



The Use of Short Implants for Restoration of Limited Bone Height Ridges



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The Use of Short Implants for Restoration of Limited Bone Height Ridges

Background

Inserting short implants is considered a minimally invasive approach for rehabilitating limited bone height ridges. Several studies have shown good predictability of these implants especially in the mandible.^[1] The main difficulty when using this technique is the need for sufficient primary stability that can be difficult to achieve due to the reduced length of these implants (less than 10mm) ^[2,3,5]. To compensate for the implants' reduced length, their design is tapered, self-tapping or spiral. In addition to the "aggressive" design of these implants, wider implant diameters are used to achieve sufficient surface area for long term survival and good predictability. Short implants are not recommended for immediate loading because of the limited primary stability.^[4]

Case Overview

A 78 year old female patient, non-smoker, was suffering from pain and mobility in old bi-laterally fixed prostheses in the mandible.

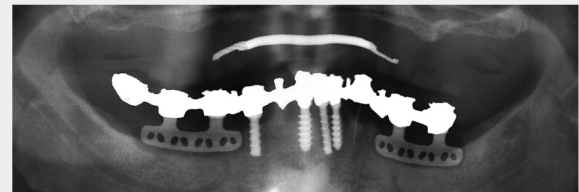
Systemic Background

The patient suffers from hypertension that is controlled by ACE inhibitor medications. The patient takes oral anticoagulants as prophylaxis due to family history of cardiac diseases.

Dental Background

At age 60 (18 years before the current complaints) two blade implants^[6] were inserted in both sides of the mandibular molar, spiral one piece implants were inserted in the anterior area of the mandible and fixed cemented restorations were fabricated.

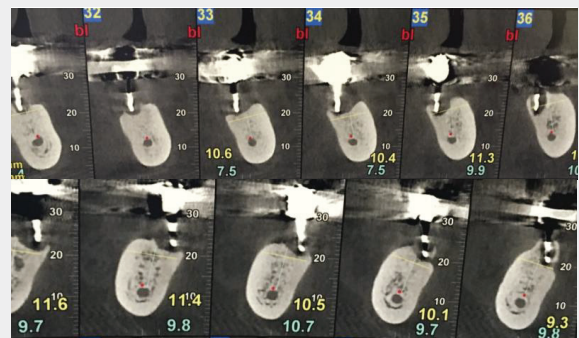
The patient recently felt pain and mobility of the posterior restorations when masticating. (fig 1.)



1 Old bilateral fixed prosthesis supported by blade implants. Mobility and pain were felt during mastication.

Treatment Plan

The mobility of the blade implants and the fibro-encapsulation left significant intra bony defects that needed to be restored in order to place new implants for the new fixed implant-supported restoration. ^[9] A CT scan shows massive infra bony defects, 5-8mm above the mandibular canal at the molar position. (fig 2)



2 Intra bony defect and high bone density with limited bone height

Two different treatment plans were presented to the patient:

1. Vertical augmentation (GBR) of posterior ridges and a second stage implant insertion. ^[11]
2. Short implant (8mm) insertion with simultaneous lateral augmentation in one stage.

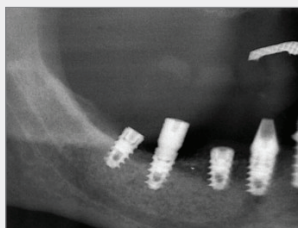
The second option was selected because of the shorter treatment time and less complicated surgery, taking into account the patient's age and systemic conditions.

Materials Used:

- Ø4.2 X 8mm NeO Implant (Alpha-Bio Tec)
- Ø4.8 X 8mm NeO Implant (Alpha-Bio Tec)
- Ø3.75 X 8mm NeO Implant (Alpha-Bio Tec)
- Ø3.75 X 11.5mm NeO Implant (Alpha-Bio Tec)
- Ø3.75 X 10mm NeO Implant (Alpha-Bio Tec)

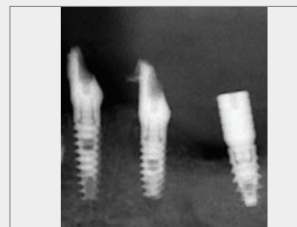
The surgery

The blade implants were removed and good curettage of the granulation tissue was done leaving socket-like infra bony defects. Ø4.2 X 8mm length NeO implants were inserted in the position of the first and second mandibular molar bilaterally. The gap between the implants and bone was filled with bovine bone substitute material (Alpha-Bio's GRAFT) and a resolvable collagen membrane was used to cover the graft. The implants were connected to healing caps due to good primary stability > 25Ncm) and sutured with silk sutures. **(figs. 1-3)** Post-operative medications: Oral antibiotics (875 mg amoxicillin and 125 mg clavulanic acid) twice a day for seven days after surgery and dexamethasone, 6 mg once a day for five days. An NSAID (500 mg of Naproxen) was given to the patient one hour before the operation and later as necessary.



3.1

Right mandible: Four 8mm NeO implants were inserted with lateral bone augmentation



3.2

3,75/8 mm NeO implants were inserted in the left mandibular molar area with lateral bone augmentation



3.3

Snap adapted collar height abutment connection



3.4

Connection of snap plastic caps (TLA-SP with adapted collar height abutment)



3.5

One stage double mix impression using A-silicon elastomeric material (Hydrorize, Zhermack)

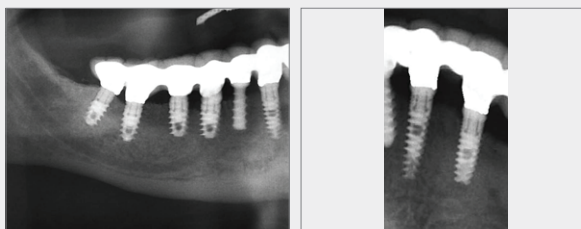


3.6

Analog connection



4 Fabrication of PFM cemented implant supported prosthesis



5 Post OP X-ray showing good osseointegrated implants and stable bone support around all implants after 6 months of function

Discussion

Short implants ($L < 10\text{mm}$) are considered a minimally invasive approach for fixed implant supported prosthesis in limited height residual ridges. The surgical difficulty is mainly to achieve minimal primary stability for good osseointegration, especially immediately after implantation.^[7] The improved primary stability despite the limited length of the implants is due to the unique spiral design of the NeO implants. The spiral design with the double thread design allows good stability in limited available depth. In this case, the infra-bony defect was relatively large due to the encapsulated blade implant, and achieving primary stability was not easily expected and a two stage surgical procedure was to be preferred.^[8]

Conclusion

Good primary stability was achieved due to the special design and the high density of the bone. Both of these conditions augured for a good prognosis. This study shows that short implants can be a good choice of treatment for fixed restorations of atrophic jaws especially when using spiral tapered implants that give good primary stability with minimal lateral forces on the cortical bone around the cervical area of the implants.

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