

Case Report:

Tooth Supported Mandibular Overdenture – A concept which needs renaissance

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Abstract:

Overdenture is a favoured treatment option for rehabilitation of full mouth dentition in elderly patients with few remaining teeth. This clinical report describes a novel method of fabricating a tooth supported overdenture because all the factors i.e healthy roots and supporting structures, good oral hygiene, retained roots in both quadrants in the jaw with strategic distribution, were in favour of it. A multidisciplinary approach was adopted to retain the remaining teeth in the mandibular arch with the help of endodontic treatment (root canal treatment) followed by prosthetic rehabilitation.

Keywords:

Bone Resorption, Tooth-Retention, Crown Reduction, Bone Preservation, Tooth Supported Overdenture.

Introduction:

Significance of a therapy that delay or omit future prosthetic issues is emphasized in Preventive Prosthodontics.^[1] Overdenture is an important part as the preventive treatment modality. A complete denture patient goes through a sequel of events like loss of tooth proprioception, transfer of all occlusal stress from the teeth to the oral mucosa, gradual loss of alveolar bone, and the most depressing sequel is the loss of patient's self-confidence. An overdenture delays the process of resorption, improves denture foundation area and increases masticatory efficiency.^[2]

Overdenture is definitely a better option as compared to a removable complete denture prosthesis. In a 4 years study by Renner *et al.*, it was found that 50% of the roots used as overdenture abutments remained immobile.^[3]

According to GPT 8, “overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants. It is also called as overlay denture, overlay prosthesis and superimposed prosthesis”.^[4]

There are different attachment systems available to retain overdenture. After extraction of tooth, dimensions of the residual alveolar ridge are altered due to bone loss, though this process vary from individual to individual and it is not possible to predict at that time (of extraction). In a lot of patients, alteration of alveolar process, results in several problems e.g compromised retention of conventional dentures. Label “a major oral disease entity” is given to such alteration/loss of the residual ridges in a classical paper.^[5]

When all the teeth have been lost the alveolar bone resorbs. Some of the tooth roots that left in place definitely lessen bone loss and provide the patient with a more stable denture.^[6] The remaining roots also help in anchoring the denture. The following case report illustrates these items.

Case Report:

In department of prosthodontics, a 50-years-old lady, presented with the complaint of difficulty in chewing due to missing teeth. Extra oral examination showed facial form ovoid, profile straight, facial muscle tone normal, adequate mouth opening. Mandibular movements were smooth with normal TMJ.(fig.1)



Fig.1

Intraoral examination showed partially edentulous maxillary arch, only two teeth present, which were 17 and 27 (fig2.a). Mandibular arch also had only two teeth which were 33 and 44 (fig2.b)



Fig2.a. maxillary arch ; b.mandiular arch

On the basis of the clinical findings, different treatment modalities available for this patient were:

1. Extraction of remaining teeth and restoration of edentulous mouth with conventional complete denture.^[9]
2. Acrylic partial denture.
3. Cast partial denture with or without attachments.
4. Extraction followed by implant supported prosthesis.
5. Tooth/root supported overdenture with or without attachment.^[8]

The case was planned to provide the patient with maxillary acrylic partial denture and mandibular root retained overdenture. After confirming from the patient, one visit root canal therapy of the healthy teeth of mandibular arch was completed first. The location of the remaining teeth was favourable for an overdenture. Two remaining natural teeth were treated with root canal therapy and cut off near the free gingival margin. A bevel around the circumference was made (fig3.a)



Fig3.a.teeth treated with rct and cut off near FGM; b. retained roots layered with GIC to prevent caries.



fig4. Periapical radiographs showing different steps of RCT

Alginate impression was made for maxillary and mandibular arch.(fig.5) After pouring model special trays were made. Final wash impression was taken with zinc oxide eugenol paste. Both impressions were carefully poured in dental stone and final casts were obtained.



Fig.5. Alginate impressions

Occlusal rims were fabricated on final cast and Jaw relation was done. After mounting the rims on the articulator, arrangement of teeth and try in was done. After the approval of try in by the patient, the denture was processed using heat cure acrylic resin.



fig6. Occlusal rims and jaw relation



Fig.7 articulation and arrangement of teeth

Further steps of jaw relation, articulation, arrangement of teeth, try in and processing of denture were done by conventional method of fabrication of conventional denture. The dentures were carefully trimmed and polished after retrieving from the flasks. Denture insertion was done and necessary adjustments were made. Border extensions and occlusion were checked.



fig.8

Patient was instructed how to wear and remove the denture, on denture maintenance and oral hygiene. Patient was called for follow ups after 24hrs, after 7

days and after 15 days. On recall it was observed that patient was satisfied with her new dentures and was able to masticate properly.

Discussion:

Denture retention which is assured by overdenture is mandatory to increase the quality of patient's life related to oral health.^[8] Maintenance of a denture on the alveolar ridge is essential to prevent it from becoming loose during functional activities like eating, speaking and others. If an overdenture therapy is recommended by a dentist, the patient should be regularly examined to lessen the risk of caries and periodontal diseases.^[12]

The remaining roots of the teeth, which are not extracted and left in place, significantly reduce bone loss.^[6] Retained tooth (roots) should preferably be on both quadrants in the jaw, strategically distributed (first molar or second premolar with canines). Removal of portion of the teeth above the gingival margin is required. So, most of a tooth crown is removed to radically improve the crown-root ratio.^[13] This often necessitates root canal therapy. Compared to conventional partial dentures, tooth supported overdentures are more acceptable to the patients because this removable choice has become increasingly popular during the recent global financial downturn.

Conclusion:

Greater satisfaction is achieved by tooth supported overdenture.^[8] This therapy presents a realistic substitute to the patients who are not willing to extract remaining natural teeth.^[14] The technical simplicity, the usefulness for geriatric patients, the increased control of jaw function through the maintained periodontal ligament are arguments for the use of overdenture. Neuromuscular mechanism, the articulation of temporomandibular joint and the denture's supporting structures are biologically maintained in much better way by teeth than by the mucoperiostium.^[15] Tooth supported overdenture is psychologically beneficial as the patient had not undergone extraction.

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Conflict of interest:

There are no conflicts of interest.

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