



## ORIGINAL RESEARCH PAPER

## Prosthodontics

### MANAGEMENT OF MANDIBULAR RESORBED RIDGE WITH IMPLANT RETAINED OVERDENTURE: A CASE REPORT

**KEY WORDS:** Resorbed ridges, O ring attachments, implant retained overdentures, single piece implant.

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#### ABSTRACT

Rehabilitation of completely edentulous patients aim towards restoring function, esthetic and preservation of remaining tissue. Resorption of bone and soft tissue affects the final outcome of prosthesis. Since ages conventional complete dentures are used for managing such cases. However managing such situations with conventional complete dentures is a great challenge for clinician. Inadequate amount of ridge volume affects the retention and stability of denture which further led patient to abdicate the complete denture. Studies have shown that the retention of mandibular dentures are poor compared to maxillary dentures. Dental implants have served boon in such conditions  
A case of implant retained prosthesis for management of mandibular resorbed ridge is presented in this article.

#### INTRODUCTION

The state of edentullessness not only affects the general health but it even affects the mental status of the individual. Thus the clinician should fabricate such prosthesis that it will not only restore the function and esthetic but it should be in harmony with the stomatognathic system.<sup>1</sup> Conventional complete denture is a treatment option which is being used since ages to manage such clinical situation. Forbearance of such prosthesis is salutary in normal clinical situation. However real challenge arises in poor ridge cases. Studies have shown that in many patients mandibular ridge is more resorbed and difficult to manage compared to maxillary ridge.<sup>2,3</sup>

Implant supported fixed or removable prosthesis are good treatment options for managing poor foundation ridges.<sup>4</sup> Implant supported fixed prosthesis needs multiple number of implants, require more time and even they are expensive. Sometimes advanced surgical procedures like sinus lift, hard and soft tissue augmentation and nerve repositioning need to be carried out before opting for implant supported fixed prosthesis. All these factors abdicate the patient to opt for implant supported fixed prosthesis.<sup>5,6</sup>

Implant overdenture is an economical option available for poor foundation cases. These types of prosthesis take support from both implants and the soft tissue which results into uniform distribution of forces. It also require less number of implants, are economical and requires less time compared to implant supported fixed prosthesis.<sup>7,8</sup> Thus implant supported removable prosthesis are clinically more easily endured both by patient and clinician.

This clinical report describes a case of mandibular resorbed ridge managed with two single piece implant retained overdenture which increased the chewing capacity of patient compared to conventional complete dentures.

#### CASE REPORT

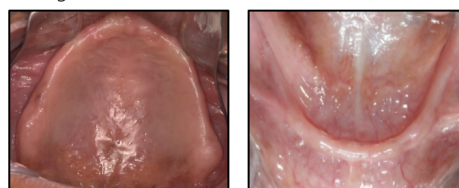
A 40 year old female patient reported with chief complain of difficulty of eating, poor esthetic and missing teeth in upper and lower region since last ten months. Past dental history showed extraction of all her teeth which were done due to poor endodontic and periodontal condition. Medical, personal and family history was not relevant.

Extra oral examination showed that patient had ovoid facial form, convex facial profile and short upper lip. Lower facial height appears to be decreased. (Fig 1)



**Fig 1: Pre operative extra oral**

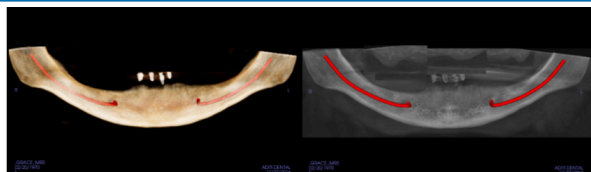
Intra oral examination showed missing maxillary and mandibular anterior and posterior teeth. Maxillary ridge was u shape. Incisive papilla and rugae were prominent. Soft palate was class 2 type. Mandibular ridge was v shape. Mylohyoid ridge was prominent. Mandibular ridge was resorbed compared to maxillary ridge. Inter ridge distance between maxillary and mandibular ridge was excessive. (Fig 2)



**Fig 2: Pre operative intra oral**

Other history was not relevant. Radiographic examination showed missing maxillary and mandibular teeth. Mandibular ridge was resorbed and mental foramen were close to the alveolar ridge. Three treatment options were given to the patients which are as followed conventional complete dentures, implant retained removable prosthesis, implant supported removable dentures and implant supported fixed prosthesis. Patient disagreed to implant supported fixed prosthesis due to expenses of the procedure. As the lower ridge was poor implant retained lower denture and conventional complete denture was planned for the patient.

Study models were made with the diagnostic impressions. Diagnostic jaw relation was taken to determine the inter ridge distance between maxillary and mandibular arches. Temporary upper and lower dentures were fabricated. Radiographic markers were placed in lower denture at prosthetically desired location of implants and cbct was done for the patient. (Fig 3)



**Fig 3: CBCT with radiographic marker**

Depending upon the availability of bone two single piece myriad equinox implants were planned for patient in right and left patients. Crestal incision was given and full thickness mucoperiosteal flap was raised. (Fig 4) 3.2\*15 was placed in 33 and 43 region with help of previous denture which acted as stent. (Fig 5) Healing period of four months was followed.



**Fig 4: Crestal incision**



**Fig 5: Placement of implant through surgical stent**



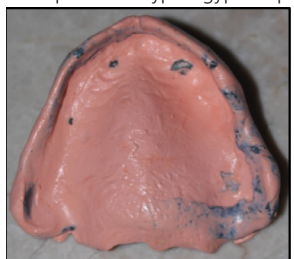
**Fig 6: Healing of implants with ball attachments after four months**

After the completion of healing period procedure for fabrication of final prosthesis was carried out. (Fig 6) Primary impressions were made with impression compound and they were poured in type 3 gypsum product. (Fig 7) Custom trays were fabricated over the primary cast.



**Fig 7: Maxillary and mandibular primary impression**

Maxillary border moulding was done with low fusing impression compound and final impression was made with zinc oxide impression material. Mandibular final impression was made with regular body elastomeric impression material. (Fig 8) Implant analogue was attached to lower impression and gingival mask was poured around it. Both maxillary and mandibular final impressions were poured in type 4 gypsum product.



**Fig 8: Final impression**

Wax rim were fabricated on both upper and lower cast and jaw relation was taken. Facebow was taken and upper cast was mounted on semi adjustable articulator with the help of facebow. Lower cast was mounted with help of centric relation record. Teeth arrangement was done on semi adjustable articulator with lingualized concept of occlusion. Try in for denture was done and patient was evaluated for phonetics, esthetic and comfort of patient. Patient was happy and satisfied with the trial. During processing of dentures relief was provided on final cast on implant analogue at the time of packing stage to provide space for female attachment. Denture insertion was done and occlusion was adjusted with 100 micron articulating paper. (Fig 9) O ring attachments were placed on implants intra orally. Space was widen in area of lower denture at future location of O ring attachments. Petroleum jelly was applied intra orally. O ring attachments were picked in mandibular denture with the help of self cure acrylic resin. Excess was removed and occlusion was checked with 100 micron articulating paper. Denture cleansing brush and powder was prescribed to the patient and all post operative instructions were given. First recall was done after 24 hrs and all the complaints were noted and treated accordingly. Patient was happy and satisfied with final outcome of the result. (Fig 10 and 11)



**Fig 9: Final Dentures along with O ring attachments picked in lower denture**



**Fig 10: Post operative intra oral**



**Fig 1: Pre operative extra oral Fig 11: Post operative extra oral**

## DISCUSSION

For success of any treatment proper diagnosis and treatment planning is essential. Adequate inter ridge distance, amount of available bone, systemic condition, oral hygiene of the patient and cost are the factors that should be taken in to consideration before deciding any treatment options.<sup>6,9,10</sup> Implant retained overdenture was justifying the above criteria in this case so implant retained overdenture was planned for the patient.

Studies conducted by McGill university showed that implant retained mandibular overdentures is better treatment option compared to conventional complete denture. They also concluded that implant retained mandibular overdenture increase the chewing efficacy, nutritional status, speech and overall satisfaction of the patient.<sup>11</sup> This is also an economical option and require less time for fabrication compared to implant supported fixed prosthesis. In reference with the McGill studies, we have similar improvement in patient outcomes and ease in the fabrication procedures. Sadowsky<sup>9</sup> stated that implants retained mandibular overdenture in the interforaminal region increases retention, stability and chewing efficacy of the patient.

Advantages of one piece implant over two piece implant are that it does not require second stage surgery, basic design of implant is simple, conventional impression can be used, Crestal bone loss is less and cost effective.<sup>12</sup> Damarisv etal from his study concluded that single piece implant works well if they are placed through surgical stent. The only limitation with single piece implant is that clinician cannot change the angulation if it not placed correctly. All these factors lead us to go for single piece implant. The connection between retentive element of implant and denture can be achieved by direct and indirect method. Errors are introduce when we use indirect technique even though it is completed in laboratory Direct technique is simple quick and allows patient to retain prosthesis. It is less technique sensitive and less time consuming provided parallel to each other.<sup>13,14</sup> when two implants are used for retaining overdenture ball attachments appear to be cost effective, less technique sensitive and favorable in v shape arches.<sup>14</sup>

## CONCLUSION

Conventional complete denture is still most commonly used as treatment of choice for management of completely edentulous patient. However in poor ridge cases, patient fail to abdicate conventional complete denture due to lack of retention and stability of dentures. Implant retained prosthesis is a good economical option in such situations which results into better acceptance of prosthesis. This clinical report has described an economical option for poor ridge condition which gives a better endurance of prosthesis by patient.

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