

Management of atrophic mandibular ridges with Mini Dental Implant system –A case report

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Mini dental implants (MDI) are ultra-small diameter (1.8 millimeter width), biocompatible titanium alloy implant screws, conceived and designed over 20 years ago by a board-certified Manhattan dentist, Victor I. Sandax, DDS. Dr. R.A. Bulard added a single one piece 'O-ball' design to Dr. Sandax's concept. These implants can be used in atrophic ridges, flabby ridges or in other cases where there is denture instability or lack of retention due to poor availability of residual bone. In this article, we shall discuss a case report of a 55 year old female patient with a severely atrophic mandibular ridge that was managed by the Mini Dental Implant system with an overdenture.

Key words: Immediate loading implants, Overdenture, Mini Dental Implants

INTRODUCTION

Every dentist has experienced the problem of dealing with patients with atrophic ridges. The patients always return with complaints of instability of dentures. This problem is more pronounced in the mandibular arch. Due to less available tissue surface, denture adhesives have limited use in the mandibular arch. Traditional dental implants require a period of healing and tissue integration in a nonloaded capacity for optimum predictability.^[1] The Mini Dental Implant system can be immediately loaded and provides ongoing stabilization.^[2]

This article will discuss a case report of a 55 year old female patient with severely resorbed mandibular ridge by placement of four Mini Dental Implants (M.D.I.) with overdenture.

CASE REPORT

A 55 year old female patient reported to the Department of Prosthodontics, Pad. Dr. D.Y. Patil Dental College and Hospital with the complaint of a loose mandibular denture. The patient was unable to chew or speak properly as the denture kept coming out.

The patient gave a history of losing her teeth 20 years back due to periodontal disease. She has been using her current set of dentures for the past 1 month and has had no previous dentures.

Clinical examination revealed that the patient has completely edentulous upper and lower arches. No

bony spicules or root pieces seen. Severely atrophic knife-edge mandibular ridge seen. However the maxillary ridge was favorable for denture construction. The patient has a Angles Class III ridge relation.

Treatment plan

After radiologic examination of the patient it was seen that the patient had dense compact bone in the mandibular anterior region without any pathology. The blood reports of the patient also did not show any pathology to rule out surgery. Hence it was decided to place MDI implants on the mandibular arch and place an overdenture on it.

Procedure

A new set of complete dentures was prepared for the patient.

The anatomy of the jaw was evaluated to determine the angulation of the implant.

A Brasseler-type latch drill was used to open denser bone layers to facilitate the self-tapping and self-cutting features of the MDI system (The speed of the drill should not exceed 1600 RPM's with adequate torque and irrigation).^[3] Drills should only be used to establish access angulation and pilot starting point for placement of the implant. The drilling technique typically involves no surgical incision, or flaps. The drilling entry procedure was completed with a few pumping motions resulting in light penetration past the dense cortex into softer, more trabeculated medullary bone. Sterile irrigation was utilized throughout the





Figure 1: Knife Edged Mandibular Ridge seen



Figure 4: Denture fitted with keeper caps

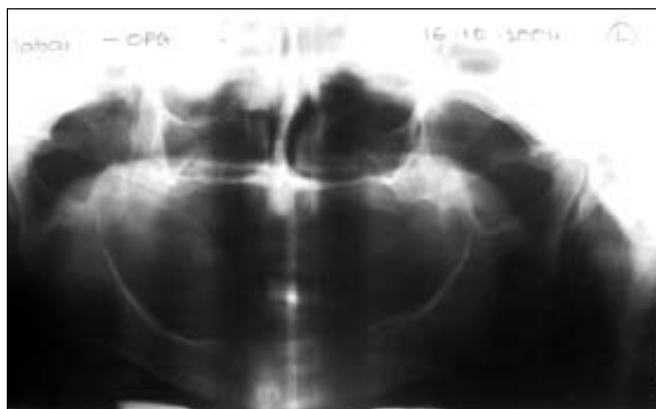


Figure 2: OPG of the patient showing a highly resorbed mandibular ridge



Figure 5: Patients ridge with 4 mini dental implants in place



Figure 3: Old denture of the patient



Figure 6: Insertion of the denture into the patients mouth

drilling procedure (The desired site depth should not exceed one third to one-half the threaded length of the mini dental implant itself.) A gentle up and down pumping motion prevents the drill tip from overheating, and/or becoming bound and embedded into the patient's bone.

Each sterile, double-pouched implant is suspended in a transparent vial for easy access and transmission

to the implant site.

A small thumb carrier-wrench or finger driver was used to retrieve, convey and introduce the mini dental implant into the target site after the initial pilot drilling process has been completed. The implant was carefully screwed clockwise into the site using rotation of the thumb and index finger on the knurled handle of the wrench until it became difficult to turn.

The thumb wrench was then removed from the implant abutment head.

The thumb wrench was replaced with a winged thumb wrench for more mechanical advantage and leverage. The implant was again turned gradually into the patient's bone until once again it binds to a point where it became difficult to turn. Then the winged wrench was removed from the implant abutment head.

A ratchet wrench was then used to slowly insert the implant into its final position. The neck of the mini dental implant was fully inserted into soft tissue (attached gingiva) so that only the abutment head protruded into the oral cavity.

The tissue side of the patient's prosthesis was relieved so that it could be seated passively over the top of the seated implants.

A soft block-out *MDI* shim was then be placed on each inserted mini implant's square base portion of abutment head, leaving the O-Ball top half exposed for attachment placement. Keeper Caps with *IMTEC MDI* O-Rings were then snapped onto the O-Ball heads.

The patient's prosthesis was carefully examined to ensure passive fit. A standard chair side self cure acrylic mix was then prepared and placed into the denture, then seated with a functional bite into the patient's mouth over the top of the mini-implants with the keeper caps attached. After an appropriate hardening time, the prosthesis was removed from the patient's mouth, the block out shims discarded, and excess acrylic material trimmed. The finished prosthesis, containing the Keeper Caps, was then replaced into the patient's mouth for occlusal equilibration and border adjustment.

DISCUSSION

In our clinical practice we regularly come across patients where we find it difficult to achieve optimum denture performance due to problems associated with reduced denture retention and stability. This can be due to a number of factors like reduced vestibular depth, flabby ridges, atrophic ridges, etc. It can also be used for stabilization of a complete denture where

bone quality is inadequate for standard implants.^[4]

The system can be used for Type I and Type II bone. In Type I bone the standard propriety thread design can be used and in type II bone the *MDI MAX* thread design is used.^[5]

The advantages of using the *MDI* system in such cases are:

- Immediate loading
- Can be inserted in minimal tissues without relying on grafting techniques⁶
- Minimally invasive procedure,
- One stage denture stabilization
- Does not require osteotomy
- Cost saving
- Can be placed in patients with ridge to narrow for conventional implants
- Simple 5 step technique

CONCLUSION

This procedure provides for immediate and on-going stabilization for the patient in an economical, efficient manner. It can be done in cases with poor bone quality as well. It is an extremely simple and safe procedure. Mini Dental Implants are an excellent and profitable addition to every dental practice. It opens many treatment modalities to the dentist and the patient.

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