



## Prosthetic Management of Edentulous Mandible using Endosseous Implants and Overdentures

Mohammed Saleem, Rayeesa Saleem, Rufus Allwyn Meshack, Rakshith Guru

### ABSTRACT

The choice of a suitable prosthesis for a specific case is determined to a great extent by the underlying residual bone as well as the mucosa. Also of significance are the expectations and demands of the patient from the prosthesis. The following case report discusses the rehabilitation of a complete edentulous mandibular arch with an implant retained mandibular overdenture.

*Clinical Significance:* Implant retained fixed or removable prostheses are good treatment options in patients who have a compromised edentulous foundation.

**Keywords:** Edentulous mandible, Implants, Retention and stability, Prosthetic rehabilitation, Over dentures.

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### INTRODUCTION

The complete removable maxillary and mandibular denture is the classical treatment plan for the edentulous patient. The fabrication of complete removable denture that offers patient comfort, function and esthetic harmony along with stability and retention remains one of the most challenging procedures in dentistry. The mandibular denture as compared with maxillary counterpart poses a great technical challenge for the dentist and often a significant management challenge for the patient due to lack of sufficient retention. So, prosthetically maladaptive patients can be treated with implant retained fixed or removable prostheses.<sup>1</sup>

Overdentures have been shown to improve the quality of life for edentulous patient and to contribute significantly to the well-being of patient psychology. Patients have reported increased satisfaction with implant retained overdentures than conventional complete dentures.<sup>2</sup>

Advantages of mandibular overdentures are as follows: as few as two to four implants may be used for support, good stability, good retention, improved function, improved esthetics, reduced residual ridge resorption, simplest implant retained prosthesis, possible incorporation of existing denture into new prosthesis.<sup>3,4</sup>

This clinical report describes prosthetic rehabilitation of a partially edentulous patient with implant retained mandibular overdentures.

### CASE REPORT

A 60-year-old woman reported with a complaint of difficulty in managing her existing mandibular conventional complete dentures, which was fabricated 2 years ago. The medical history was noncontributory. The dental history revealed that her mandibular arch was completely edentulous since past 3 years. She was rehabilitated with a conventional mandibular complete denture for her missing dentition since 2 years. But the patient was not satisfied with mandibular denture due to poor retention and she requested for a better alternative.

The intraoral examination revealed that:

- All maxillary teeth were present with generalized attrition and satisfactory periodontal health
- Completely edentulous mandibular ridge of medium size without undercuts. The ridge was covered with healthy and uninflamed overlying mucosa
- Adequate interarch space (Fig. 1).

The treatment options included fabrication of implant-supported fixed prosthesis or implant-retained overdentures for mandibular edentulous ridge. So the panoramic radiograph and computed tomography scan were performed for evaluating the bone quality and quantity. The amount and quality of bone were adequate for implant placement. The patient opted for implant retained overdentures but not for an implant-supported fixed prosthesis due to economical constraints.



**Fig.1:** Edentulous mandible without undercuts

The definitive treatment plan included placement of two independent endosseous implants in the anterior region of mandible in accordance with patient's financial limits and the bone quality. Technically, it is mandibular overdenture type 1 (OD 1) prosthesis with implants in B and D positions. Before the placement of implants, conventional mandibular denture was fabricated. The implant surgery was designed in two phases. The mandibular rehabilitation was initiated with the first implant surgery, which included specific oral surgical procedures of placing implants in B and D (slightly lingual) positions. Two screw-type implants measuring 13 mm in length and 5.3 mm diameter (Uniti), placed at the proposed implant sites (B and D). The healing screws were secured over the implants after evaluation of primary implant stability and the mucoperiosteal flap was meticulously sutured. The postoperative healing was uneventful.

After 3 months of uneventful healing, the healing screws were exposed and ball attachments were placed. The implants remain independent of each other and are not connected with superstructure (Figs 2A to 3).

O ring and metal encapsulators were placed into the existing denture using autopolymerizing acrylic resin at chairside (Fig. 4).

The patient was educated regarding the manipulation of prosthesis. The patient was also emphasized about routine recall, follow-up evaluations and treatment.

## DISCUSSION

The patient in this clinical report was previously restored with conventional complete denture and revealed her dissatisfaction with the conventional prosthesis. Redford et al showed that over 50% of mandibular complete dentures have problems with stability and retention.<sup>5</sup> The existing dentures were modified to accommodate implant-independent parallel overdenture attachments in B and D



**Figs 2A and B:** Implants with ball abutments in B and D positions



**Fig. 3:** Implants with O rings

positions (OD type 1). When existing conventional dentures are directly altered to accommodate implant overdenture attachments, the treatment is usually easier and more predictable with independent implants that require less alteration of the denture base.<sup>6,7</sup> The procedure explained in this clinical report for the rehabilitation for edentulous mandible resulted in retentive, esthetic and functionally efficient prosthesis. Treatment involving two independent



**Fig. 4:** Metal encapsulators and O rings placed in denture

implants without rigid interconnection is an important consideration with mandibular overdenture treatment. Data support the use of independent implants for a mandibular overdenture.<sup>8-10</sup> When using B and D implants, the anterior movement of the prosthesis is reduced and the prosthesis even may act as a splint for the two implants during anterior biting forces, thereby decreasing some of the stress to each implant. But most situations do not allow for this. With certain disadvantages like psychological feeling of a removable appliance, need for frequent attachment change, relines and prosthesis movement OD 1 is used as a treatment option, when patients understand that additional implant support is beneficial but financial constraints require a transition period of few years before placing additional implants.<sup>4</sup>

## CONCLUSION

Edentulism is a significant health problem. Data indicates significant increases in patient satisfaction with mandibular implant overdenture treatment when compared with conventional denture treatment. In this clinical report, by the fabrication of the implant retained overdenture (OD 1), it was possible to economically yet effectively rehabilitate a 60-year-old female patient with functionally efficient, esthetic and retentive denture.

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## ABOUT THE AUTHORS

### Mohammed Saleem

Professor and Head, Department of Prosthodontics, KGF College of Dental Sciences, Bengaluru, Karnataka, India

### Rayeesa Saleem

Professor, Department of Endodontics, Hazaribagh College of Dental Sciences, Hazaribagh, Jharkhand, India

### Rufus Allwyn Meshack

Professor, Department of Endodontics, Hazaribagh College of Dental Sciences, Hazaribagh, Jharkhand, India

### Rakshith Guru

Professor, Department of Prosthodontics, Hazaribagh College of Dental Sciences, Hazaribagh, Jharkhand, India

## CORRESPONDING AUTHOR

Mohammed Saleem, Professor and Head, Department of Prosthodontics No-4, Olleff Road, Langford Town, Bengaluru-560025, Karnataka India, Phone: 9845598610, e-mail: drcmsaleem@yahoo.com