

CASE REPORT

A Safe Approach to Full Mouth Rehabilitation

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ABSTRACT

The oral rehabilitation for a patient with severe loss of alveolar bone presents a challenge to clinicians. Replacing missing teeth in such a situation with fixed prostheses supported by dental implants often requires either bone grafting or basal implants. Sometimes, multiple surgeries and a longer healing time are required to overcome the unpredictable outcome of bone grafting. In a biomechanically compromised environment, strain to the crestal bone can be reduced by increasing the anteroposterior spread of implants, placement of longer implants, and maximizing the number of implants. Here, we present a clinical case of a patient who had undergone full mouth reconstruction with mandibular implant-supported fixed prostheses and maxillary metal-free crowns for discoloration. This case report demonstrates an immediate implant placement with All-on-4[®] concept, which may be an alternative to conventional bone grafting followed by implant placement. Also, principles of splinting and load sharing were followed by performing intraoral welding using titanium wires. We hypothesize that primary stability during implant placement is a prime factor contributing to our success.

Keywords: All-on-4, Immediate loading, Intraoral welding, Multiunit abutments, Tilted implants.

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INTRODUCTION

Partial or complete edentulism affects the patient in many ways. For such situations, various treatment modalities are available in today's scenario, with most affordable

and conventional treatment being removable partial or complete denture respectively. However, the patient's acceptance is compromised due to inadequate retention and stability, gagging, soft tissue erosions, decreased oral sensory function, decreased masticating ability, and speech difficulties. Thus, with recent advancements, implant-supported fixed restorations offer a better prognosis.¹ However, for managing severely resorbed mandibular ridge, the traditional two-stage implant protocol requires greater dealings with the patient, such as second surgery, long osseointegration time, bone grafting procedures,^{2,3} systemic complications, nerve repositioning,⁴ cost, and invasive surgeries which reduce patient compliance. A simpler and more cost-effective treatment modality for such situations is All-on-4[®] concept by Paul Malo, which is well functional in biomechanics with an added advantage of immediate functionality.^{5,6}

CASE REPORT

A 50-year-old female patient reported to the Department of Prosthodontics with a chief complaint of difficulty in chewing due to missing teeth in the lower back region of jaw and also mentioned discolored upper teeth. On examination of teeth, 16, 17, 24, 35, 36, 37, 44, 45, 47, and 48 were missing, 34 was fractured, and generalized attrition with upper anterior with severe staining (Fig. 1). The patient desired a fixed treatment option, as she was not satisfied with her removable partial denture. A detailed medical history was recorded and relevant laboratory tests were conducted. The panoramic radiograph revealed an advanced alveolar bone resorption in the mandibular posterior region. Cone beam computed tomography (CBCT) scan confirmed the mandibular atrophy in the posterior region requiring additional graft surgery, cost, morbidity, and complexity for conventional implant (Fig. 2). An alternative treatment plan of immediate implant (NobelActive) with the All-on-4[®] concept with immediate loading was accepted by the patient for mandibular arch. A diagnostic impression was made for the fabrication of surgical template for the accurate placement of implant.

SURGICAL PROCEDURE

The patient was prepared for implant surgery. Under local anesthesia, full thickness mid-crestal and sulcular incision was performed for flap reflection. An atraumatic extraction of the remaining lower anterior teeth was done

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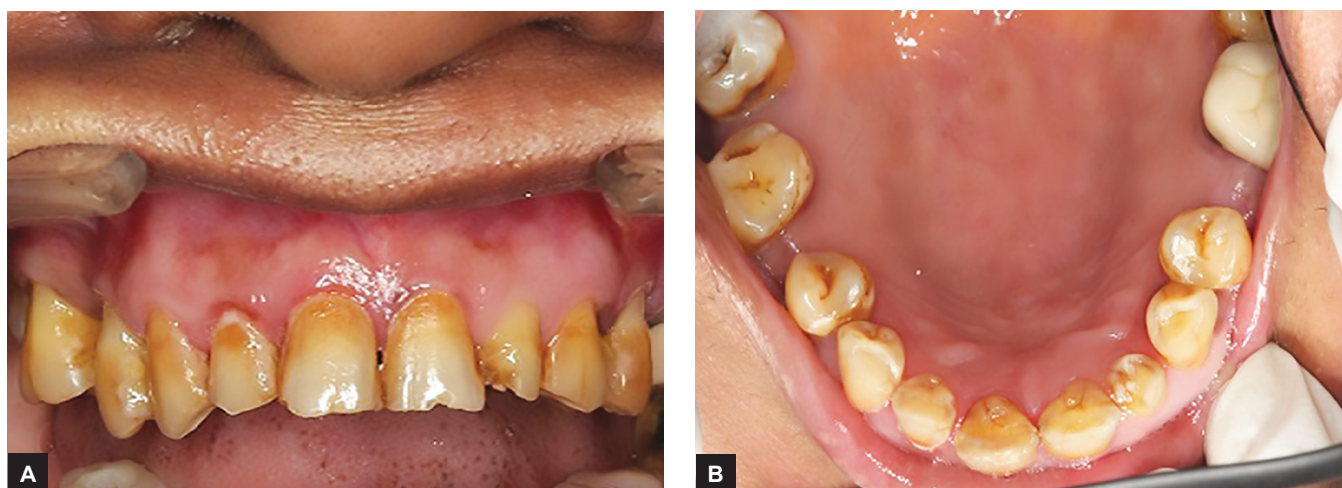
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Figs 1A and B: (A) Preoperative maxillary frontal view. (B) Preoperative maxillary occlusal view

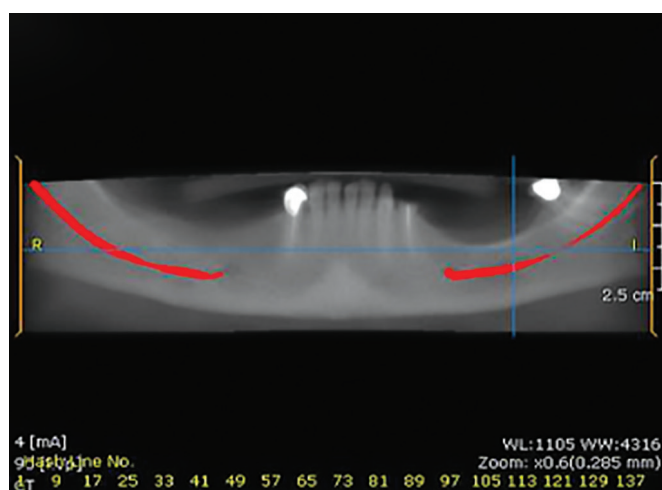


Fig. 2: Preoperative three-dimensional CBCT



Fig. 3: Complete extraction of remaining mandibular anterior teeth

and the sockets were thoroughly disinfected (Fig. 3). Osteotomy sites were prepared for two straight implants which were placed in incisive areas and two angulated implants which were placed anterior to mental foramen using surgical and Paul Malo® guide (Fig. 4). Guiding pins were placed to check the orientation of each implant (Fig. 5). Adequate stability was achieved for immediate loading; 30° multiunit abutments for angulated implants and 17° multiunit abutment for straight implants were screwed to implant and torqued to 25 Ncm. Immediate loading was planned using intraoral welding with temporary abutments, which further reduces the chances of micromotion (Fig. 6). An open tray impression was made and the bite was recorded (Fig. 7). Following this, denture was fabricated using heat cure acrylic resin and screwed to multiunit abutments (Fig. 8). A 2 to 3 mm self-cleansing relief area was provided to prevent food lodgment, and occlusal contact was avoided toward the distal of the prosthesis.⁷ After 15 days, two-staged submerged NobelActive implant was placed with region 25.

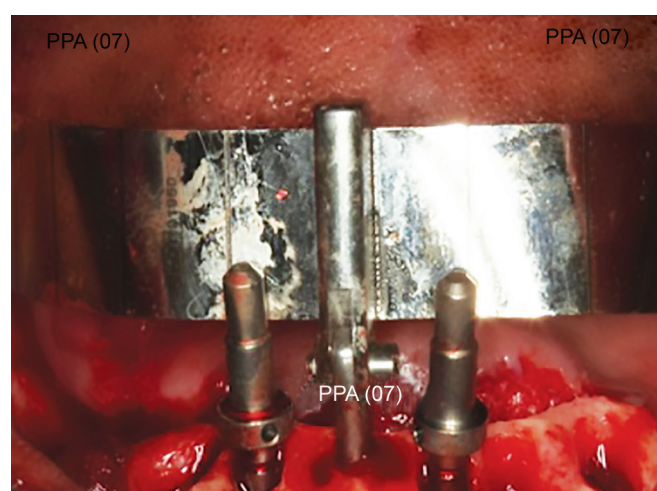


Fig. 4: Placement of Malo guide for parallelism

The patient was followed up after 3 months of successful osseointegration, and it was noticed that a few of the acrylic facings became displaced from the prosthesis, though it did not bother the patient significantly. The

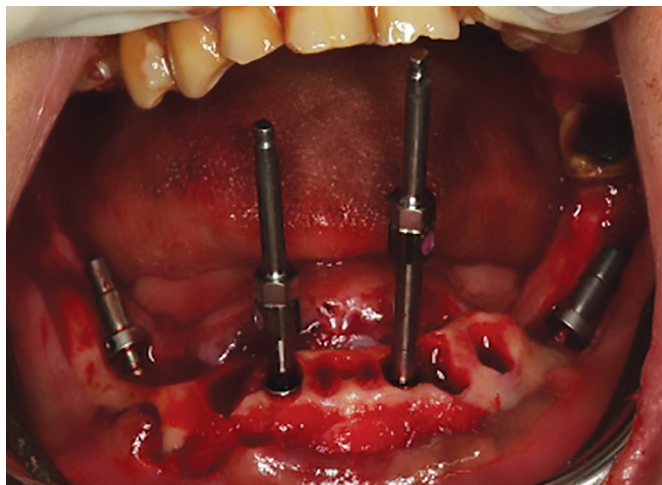


Fig. 5: Guiding pins placed for orientation of implants



Fig. 6: Temporary abutments placed and intraoral laser welding done

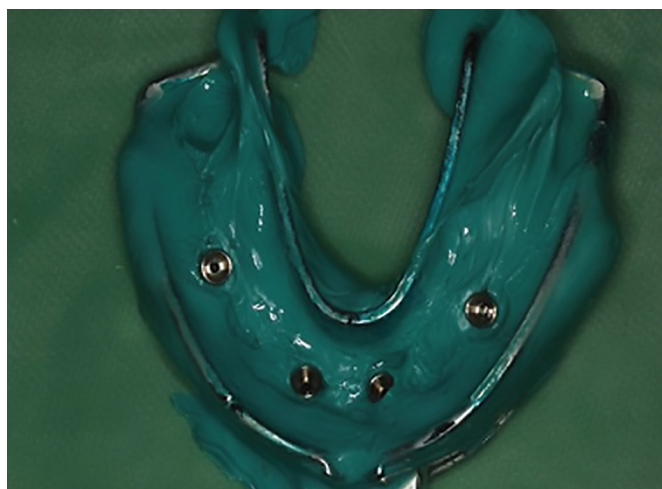


Fig. 7: Open tray impression

panoramic radiograph revealed a good bone healing and no sign of bone resorption around implant shoulders (Fig. 9). The temporary prosthesis was unscrewed and the region was thoroughly irrigated. For the discoloration

of the maxillary arch, anterior teeth were prepared for metal-free ceramic crowns with subgingival margins, and a 3-unit zirconia bridge with 1st quadrant (Fig. 10). Multiunit impression copings (multiunit Nobel care) were attached to the prosthetic abutment and splinted using low-shrinkage autopolymerizing resin. The final impression was made using open tray impression for lower arch and putty wash impression for upper arch (Fig. 11).

The centric relation and protrusive records were made with recording bases fabricated on the lower master cast. A jig was made on the articulated cast using tooth-colored resin. Following this, mandibular metal frameworks and unglazed metal-free crown and bridges were casted. Both were tested in the patient's mouth and verified using X-ray. The porcelain was fabricated with mutually protected occlusion and occlusal contacts were evaluated and adjusted. After the final glaze, maxillary crowns were cemented using resin cement (Panavia F2.0) and the lower metal ceramic bridge was torqued to 15 Ncm (Fig. 12). Oral hygiene instructions were also provided to the patient. A



Figs 8A and B: Immediate fixed provisional prosthesis fabricated



Fig. 9: Panoramic radiograph after 3 months of successful osseointegration



Fig. 10: Tooth preparation done with maxillary arch for metal-free ceramic prosthesis

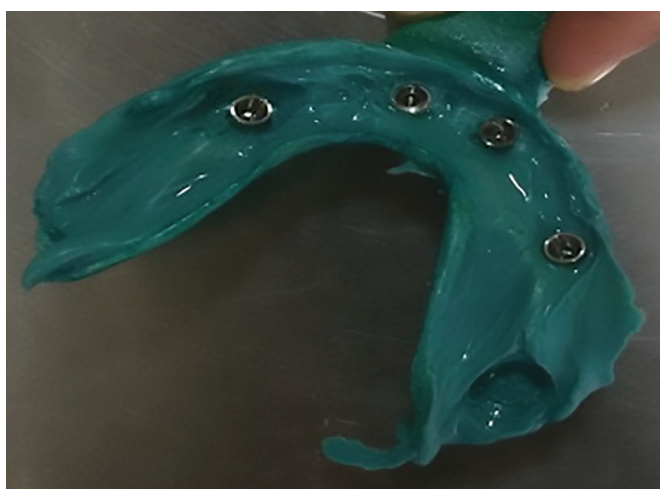


Fig. 11: Abutment level final impression



Fig. 12: Definitive prosthesis



Fig. 13: Postoperative panoramic radiograph

postoperative panoramic radiograph was taken to check the final fit and excess cement (Fig. 13). Panoramic radiographs were taken after 1 year to assess peri-implant bone loss and also the patient reported functioning well with no complications.

DISCUSSION

The All-on-4 treatment appears to be a safe option for rehabilitating edentulous jaw compared with conventional implant procedure, especially for cases with severe posterior ridge resorption or long distance patients in which immediate single-day dentures can be delivered. Studies have proved that a slight load on healing bone shortens the healing time rather than prolonging.⁸ Thus, it decreases treatment time, morbidity, need for grafting, and the cost factor. This method advocates tilting distal implants in edentulous arches, which enable the placement of longer implants, improved prosthetic support with shorter cantilever arm, improved inter implant distance, and improved anchorage in the bone.⁹ All these factors may have a role in the reduction of stress values in the implant when compared with vertical implants.^{10,11} This new protocol provided fixed teeth on the same day of the patient's initial visit to the treatment center and facilitated a successful and esthetically pleasing and functional final reconstruction.

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