Clinical Report

Rehabilitation of auricular defect utilizing single implant and tissue support

Chethan Hegde, D. Prasad Krishna, Prasoon Shukla, Manoj Shetty
Department of Prosthodontics, AB Shetty Memorial Institute of Dental sciences, Deralakatte, Mangalore-575 018, Karnataka, India

For correspondence
Dr. Prasoon Shukla, Department of Prosthodontics, AB Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore - 575 018, Karnataka, India. E-mail: abshetty.prostho@yahoo.com

Predictable esthetic results coupled with survival rate being more than 95% has made implant supported auricular prosthesis as one of the most accepted modality to treat auricular defects. Use of two osseointegrated implants to achieve support is classically accepted treatment modality in alloplastic ear reconstruction. This case report deals with rehabilitation of congenital auricular defect utilizing single implant and tissue support.

Key words: Auricular defect, implant supported, soft tissue reactions

INTRODUCTION

Quality of life can be severely affected by congenital absence or loss of external ear either post surgically or due to trauma. This case report deals with rehabilitation of congenital auricular defect utilizing single implant and tissue support.

CASE REPORT

A 28 year old male patient was referred to the Department of Prosthodontics, A. B. Shetty Memorial Institute of Dental Sciences, Mangalore, with the complaint of congenitally deformed right external ear. The cranial half of right auricle was severely deformed with helix being folded on itself and obliterating anthelix and scaphoid fossa completely. Caudal half of the ear was relatively normal in appearance. Patient's left ear was normal in appearance with normal hearing pattern in both the ears. There were no associated features suggestive of microtia or any other syndrome. Patient was devoid of any systemic disorders. Patient gave the history of having undergone reconstructive surgery with adhesive retained auricular prosthesis but was not satisfied due to lack of stability. Patient also expressed strong desire to retain residual ear during the course of treatment.

Treatment planning

Keeping in mind previous unsatisfactory experience of the patient with adhesive retained prosthesis and better esthetic predictability of implant supported prosthesis over the surgical autogenous reconstruction, with patient's consent implant supported auricular prosthesis was selected as final treatment modality. It was also planned not to resect deformed ear during course of treatment.

Procedure

Two endosseous screw type implants (Endopore dental implant system) were selected and placed in eight - o clock and eleven - o clock positions in the mastoid region at a distance of *twenty mm* from the centre of external auditory meatus with inter implant distance of *fifteen mm*.

Six months following the surgery on confirmation of osseointegration second stage surgery was performed. Implants were uncovered and UMA abutments with length of 5.5 mm and width of five mm were placed with cover screws. Subcutaneous tissue around the implants was thinned and tissues were made to seat around the abutments with the help surgical dressings to prevent soft tissue overgrowth.

During healing period soft tissue over growth was noticed around caudal cover screws / abutment complex. Attempts such as surgical removal of soft tissue, compressing the soft tissue by placing a plastic ring beneath the cover screw and split thickness skin graft around the implant could not prevent recurring soft tissue overgrowth.[2-4] This repeated overgrowth resulted in almost completely submerged caudal cover screw / abutment complex with only superficial portion of cover screw being exposed [Figure 1]. Apart from this location of caudal implant was found so close to

anthelix that attachment of Hader bar to abutment was very difficult [Figure 1].

Treatment plan was modified at this stage and decision was made by the prosthetic team to use single cranially placed implant and hard tissues (temporal bone) around the implant to take support for the prosthesis by providing extensions on the tissue surface of acrylic plate (which acts as housing for Hader bar clips) [Figure 3].

A detailed anatomic impression of the defect area and the abutments was made using impression copings and long guide pins with a special tray and light body polyvinyl siloxane (3 M ESPE Dental products). Abutment replicas were connected to the impression copings and cast was poured in die stone (Kal Rock, Kala Bhai Karson Pvt.).

To fabricate the superstructure Hader bar was cast in Co-Cr alloy (Wirolloy, Bego Dental products) with the reduced cantilever length of 6 mm (to reduce the leverage forces while placing and removal of prosthesis). Caudal end of the bar was extended and made to rest over the cover screw of caudal abutment to gain support from the implant [Figure 2]. Bar was screwed to the cranial abutment and retention clips were positioned over the bar and secured in a plate made with cold cure acrylic. Extensions were made on the tissue surface of the acrylic plate to take support from underlying temporal bone and whole assembly was tried in situ to check the fit and contours. These extensions also prevent movement of prosthesis.

A wax pattern for the defected ear was sculpted and tried on the patient. A heat cured acrylic resin prosthesis was fabricated and attached to the acrylic plate using cold cure acrylic [Figure 4].

DISCUSSION

First implants in craniofacial region were placed in 1976 by Branemark and Alberktsson to retain a bone anchored hearing aid, while osseointegration was first used to retain an auricular prosthesis by Tjellstrom in 1979.[1] Osseointegration in temporal region has

Figure 1: Soft tissue overgrowth around caudal implant and close approximation of implant to anthelix

Figure 3: Extensions on the tissue surface of acrylic plate to take support from temporal bone

Figure 2: Hader bar extending to take rest on caudal healing cap

Figure 4: Final prosthesis in place

been so predictable that number of implants to retain the prosthesis has come down from five to three and presently two implants are considered to be sufficient for retaining auricular prosthesis.[1]

Autogenous ear reconstruction which utilizes patient's own tissues (cartilaginous tissues) for reconstruction has few advantages over implant supported prosthesis. It produces a stable long term results with no maintenance. Cartilaginous framework has been shown to grow with age can be used in children. However the disadvantages such as lengthy surgical procedures, greater surgical morbidity and above all less predictable esthetic results (especially in the shape of reconstructed ear) can not be ignored.[1]

Many options have been suggested in the literature to overcome unfavorable soft tissue reactions. These include surgical removal and compression by packing the surgical dressing, compression by plastic washer or ring placed beneath healing cap and grafting split thickness split graft around the abutment. Soft tissue overgrowths can still render an implant unsuitable to provide support for prosthetic superstructure.[2-4]

Forces on an implant supporting an auricular prosthesis (0.1-1 N) are significantly less when compared with implants supporting intra oral prosthesis (50-200 N), so a single implant along with hard tissues can provide sufficient support to an auricular prosthesis.[1]

Site selection for the implant placement is very critical to avoid unfavorable soft tissue response. After raising the tissue flap, implant placement sites should be evaluated for soft tissue thickness and if necessary location of the implant can be shifted to the areas with lesser soft issue thickness.[1]

The procedure suggested in the case report provides an alternative treatment option when one of the two implants is not available to retain and support the prosthesis either due to failure in osseointegration or poor soft tissue response.

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