

Case Report

A conservative and affordable implant supported overdenture- Case report

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ABSTRACT:

Successful implant surgeon has to follow high standards that start from patient selection to postoperative care. Similarly, an implant prosthodontist needs to do same irrespective of the prosthetic option that has been chosen for a particular patient. The prosthetic option of implant support overdentures provides both clinicians a platform where standards can be learned, maintained and practiced easily. We present a case of an elderly female patient who was rendered recently completely edentulous with a two staged two implant supported overdenture. The patient was principally motivated when educated about the importance of bone preservation for future, since her age of becoming edentulous was lower. Complete denture was retained by ball and socket attachments. A two stage procedure was used for implant osseointegration. complete dentures were then adjusted once the abutments were placed on the implant fixtures. The patient was highly satisfied with the outcome of the implant supported overdenture.

Keywords: edentulism, complete denture, precision attachment, osseointegration, implants.

Received: 23/09/2020

Modified: 18/10/2020

Accepted: 20/10/2020

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This article may be cited as: Yunus N, Tanvir H, Bhatt JT. A conservative and affordable implant supported overdenture- Case report. J Adv Med Dent Scie Res 2020;8(11):42-45.

INTRODUCTION

The mandible is central to effective mastication since it is responsible for generating forces of mastication that have to break food into pieces inside the oral cavity. The natural teeth add to its efficiency since sharp pointed cusps direct all forces at one point to effect breakage. Preserving natural teeth for supporting various forms of complete dentures (overdenture, immediate overdenture, overdenture with coping/ attachments) is a preventive prosthodontic practice that has hardly seen any modifications.¹ The same is not the case with the mandibular efficiency, if and when natural teeth are lost. The mandible is just a moving member of the oral cavity which still has the capability to generate most of its force, but due to lack of teeth it cannot achieve even an average masticatory efficiency.² However the difference between the two is not the presence of the teeth, but it is the manner in which the

teeth are attached to the jaws. A similar difference exists between a conventional removable complete denture and an implant supported denture. Although it is feasible to have at least four implants to retain a mandibular overdenture, studies have shown that even the use of 2 implants improves prognosis of a complete denture.^{3,4} The 2 implant retained has rightly been declared as a standard of care for mandibular edentulism.⁵ Factors to be considered mainly during treatment planning of such cases is the patient's understanding of its limitations, the existing restorative space for prosthetic components of implant system and the type of attachment chosen by the clinician.⁶

From the patients' point of view, his apprehensions always increase with wearing of a removable prosthesis even if it supported by natural teeth and/or implants.⁷ Controversies in the rehabilitation of a patient with implants have been

mainly associated with the difficulty of achieving the standards that have been set for it.⁸ However, a two implant supported overdenture is a prosthetics option where standards can be achieved easily if all the factors related to diagnosis and treatment planning have not been violated. This article in the form of case report describes a case of implant supported overdenture while describing its clinical planning procedure.

CASE REPORT

An elderly female patient aged 49 years, married to an agriculturist and having three children reported to the department of prosthodontics with a chief complaint of inability to eat since she had no natural teeth. Medical, social, drug and other related histories did not show any negative clinical finding. Dental history disclosed patient completely edentulous since last 8 months while the teeth had been removed due to either caries or periodontal problems. Extra oral examination showed normal clinical findings while intra oral examination showed a well formed maxillary completely edentulous residual alveolar ridge (RAR) and a moderately built mandibular RAR (**Fig 1a**). Radiographic evaluation showed normal radiographic anatomical features. Treatment options presented to the patient included conventional complete dentures or mandibular overdenture supported by two implants with opposing maxillary single complete denture. The patient consented to the implant supported overdenture after she was educated about the importance of bone preservation at her age. A diagnostic impression from impression compound was made which was border molded using compound molded border molding technique, following which diagnostic casts were fabricated. Routine clinical and laboratory procedures were then done to fabricate a conventional complete denture with the bilateral balanced occlusal scheme. Duplication of mandibular denture was done using a duplicate flask and a clear autopolymerising self cure acrylic resin (DPI, Clear) was poured to form a surgical template. Desired implant locations were drilled in the surgical guide which also provided guidance for the angulation of the implants. The vertical dimension of the duplicate denture was analyzed and the implant fixtures were selected (Adin - Touareg TM implants of 11.5 mm length and 3.75 mm diameter). The decision for attachment went in favor of the ball and socket type of attachment.

Implant surgery was done in two stages, performed under local anesthesia. Surgery was initiated giving an incision from canine to canine region, following which a full thickness flap was raised (**Fig 1b**). This was followed by placement of surgical guide (**Fig 1c**) and two implant fixtures were placed within the bone, the alignment of which was verified using the guide pins (**Fig 1d**). Verification of alignment of attachments was done using the method described for single implant attachments.⁹ Surgical

cover screws were placed after flap approximation with primary closure. The patient was given post surgical instructions and after a period of 2 weeks sutures were removed. After adjusting tissue surface of the denture, a heat cure soft liner (GC Reline Soft TM) was applied to tissue surface following which the patient wore the removable prosthesis during the time period of osseointegration.



Figure 1: (a) Intra oral view of mandibular completely edentulous residual alveolar ridge (b) Incision and flap reflection (c) Surgical guide (d) Verifying implant alignment using guide pins



Figure 2: (a) Implant abutment in place (b) Implant analogue for impression (c) Mandibular denture with attachment (d) Implant supported mandibular overdenture with opposing maxillary conventional complete denture

In the second stage, exposure of the implant fixture was done (**Fig 2a, b**), following which cover screws were removed and implant sites were irrigated. Collars for healing were fixed for a period of four weeks to allow the surrounding tissue to mature and heal. Mandibular denture was further relined with a soft liner and the denture was placed. In the next

clinical stage, the ball and socket over denture abutment of 2 mm diameter (NP-0022) were checked for complete seating and verified radiographically. The attachments were fixed to the implant fixtures following which two O-rings (RS—2662) were placed on the implant abutment. After blocking the undercuts beneath the O-rings, the tissue surface of the denture was relieved to allow passive denture fit although some adjustments using pressure indicate paste was necessary. A vent for excess material was directed lingually and fast setting pattern resin (GC) was then flowed into the space. With patient maintaining a light occlusal pressure in centric relation position, the resin was allowed to polymerize. Excess resin was removed and the implant abutment was removed to check for proper fit within the denture (**Fig 2c**). After a thorough occlusal checkup, the patient was instructed regarding the denture care and maintenance. After one day the patient was recalled and minor adjustments were done in occlusion. The patient continues to wear the denture and is extremely satisfied with the outcome of the treatment (**Fig 1d**).

DISCUSSION

A two staged, two implant supported overdenture has been presented in this article. The main feature of the case being young age of the patient, the procedures involved in fabrication and the quick response in adaptation at a young age to implant supported overdentures.¹⁰ The significance of implant supported overdenture is its ability to remain in place within the dynamic and forceful tongue and peripheral musculature permitting the individual to perform a somewhat natural chewing pattern. The denture basically directs the muscles to forget the adapted role of holding the denture in place and focus on the efficiency of mastication.^{11,12}

The designing of a two implant overdenture can be either using a splint (bar) or using an individual attachment on each implant thus making the two implants non connected. The advantage of the latter being the ability to use prefabricated stock retentive abutments.^{13,14} When implant alignment does not coincide, then bar overdenture overcomes the problem by splinting them.¹⁵ The individual designing also allows abutment replacement in case of abutment failures. Since the stock abutments are always identical, they can also be replaced without remaking the complete denture. This was one of the main reason the design of stock abutments was chosen since the patient was young and had financial constraints in terms of expenses on dental treatment at present as well as future circumstances. Between the two methods of incorporating the attachment matrices into the overdenture we chose the clinical method since it is less sensitive than the laboratory method and was economically viable.^{16,17} Since implant restorations require a period of time during which the bone has to be allowed to integrate around

the implant fixture (3 to 6 months), pre prosthetic treatments can be initiated after stage 1 surgery. This has been found advantageous,¹⁸ especially in dentulous cases where orthodontic treatment is required.¹⁹ We initiated tissue physiotherapy and complete denture construction after 3 months of first stage surgery.

CONCLUSION

An overdenture supported by two implants is a feasible treatment, especially among low economic patients. The patients benefit since mastication, speech and esthetics are improved. Two implant supported overdenture should be considered as a minimum standard for all completely edentulous patients unless their clinical condition contraindicates its use.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the efforts of the staff of the department of oral surgery and prosthetic laboratory for their contribution towards completing this case.

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