

Case Report

Implant retained, tooth and mucosa supported mandibular overdenture

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The choice of a suitable prosthesis for a specific case is determined to a great extent by the number, position and salvagability of the existing teeth as well as the mucosa and underlying residual bone. Also of significance are the expectations and demands of the patient from the prosthesis. The following case report discusses the rehabilitation of a partially edentulous patient with an Implant retained, tooth and mucosa supported mandibular removable partial denture against conventional maxillary removable partial denture.

Key words: Implant retained (ball and socket), tooth-mucosa supported over-denture

INTRODUCTION

Rehabilitation of a partially edentulous patient can be established using a wide range of prosthetic treatment options. Depending upon the clinical need and demand, restoration of the lost structure can be achieved by using a simple conventional removable partial denture, overdenture, fixed partial denture, or dental implant prosthodontics. Choice of a single or a combination of these will completely depend upon the number and status of the existing teeth, available bone and influenced by the esthetic and functional demands and desires of the patient. In case of mandible where occurrence of resorbed ridges is more common and there is poor availability of tissue and mucosa support for conventional partial denture, an implant retained, tooth and tissue supported over-denture is a superior choice for rehabilitation. In the case undertaken by us, a partially edentate patient was rehabilitated using a mandibular implant retained over-denture and a conventional removable partial denture for maxillary arch. The retention and stability achieved with implant over-denture far exceeds that obtained with a successful conventional denture treatment.^[1]

CASE REPORT

A 57-year-old male patient reported to the dental OPD with the chief complaint of missing teeth in the upper and lower arch, which led to difficulty in chewing

food and problem with phonetics. The patient was also concerned about his compromised facial appearance.

On intra-oral examination, tooth no.1, 2, 3, 6, 7, 15, and 16 (Kennedy class-I Modification I^[2]) were found to be missing in the maxillary arch. All teeth except tooth no. 28 and 29 were missing in mandibular arch. The residual ridge was badly resorbed and offered little mucosal support. Though adequate bone support was present around tooth no. 28 and 29. There was generalized recession present around remaining teeth. Tooth no. 28 and 29 were supra-erupted (class-I Modification - I). As per the division of available bone,^[3] anterior mandibular ridge showed patterns of Division A, whereas posterior ridge was classified under Division C. The bone density of anterior mandible was presumed to be D2, according to the Misch bone density classification,^[4] after clinical examination of the location and radiographic evaluation. However definitive bone density can be determined only with computerized tomograms or tactile sense during implant surgery.

Treatment planning

The mandibular arch had all but two missing teeth and the alveolar ridge was heavily resorbed for a conventional tissue/mucosa supported partial denture [Figure 1]. However adequate bone was available for the implant placement in the anterior ridge as against the posterior region. A partial over-denture for mandibular arch was planned which would be

supported by the existing natural teeth and retained by three ball and socket implants which would be placed in the anterior region. According to the mandibular implant site selection, the chosen implants would be placed in sites named A, C, E.^[5]

Sufficient number of teeth were present in the maxillary arch and the quality of ridge was considered satisfactory for a conventional tooth tissue supported removable partial denture.

Clinical procedure

- 1 Thorough medical and dental history of the patient was recorded. Maxillary and mandibular study models were made and an OPG was taken to assess the bone for selection of implants.
- 2 Oral prophylaxis followed by conservative and endodontic treatment of 28 and 29 were carried out.
- 3 Tooth no. 28 and 29 were reduced in height by 10 mm (Original teeth were supra erupted and had unfavorable crown root ratio) and restored with the metal copings so that they could act as abutment support for the overdenture [Figures 2 and 4]. This also resulted in optimal crown root ratio and adequate clearance for the over-denture prosthesis which was initially inadequate because of the supra eruption.
- 4 Implant surgery was undertaken in the mandibular anterior region [Figure 3]. Three, one-piece ball and socket type of implants were chosen in accordance to the height, width, length, and angulation of the Available bone and placed at predetermined locations following the essentials of surgical protocol. (Indident Dental Implant, l-13 mm, d-3.8 mm; Root form cylindrical implant with rectangular threads; GEPL India). The patient was recalled for regular follow-ups to assess the status of implant and the peri-implant tissues.

- 5 Periodic clinical, radiological and SPECT studies were carried out and once the evidence of osseointegration was established, the loading of the implants was initiated with the prosthetic rehabilitation. A preliminary impression for mandibular arch was made using irreversible hydrocolloid impression material (Septalgin, Septodont France) in a suitable stock tray to produce working models upon which custom trays were fabricated. Auto-polymerizing resin custom tray (Rapid Repair, DPI India) was used to record the final impression with elastomeric impression material (Zeta Plus, Zhermack, Italy) capturing the details of abutment teeth, implant abutments and supporting soft and hard tissues. A similar impression procedure was used for the maxillary arch [Figure 5].
- 6 The position and form of the implants placed in the oral cavity was duplicated on the working cast by using the implant analogs [Figures 6 and 7].
- 7 The spatial relationship between the maxilla and



Figure 2: Prepared tooth No. 28 and 29



Figure 1: Partially edentulous patient with multiple missing teeth



Figure 3: Ball and socket implants placed in mandibular anterior region



Figure 4: Metal copings on the prepared teeth



Figure 7: Model duplicating position of implants and prepared teeth



Figure 5: Maxillary and mandibular final impressions



Figure 8: Retentive elements housed into the fitting surface



Figure 6: Mandibular final impression with implant analogs



Figure 9: Implant retained, tooth-mucosa supported mandibular overdenture

mandible was recorded and was followed by trial insertion, which satisfied the patient. Finally the dentures were cured in heat polymerizing resin. (Trevalon Hi, Dentsply)

- 8 The retentive elements for the implant abutment were housed directly at chair side into the fitting surface of the denture [Figure 8]. The final prosthesis was an excellent blend of retention, stability, and support [Figure 9].
- 9 Patient was put on regular recall and maintenance.

Traditional over-dentures rely on the remaining natural teeth to support the prosthesis. The location and distribution of these natural teeth is highly variable and they are often compromised because of bone loss associated with periodontal disease. A similar situation was presented in the case discussed above. For maxilla a conventional removal partial denture was fabricated while an implant retained, tooth-mucosa supported over-denture was given in the mandibular arch where the implants were placed a specific sites and the final prosthesis gave improved retention, stability, support and patient satisfaction over the conventional one.

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