

Two Implant Supported Mandibular Over denture: A Case Report

Rajanikanth AV¹ Eisha Shaw² Achyut Sinha³ Swati Solanki⁴

¹Professor, Department of Prosthodontics, Rama Dental College, Hospital & Research Centre, Kanpur, India.

²Senior Lecturer, Department of Prosthodontics, Rama Dental College, Hospital & Research Centre, Kanpur, India.

³Post Graduate Student, Department of Prosthodontics, Rama Dental College, Hospital & Research Centre, Kanpur, India.

⁴Reader, Department of Prosthodontics, Rama Dental College, Hospital & Research Centre, Kanpur, India.

ABSTRACT

Background: Maxillary and mandibular complete dentures have been used for longer than a century as a conventional treatment option of edentulous patients. Most often suitable complete maxillary denture fabricated by a trained dentist is well tolerated by the patient but many patients struggle to chew and swallow with the complete mandibular denture because of its instability and also less retentive. Support, retention and stability are enhanced by an organized approach of implant supported over denture. As a result, patients are very willing to accept the treatment plan. Many studies have been shown those mandibular implant supported over dentures are superior than the conventional denture in term of retention and stability. In our case report, two implant supported mandibular single overdenture with the opposing maxillary natural teeth was discussed.

Keywords: Implant supported mandibular overdenture, Conventional denture, Overdenture, Retention, Stability.

INTRODUCTION

The dental profession and public are more experienced with the problems associated with the mandibular conventional denture than any other dental prosthesis. The problems are associated with the instability of the lower denture and patient is experienced difficulty during chewing, speaking and swallowing. The implant supported overdenture enhances the retention, stability and support of the mandibular denture. As a result the edentulous mandibular patient very willing to accept the treatment plan for mandibular implant supported overdenture.

As maxillary implants for over dentures are more difficult to place and restore, they are not often preferred. Because most of the patients are satisfied with the conventional maxillary denture regarding its stability and retention. The success rates of maxillary implants are less in comparison

with the mandibular implants. The bone density of the maxilla is poor than the mandible which results in less primary stability of implant and less bone implant contact ratio. So there is required more implant to support an overdenture which is not economical to the patient. Maximum retention of the complete mandibular dentures in the jaws with advanced ridge resorption can be attained by oral implants.¹⁻⁴ Maximum amount of bone loss had been reported during the first year after tooth extraction. A 4-mm vertical bone loss within the first 6 months has been observed in case of multiple extractions. As the bony ridge resorbs, the muscle attachments become level with the edentulous ridge.^{5, 6,7} The benefits of implant placement should be explained to the patient in order to prevent the residual bone resorption.⁸

Implant supported overdenture has many advantage over conventional complete denture. It

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*Correspondence Dr. Rajanikanth. AV.

Department of Prosthodontics, Rama Dental College, Hospital & Research Centre, Kanpur, India.

Email: Not Disclosed

includes minimum anterior bone loss, improved stability by reduces or eliminates prosthetic movement, improved occlusion, increased occlusal efficiency improved chewing efficiency and force, improved retention, improved speech, reduced prosthesis size by elimination palate and denture flange, decrease in soft tissue abrasions and improved patient's psychological outlook and quality of life. When an implant-retained overdenture is advised, The following factors should be considered: [1] cost effectiveness, [2] amount of retention needed, [3] pain cause on the soft tissue, [4] amount of bone available, [5] oral hygiene, [6] patient's social economic status, [7] expectations of the patient, [8] maxillomandibular relationship, [9] status of the antagonistic jaw, and [10] inter-implant distance.⁹ In this report, we applied two implant supported mandibular overdenture and opposing by maxillary natural teeth.

CASE REPORT

A male patient aged 53 years old, reported to the Department of Prosthodontics, Rama Dental College, Kanpur with the chief complaint of difficulty in mastication due to missing teeth in the lower jaw since past 3 months and wanted replacement with the same. The patient was generally healthy and had no significant medical history. Patient has habit of smoking 2-3 cigarette\day for last 20 years. On extraoral examination patient has bilateral symmetrical face with decreased lower facial height. On intraoral examination the teeth present were 16,15,14,13,12,11,21,22,23,24,25,26,27,28 &38. All the teeth had generalized attrition. Grade II mobility was present in respect to 38 [Fig. 1].



Fig 1: Preoperative OPG

The treatment plan was extraction of 38 followed by retrofitted denture on two independent implants in B and D position. The approval from the patient was taken after explaining the treatment plan to him. Prior to the commencement of the procedure the patient was educated and motivated to quit smoking.

Proper anesthesia was achieved and checked in the patient's mouth. A mid crestal incision was given in the inter-mental foramina region by using the scalpel #15. A Molt periosteal elevator was used to raise a full thickness flap and expose the crestal bone. A Lance drill was used with copious irrigation to mark the implant site. A 2.0 mm diameter pilot drill is positioned in the marked site and the osteotomy is done till 9 mm under copious cooled sterile saline (fig. 2).

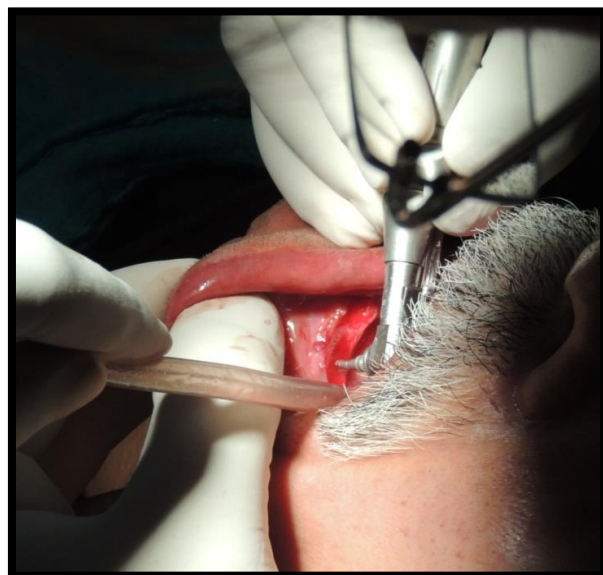


Fig 2: Osteotomy was done by using 2 mm diameter drill.

A 9-mm-long paralleling pin was positioned into the site to take a radiograph for evaluation. The 2-mm-diameter drill was reinserted to the final depth position. The drill prepares the bone 1 to 2 mm deeper than the length of the implants (when the opposing landmark permits) (Fig. 3). So we prepared the bone upto 13mm of depth and planned for 11.5mm length of implant. Then sequential osteotomy were done upto 3.0mm and planned for 3.3 mm width implant.

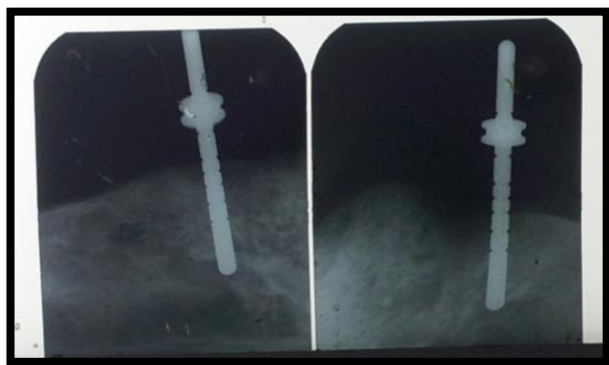


Fig 4: After osteotomy with 2mm diameter drill and Evaluate with the paralleling pin.

After the final osteotomy was done, the implant of 11.5*3.3 mm was inserted subcrestally with the help of torque wrench.[Fig. 5 & 6]



Fig 5: Implant was inserted with the help of torque wrench.

After implant was inserted a radiograph was taken for evaluation of final placement of implant. Cover screw was tightened at 10 N-cm. Then suture was done by 4/0 Vicryl suture material. post surgical instructions were given and the patient was recalled after 10 days.



Fig 6: After implant insertion.

After 10 days, the sutures were removed. After 15 days the single lower complete denture was fabricated by conventional method. This denture served as a transitional prosthesis until the implants were osseointegrated. The patient was recalled after 3 months. After 3 months a radiograph was taken for evaluation [Fig. 7]. Radiograph showed that implant were osseointegrated, the second stage surgery was done under local anesthesia.



Fig 7: IOPAR of Osseointegrated implant.

Then the cover screws were exposed after 1st stage and healing abutments are placed. After 2 weeks healing abutments are removed and the ball abutments were tightened at 30-35 N-cm[Fig. 8]



Fig 8: After removal of healing abutment.

The intaglio surface of the denture was relieved. Then metal housing with O-ring was

placed on the ball abutment and were picked up by using hard self-curing acrylic in the mouth. [Rebase II, Tokuyama] [Fig.9 & 10].



Fig 9: Rubber disc was placed to restrict the extra material flow.



Fig 10: The metal housing with the O-ring in the denture.



Fig 11: Implant overdenture in occlusion.

The patient was advised to follow the required instructions. The patient was properly

trained to use the prosthesis. First recall was attended after 24 hours and the patient was advised for follow up after every six months. Plaque control is maintained by using a soft single-tufted brush for the attachments and the prosthesis. The patient is successfully using the overdenture since one year and is satisfied with it.

DISCUSSION

In our case report we were used RP-5 prosthesis which was supported anteriorly by implant and posteriorly by alveolar ridge. Rp-5 prosthesis is a removable soft tissue and implant supported overdenture indicated when cost is the primary factor. In our case patient socio-economical status was average, but the anatomical conditions were good to excellent and also posterior ridge form was an inverted U shape with high parallel walls which provides sufficient support and stability of the posterior part of the denture and decreases the prosthetic movement during function. Patient is also convinced for addition implants be inserted within 2 years. Under this condition, two implants were inserted in B & D position. The implants remain independent of each other and were not connected to the superstructure. So it was categorized as an OD-1 treatment option. We inserted implants in B & D position rather than A & E position as positioning the implants in the B and D position is a better option in OD-1 than positioning them in the A and E regions. As greater amplitude of rocking of the restoration will be there with the independent implants in the A and E positions when compared with implants in the B and D regions. There was reduced anterior movement of the prosthesis when the implants were placed in B and D regions. During anterior biting forces, the prosthesis can act as a splint for the two implants, hence forth reducing the stress to some extent of each implant.

There are two approaches carried out for the implant-retained overdenture.^{9,10,11} In the first approach, retention of the overdenture is obtained by splinting of the implants with a rigid interconnecting bar that incorporates an attachment mechanism. In the second approach, instead of connecting the implants to each other, an abutment is provided to incorporate some form of retentive mechanism. The advantage of the

freestanding implants is that they allow for the use of the prefabricated stock retentive abutments. There is increase in the expenditure and it is time consuming when the interconnecting implant bar is used. The desired compensation may not be provided by stock abutments in case of the malpositioned implants, and these problems can be overcome by the splinting of the implants with the interconnecting bar. The prefabricated stock abutments can be easily replaced in case of abutment failure and replacement of these abutments does not require the remaking of the over denture as these stock abutments are identical.¹²

We used the direct procedure to connect a mandibular implant-retained overdenture with metal housing locator attachments, so the rate of error is significantly reduced while making the clinical impression and during laboratory processing. Nissan et al¹³ stated that the aftercare over a long-term evaluation period was superior in the direct technique for attachment incorporated in mandibular implant-supported over dentures by using ball attachments than compared with that of the indirect technique. Nevertheless, pressure spots were found after delivering the implant-assisted mandibular overdenture. These pressured spots were removed by the adaptation of soft tissue surface of the mandibular denture which was re-assessed with pressure indicating paste after connecting the attachment introrally.

Studies conducted by McGill University revealed that mandibular over dentures that are retained by the implants are superior to conventional dentures. This was due to the ease in the fabrication of the implants, and they also provide the satisfaction,¹⁴ while mastication thus enhancing the^{15,16} nutritional status,¹⁷ and social activity,¹⁸ of the individual.¹⁹ The implant retained mandibular overdenture is a cost-effective intervention.²⁰ In consistent with McGill group, we have the similar improvements in patient outcomes and the fabrication was easier.

CONCLUSION

This clinical report states that the patient was benefited by the mandibular implant-retained overdenture. The fabrication procedure is relatively easier as compared with that for conventional

denture. Therefore, the two implant-retained overdenture should be considered as the first treatment option for mandibular edentulous patients.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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