CASE REPORT

Simplified Method for fabrication of O-Ring Implant Supported Overdenture- Case Report

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Abstract

Dental implants are increasingly used as suitable prostodontic substitutes for natural teeth. The benefits of implant supported mandibular implant overdenture treatment relative to conventional mandibular denture treatment have been well documented. Half of all conventional mandibular dentures illustrate problems like improper retention and stability in prosthesis. It may also be a practical form of treatment for “satisfied” denture wearers who desire additional stability for their prostheses.

Key words- Overdenture, Implant supported Overdenture, Dental Implant.

Introduction

Mandibular complete overdenture treatment uses a removable complete denture that overlies retained teeth, tooth roots, or dental implants. Conventional mandibular dentures demonstrate problem with prosthesis like stability and retention, with the retention being a single most important deficiency¹. For completely edentulous mandible, a 2-implant overdenture treatment should be the standard of care relative to conventional denture treatment.²,³,⁴

During the last decade, however, the increased use of dental implants in association with this treatment and the desire to provide less complex, more economical implant prostodontic treatments for edentulous patients have led practitioners to use this treatment and the dental literature to report it to an unprecedented extent.⁵

The recent thrust toward endosseous dental implants as the support and retention mechanism for mandibular overdenture treatment has occurred because of a number of important considerations. First, implant overdenture treatment provides many of the benefits of conventional tooth-borne overdenture while negating some of the most troubling problems, such as tooth decay and periodontal disease. Second, dental implants provide a mechanism for establishing a foundation for overdenture treatment, even after all the teeth have been removed. Implants allow practitioners to regain lost supporting structures for edentulous patients already using conventional complete dentures. Third, implant overdenture treatment provides a cost effective alternative to more costly treatments involving additional implants. Finally, the outcome of implant overdenture
treatment is predictably and significantly better than that of conventional complete denture treatment.6-8

This case report describes the re-fabrication of O-ring type mandibular overdenture using three implants.

Case Report

A 63 year old male patient reported to department of prosthodontics 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 all his teeth 25 years back due to periodontal disease. He was using his current set of dentures since 2 month and had no previous dentures.

On clinical examination revealed that the patient has both completely edentulous upper and lower arches. Maxillary ridge was favorable for conventional denture fabrication whereas, mandibular ridge was severely atrophic knife edge.

Treatment Plan

After radiographic examination of the patient, it was observed that patient has dense compact bone in anterior mandibular region without any pathology. All blood investigations were also satisfactory for oral surgery. Hence it was decided that to place Mini Dental Implant (MDI) on mandibular arch and make implant supported overdenture over it.

Procedure

• Three O Ring Type (MDI) implants (Life care device Pvt. Ltd.) were placed in the anterior region of the mandible, two of which were at the canine region on both sides and one is in between two central incisors by following all standard implant placement procedures protocol. (Figure 1 A & B)

• At the initial denture insertion appointment, the healing abutment caps were removed, and the key components of the O-ring stud attachments were attached into the implants (Life care device Pvt. Ltd.).

(Figure 1A: 3 Mini dental implants are placed in atrophic mandibular ridge)

(Figure 1B: OPG showing, 3 Mini dental implants are placed in atrophic mandibular ridge)

• A maxillary primary impression was made with reversible hydrocolloid and the mandibular primary impression was made with the irreversible hydrocolloid in conventional manner.

• Border moulding was done by Fournet Tuller method and final impression was made with medium body polyvinyl siloxane. (Figure 2)

• In mandibular denture base, implant projection were relived with wax to seat on mandibular master cast. Jaw relation, teeth arrangement and try-in were carried out in conventional manner.
Complete Denture was cured in a conventional manner. (Figure 3)

Appropriate holes, corresponding to implants were made in the mandibular denture base over the implant abutments so that the denture base does not contact the attachment assemblies when the mandibular denture is seated firmly in the mouth. (Figure 4)

Caution should be taken to prevent the bur from penetrating the cameo side of the denture at this time.

Pressure indicating paste was used to demonstrate that the denture base was completely seated and did not contact the O-ring assemblies.

Low-viscosity vinyl polysiloxane elastomeric impression material was injected fill the hollowed denture base space created for the keyway attachment.

The denture was completely seated in the mouth and the patient was guided into centric occlusion.

This position was maintained under light occlusal contact until the impression material was set.

The denture was examined, the impression material, replace it and verify the denture position again. When the positional relationship is incorrect, the impression material is easily removed.

The impression material was removed from one of the attachment sites in the denture base.

With the help of acrylic bur, the holes were drilled completely through the cameo surface of the denture, to allow excess acrylic resin to escape when the O-ring keyway attachment is bonded to the denture base. (Figure 5)

Separating medium was applied onto the implant surface to prevent adhesion of acrylic to the implant surface.

Tinfoil was placed around the O-ring assembly on the implant in the mouth to prevent the seepage of acrylic resin into gingiva.

The holes were filled with auto-polymerizing acrylic resin and the denture was placed into the mouth.
and the patient was guided to occlude in centric.

(Figure 5: O-ring mini dental implant teflon housings were in positioned)

- After the acrylic resin was polymerized, the denture was examined and excess acrylic was removed.
- The same procedure was repeated in other two implants and the denture was finished and polished. (Figure 6)

(Figure 6: Implant teflon housings were imbedded in the tissue surface of the denture)

Discussion

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. In this method the 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 O-ring 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. The number of implants necessary for implant overdenture treatment remains controversial; the most common choices seem to be using either two or four implants. Two dental implants are usually considered the minimal number necessary for mandibular implant overdenture treatment. Both the supporting mucosa and implants provide support, retention, and stability for overdenture prosthesis. As more implants are used, the responsibility for these functions shifts from the mucosa to the implants.

The main advantage of this technique may provide the accurate relation of the implant components and the supporting tissues without finger pressure. 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.

Any subsequent improvement in the clinical outcome for this treatment that would result from increasing the number of implants is not clearly understood.

Additional implants may improve prosthesis support, but retention and stability, and ultimately the clinical outcome, are probably not significantly improved by increasing the number of implants used with mandibular implant...
overdenture treatment. In fact, a growing body of evidence promotes the use of two implants placed bilaterally in the anterior mandible.

Conclusion
Using O-ring type implant overdenture provides a strong return for the investment in treatment time and expense and is a treatment of a choice in patients who want more retention and stability of complete dentures. It is an extremely simple and safe procedure, which can be in cases with poor bone quality as well. It opens many treatment modalities, both to the dentist as well as to the patient.

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