

Implant Supported Mandibular Overdenture: A Case Report

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ABSTRACT

The most important aim of oral implantology is to improve the retention of complete mandibular dentures, which are often associated with problems in jaws with advanced ridge resorption and in the process improve patient's satisfaction. Implant-supported overdenture (IOD) improves retention, stability, function, proprioception, and comfort. In this article, the fabrication process for 2-implant overdenture is described. The retentive elements for the implant abutment were housed directly into the fitting surface of the denture with the help of autopolymerizing resin through a simple chair side technique. It represents a case of a typical edentulous patient looking for low-cost improvement of denture retention.

Key Words: Overdenture, O-ring attachments

INTRODUCTION

Complete maxillary and mandibular dentures have been used as a conventional treatment of edentulous patients for longer than a century. Suitable complete maxillary dentures are usually well tolerated but many wearers struggle to eat with the complete mandibular denture because it is relatively unstable. A successful mandibular complete denture relies on sufficient retention and stability. The most important aim of oral implantology is to improve the retention of complete mandibular dentures, which are often associated with problems in jaws with advanced ridge resorption and in the process improve patient's satisfaction.^{1-3,5,6,9} During the past 20 years, placement of a bar-retained 4-implant overdenture in the front region of the mandible has become the treatment of choice in overdenture prosthodontics. Van Steenberghe et al⁴ were among the pioneers to propose the placement of only 2 implants in the edentulous mandible. Redford et al demonstrated that more than 50% of conventional mandibular complete dentures have problems with retention and stability. Previous studies have shown that a mandibular two-implant retained overdenture is superior to the conventional denture in terms of retention and stability^{10,11,12}. Thereby, the two-implant assisted mandibular overdenture should be the first treatment option for mandibular edentulous patients. Nevertheless, the controversy regarding the treatment concept and indications persists¹³.

CASE REPORT

A 60 year-old female patient visited the prosthodontic department of PGIDS Rohtak with chief complaint of poor retention of previous lower denture, and wanted to renew her maxillary and mandibular complete dentures. The patient was not satisfied with the existing prostheses. Her major complaint with the prostheses was the rocking of lower denture during speaking and chewing. She had to take off her dentures in order to swallow the food. Patient was edentulous from last 10 years. On intraoral examination, the mandibular ridge was found to be resorbed and maxillary ridge was flabby with respect to pre maxilla region (Fig.1 & 2). Patient was willing for fixed denture, but it was not affordable for patient, so implant supported overdenture w.r.t mandible was planned with ball and socket attachment. Implant supported overdenture for mandibular arch and conventional denture for maxillary arch was planned for this case. A thorough medical and dental history of the patient was recorded. Maxillary and mandibular diagnostic impressions were made (Fig. 4) and CBCT scan was taken to assess the bone for selection of implants (Fig. 3).



Fig. 1: Intraoral view- Mandibular ridge



Fig. 2: Intraoral view- Maxillary ridge

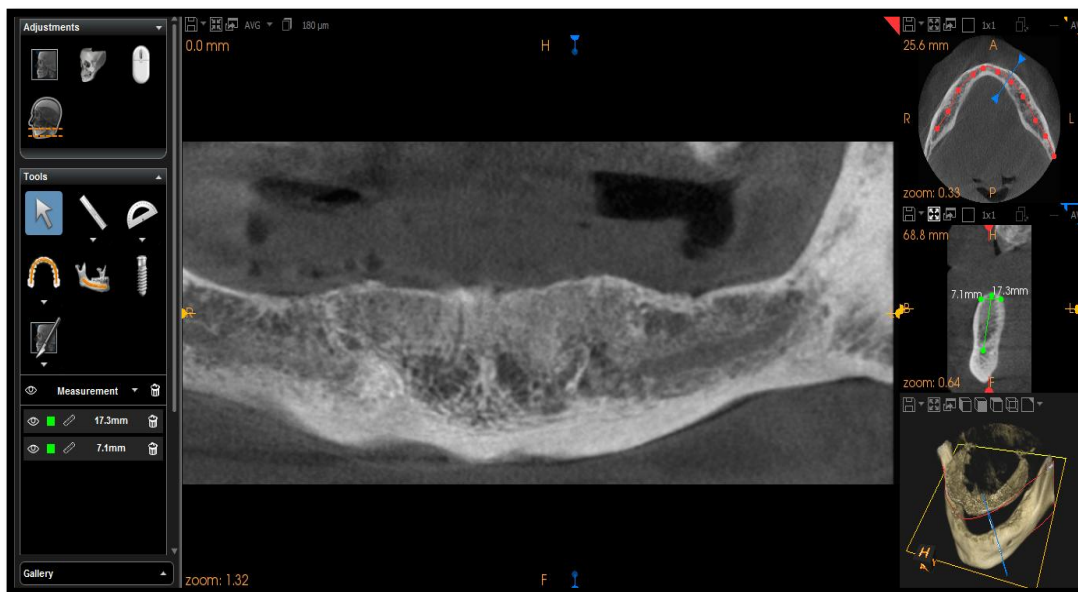


Fig. 3: CBCT images



Fig. 4: Diagnostic impression in irreversible hydrocolloid impression material

Surgical Phase

After thorough medical examination and taking CBCT record of the patient, surgical phase was carried out with the help of surgical stent (Fig. 5 & 7) for positioning of implants. Mucoperiosteal Flap was raised (Fig. 6) and osteotomy was carried out (Fig. 8, 9 & 10). 2 single body implants with ball attachment (Osstem) were placed of size 3.0*13 into interforminal region at site of canine in mandible (Fig. 11 & 12). A torque of 50ncm was achieved during implant placement and a post operative OPG was taken (Fig. 13). Sutures were removed after one week. After completion of three months prosthetic phase carried out.



Fig. 5: Surgical stent fabrication



Fig. 6: surgical incision given

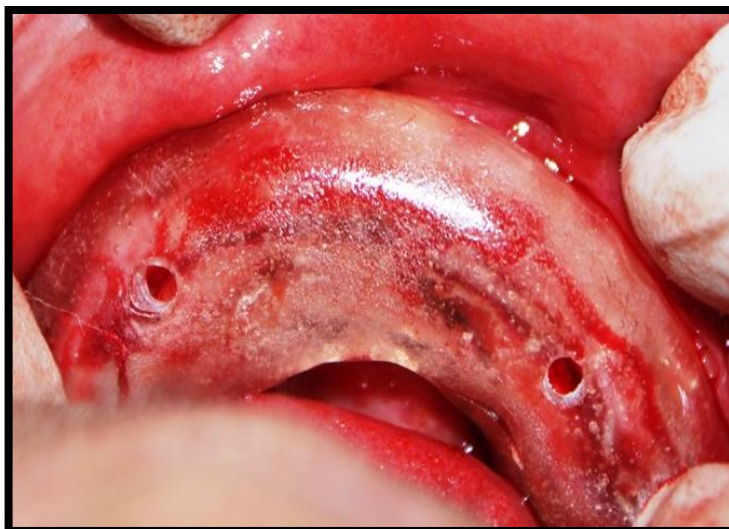


Fig. 7: Surgical stent placement for osteotomy



Fig. 8: surgical osteotomy performed on right side



Fig. 9: surgical osteotomy performed on left side

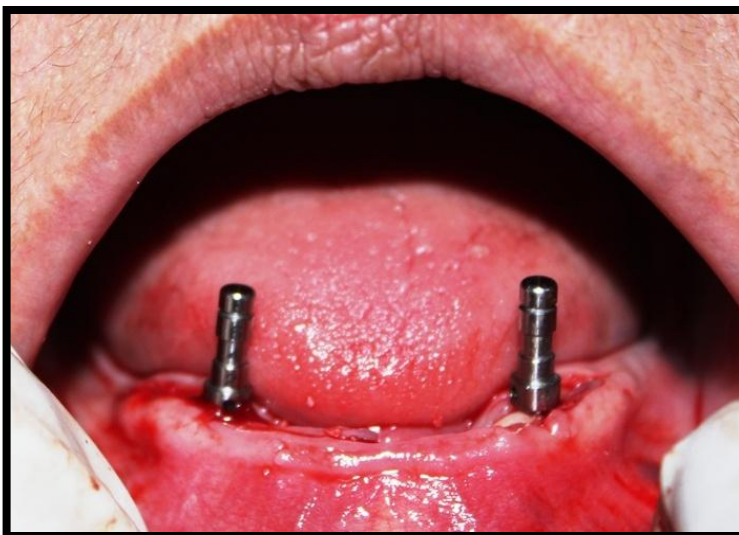


Fig. 10: Paralleling guide placement



Fig. 11: Single body Implant placement



Fig. 12: Post implant placement

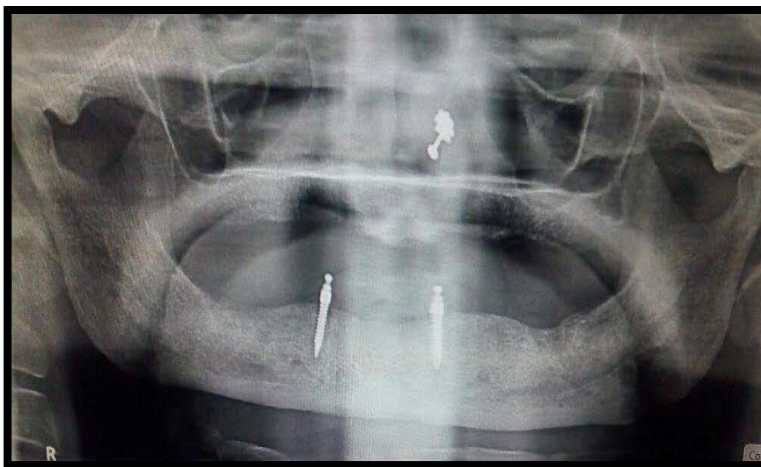


Fig.13: Post operative OPG showing single piece dental implants with ball attachments

Prosthetic Phase

1) First of all normal conventional denture was fabricated for both the arches. Alginate preliminary impression for both arches were obtained and followed by fabrication of individual trays (Fig. 14) .



Fig. 14: Preliminary impression in irreversible hydrocolloid impression material

2) After border molding with green stick compound secondary impression was made with ZOE impression paste. Window technique was used for making secondary impression for maxillary flabby ridge (Fig. 15).



Fig. 15: Secondary impression

- 3) The master casts were poured to fabricate record bases and occlusal rims. Vertical dimension, occlusal plane and lip support were evaluated and duplicated with record bases and occlusal rims.
- 4) Vertical dimension, lip support, and phonetics were re-evaluated with wax dentures after denture teeth were arranged (Fig. 16).



Fig. 16: Try in

- 5) Dentures were then acrylized and tissue adaptation was first assessed in the oral cavity. Necessary occlusal adjustment was done in oral cavity. Relief area was created inside the mandibular denture to create space for new acrylic resin to encase the attachment and metal housings (Fig. 17 & 18). Relief holes were drilled on the relief space to ensure passive seating over abutments and attachments. Simultaneously, modelling wax spacers were used to prevent acrylic resin from being locked into undercut areas. Manual stabilization of the mandibular denture preceded patient's closure into centric occlusion during polymerization of acrylic resin.

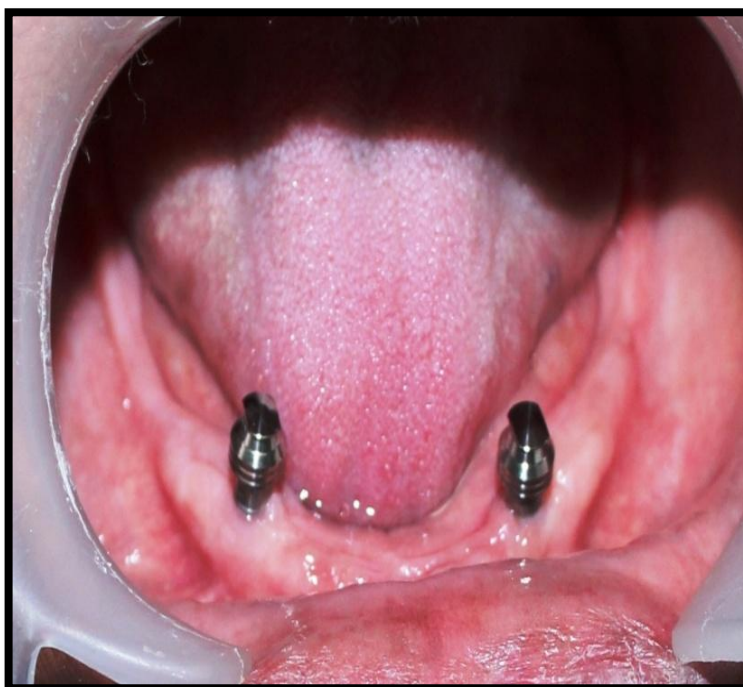


Fig. 17: Metal housing placement on ball attachments



Fig. 18: Intaglio surface of mandibular denture with Metal housing attached to it

6) After resin polymerization, the denture was removed from oral cavity and was confirmed that stability and adequate encasement of the attachment housing in the acrylic resin. Patient was instructed with the insertion and removal and maintenance of the dentures after occlusal adjustment and the verification of soft tissue adaptation. Patient was well trained to use the new dentures, and was satisfied with the good stability and better retention of the mandibular denture as compared to her old denture(Fig. 19-23).



Fig. 19: Post Denture insertion -front view



Fig. 20: Post Denture insertion -lateral view



Fig. 21: Pre-operative extraoral frontal view of patient



Fig. 22: Post -operative extraoral frontal view of patient



Fig. 23: Patient's satisfaction after denture insertion

DISCUSSION

We used the direct procedure to connect a mandibular implant-retained overdenture with ball attachments. Nissan et al stated that the direct technique for attachment incorporation in mandibular implant-supported overdentures by using ball attachments is superior to the indirect technique in terms of aftercare over a long-term evaluation period¹⁴. Previous series studies conducted by McGill University revealed that the implant retained mandibular overdenture group is superior to conventional denture not only in overall satisfaction, chewing satisfaction, nutritional status, eating and social activity, but also easier to fabrication. Moreover, the implant retained mandibular overdenture is a cost-effective intervention. In consistent with McGill group, we have the similar improvements in patient outcome and easier task in the fabrication procedure.

CONCLUSION

The patient benefited tremendously from the mandibular implant-retained overdenture as presented in this clinical report. The fabrication procedure is relatively easier as compared with that for conventional denture. therefore, the two implant-retained overdenture should be considered as the first treatment option for mandibular edentulous patients.

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