prosthesis for a patient with a congenital bilateral auricular defect.*

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I. Case Report:

A 45-year-old male patient reported to the Department of Prosthodontics with a history of congenital defect of right and left ear [Figure 1]. After examination, impression were made with irreversible hydrocolloid [Figure 2]. Petrolatum gel was applied to the surrounding facial skin and hair for easy removal of the impression without any distortion. The external auditory canal was blocked with gauze to prevent entry of impression material. Beading and boxing of the impressions of the defects were done to provide adequate support for the plaster. Stone cast was obtained which was used as a guide to obtain the wax pattern. The prosthesis can be fabricated by sculpting wax pattern or by using 'donor technique'. For this patient 'donor technique' was done from the beginning as the defect were bilateral and extensive. Bilateral impression of the donor was obtained in similar manner by using irreversible hydrocolloid impression material and wax patterns were obtained [Figure 3]. The wax prosthesis then tried on the patient and evaluated for the accurate fit on the tissue, correct horizontal bilateral alignment with the contra side, orientation of the ear in relation to the side of the head and integrity of the margins during simple jaw movements was checked to evaluate the integrity of margins. The wax pattern was invested in the denture flask to obtain the mold[Figure 4]. Further, addition silicone was used to make the prosthesis such as to obtain certain retentive features that aid in more retention of the prosthesis. Since, the addition silicone will not distort easily as compared to the wax so changes can be easily made in the prosthesis before final fabrication[Figure 5]. After modification of the putty prosthesis final mold was made by investing in the denture flask.

The room temperature vulcanizing (RTV) silicone (MP Sai, Enterprise) was used for final prosthesis provided with intrinsic stains for shade matching. Basic colors used were yellow, white, brown, purple, and red. The base paste and catalyst paste were mixed in increments with gradual addition of the stains. Constant comparison was done with the skin of the approximate area and the contralateral ear. The flask were kept for 48 h at room temperature as per the manufacturer's instructions. Examination of the final prosthesis was done for any defects and porosities. The final prosthesis was then tried on the patient, and retained with the help of spectacles[Figure 6]. Thus, restoration of the lost facial structure was done that was acceptable by the patient aesthetically as well as economically.

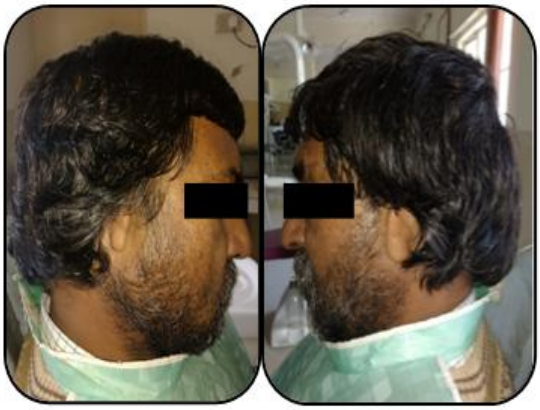

Figure 1:Left lateral view of auricular defect

Right lateral view of auricular defect

Figure 2:Final impressions of the left and right auricular defects

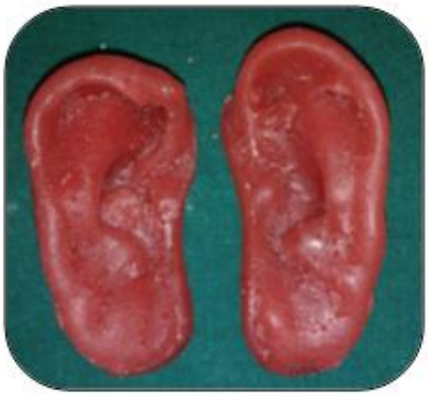

Figure 3: Wax patterns obtained by 'donor technique'.

Figure 4: Mold prepared

Figure 5: Try in done on patient.

Figure 6: Spectacle retained ear prosthesis

II. Discussion

Auricular defects can be congenital or acquired due to trauma or malignant disease. Congenital anomaly of the external ear may be termed as "Microtia". It ranges from a scale of deformities from a grossly normal but small ear to the complete absence of the entire external ear. Bilaterally missing ears has been reported fewer than 10% of all case while other deformities account for three in every 10,000 births[1]. The patient presented in this article had a bilateral congenitally missing ear.Patients with auricular deformity or absence of auricle undergo through a psychological trauma. The aim of maxillofacial rehabilitation is to provide a confident life to the patient by rehabilitation of facial defects with a suitable prosthesis. Surgical reconstruction of auricular defects can be done with autogenous tissue, but this may not be feasible for personal/medical reasons. Prosthesis reconstruction is a good alternative to develop an auricular prosthesis more conservatively with a suitable material Silicone because of its life like appearance and flexibility. In this case, RTV silicone (MP Sai Enterprise) was used. Intrinsic stains provide better coloration and stability and esthetics as compared to extrinsic stains.[2]Intrinsic stains undergo considerably less amount of color alteration as compared to extrinsic coloration methods as reported in color evaluation studies using spectrophotometer.

RTV silicones undergo hardening and discoloration over a period of time, when in contact to hot and humid environment but the material still remains in considerably acceptable condition for about 9-12 months of time.

The common technique in making the wax pattern is to make impression and cast of the contra-lateral ear which is used as a reference for sculpting of the wax pattern but in this case bilateral auricular defect was evident. So, as in the literature various techniques have been suggested for sculpting the pattern were used[2-3].

The various options available to retain the ear prosthesis are- implant retained, [4,5]adhesive retained, magnet retained, [6]hair band retained and spectacle retained prosthesis [7].Implant retained is though superior, but we opted for a spectacle frame and hair band retained prosthesis as patient was apprehensive for the surgical procedure. The spectacle frame is the most commonly used mode of retention for ear prosthesis as it is easy to attach and remove, cost effective and requires less chair side time. Recent advances in the field of maxillofacial prosthesis is fabrication of prosthesis by 3D rapid prototyping[10,11]and tissue engineering. Tissue engineering studies done in animal models have various possibilities of potential clinical applications [8,9].

III. Conclusion

Cosmetically acceptable auricular prosthesis for a male patient was made, which was esthetically, functionally and economically acceptable to him as maxillofacial defects can be traumatizing to the patient socially andpsychologically.

The patient in this case was highly satisfied with the prosthesis and stated significant improvement in confidence as reported in the follow up phase. He appreciated the limitations of the prosthesis and seemed reasonably happy with what was delivered to him.

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