



FULL MOUTH REHABILITATION WITH IMPLANT-SUPPORTED PROSTHESES FOR PATIENT WITH PERIODONTITIS: A CASE REPORT

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ABSTRACT

Oral rehabilitation for a patient with severe loss of alveolar bone and soft tissue resulting from severe periodontitis presents a challenge to clinicians. Replacing loosening natural teeth with fixed prostheses supported by dental implants often requires either gingival surgery or bone grafting. The outcome of the bone grafting is sometimes unpredictable and requires longer healing time and/ or multiple surgeries. The presence of periodontal inflammation and periapical lesions often delay the placement of bone grafts as well as dental implants. Here we present a clinical case of a patient undergone full mouth reconstruction with implant-supported fixed prostheses with minimal grafting. We believe that primary stability during implant placement may contribute to our success.

KEYWORDS : Dental implants, Full mouth rehabilitation, Full mouth reconstruction, Periodontitis.

INTRODUCTION

Chronic advanced periodontitis can result in severe loss of periodontium, which is often associated with systemic conditions. Restoring the oral function and aesthetics in these patients becomes a challenge and requires major bone grafting or artificial gingival tissue. Bone grafting is usually required before placing dental implants^[1, 2]. However, horizontal bone augmentation procedures are often difficult and offer an unpredictable result^[3]. Furthermore, in patients with chronic periodontitis with multiple endo-periodontal lesions, the remaining infection often prevents simultaneous tooth extractions and bone grafting or immediate placement of implants^[4].

Here we present a case report of a patient, suffering from severe alveolar bone loss, who had undergone a full mouth reconstruction with dental implants. We also presented an option of extractions with minimal bone grafting and immediate placement of implants after tooth extractions. We had restored the oral function and aesthetics of these patients with fixed cement-retained implant supported prostheses.

Clinical Report

Preoperative Information and Treatment Planning

A 63-year-old female presented to our Practice with the chief complaint of "All my teeth are loose and inability to eat." The Patient reported that she was in good health and had no known allergy. Clinically, almost all of her remaining teeth appeared to have second to third degree mobility (Fig. 1 a, b, c, preoperative photographs)

These teeth were loosening and appeared to suffer from traumatic occlusion secondary from the condition of advanced loss of periodontal support. A treatment plan was constructed including removal of all his remaining teeth, implant placement, and fixed implant-supported prostheses.



Fig 1a

Fig 1b



Fig 1c

Fig. (1). a-c) Preoperative intraoral photographs.

Preoperative CBCT were done to evaluate teeth condition and bone levels for implant planning. (Fig: 2 a, b)

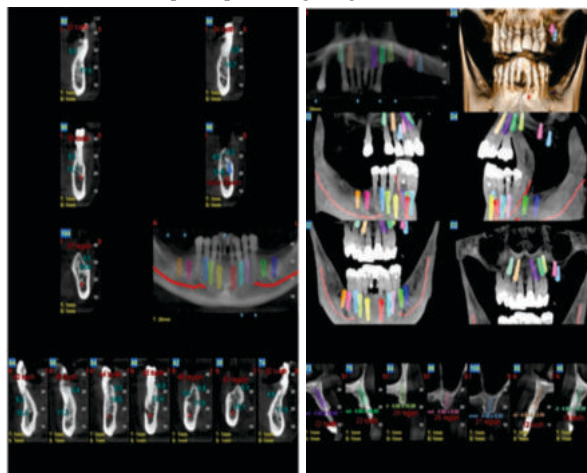


Fig 2a

Fig 2b

Fig. (2). a-b) Preoperative CT scans

Surgical Procedures and Interim Prostheses

The surgery was performed under local anaesthesia with lignocaine and 1:80,000 adrenaline. We started with mandibular arch, did atraumatic extraction of all mandibular teeth after raising flap.

Thorough curettage/ degranulation of the socket surface was done followed by profuse irrigation with Chlorhexidine 0.12% solution⁽⁵⁾.

Then crestotomy was done to achieve flat prosthetic platform. Six Osstem implants were placed. Implant stability was sufficient (40 N/cm measured with a torque spring) for all 6 implants. (Fig 3 a, b)

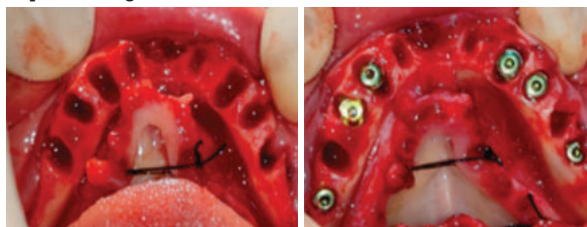


Fig 3a

Fig 3b

Maxillary arch surgery was done after 10 days following similar protocol and 7 Osstem implants were placed. Indirect sinus lift was done using densah drills and nova bone putty graft in 16 and 17 region. (Fig 4)

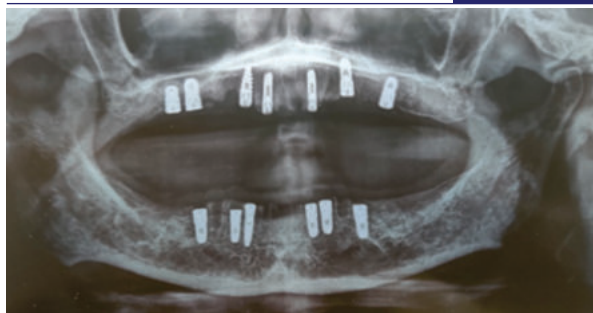


Fig 4

The second-stage surgery was performed 3 months after the placement of dental implants. The implants were uncovered with a small crestal incision and the healing abutments were placed. Complete tissue healing was evident 15 days after placing healing caps (Fig 5 a, b)

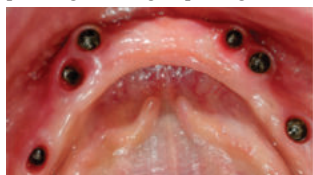


Fig 5a

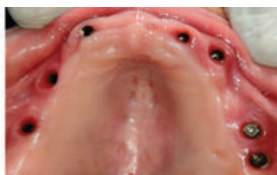


Fig 5b

Prosthetic phase

Impression making for multiple implants

For rehabilitation, a conventional alginate impression was made, and study models were cast. A rigid custom tray was manufactured with a window cut through over the implants. Then, the healing abutments were removed; appropriate impression copings were selected and fitted. These copings were splinted together intraorally to provide greater rigidity and possibly greater accuracy.

The open tray was tried in the mouth taking care that the impression copings emerged in level with the windows made in the tray. This permitted easy removal of the impression copings while ensuring that the copings are supported by sufficient impression material. The impression of implants was made with addition silicone (VPS) after splinting all the impression transfer copings with DuraLay pattern resin.

Once the impression was set, the impression copings were unscrewed through the window on the tray, and the impression was removed from the mouth along with all the impression copings in place.

Jaw relation record and try-in

The vertical dimension for rest and occlusion was checked with wax occlusal rims placed in the mouth. A divider was used to measure the vertical dimension at occlusion (VDO) and vertical dimension at rest. Face bow record was established, and centric relation recorded. Teeth were arranged in the rim, and try-in was done.

Maintaining the same VDO, metal framework was fabricated, and metal try-in was done. Interocclusal records were made with the metal framework in place. The porcelain fused to metal crowns were fabricated with mutually protected occlusion. The occlusal contacts were evaluated and adjusted.



Fig 6a



Fig 6b



Fig 6c



Fig 6d

The final prostheses were delivered (Fig. 6a, b, c, d- Radiograph) with a maxillary occlusal splint. The prostheses screws were tightened to 30 N/cm². The screw access holes were filled with composite resin. Oral hygiene instructions were also provided to the patient. The patient was instructed to wear the occlusal splint at night to prevent implant overloading from possible parafunction.

The patient was followed up one week, one month; six months after the prostheses were delivered. The patients had a six-month-hygiene recall. There has been no clinical mobility. No bone loss was found in IOPA at 6 months recall.

DISCUSSION

The original work of Branemark *et al.*^[6] was carried out in 1977, whereby they utilized 4–6 vertical implants placed within the anterior segment of the edentulous maxilla and mandible cantilevered to accommodate a full-arch fixed prosthesis. Their 10-year study (78.3%–80.3% for the maxilla and 88.4%–93.2% for the mandible) showed a good success rate.

Four implants are used to rehabilitate fully edentulous jaws with fixed dentures^[7]. Two implants are placed axially in the anterior region of the alveolar ridge, and two are distally angled (30° to 45°) in the posterior region. Clinical studies^[8,9, and 10] have shown that the all-on-four approach is predictable and has an implant cumulative survival rate of up to 99%. However, prosthetic survival is slightly smaller (up to 95% after 10 years^[11]). Problems such as prosthetic fracture, porcelain crown fracture, abutment loosening, and prosthetic screw loosening and factors that lead to prosthesis overloading, such as

bruxism or presence of long cantilever, may be related to the decrease of prosthetic survival rate in all-on-four concept^(12,13,14)

Depending on the positioning of the posterior implant and the degree of jaw atrophy, the presence of cantilever may be inevitable which increases the risk of mechanical complications in the prostheses (up to 50%^(12, 13, 14)). Thus, the presence of bone volume in the posterior jaw that allows the insertion of more implants (six implants in each arch) is beneficial to improve prosthetic support and to decrease cantilever length^(12,13,14). The impression posts were splinted using floss and pattern resin for better precision and accuracy. The vertical dimension of occlusion was established and maintained throughout the prosthetic protocol.

While prosthetic planning of the case, special attention was paid to the transition zone and the smile line. In this case, a ceramometal final prosthesis was selected as the cosmetic defect was not much⁽¹⁵⁾. Careful occlusal adjustment was done to provide bilateral occlusion in the canine and first premolar areas.

Summary

An appropriate diagnosis and accurate implant planning are keys to success in implant rehabilitation. Good impressions and meticulous attention to detail were crucial for successful implant-supported fixed prosthesis. As the stresses at the majority of the implants were lower in the all-on-six planning in comparison to the all-on-four planning, it should be considered as advantageous as it decreases the cantilever.

REFERENCES

1. Chiapasco M, Zaniboni M, Boisco M. Augmentation procedures for the rehabilitation of deficient edentulous ridges with oral implants. *Clin Oral Implants Res.* 2006;17(Suppl 2):136–59. [PubMed] [Google Scholar]
2. Aghaloo TL, Moy PK. Which hard tissue augmentation techniques are the most successful in furnishing bony support for implant placement? *Int J Oral Maxillofac Implants.* 2007;22(Suppl):49–70. [PubMed] [Google Scholar]
3. McAllister BS, Haghhighat K. Bone augmentation techniques. *J Periodontol.* 2007;78:377–96. [PubMed] [Google Scholar]
4. Kfir E, Kfir V, Kaluski E. Immediate bone augmentation after infected tooth extraction using titanium membranes. *J Oral Implantol.* 2007;33:133–8. [PubMed] [Google Scholar]
5. Jofree Jorge DDS, Valenzuela Daniela DDS, Quintana Paula DDS, Asenjo Lobos Claudia. Protocol for immediate implant replacement of infected teeth. *Implant Dent.* 2012 Aug;21(4):287–94.
6. Brånemark PI, Engstrand P, Ohmell LO, Gröndahl K, Nilsson P, Hagberg K, et al. Brånemark novum: A new treatment concept for rehabilitation of the edentulous mandible. Preliminary results from a prospective clinical follow-up study. *Clin Implant Dent Relat Res.* 1999;1:2–16. [PubMed] [Google Scholar]
7. Maló P, Rangert B, Dvårsäter L. Immediate function of brånemark implants in the esthetic zone: A retrospective clinical study with 6 months to 4 years of follow-up. *Clin Implant Dent Relat Res.* 2000;2:138–46. [PubMed] [Google Scholar]
8. Esposito M, Grusovin MG, Coulthard P, Worthington HV. The efficacy of various bone augmentation procedures for dental implants: A Cochrane systematic review of randomized controlled clinical trials. *Int J Oral Maxillofac Implants.* 2006;21:696–710. [PubMed] [Google Scholar]
9. Hashemi HM. Neurosensory function following mandibular nerve lateralization for placement of implants. *Int J Oral Maxillofac Surg.* 2010;39:452–6. [PubMed] [Google Scholar]
10. Corbella S, Taschieri S, Del Fabbro M. Long-term outcomes for the treatment of atrophic posterior maxilla: A systematic review of literature. *Clin Implant Dent Relat Res.* 2015;17:120–32. [PubMed] [Google Scholar]
11. Brånemark PI, Engstrand P, Ohmell LO, Gröndahl K, Nilsson P, Hagberg K, et al. Brånemark novum: A new treatment concept for rehabilitation of the edentulous mandible. Preliminary results from a prospective clinical follow-up study. *Clin Implant Dent Relat Res.* 1999;1:2–16. [PubMed] [Google Scholar]
12. Maló P, Nobre Md, Lopes A. The rehabilitation of completely edentulous maxillae with different degrees of resorption with four or more immediately loaded implants: A 5-year retrospective study and a new classification. *Eur J Oral Implantol.* 2011;4:227–43. [PubMed] [Google Scholar]
13. Maló P, Rangert B, Nobre M. All-on-4 immediate-function concept with brånemark system implants for completely edentulous maxillae: A 1-year retrospective clinical study. *Clin Implant Dent Relat Res.* 2005;7(Suppl 1):S88–94. [PubMed] [Google Scholar]
14. Malo P, de Araujo Nobre M, Lopes A. The use of computer-guided flapless implant surgery and four implants placed in immediate function to support a fixed denture: Preliminary results after a mean follow-up period of thirteen months. *J Prosthet Dent.* 2007;97:S26–34. [PubMed] [Google Scholar]
15. Bedrossian E. *Implant Treatment Planning for the Edentulous Patients A Graftless Approach to Immediate Loading.* St Louis, MO: Mosby, an Imprint of Elsevier; 2011. [Google Scholar]