

# Implant Supported Mandibular Over Denture Post Vertical Ridge Reduction– A Case Report

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## ABSTRACT

For the past few decades, implant supported overdentures have become a routine treatment modality for the completely edentulous. They have been accepted as the standard care for fully edentulous patients and should be the first choice of treatment for the edentulous mandible as they offer many practical advantages over conventional complete dentures and removable partial dentures. There are two basic types of implant-supported overdentures – bar supported and ball supported. As compared to the latter bar supported overdentures provide more retention, stability and support, as well as splinting of the implants. This article presents a case of implant supported mandibular overdenture, retained with a permanent resilient reliner, post vertical ridge reduction.

**KEYWORDS:** Overdenture, Customized bar supported complete denture, Implant supported overdenture, Resilient Reliner,

## INTRODUCTION

The cases of complete edentulism have three treatment options, which include complete dentures, implant-supported overdentures and implant-supported fixed dentures. Endosseous implants have been routinely used for the rehabilitation of the edentulous mandible for both fixed and removable prosthesis.<sup>1,2</sup> The use of implants improves the retention, support and stability. Both fixed and removable implant-supported restorations successfully address problems associated with complete dentures in edentulous mandibles.<sup>1,5</sup> Often the soft and hard tissue contours of the patient demand rehabilitation with an overdenture instead of a fixed restoration as the thickness of flanges can be managed only in a removable prosthesis.

Various multicenter studies were carried out on the clinical performance of implant-supported overdentures and results showed 100% success rate.<sup>3,4,6</sup> Implant supported overdentures differ in design, according to the attachment used and the amount of support derived from the implant and the edentulous ridge.<sup>7</sup> There are no absolute rules for overdenture design with implants while the factors influencing attachment selection include the type of prosthesis, the number and angulation of implants, the antero-posterior span, dexterity, expectation and financial capabilities of the patients.<sup>8</sup> Out of various attachment systems, bar attachment along with clips/resilient liner gives improved retention and stability allowing splinting of implants. A wide variety of bar designs exist including prefabricated, custom-made and castable bars. Another advantage of using the bar design is that an attachment system of choice can be incorporated. There is no scientific data that supports the use of one attachment system over another one.<sup>9,10</sup>

In this case report, the patient presented with an unstable mandibular denture and numerous sore spots. Rehabilitation consisted of a mandibular implant-supported overdenture with a cast bar and resilient heat cure silicone based reliner (Molloplast-B) attached to denture with indirect technique.

## CASE REPORT

A 60-year-old completely edentulous female patient reported to the Outpatient Department, with a chief complaint of ill-fitting lower denture. She desired for fabrication of new dentures with a better fit and function.

**Diagnosis and Treatment Planning:** Clinical and radiographic evaluation revealed edentulous maxillary and mandibular arches. The posterior mandibular ridges exhibited increased bone loss and deficiency in height and width (Type 2, Division B). Gross hard and soft tissue irregularities were evident in the anterior segment of the mandibular ridge (Fig. 1).



Fig. 1: The edentulous mandibular ridge

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Diagnostic impressions were made, tentative jaw relations were recorded and teeth were set at the appropriate vertical dimension to assess the available restorative space and tooth positions for best esthetic and functional results. Based on the diagnostic setup, a class I skeletal relationship existed and 15 mm of restorative space was available, with a tilted occlusal plane. After giving the patient a detailed explanation concerning the present state, procedures and alternative treatment plans, the following decisions were made: vertical ridge reduction in the anterior region of the mandibular arch, followed by placement of two implants in the interforamina region i.e. B and D (Misch) of the mandible and fabrication of maxillary denture along with a bar-supported mandibular overdenture as a definitive prosthesis. Ridge reduction was necessary to eliminate the hard and soft tissue irregularities and the placement of the implants in the same plane for subsequent fabrication of the bar.

**Vertical ridge reduction and Implant Placement:** In stage one surgery, vertical ridge reduction was done and a chunk of the anterior mandibular ridge (approx. 7mm in height) was removed, followed by alveoloplasty to smoothen out the rough edges (Fig. 2). Subsequently, Two implants (3.5 × 10) (ADIN Toureg-S™, Adin Dental Implant System Ltd; Israel) were placed in the flat platform created at B and D regions (Fig. 3, Fig. 4).

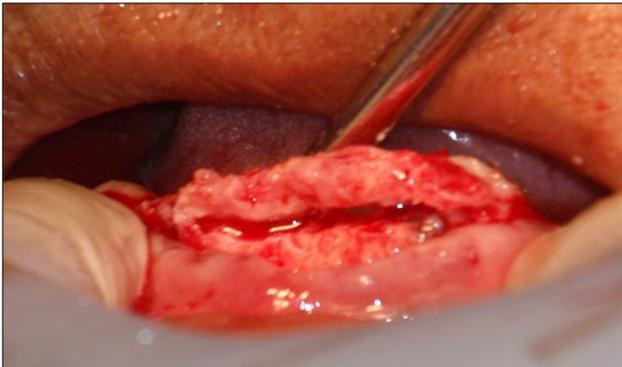


Fig. 2: Resection of a portion of the mandibular ridge

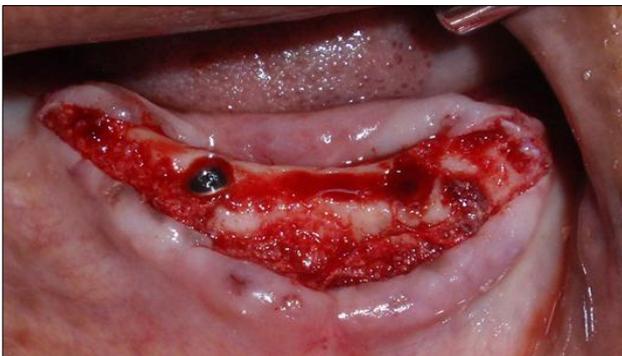


Fig. 3: Implant placement in B and D region

**Prosthetic Procedures:** Accurate transfer of the implant positions to the master cast is a primary requirement to ensure a passive fit restoration. An impression procedure that implements rigid splinting of

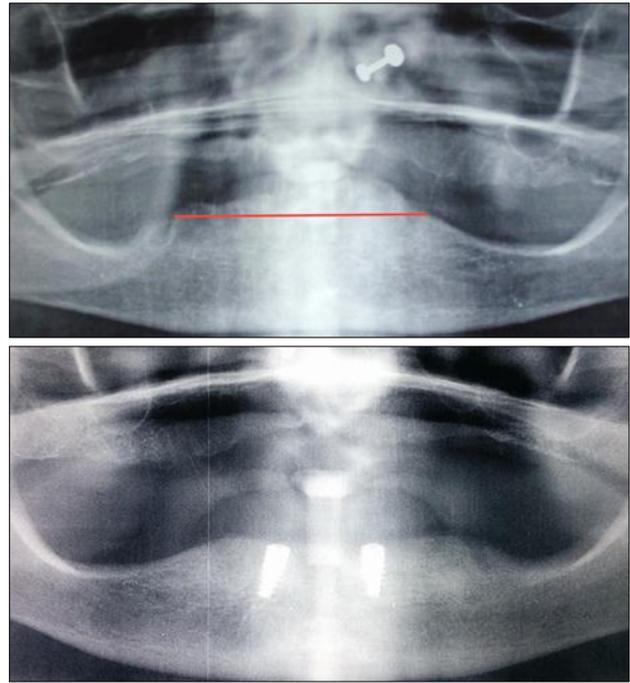


Fig. 4: Pre and post-operative OPG comparison

the impression copings was therefore used for the mandible.<sup>11,12</sup> Further on standard procedures were followed and maxillary and mandibular complete dentures were fabricated.

#### Bar Fabrication

1. UCLA abutments were screwed to the master cast and cut to appropriate height.
2. A castable bar system (OT Bar Multiuse; Rhein 83, NY, USA) was used. The bar was attached to abutments and casted.
3. The bar was finished and polished and checked in the patient for a passive fit (Fig. 5).



Fig. 5: Bar screwed on to the implants

#### Placement of completed prosthesis

1. The mandibular denture was hollowed out to accommodate the bar and a pickup impression with bar in place was taken with monophase impression material (Fig. 6).
2. Resilient Reliner (Molloplast-B) was applied on the intaglio surface of the denture.
3. Finished bar was placed in the patient's mouth and the screw openings were blocked by gutta-percha.

4. The denture was checked in the patient for proper extensions.
5. The intimate fit of the intaglio surface of the denture to the bar provided enough retention for the prosthesis (Fig. 7).



Fig. 6: Pick-up impression of the bar taken with the denture



Fig. 7: Denture relined with Molloplast-B

## DISCUSSION

A minimum of two implants is recommended to support a mandibular denture.<sup>13</sup> Thomason et al. after a comprehensive literature review found there was no evidence to support fixed or removable being superior.<sup>14</sup> In 2011, De Kok et al. did a survey to compare fixed versus removable dentures in the mandible and found patients were equally happy and functional with either an overdenture or a fixed denture.<sup>15</sup>

Regardless of the type of attachment system used - bar, ball or magnet - patients are significantly more satisfied with implant-supported overdentures than with conventional dentures. Molars are usually the first teeth to be lost followed by the remaining posteriors and the anterior teeth. As in this case, there is often a history of the loss of all posteriors followed by gradual wear of the anterior teeth, which is compensated by gradual extrusion of the attrited teeth. Thus, when the teeth are eventually

removed there results an uneven residual ridge with greater height in the region of the teeth last removed. For the placement of a bar, it is necessary for the supporting implants to be in the same plane, which often necessitates ridge modifications in accordance to the planned position of the implants.

In the present case, thorough evaluation and treatment planning that addressed the patient's needs, expectations, clinical and radiographic findings resulted in the final prosthesis design that met the patient's functional and esthetic needs. The need to have an overdenture design of superior stability and retention was recognized at an early stage of the treatment plan, allowing ridge modifications and implant placements with optimal distribution. The bar supported overdenture is an advantageous option as it got several advantages of implant splinting, improved retention and stability, reduced forces on implant, less screw loosening and crestal bone loss. The use of Resilient Reliner provided the patient with sufficient retention to prevent vertical movement of the denture.

## CONCLUSION

The implant supported mandibular overdenture was more stable, mastication was easier and speech dramatically improved. Overdenture treatment was possible only after vertical ridge reduction, which should be considered whenever necessary. The use of a resilient reliner instead of clips resulted in a more snugly fitting lower denture. It can be thus concluded that conventional treatment should be modified in the best interests of the patient and implant supported overdenture or some variant should become the first choice of treatment for the edentulous mandible.

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