CASE REPORT

An Innovative Technique for Rebasing of Complete Arch Implant Fixed Prosthesis: A Case Report

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ABSTRACT

This case report targets to present a technique for the substitution of acrylic resin denture base material and teeth for an implant-retained fixed complete denture utilizing the existing metallic framework. This technique helps in precise alignment of the impression and framework to implants and residual ridges and simultaneously affords a cast and record for the articulation of substitute teeth at the appropriate vertical dimension of occlusion.

Keywords: Case report, Implant, Metallic framework, Relining.
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INTRODUCTION

The substitute of conventional complete denture is implant-retained prosthesis. But this prosthesis requires necessary maintenance.¹ Following long-term use, a common maintenance procedure is the replacement of acrylic resin and metal implant framework and denture teeth.² Because of continuing bone resorption there is loss of support of denture base and poor fit. So there is requirement of periodic relining of denture base to improve support.¹

This case report highlights the clinical and laboratory procedures used to reinstate acrylic resin teeth on the same metal framework and the time sequence associated with this treatment.

CASE DESCRIPTION

A 65-year-old male patient reported to the department of prosthodontics, crown, and bridge with the chief complaint of attrition of acrylic teeth with fractured denture and accumulation of food under his lower denture. On history taking, it was revealed that implant-retained fixed-complete dental prosthesis was given to patient 6 years ago. It was told to patient that the acrylic resin denture teeth might be required to replace after 4–5 years. The patient was recalled every 6 months for prophylaxis. There was general attrition of artificial teeth.

On palpation, there was no movement of the prosthesis. The metal framework was splinted and abutments were encased with the help acrylic resin base material. Four implants were supporting the prosthesis. The tissue surface was in a form of modified ridge-lap configuration, and there was slight space was seen between the residual ridge and the tissue surface of the prosthesis (Fig. 1).

The prosthesis was removed. Tissue surface revealed intact acrylic but slight resorption of alveolar ridge with tissue inflammation confined to area of complaint of patient. There was loss of occlusal vertical dimension, attrition of teeth with discoloration (Fig. 2).

The treatment plan consists of the reinstating acrylic teeth and denture base using same metal framework.

CLINICAL AND LABORATORY APPOINTMENT SEQUENCE

For ease of patient for use of prosthesis during treatment, clinical and laboratory procedure was planned in series (Table 1).

Day 1
The prosthesis was retrieved smoothly by drilling the access holes in the composite restorations, cotton block-out material and screws removed. Inflammation of the mucosa was seen under the prosthesis because of food accumulation. Healing abutments were placed (Figs 1 and 2).

Day 2
The inflammation subsided after 1 week (Fig. 2D). The mandibular master cast was made by using old prosthesis as verified index, and to avoid additional expenses, same framework was used along
with mandibular cast. The mandibular impression was made with light-bodied condensation silicone (Zetaplus system, Zhermack) using the existing prosthesis as a custom tray. Implant analogs were screwed into the abutments (Fig. 3A).

As per the manufacturer’s instructions Type IV dental stone (Kalabhai Kalrock Diestone, Kalabhai Karson Pvt. Ltd. Mumbai, India) was mixed and the impression was poured gently and allowed to set. The prosthesis was retrieved from the cast. The teeth and denture base were removed by grinding and shell blasting (Fig. 3C). Over the framework, occlusal rims were fabricated (Fig. 4A).

**Day 3**
Vertical dimension at rest and vertical dimension of occlusion (VDO) was recorded by placing dots on onto the patient’s nose and chin with the help of esthetics, phonetics, and swallowing methods. Centric relation recorded. Teeth selection done. Casts were mounted on articulator. Teeth arrangement was done in optimal cusp/fossa centric contacts in a group function occlusion (Fig. 4B).

**Day 4**
The try-in was done. Evaluation of esthetics, lip support, VDO, and VDR were done. Patient’s consent was taken for esthetics (Fig. 4C).

The prosthesis was waxed up (Fig. 4D), flaked, dewaxed, and processing was done with compression molding technique with polymethyl methacrylate (PMMA) (Ivolcar SR Triplex Hot, Ivoclar Vivadent) (Fig. 5). Finishing and polishing was done (Fig. 6).

**Day 5**
The healing abutments were removed. The prosthesis was placed (Fig. 6D) and abutment screws were tightened. To check any irritation of acrylic or metal on intaglio, surface pressure indicating paste was used, and required necessary grinding was done for passive seating of the prosthesis. For even contacts in the posterior region, selective grinding was done. The patient was extremely happy with the results. The screw heads were blocked out with putty impression material (Zetaplus system, Zhermack); access openings were restored with tooth color, light-cured composite resin (Ivolcar Te-Econom plus Composite Kit, Ivoclar Vivadent Gurugram, India).

**Day 6**
The patient was recalled after 24 hours but did not report any post-insertion issues.

**Discussion**
The replacement of missing teeth is very crucial from medical as well as esthetic point of view since decades. With the support of osseointegrated implants, the fixed-removable prosthesis resembles a flangeless denture. There is no contact of intaglio surface of prosthesis and the tissues.

The hybrid dentures usually need replacement after 4–5 years. The reasons were the overall thickness of the acrylic is less because of the metal framework, so strong affinity to fracture on chewing and the flanges are short buccally and lingually as no proper border.

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Figs 1A to D: Retrieval of the existing prosthesis
molding is done. It further reduces the surface area and hence less acrylic. There are two different materials at the interface – metal and acrylic. As the bond between denture base and metal is purely mechanical, with no chemical bond, so it had adhesive failure and microleakage.

This method of treatment avoids additional expense of patient for the fabrication of new prosthesis, permits precise realignment, easy impression making, easy jaw relation, and teeth arrangement for better occlusion. It had disadvantage like patient has to be without prosthesis for some time during laboratory procedures.

Table 1: Clinical and laboratory appointment sequence

<table>
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<tr>
<th>Appointments</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
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<tbody>
<tr>
<td>Clinic</td>
<td>Removal of the old prosthesis</td>
<td>Mandibular definitive denture impression.</td>
<td>Initial jaw relation, select denture teeth</td>
<td>Wax try-in, verify esthetics, OVD, jaw relations</td>
<td>Remove healing abutments.</td>
<td>24-hour post-insertion follow-up. Evaluate occlusion, Polish</td>
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<td></td>
<td>Placement of healing abutments</td>
<td>Maxillary diagnostic impression</td>
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<td>Insert prosthesis</td>
<td>Evaluate occlusion, tissue adaptation, oral hygiene</td>
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<td>Torque screws</td>
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<td>Restore access openings</td>
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<td>24-hour post-insertion</td>
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<td>oral hygiene</td>
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<td>Laboratory</td>
<td>Pour master cast</td>
<td>Remove denture teeth and base from the prosthesis</td>
<td>Articulator mounting Set mandibular denture teeth</td>
<td>Final waxing, processing, and finishing</td>
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<td>Fabrication of occlusal rims over the framework</td>
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Figs 2A to D: Condition of the existing prosthesis and oral mucosa
Figs 3A to D: Impressions and retrieval of metal bar

Figs 4A to D: Wax up and access hole blocked with putty
Figs 5A to D: Flasking, packing, and curing of prosthesis

Figs 6A to D: Final prosthesis in different views and prosthesis in situ
Silicon coating or tin plating and oxidation are two chemical bonding techniques that can be performed by the commercial dental laboratory during processing.  

**CONCLUSION**

Osseointegrated implants supported prosthesis can provide satisfactory results in patients. The maintenance of prosthetic component as well as the implants is very important. Regular recall visit after 6 or 12 months is must to avoid complications and to assess the status of the peri-implant tissue.

**REFERENCES**

