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Tooth Supported Overdenture - A Preventive Prosthodontic Approach Case Report

[1]Dr. Jasleen Arora, Sr. Lecturer, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

[2]Dr. Manmeet Gulati, Prof. and Head, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

[3]Dr. Ram Rattan Goyal, Professor, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

[4]Dr. Manmohit Kumar, Professor, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

[5]Dr. Pratik Gupta, Reader, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

[6]Dr. Avrinder Bajwa, Lecturer, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

Corresponding Author: Dr. Jasleen Arora, Sr. Lecturer, Dept. of Prosthodontics and Crown & Bridge, Desh Bhagat Dental College and Hospital, Mandi, Gobindgarh

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Abstract

Preventive prosthodontics stresses on the procedures which eliminates or delays the further need of rehabilitation of the dentition. With few teeth remaining in the oral cavity, preserving them and giving an overdenture is most favoured treatment modality. Most common problem faced with mandibular denture is retention and stability. The tooth supported overdenture preserve the alveolar ridge, gives a proprioceptive response and provides good retention and aids in better stability. This clinical case report describes a novel method of fabricating a tooth supported overdenture using a short cast metal coping design.

Keywords: Preventive prosthodontics, Preservation proprioceptive responses, Bone preservation, Alveolar bone resorption, Cast-metal copings, Tooth retained overdenture.

Introduction

The utmost important thing in prosthodontic treatment is satisfaction of the patient. There are numerous factors

which play an important role in achieving satisfactory prosthesis which includes retention, stability, good esthetics, comfortable speech, function along with efficient mastication. It is often seen that completely edentulous patients are not contented with conventional complete denture prosthesis. A complete denture patient goes through a sequel of events like loss of discrete tooth proprioception, progressive loss of alveolar bone, transfer of all occlusal forces from the teeth to the oral mucosa and the most depressing sequel is the loss of patient's self-confidence. [1]

The effective treatment modality which can be implemented to deliver satisfactory prosthesis to patient is Overdenture which is a definitely a better option as compared to a removable conventional complete denture prosthesis, which certainly has its drawbacks. Overdenture is one of the most practical measures used in preventive dentistry. Preventive prosthodontics emphasis on preserving the bone by retaining the root stumps or titled teeth which could be further used to give overdenture prosthesis. In a 4 years study by Renner et al., it was found that 50% of the roots used as overdenture abutments remained immobile. [2]

Overdenture prosthesis are defined as any removable prosthesis that cover and rest on one or more remaining natural teeth, the root of natural teeth, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants. [3] There are several advantages offered by overdenture, to patients ranging from functional to biologic one. In this paper a case, where overdenture was given with small dowel copings based on the number of abutment teeth present, their alignment and intra-arch space present.

Case report

A 67-year-old female patient reported to the Department of Prosthodontics and Crown & Bridge, Baba Jaswant Singh Dental College, Ludhiana to get her missing teeth replaced. The patient gave a history of loss of her missing teeth over a period of 3 years due to multiple caries and periodontal problems. Also gave history of hypertension since last 3 years and was taking regular medication for the same.

Intraoral Examination revealed completely edentulous maxillary arch and partially edentulous mandibular arch with Kennedy type I modification 1, 33 and 43 were present [Figure 1]. Patient had well keratinized mucosa and was a complete denture wearer since last 2 years. The patient wanted a prosthesis with good retention as compared to her previous dentures.

Figure 1: Intra oral view: Maxillary and Mandibular arch with 43,33

Treatment plan

After diagnosis and thorough planning, overdenture was decided to be the choice of treatment. 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 prosthesis with short cast copings.

1. An intentional root canal therapy of 34 and 44 was done and dome shaped tooth-preparation was done with tapered round end diamond point with chamfer finish line made subgingivally [Figure 2].
2. Preparation for the post space was done [Figure 3].

3. Custom post was prepared with the help of a trimmed matchstick with pattern resin (Duralay inlay pattern resin). The copings were dome shaped and extra pattern resin was trimmed off [Figure 4].

4. The patterns were invested, burnt out, and casted to obtain metal copings [Figure 5].

Figure 2: Dome shaped preparation

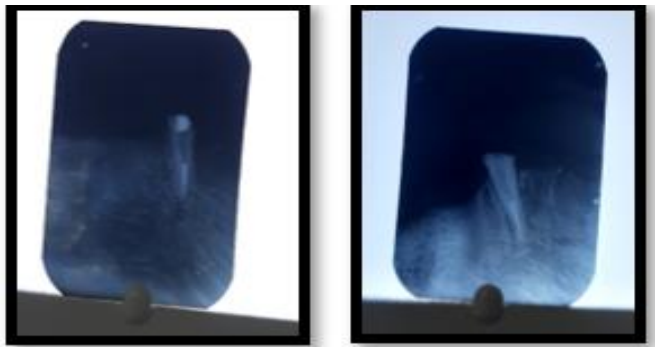

Figure 3: Post space preparation done.

Figure 4: Post space impression made using pattern resin (Direct technique).

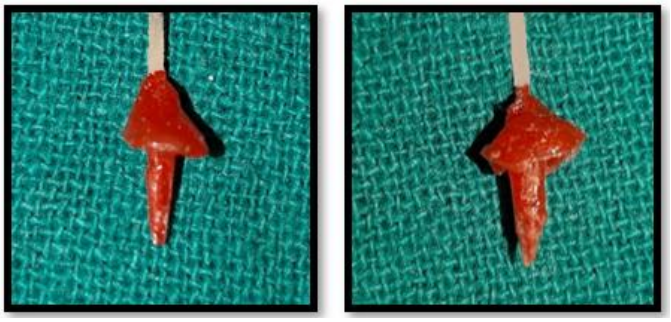

Figure 5: Patterns were invested, burnt out, and casted to obtain metal copings. (L) 43 (R) 33

Figure 6: Dome shaped short cast metal copings which were obtained after investing and casting were finished, polished and cemented to teeth with glass ionomer cement.

5. After finishing and polishing copings were checked intraorally for the fit and after verification, copings were luted with Glass inomer cement [Figure 6].

6. Primary impression for the maxillary arch was made with Impression compound and with alginate for the mandibular arch [Figure 7]. The impressions were poured and special trays were fabricated with self-cure acrylic resin.

7. Border molding was done with low fusing green stick compound. Final impressions were made with light body polyvinyl siloxane elastomer and master casts were made [Figure 8, 9].

8. Occlusal rims were fabricated; maxillomandibular relations recorded and transferred onto the articulator [Figure 10].

9. Teeth setting was done, evaluated in the patient's mouth for phonetics, vertical dimension and centric relation and finally esthetics and patient's approval was taken [Figure 11].

10. The denture was fabricated in a conventional manner using compression molding technique and was the dentures were placed in the patient's mouth and checked for the fit and retention [Figure 12].

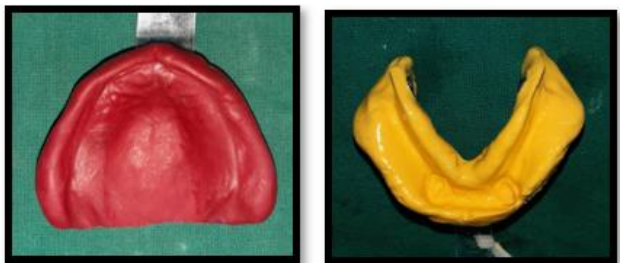

Figure 7: Primary impressions – Maxillary and Mandibular arch

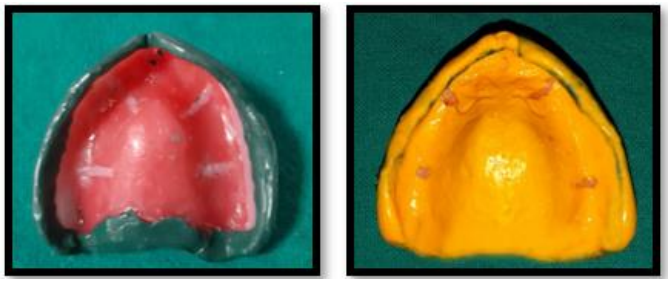

Figure 8: Border molding done and secondary impressions made wrt maxillary arch.

Figure 9: Border molding done and secondary impression made wrt mandibular arch.

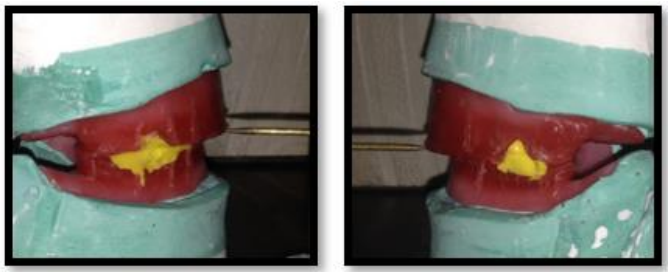

Figure 10: Jaw relation recorded

Figure 11: Try in done.

Figure 12: Denture insertion

Discussion

In elderly patient, loss of teeth is mostly due to periodontal condition and dental caries. The prospect of losing all his teeth can be very disturbing for a patient. It brings down patient's morale as it is an indirect reminder for being dependent on others and losing senescence. In such conditions, preservation of teeth or remaining tooth structure leads to preservation of the bone. In such conditions, an overdenture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages.[1]

Miller stated alveolar bone resorption depends upon three variables which includes- character of the bone, health of the individual and the amount of trauma to which the structures are subjected. The shrinkage of surrounding bone is reduced in case of overdenture because of reduced pressure on the alveolar ridge.[4]

In case of overdenture prosthesis, proprioception is maintained,[5] there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity.[6] The average threshold of

sensitivity to a load was found to be 10 times as great in denture wearers as in dentulous patients. [7,8]

According to Crum, retaining tooth helps in preserving the edentulous ridge and he also stated that in case of overdenture prosthesis patients there is only a 0.6mm of ridge reduction as compared to 5mm loss in complete dentures patients.[9] Similarly, Van Waas compared complete denture with overdenture and found that the reduction of bone was 0.9mm in overdenture and 1.8mm in complete denture in canine region and 0.7mm in overdenture group and 1.9mm in complete denture group in the molar region.[10]

Rissin *et al*. in 1978 stated that overdenture have one third higher chewing efficiency when compared to complete denture patients.[11]

This case report described the utilization of remaining tooth in the oral cavity by doing post and core and fabricating an overdenture prosthesis over the metal copings of the canines in lower arch. The success of conventional complete dentures treatment is variable and depends on the patient's capacity to overcome the limitations of complete dentures via adaptive process.[12] On the other hand, overdentures treatment improves stability, retention, bite force, chewing efficiency and oral health leading to improvement in the quality of life of the patient. [13,14,15]

Conclusion

The retention of patient's natural teeth or tooth or root stumps leads to preservation of alveolar bone and aids in improving the retention and stability of denture. So, the tooth-supported overdentures may be considered as a good alternative to the conventional removable dentures. This patient was treated as a part of preventive prosthodontics and a successful overdenture was delivered.

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