

Fabrication of Overdenture using Three different Retentive Mechanism

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ABSTRACT

Introduction: An overdenture is a removable complete or partial denture that has one or more tooth roots or implants to provide support. In treatment planning of overdenture, variety of clinical alternatives must be considered to achieve good prognosis and to provide comfortable prosthesis to patient.

Case report: Here, in this article, three different patients were planned for overdenture using different retentive mechanisms which are metal copings, intracoronal retainer (postkit system) and implants.

Conclusion: Fabrication of overdenture is a challenging task for a dentist, but use of appropriate retentive mechanism can achieve successful overdenture for an individual.

Keywords: Overdenture, Implant, Metal coping, Postkit System.

INTRODUCTION

The tooth-loss is related with functional, esthetic, social and psychological impairment of patient's lifestyle which may have an adverse effect on the patient's self-respect, dignity and general health. Primary etiologic factors for loss of teeth are periodontal disease and dental caries while secondary etiologic factors are socioeconomic factors such as low educational level and inability to access primary health services. These socioeconomic and psychological factors may put patient into an awkward situation where only removal of teeth is possible.^{1,2} Inevitable consequences of loss of teeth is "Residual Ridge Resorption"(RRR). It is postulated that RRR is a multi-factorial bio mechanical disease that results from a combination of anatomic, metabolic and mechanical determinants. Since all of these factors may vary from one patient to the next, these different co-factors may combine in an infinite variety of ways, thus explaining the variations in RRR between patients.

There are mainly two possible ways to prevent or at any rate reduce the bone loss of residual ridges. One of them is simply to avoid extraction of all teeth and other is to preserve a few teeth or their roots which can be used to make a tooth or root supported overdenture. Overdenture has been found very effective to substantially reduce the bone loss in the residual ridges. There are many advantages of root or tooth supported overdentures compared to complete dentures such as improved denture stability and retention. In cases where it is not possible to preserve teeth or their roots, Implants can be placed to make implant supported overdenture. Implant supported overdenture will prevent bone loss by transferring functional stimulus to bone via implants which will Not only reduce bone loss but also cause even bone apposition.³⁻⁵

In comparison to complete denture, Tooth or root or implant supported overdenture is viable alternative. In this article, following case series has been demonstrated to be efficient

in different clinical situations using three different retentive mechanisms which are metal copings, postkit system and implants.

CASE REPORT

Case 1- Metal coping retained over denture

A 50 years old male patient came to department of prosthodontics, crown and bridge with chief complain of construction of prosthesis. On intraoral examination patient had bilateral mandibular canine and first premolar present, which were periodontally sound. In maxillary arch on right side canine was present and on left side, both canine and first premolars were present. In maxillary arch gingival recession was present in all teeth and teeth were not periodontically sound so we planned convention removable partial denture for maxillary prosthesis and tooth coping retained over denture for mandibular prosthesis.

Once planned for coping retained over denture, patient was asked to undergo root canal treatment in all four teeth, after which dome shaped teeth preparations were done with chamfer finish lines. The copings were fabricated and cemented using glass-ionomer luting cement. (GC Gold Lable, GC corporation, JAPAN).

After completion of this procedure denture construction procedure were started. Removable partial denture for maxillary arch was made in conventional way. Primary impression for lower arch was made using light body and putty condensation silicon impression material (speedex, Coltene/Whaledent AG, Switzerland). Custom tray was made with spacer. After achieving satisfactory border molding, impression was made using addition silicon material (AFFINIS, Coltene/Whaledent AG; Switzerland). Maxillo-mandibular relations were recorded. Teeth's setting were done and denture try-in was checked for any errors. The dentures were fabricated and finished and polished in a conventional manner.

After fabrication, intaglio surface of denture had concavities on both side in canine-premolar region. Needful adjustments were done in denture for easy insertion and removal. Once proper tissue adaptability and occlusion were achieved, patient was asked to follow instruction and regular follow ups were appointed (figure 1).

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Case 2 – Tooth post kit system retained over denture

A 47 year old female patient came to department of Prosthodontics with the chief complain of construction of prosthesis. On intraoral examination, In maxilla complete edentulous arch was present and in mandibular arch periodontically sound canine and first premolar were present. So we planned conventional complete denture for maxillary arch and tooth post kit system retained over denture for mandibular arch.

Once planned for tooth post kit system retained over denture, patient was asked to undergo root canal treatment in all four teeth, after which dome shaped teeth preparations were done with chamfer finish lines in premolars. The copings were fabricated and cemented using glass-ionomer luting cement on first premolars. In both canines canal preparation was done to receive posts. Posts were luted using glass-ionomer luting cement. (GC Gold, GC corporation, JAPAN)

After completion of this procedure denture fabrication procedures were started. Complete denture for maxillary arch was made in conventional way. Primary impression for lower arch was made using light body and putty condensation silicon impression material (speedex, Coltene/Whaledent AG; Switzerland). Custom tray was made with spacer. After achieving satisfactory border molding, impression was made using addition silicon material (AFFINIS, Coltene/Whaledent AG; Switzerland). Maxillo-mandibular relations were recorded. Teeth arrangement was done and denture try-in was checked for any errors. The dentures were fabricated and finished and polished in a conventional manner.

After fabrication, intaglio surface of denture had concavities on both side in premolar region and a space for anchoring housing female attachment of male component in bilateral canine region. Needful adjustments were done in denture for easy insertion and removal. Once proper tissue adaptability and occlusion were achieved, those female parts were incorporated in dentures using chemically rapid cure acrylic resin. Patient was asked to follow instruction and regular follow ups were appoint (figure 2).

Case 3 – Implant retained over denture

A 55 year old male patient came to department of Prosthodontics with chief complain of construction of prosthesis. On intraoral examination, maxillary and mandibular ridges were completely edentulous. However, mandibular ridge was severely atrophied. So we planned a conventional complete denture for maxillary prosthesis and an implant retained over denture for mandibular prosthesis.

After proper treatment planning, implants were placed in interforaminal region (bilateral canine region) with the help of surgical template. (MIS SEVEN, mis implants technologies LTD., ISRAEL) Periodic evaluation was done every month. After 3 months, satisfactory integration was achieved, so ball attachments were attached to implants.

After completion of this procedure denture construction procedure was started. Complete denture for maxillary arch was made in conventional way. Primary impression for lower arch was made using light body and putty condensation silicon impression material (SPEEDEX, Coltene/Whaledent AG; Switzerland). Custom tray was made with spacer. After achieving satisfactory border molding, impression was made using addition silicon material (AFFINIS, Coltene/Whaledent

AG; Switzerland). Maxillo-mandibular relations were recorded. Teeth setting were done and denture try-in was checked for any errors. The dentures were fabricated and finished and polished in a conventional manner.

After fabrication, intaglio surface of denture had a space for anchoring housing female attachment of housing in bilateral canine region. Needful adjustments were done in denture for easy insertion and removal. Once proper tissue adaptability and occlusion were achieved, those female parts were incorporated in dentures using chemically rapid cure acrylic resin. Patient was asked to follow instruction and regular follow ups were appointed (figure 3).

DISCUSION

Complete dentures have limitations not only in retention, support and stability but also in patient compliance and comfort. In complete denture, there is no direct connection between prosthesis and ridges which provide functional stimulus with improved retention, stability and support. Many completely edentulous patient have difficulty in adapting to lower complete denture due to various factors like presence of tongue, less tissue coverage and poor bony support etc. Nutrition is also affected in edentulous patient due to limited choices of food. It has been postulated that if patients are challenged to eat a different range of foods, they were less satisfied with current denture. In simple words we can say that conventional complete dentures have negative effect on psychosocial behaviour of edentulous patient.⁶

Overdentures are designed to distribute the masticatory load between the edentulous ridge and the abutments. The overdenture transfers occlusal forces to the alveolar bone through the periodontal ligament of the retained tooth roots. Proprioceptive feedback, from the periodontal ligament to the muscles of mastication, may act to prevent occlusal overload and thereby prevent bone resorption because of excessive forces.⁴

In this article, we have fabricated overdentures using different retentive mechanism for different patients having different conditions (figure 4). Clinician must select the treatment plan based on present tooth condition, oral hygiene, systemic health and socio economic status of patient.

It can be easily determined that patients' Satisfaction and quality of life with implant/tooth-tissue supported mandibular dentures is significantly greater than for conventional dentures.

Patients rehabilitated with ovedentures must be always motivated and instructed for improvement in oral hygiene. This will lead to longevity of abutments and ultimately it lead to successful overdenture rehabilitation of patient.

CONCLUSION

The use of own teeth or implant-supported fixed prostheses to replace missing teeth in partially or completely edentulous jaws is a highly successful prosthodontic treatment. An often-overlooked benefit of implant-supported fixed prosthetic treatment is the preservation of residual alveolar bone.

When tested on the bases of retention, tooth postkit system retained over denture provided highest retention followed by implant retained over denture, while coping retained over denture shown least among three, still it was 8 times more retentive than average value of conventional denture.

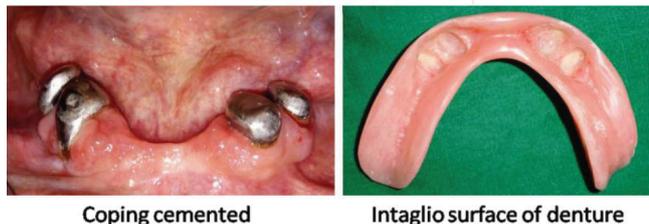
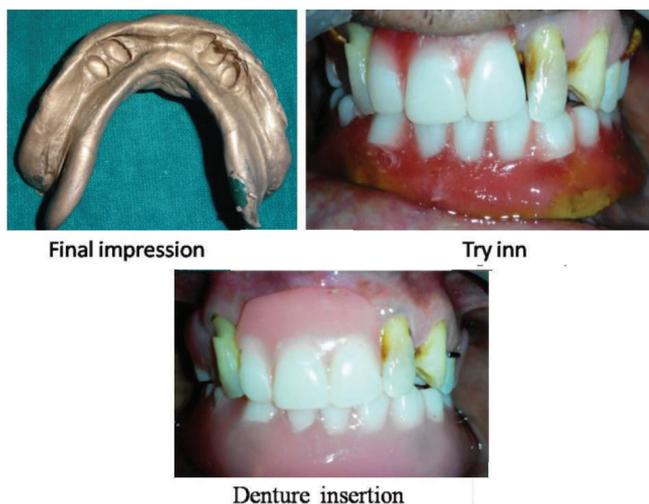


Figure-1: Metal coping retained over denture.

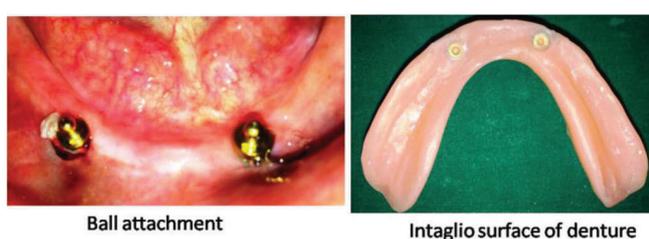
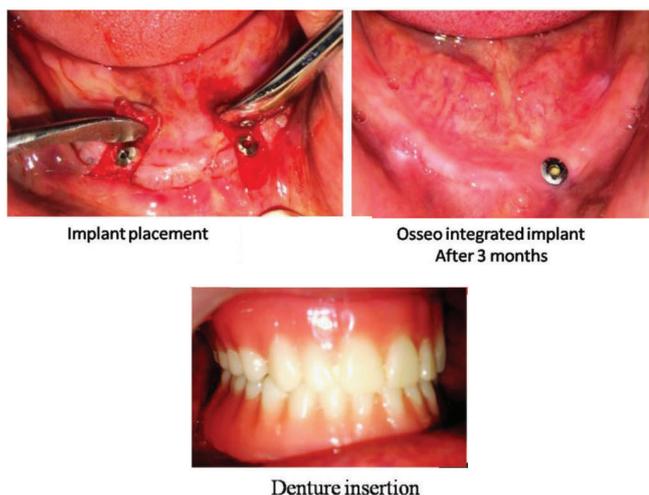


Figure-3: Implant retained over denture.

With awareness of improvement in oral hygiene, tooth or root or implant supported overdentures can successfully rehabilitate edentulous or partially edentulous patient and can also overcome limitations associated with complete dentures.

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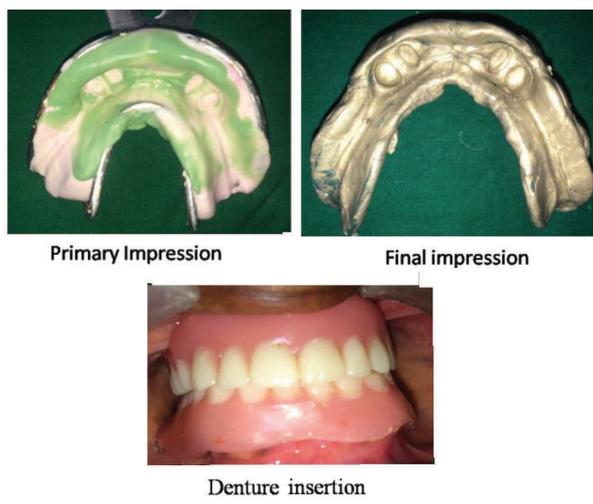


Figure-2: Postkit retained over denture.

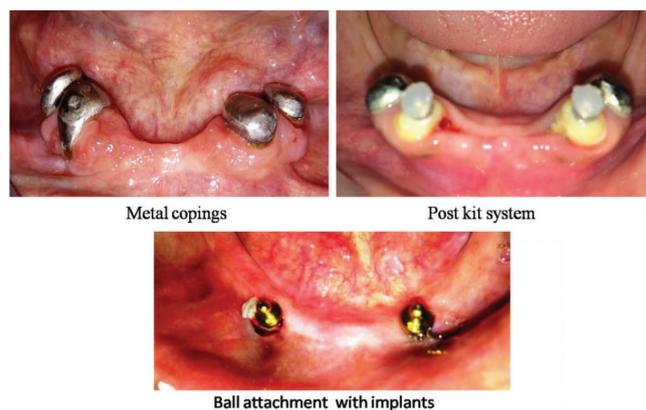


Figure-4: Different attachment systems

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