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CASE STUDY

REHABILITATION OF EDENTULOUS MANDIBLE BY IMPLANT SUPPORTED OVERDENTURE

***Vishakha Ugale**

Department of Prosthodontics and Implantology, YCMM & Rdf's dental college, Ahmednagar

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ABSTRACT

The prosthetic management of the edentulous patient has long been a major challenge. Complete maxillary and mandibular dentures have been the traditional standard of care. However, most of the patients report problems adapting to their mandibular denture due to a lack of comfort, retention, stability and inability to masticate. For many years osseointegrated implant-supported overdentures have been used in the rehabilitation of the edentulous lower jaw with excellent result. Previous studies have shown that a mandibular two-implant retained overdentureis superior to the conventional denture in terms of retention and stability. Thereby, the two-implant assisted mandibular overdenture should be the first treatment option for mandibular edentulous patients. They satisfy thepatient's expections, improve quality of life with their long term serviceability andpredictable outcomes. In this report, a mandibular two-implant retained overdenture was given to rehabilitate the edentulous mandible.

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INTRODUCTION

The transition from dentulous to edentulous condition poses differentchallenges to the patient as well as the clinician. Bone resorption particularly in mandible is an important factor to be consideredduring rehabilitation (ReenaLuthra *et al*., 2016). Various treatment options with implant have been described for mandibular edentulous patients. Sincemany years, osseointegrated implant-supportedoverdentureshave been used in the cases of rehabilitation of the edentulous lower jaw with excellent results[2]. A successful mandibular complete denture requires sufficientretention and stability. Redford *et al* demonstrated that more than 50% of conventional mandibular complete dentures have difficulties with retention and stability. Mandibular implant supportedoverdentures have been shown to besuperior to conventional dentures (Hsiu-Ju Yen, 2013). Thereby, the two-implant assisted mandibular overdenture is the first treatment option formandibular edentulous patients. For making the treatment plan and selection of the attaching mechanism for an implant-retained overdenture, the following factors should be taken under consideration: (ReenaLuthra *et al*., 2016) cost factor, (Jun-Beom Park, 2009) amount of retention required, (Hsiu-Ju Yen, 2013) pain caused on the soft tissue, (SwetaBhandari *et al*., 2015) quality and quantity of available bone, (DiptiLambade *et al*., 2014) condition of oral health, (Oetterli *et al*., 2001) patient's social economic status, (Watson *et al*., 2002) patient's expectation, (Walton, 2003) maxilla-mandibular relationship, (Klemetti *et al*., 2003) inter-implant distance (Hsiu-Ju Yen, 2013).

Corresponding author:* **Vishakha Ugale,
Department of Prosthodontics and Implantology, YCMM & Rdf's dental college, Ahmednagar.

Case report

A 42 yr old male patient visited our department of prosthodontics &implantologyfor replacement of his missing teeth. No significant past medical history present. Past dental history revealed multiple extractions due to sever periodontitis. Intraoral examination shown completely edentulous maxillary & mandibular arch. Orthopantomograph was advised to evaluate bone availability and architecture (Fig 1&2). The inter-ridge distance was assessed. Routine blood examination revealed no abnormal findings. A treatment plan was prepared after a standard protocol. It included fabrication of a conventional complete denture for the maxillary arch and a 2-implant-supported overdenture for the mandibular arch. Impression of maxillary arch was made for diagnostic wax-up in order for the patient and the dentist to know the final outcome of the treatment and of mandibular arch for preparation of surgical stent. Then the surgical stent was prepared using clear acrylic resin to guide the placement of implants.

Surgical procedure

Implant surgery was carried out in a 2-stage surgical protocol. Surgery was performed under local anesthesia. The osteotomy sites were prepared with the help of surgical template (fig no 3, 4&5).

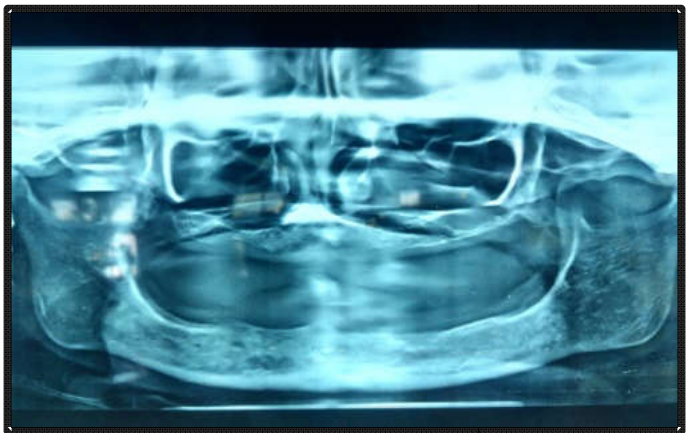

Fig. 1. OPG

Fig. 2. Intraoral View

Fig. 3. Surgical incision

Fig. 5. Osteotomy

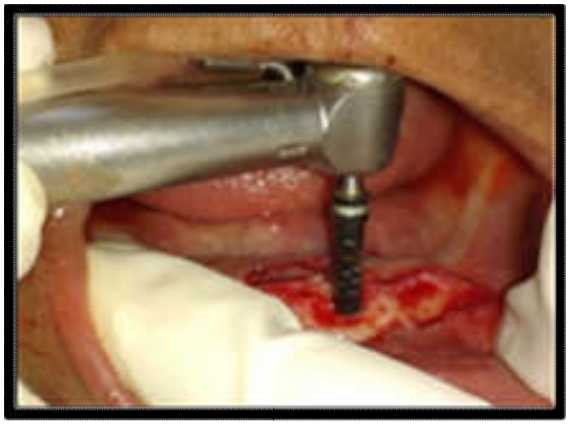

Fig. 6. Checking Parallism

Fig. 7. Implant Placement

In stage one surgery 2 implants equinox (myriad) were placed based on bone thickness and anatomic considerations. The implant sizes were 3.3 x 11 mm. A guide pin was used to ensure that the second implant was as parallel as possible to the first. fig no 6) The selected implants were placed at the prepared sites. (fig no 7 & 8) Stage two (three months after initial implant placement) consisted of exposing the implants after the removal of cover screw followed by the placement of prefabricated gingival formers to allow formation of soft tissue cuff.

Fig. 8. Radiographic Assesment

Prosthetic Procedure

Primary impressions were made of both maxillary and mandibular arch using medium fusing impression compound. Autopolymerizing acrylic resin was used to prepare a custom tray. Border moulding was done using low fusing impression compound and poly vinyl impression material (light body) was used to make final impressions (fig no 9).

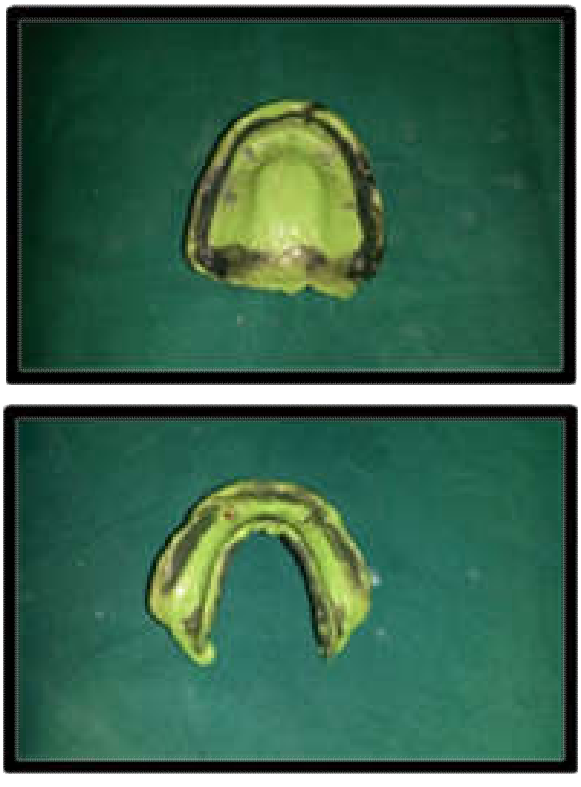

Fig. 9. Final impression of both arches

Record bases and occlusal rims were fabricated on master cast. Vertical and horizontal jaw relations were recorded. Trial arrangement was checked for esthetics, phonetics, vertical dimension at occlusion and centric relation. Denture was fabricated with spaces to receive the attachments. A closed mouth technique was employed to incorporate the ball attachments directly into the denture base. Seating of the abutments was verified. The attachments were placed and O rings were blocked-out on the abutments (Fig no 10). Acrylic resin from the intaglio surface of the denture was removed to allow passive fit of the denture against the tissue. Pressure indicating paste was used to verify that no contact of the denture base with abutment or attachment. A no 6 round bur was used to vent the pick up space toward the surface of the denture (Fig no 11).

Fig.10. Placement of Ball Attachment

Fig.11. Vent Holes in Intagilo surface of denture to receive attachment

Fig.12 Intraoral View (Frontal)

The vent was situated lingual to the denture teeth. The space was half filled with CG Pattern Resin and the mandibular denture was placed over the abutments.

Fig.12 Intraoral View (Frontal)

Fig.13. Intraoral View (Rt Lateral)

Fig.14 Intraoral View (Lt Lateral)

The complete seating of the denture was verified and the patient was asked to maintain light occlusal pressure in the centric relation position while the resin polymerizes. The pick-up resin was trimmed and polished in the venting area. Fit and occlusion of the dentures was rechecked in centric relation position (Fig no 12, 13 & 14). Home care instructions were given to the patient. The patient was trained to place and remove the prosthesis properly. First recall was attended after 24 hours. The regular follow up was advised every six months. Patient was instructed to remove their prosthesis at night.

DISSCUSION

The sequel of tooth loss and edentulism is residual ridge resorbtion in both vertical and horizontal direction.

This leads to the loss of facial support, esthetics, phonetics and loss of vertical dimensions and causes impaired oral function, pain, loss of retention and instability of conventional dentures as well as nutritional and psychological changes (SwetaBhandari *et al*., 2015). The standaradtreatment protocol of edentulism is conventional complete denture. Another alternative to conventional complete denture are implant supported prosthesis, hybrid denture and removable prosthesis (SwetaBhandari *et al*., 2015). Among all the available various treatment modalities implant supported overdenture is the best treatment of choice.

Mandibular anterior region wasselected for implant placement as it has sufficient bone in height and width in the interforaminal region (Reena Luthra *et al*., 2016). The implant-supported overdenture remains in place during mandibular movements which allows the tongue and perioral musculature to perform normal function since they are not required to control mandibular denture movements[5]. The retention and stability of the dentures along with their masticatory efficency may be improved with an increasing number of implants (Jun-Beom Park, 2009). The dilemma associated with overdenture treatment is the technique of incorporating the attachment matricesinto the overdenture (Dipti Lambade *et al*., 2014). Basically there are two methods; one approach includes incorporation of the matrices into the overdenture in the dental laboratory. This is important step and, if not performed correctly it influencethe fit of overdenture or leads to the dislodgement of the matrix from the overdenture. This method ensures proper fit of the overdenture. However, it requires additional chair side time and it is very technique sensitive. The other approach is pick-up intraorally in the clinic (Dipti Lambade *et al*., 2014). However the recording and transferring of implant position with analogs may introduce some errors.

Conclusion

Restoration of the edentulous mandible is a challenge in terms of its stability and retention. Among various treatment modalities, an implant-retained overdenture is a simple, economic solution in the rehabilitation of the edentulous mandible. But still some controversies exist with regard to the design of the overdenture, selection of the suitable attachment system, and the most optimal techniques for the overdenture fabrication. Clinicians and dental technicians have to select sound design principles such as simplicity in fabrication, ease of maintenance and repair and cost factor. This clinical report described the successful management ofedentulous patient with implant supported overdentures; so the implant supported overdenture become an excellent option for rehabilitating the edentulous mandible.

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