CASE REPORT

PRESERVING WHAT REMAINS- A CASE REPORT ON TOOTH SUPPORTED OVERDENTURE

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ABSTRACT

Rehabilitation of edentulous patients in prosthodontics has long been a major concern and a challenge for dentistry. In the past and even today, complete maxillary and mandibular denture are the traditional standard of care. However, most of the patients have issues adapting to their dentures mainly because of increased residual ridge resorption which leads to decreased retention, stability and inability to chew and eat efficiently. Overdenture aid in decreasing residual ridge resorption by preserving the already present abutments in the dental arch. This article presents a case report on the prosthetic rehabilitation of a partially edentulous upper arch of a patient by two tooth supported conventional over denture.

KEY WORDS

Residual ridge resorption, overdenture, bone preservation, metal copings

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INTRODUCTION

Using natural teeth to support a complete denture is not new in dentistry. Schweitzer relates that this approach in prosthodontics dates back to the 1800s.[1] DeVan's statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" relates most appropriately with the concept of overdenture. Bone is a dynamic tissue. The extraction of teeth results in the initiation of the bone resorption. This is complicated by giving partial or complete prosthesis which further leads to the process of residual rigde resorption. However, in case of overdenture the natural dentition is preserved in the form of modified abutments, over which the removable prosthesis is fabricated. The concept behind overdenture is that the modified natural tooth through the periodontal attachments, provides tensile stimulation conducive to bone repair and maintainence.[1]

According to GPT9, An overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots, and/or dental implants. It is also called as overlay denture, overlay prosthesis.

Overdenture is indicated in patients with few remaining retainable teeth in an arch, preferred in patients with mal related ridge cases; patients requiring single denture; patients with unfavorable tongue positions, muscle attachments, and high palatal vault, which decreases the stability and retention of the prosthesis. Overdentures are contraindicated in patients with questionable oral prophylaxis, systemic complications, and inadequate inter-arch distance.[2]

Advantages of overdentures include preservation of alveolar bone, proprioception, enhanced support, stability and retention and maintenance of vertical dimension of occlusion. It is also useful for patients with congenital defects such as oligodontia, cleft palate, cleidocranial dystosis and Class III occlusion. It can be easily converted to complete denture over a period of time. Disadvantages of overdenture include maintainence of meticulous oral hygiene in order to prevent caries and periodontal disease. It tends to be bulkier and overcontoured. Encroachment of inter-occlusal distance is another disadvantage. It is an expensive

treatment modality with frequent recall check-ups of the patient than a conventional removable complete denture.[3,4,5]

General considerations during diagnosis and treatment planning

Periodontal consideration: an important periodontal requisite with over denture abutment is adequate zone of attached gingiva. Therefore, Periodontal inflammation, pocket formation, bony defect and poor zone of attached gingiva must be eliminated before starting treatment.

Endodontic consideration: caries involvement must be considered and should be minimal in prospective abutments. Carious lesions must be restorable. Endodontic treatment should be performed as it result in crown root ratio which is more favorable and moreover clinical crown reduction provides interocclusal clearance for placement of artificial teeth. [2]

Selection of abutment teeth: It depends upon number of teeth present in patient's mouth. But, two cuspid and two second molar abutments typify an optimal abutment distribution for one arch. The rectangular distribution provides for maximum stability and support of the prosthesis[2].

CASE REPORT

A 64-year-old male patient came to the Department of Prosthodontics Crown & Bridge, Dr. R. Ahmed Dental College & Hospital with the chief complaint of difficulty in eating and desired to get his missing teeth replaced. On clinical examination, he had partially edentulous both maxillary and mandibular arches, with 13 and 23 remaining in maxillary arch and 37, 38 and 47, 48 remaining in mandibular arch [Figure 1,2]. In radiological examination, patient already had an OPG, which shows 13,14, 23, 24 in upper arch and 34, 37, 38, 41, 42, 47, 48 in lower arch was used for the treatment planning[Figure3]. Patient told about the history of extracted teeth in which he mentioned of severe mobility present in 14, 24, 33, 41, 42 due to which they were extracted earlier. The patient also gave a history of loss of his missing teeth over a period of 10 years due to multiple caries and periodontal problems.

Both the maxillary canines were retained and intentional root canal treatment (RCT) was done for a more favourable crown root ratio, followed by coping over these two teeth.

As there was compromised bone support, which was not favourable for giving conventional removable partial denture in maxillary arch, as it may lead to loss of teeth in future, So Maxillary overdenture was planned. In mandibular arch 37, 38, 47, 48 were tilted, so it was not possible to give a cast partial removable prosthesis. Flexible denture was planned to reduce the masticatory forces and bone resorption, by conventional denture and also to improve the retention and stability. Along with this metal crown were fabricated in 37, 38, 47, 48 as attrition and caries were present. Also, the tilting of the teeth was corrected a bit by modifying the crown anatomy.

A tentative jaw relation of the diagnostic casts was done to assess the inter-arch space. It was found to be sufficient for an overdenture with medium short copings (2-4mm). After intentional root canal of 13 and 23, they were prepared with tapered round end diamond point with chamfer finish line. In the same sitting lower 37, 38 and 47, 48 were also prepared for metal crown(Figure 4a, b). Impression of abutment teeth was taken with the help of alginate (Algitex, DPI, Mumbai) for fabrication of metal copings and metal crown [Figure5]. The copings and metal crown thus fabricated, were checked for fit in the patient's mouth and finally cemented with glass ionomer cement [Figure 6].

Primary impression for both the arches was made with alginate (Algitex, DPI, Mumbai). The impressions were poured in type 2 dental plaster and special trays were fabricated with self-cure acrylic resin with double spacer over copings. Border molding was done for both the arches with low fusing compound. Final impression for the maxillary cast was made with withregular body elastomer (Reprosil, Dentsply Caulk), Mandibular final impression was made by 2 stage impression technique with zinc oxide eugenol (ZOE) impression material for edentulous arch followed by pick up impression by alginate. [Figure7]Master casts were then prepared by pouring the impressions in Type IV gypsum.

Copings on the master cast were covered with wax and record base fabricated after applying separating media. Placement of wax over the coping area prevents the fracture of abutment during removal and placing of denture bases during various laboratory procedures. Occlusal rims were fabricated; maxillomandibular relations were recorded and teeth setting was done, [Figure 8] teeth setting was evaluated in the patient's mouth for phonetics, vertical and centric relation and finally esthetics [Figure 9]. Patient's approval was taken, and the curing of the final denture was done in heat- cure acrylic resin for maxillary arch and flexible denture for mandibular arch. Denture was cured and polished. Denture bases were adjusted to the supporting mucosa using pressure indicator paste. Patient was quite satisfied with the final outcome of the treatment [Figure 10]. There was significant change in patient's profile also as seen in pre treatment [11a,b] and post treatment photographs [12a,b].

He was recalled for follow up monthly for first six months, which was found to be satisfactory and patient will be followed for recall visit once in every three months.

Fig 1

Fig 2

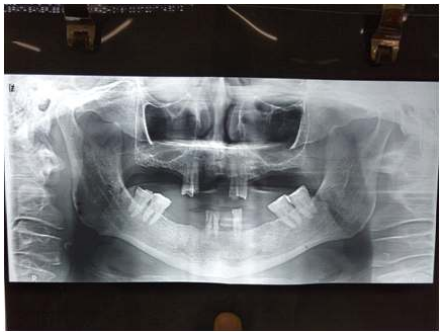

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

Fig 8

Fig 9

Fig 10

Fig 11a

Fig 11b

Fig 12a

Fig 12b

DISCUSSION

In overdenture treatment, the teeth are included as part of the residual ridge. The most important advantage is that the patient has the psychological benefit of having his own teeth which outweighs all the disadvantages stated before.[6]

Rissin et al. in 1978 compared masticatory performance in patients with natural dentition, complete denture and over denture. They found that the over-denture patients had a chewing efficiency one third higher than the complete denturepatients[7]. The concept of tooth support for complete dentures permits the dentist to assume a significant role in preserving natural teeth and supporting structures. In many instances, teeth that would otherwise be removed can be maintained to help support complete dentures.[2] In case of overdenture prosthesis, proprioception is maintained[5], there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity[8].

The over denture has innumerable advantages and applications compared with conventional complete denture. The success depends upon proper case selection with critical monitoring of various steps involved.

These days implant treatment has become the standard of treatment, thus tooth supported overdentures have taken a backseat as a result of competitive commercialization of implants[9].

Over denture patients have a chewing efficiency one third higher than the complete denture patients, which suggests that tooth supported Overdenture is

very much effective both functionally as well as esthetically. Moreover it is more economical treatment modality and does not put heavy burden on patients pocket as in case of the implant supported prosthesis hence this treatment modality should be considered in our regular clinical practice.

CONCLUSION

The overdenture is an outstanding mode of treatment. As Brewer and Fenton (1973) stated, "the application of this method of treatment is limited only by the imagination of the dentist," and in relation with this we must remember what Einstein once said, "imagination may be more important than knowledge." Also remember that every patient is different so is the treatment planning. There is no single mode of treatment for an overdenture patient. There are numerous methods to perform it with adequate knowledge and skill.

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