Research Paper

Volume : 4 | Issue : 4 | April 2015 • ISSN No 2277 - 8179

Implant Supported Mandibular overdenture – A Treatment Option for Rehabilitation of Edentulous Patients

Medical Science

KEYWORDS : Overdenture, Implant supported mandibular Overdenture, Dental Implant, O-ring attachment.

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ABSTRACT

The prosthetic management of the edentulous patient has long been a major challenge. Complete maxillary and mandibular dentures have been the traditional standard of care. However, most of the patients report problems adapting to their mandibular denture due to a lack of comfort, retention,stability and inability to masticate. Dental implants are increasingly used as suitable prosthodontic substitutes for natural teeth. The benefits of implant supported mandibular implant overdenture treatment relative to conventional mandibular denture treatment have been well documented and predictably achieve good clinical results. These include decreased bone resorption, reduced prosthesis movement, better esthetics, improved tooth position, better occlusion, increased occlusal function and maintenance of the occlusal vertical dimension.This article represents management of completely edentulous patient with severely resorbed ridge treated with implant supported overdenture.

Case Report

A 57 year old male patient reported to department of prosthodontic with complain of a loose mandibular denture. The patient was unable to speak and chew properly as denture was kept coming out.

The patient lost lower teeth 1 year back due to periodontal disease. He was using lower complete denture since 2 months.

On clinical examination revealed that the patient has partially edentulous maxillary arch and completely edentulous mandibular arch. Mandibular ridge was severely atrophic and resorbed.

Treatment Plan

After radiographic examination of the patient, it was observed that patient had dense compact bone in anterior mandibular region without any pathology. All blood investigations were also satisfactory for oral surgery. It was decided that four implants were necessary in the anterior region (between central and lateral incisors and canine region) of mandibular arch for implant supported overdenture .

Procedure

- Four implants (MIS Company) of 10 mm length and 3.75 mm diameter were placed in the anterior region of the mandible by following all standard implant placement procedures protocol.
- Placement of placements was done with the help of a surgical template. Implant surgery was carried out in a 2-stage surgical protocol. Surgery was performed under local anesthesia. The osteotomy sites were prepared with the help of surgical template. And ensure that all the implants were parallel to eachother as much as possible.
- Surgical cover screws were placed. The flaps were approximated with primary closure. The patient was told not to wear the lower denture following surgery. Antibiotics were prescribed for seven days. - Patient was advised to use disinfectant mouth rinse (Listerine) 3-5 times daily. Instructions were given regarding oral hygiene maintenance. The sutures were removed after two weeks.
- A new mandibular denture was fabricated in conventional manner after healing.
- This allowed the patient to wear the removable prosthesis during the period of osseointegration without transmitting excessive forces to the surgical sites.
- The denture was inspected for fit and occlusion. The patient was seen on a regular follow-up visits and home care instructions were given to the patient. The patient was trained to place and remove the prosthesis properly. First recall was attended after 24 hours. The regular follow up was done for 4 months.
- Permucosal extensions were removed, and the key components of the O-ring stud attachments(MIS Company) were attached into the implants.(Fig.1)

Fig.1

- Mandibular denture was inserted into patient's mouth and appropriate holes were made for metal housing, corresponding to implants were made in the denture base with the help of the cabon paper.
- Place the denture with metal housing and inspect the proper position. Pressure indicating paste was used to demonstrate that the denture base was seated completely .
- - implant in the mouth to prevent the seepage of acrylic resin into gingiva. The holes were filled with autopolymerizing acrylic resin and the denture was placed into the mouth and the patient was guide to occlude in centric.
- After the acrylic resin was polymerized, the denture was examined and excess acrylic was removed. (Fig.2)The denture was finished and polished. After that o-rings were placed

into the housings.Inspect the denture for proper fit. (Fig.3,4)

- Patient was recalled after 24 hours and regular follow up was done.

Fig.2

Fig.3

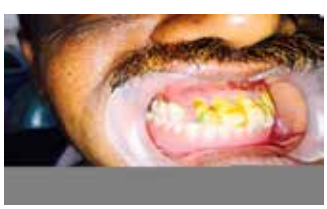

Fig .4

Discussion

The implant-supported overdenture remains in place during mandibular movements which allows the tongue and perioral musculature to resume a more normal function since they are not required to control mandibular denture movements.[1-5]

The design of the implant-retained overdenture can be carried out in 2 ways.[1,2,5] In the first approach, implants are splinted with a rigid interconnecting bar that incorporates an attachment mechanism for the overdenture retention. In the other approach, implants are not connected to each other, and the retention mechanism is provided by an abutment that incorporates some form of retentive mechanism. A major advantage of the freestanding implants is the fact that they allow for the use of the prefabricated stock retentive abutments. The use of the interconnecting implant bar requires additional laboratory and clinical procedures for its fabrication and the associated increase in treatment cost. Another advantage of the prefabricated stock abutments is that the abutment itself can be easily replaced in case of abutment failure. Because stock abutments are identical, their replacement does not require remaking the overdenture.

This method eliminates a lengthy indirect laboratory procedure that requires additional implant components such as impression posts and transfer analogs. The prolong treatment time, resulting in improved patient satisfaction. Bonding of one O-ring attachment at a time should be there so that it minimizes the positional change in the denture during the polymerization of acrylic resin. Attempting to simultaneously bond more than one Oring attachments to the denture is difficult.

The procedure may require removing, repositioning, and rebonding of the attachments if they are improperly positioned. The denture may lock in place if excessive material is applied or if the implants are not parallel to each other or the path of withdrawal.[6]

The number of implants necessary for implant overdenture treatment remains controversial; the most common choices seem to be using either two or four implants. Both the supporting mucosa and implants provide support, retention, and stability for overdenture prosthesis.[7]

After delivery of the prosthesis to the patient, chair time decreases for post insertion adjustments. However, it is technique sensitive, and the clinician must assure the accurate placement of the locator attachments on the implant abutments during the impression process.[7]

Performance data of the implant-retained overdenture indicate that most of the complications and prosthodontic maintenance are related to the attachment components of the overdenture.[8]

As with any treatment modality, aftercare and maintenance is vital if the overdenture is to be successful. The patient must be advised of this and reviewed regularly. Optimal surgical implant positioning is essential for the success of implant supported restorations. An implant-retained overdenture requires meticulous treatment planning than a conventional complete denture. Final placement of the implants should follow the principles of ideal implant parallelism and maximum initial stabilization, and path of placement and removal.[8]

Conclusion

Attachment retained overdenture have become routine alternative to traditional removable dentures and lower cost alternative to more complex fixed dental prosthesis. Advantages of using attachnents are cost saving, reducing chair side time,more accurate and simple method by giving the clinician complete control of attachment placement and elimination of inaccuracies caused by laboratory transfers.It is a treatment of a choice in patients who want more retention and stability of complete dentures and in cases with poor bone quality as well.

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