# Rehabilitation of completely edentulous mandibular arch with implant retained overdenture: A case report.

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**Abstract**

Rehabilitation of completely edentulous arch is really a difficult job for prosthodontists. A successful prosthesis should restore the normal contour, function, esthetics, speech and overall health of stomatognathic system. Implant retained overdenture has more advantages over a conventional complete denture. Dental implants maintain integrity of residual alveolar ridge, soft tissue profile, improve chewing efficiency and psychological health. This case report is about an old male patient reported to the department of Prosthodontics and Crown & Bridge with a chief complain of loose fitting mandibular complete denture and difficulty in chewing. Considering the financial condition of the patient as well as expected outcome of the prosthesis an implant retained overdenture for mandibular arch was planned.

**Keywords:** Complete edentulism, Dental implants, Overdenture, Attachment, Surgical stent

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**Email address:** - goggle011@ gmail.com **Phone no:** 9051998850. **DOI:** 10.5281/zenodo.5726271
**Submitted**: 14-Nov-2021 **Revised**: 24-Nov-2021 **Accepted:** 3-Dec-2021 **Published:**15-Dec-2021
**Bibliographic details:** Journal of Orofacial Rehabilitation Vol. 1(3), Dec 2021, pp. 28-33.

## Introduction

Complete edentulism is the end result of a multifactorial oral disease process as well as other comorbid diseases.[1] Prolonged edentulism affects both oral health and general health adversely. Residual ridge resorption causes significant loss of alveolar ridge height and width that leads to reduction in vertical dimension of face and substantial changes in soft tissue profile. Effects of complete edentulism on general health is mainly due to changes in dietary habits and it may increase the risk of cardiovascular diseases and gastrointestinal disorders.[2] Rehabilitation of completely edentulous arch is very essential to overall improve in health-related quality of life.

The mandibular denture is typically more troublesome than the maxillary denture. The problem of retention and stability is more pronounced with mandibular denture as compared to the maxillary denture due to the less surface area coverage of the supporting tissues and presence of the mobile tongue on the floor of the mouth .[3 ] The most common treatment modality for completely edentulous patients is a soft tissue-borne complete denture prosthesis. But, there are many negative consequences related to a complete denture and edentulous patients, including masticatory function, systemic consequences, patient satisfaction, speech and psychologic effects.[4] Implant supported prosthesis has many advantages in comparison to removable soft tissue –borne restoration. It prevents residual alveolar bone loss, improves masticatory efficiency, phonetics, retention and stability of a removable prosthesis. For these reasons, whenever possible an implant supported fixed restoration is always preferable over a removable mucosa-borne prosthesis considering oral anatomy and financial condition of the patient is in favaouarble situation.

**Case Report** –

A 58 years old male patient reported to the department of Prosthodontics and crown & bridge with a chief complain of loose, unstable mandibular complete denture with difficulty in chewing. Patient had lost his teeth due to caries and periodontal disease about eight months ago. Conventional complete dentures in both maxillary and mandibular arch were fabricated about six months ago, but the mandibular denture became loose. Clinical examination revealed a completely edentulous maxillary arch that was medium in size and well-rounded. The mandibular ridge was U-shaped and smooth, with no abnormalities (Figure 1).

**Treatment Planning –**

Patient was not happy with his loose fitting mandibular complete denture. So, implant supported fixed prosthesis was planned initially for mandibular arch and a conventional complete denture was selected for maxillary arch. An implant supported fixed prosthesis needed a greater number of implants and it was a complex laboratory procedure. Considering patient's financial support implant retained overdenture was finalised for lower arch . Implant overdenture treatment option 1 (according to Misch ) was selected with two individual implants at B and D positions ; locator attachment was given as retentive device .Dimension of dental implants were selected after CBCT analysis (Figure 2).

**Treatment Procedure** –

1. After evaluating patient's old denture it was found that prosthesis was well fabricated, no errors in occlusion and no need of modification. So, it was decided that there was no need to refabricate the old dentures and lower one had to be converted into a two implant retained overdenture. A surgical stent was made after duplicating the mandibular denture with alginate impression material.
2. The surgical procedure was carried out under local anesthesia. Incision was given along crest of alveolar ridge with vertical releasing incision and the full-thickness mucoperiosteal flap was raised atraumatically (Figure 3).
3. Two initial osteotomy sites were marked with a pilot drill in the B and D locations using surgical stent (Figure. 4) and relative parallelism was evaluated using paralleling tools. Under strict sterile surgical protocol and with ample irrigation, sequential drilling was performed to prepare the implant site. With a cover screw, two implants (NORIS MEDICAL) measuring 3.75 mm × 11 mm were placed (Figure. 5). The post-operative OPG revealed two well-aligned implants in the B and D locations of the mandible (Figure. 6). The primary implant stability was assessed during implant placement using the insertion torque measurement. For both implants, the final torque levels were 35 Ncm. Sutures were used to close the flap.
4. After three months, (Osseointegration time) the patient was recalled for second stage surgery. Implant sites were exposed to remove cover screws and healing abutments were given for 2 weeks to form gingival collar (Figure. 7).
5. After two weeks, healing abutments were replaced with locator attachments (NORIS MEDICAL, H3.0) with the help of abutment driver (Figure. 8). A torque wrench was used to tighten the abutments to 25-30 N-Cm as per manufacturer guidelines. Chairside direct pick up technique was used for processing of metal housing with plastic resilient male caps into the denture. The locator abutment was marked with an indelible pencil and this marking was transferred to

lower denture to trim out acrylic for making a space for metal housing (Figure. 9). White block out spacer was placed to the abutment (Figure. 10) and chair side pick-up procedure was conducted with auto polymerizing resin (Figure. 11).

6. After inserting maxillary complete denture occlusion was evaluated carefully and any pressure points on mucosa was corrected using pressure –indicating paste (Figure. 12). Denture retention and stability was adequate. After explaining post insertion instructions denture was delivered and patient was advised to follow up after 24 hours (Figure.13). After 6 months, there was no significant bone loss around implants, no compromise in retention and stability and patient was completely satisfied.

## Discussion

Retention, stability and support of a soft tissue borne removable prosthesis can be adequately improved by incorporating dental implants due to its osseointegration property with alveolar bone. An IOD provides improved retention and stability of the prosthesis, and the patient is able consistently to reproduce a determined centric occlusion.[5]

According to recent International Team of Implantology (ITI) consensus, there are three loading protocols, which include immediate, early, and conventional prosthetic loading. Early and conventional loading protocols are still better documented than immediate loading and seem to result in fewer implant failures during the first year.[6]

The selection of attachments usually depends on the clinical situation.[7] Locator can be used when there is minimum interocclusal space and it's self aligning features allows a patient to easily seat their overdenture. According to Cakarer *et al*. it was found that the locator system showed superior clinical results than the ball and the bar attachments.[8]

## Conclusion

This article has described a straightforward, cost-effective, non-invasive, and more retentive locator attachment overdenture treatment approach. This treatment stops the degradation of the residual alveolar ridge and takes less time in the clinic. Above all, it improves patient satisfaction by providing a more comfortable and stable prosthesis with improved functionality.

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**FIGURES:**

Figure 1. Preoperative maxillary and mandibular edentulous arch

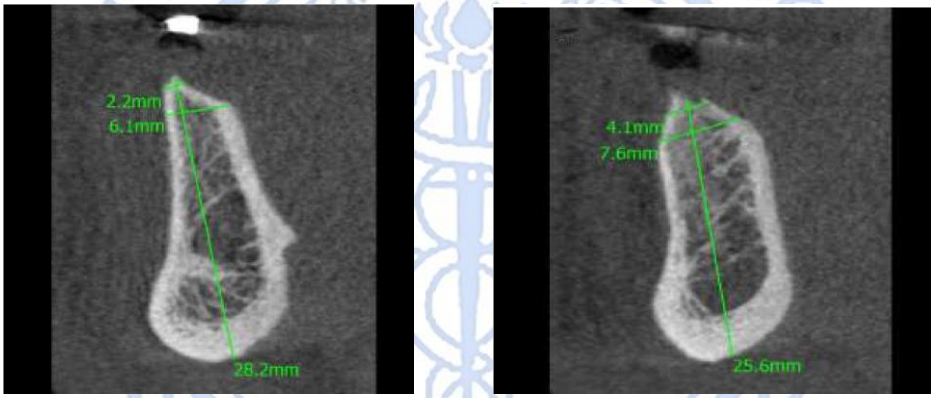


Figure 2. CBCT analysis of the implant sites

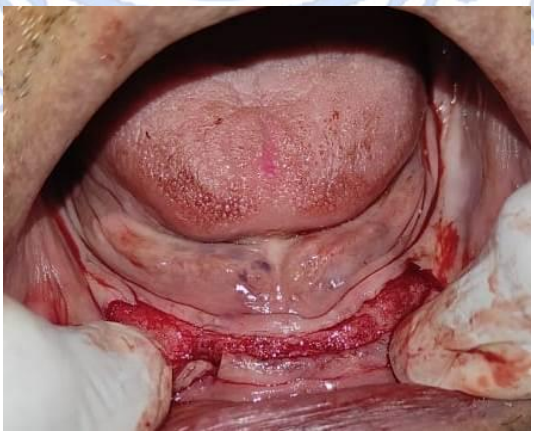

Figure 3. Surgical incision and elevation of flap

Figure 4.: Pilot drilling using surgical stent

Figure 5. Placement of dental implants

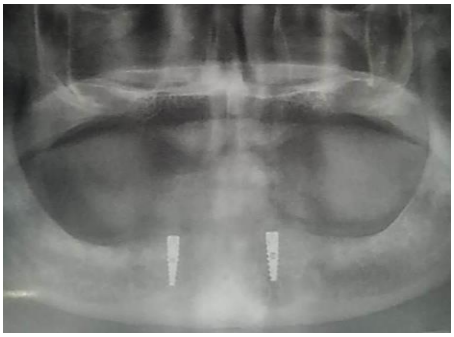

Figure 6. Radiographic evaluation after placement

Figure 7. Gingival former

Figure 8. Locator attachments

Figure 9. Space making in mandibular denture

Figure 10. Placement of spacer in locator attachment

Figure 11. Pick up of metal housing

Figure 12. Verification of occlusion

Figure 13. Pre and Post-operative Smiling view