

Complex Rehabilitation of Advanced Periodontitis Subject with a Staged Approach; Implant Supported Fixed Detachable Prosthesis

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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. The use of dental implants for replacement of teeth has become a routine procedure also in the periodontally compromised patient. The presence of periodontal inflammation and periapical infection often delay the placement of bone grafts as well as dental implants. When transitioning from a failing dentition to complete-arch implant rehabilitation, significant treatment planning is required. In this report a patient with severe chronic periodontitis underwent a full mouth reconstruction with staged approach. The oral function and esthetics was restored with fixed screw retained implant supported prosthesis. However supportive periodontal therapy becomes the most important aspect for survival of complex prosthesis.

Keywords: dental implants, full mouth rehabilitation, full mouth reconstruction, periodontitis, early implant placement

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1. Introduction

Chronic advanced periodontitis can result in severe loss of periodontium, which is often associated with systemic conditions. The findings reported were interpreted to document that a high degree of success can be obtained with implant therapy also in properly treated and well-maintained periodontitis-susceptible subjects.[1] Wennstorm et al [2] in a prospective randomized, controlled clinical trial described about the outcome of restorative therapy with implants in periodontitis-susceptible patients that had been restored with either machined or a rough surface topography. The study demonstrated that bone loss during the first year of function as well as annually thereafter was small and did not vary between implants with machine or rough surface designs. In our report a staged treatment approach includes the strategic retention of hopeless teeth to serve as abutments for maintaining vertical dimension of occlusion during the osseointegration period. The staged approach comprises the following steps: phase 1, diagnosis and treatment planning; phase 2, removal of disease; phase 3, strategic extractions and removable interim restoration; phase 4, prosthetically driven implant placement followed by healing period; phase 5, prosthodontic procedures for definitive rehabilitation. This treatment option offers the benefits of interim restorations throughout the treatment, maximum patient comfort, and enhanced prosthodontic control. [3,4] The purpose of this clinical report was to describe a staged approach protocol

for complete rehabilitation of advanced periodontitis subject.

2. Case Report

A 63 – year old female presented to the Faculty of Dental Science, Banaras Hindu University with the chief complaint of “not able to eat her food and having poor self image due to her appearance” (Figure 1). The patient reported that she was in good health and had no known allergy. The oral examination revealed that she had several missing teeth and majority of the remaining teeth appeared to have second or third degree mobility (Figure 2).



Figure 1. 65 year old female with failing dentition



Figure 2. Periodontally Compromised Dentition

As evident from CT scan picture (Figure 3 a,b,c), maxillary teeth appeared to flare and suffer from traumatic occlusion secondary from the condition of advanced loss of periodontal support. Molars had significant bone loss and through – and – through furcation involvement. A synopsis of the final treatment plan of the patient was as follows, oral prophylaxis to reduce infection in the mouth, after three weeks removal of all remaining teeth except molars of left side to help in guidance of vertical dimension of occlusion (Figure 4 d,e). Complete dentures with three weeks post implant placement and fabrication of detachable screw retained prosthesis.



Figure 3 a,b,c. Denta Scan 3D view

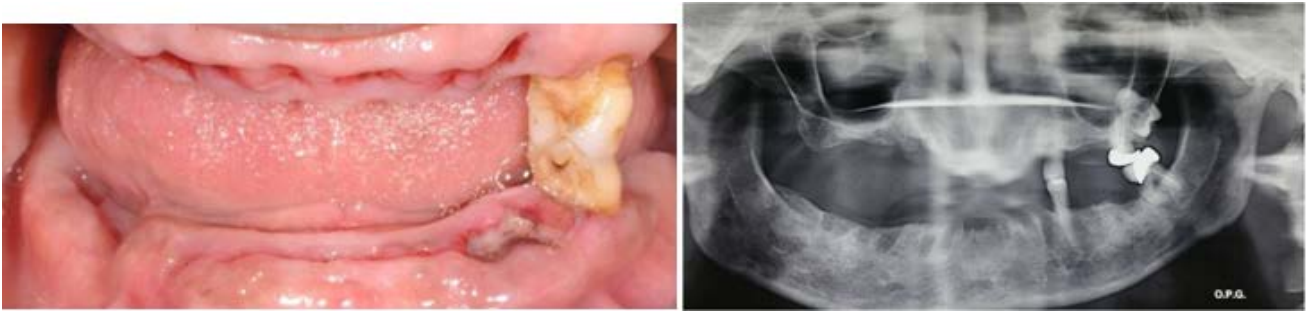


Figure 4 d,e. Edentulous Mouth With Molars and premolars Left for VDO

Two separate surgeries including (1) removal of natural teeth; and (2) placement of dental implants. Complete dentures were delivered which maintained the occlusal vertical dimension.

Three weeks post extraction six tissue level implants (Myriad Connect, Equinoxmed) were placed in mandible. 3.8/9.5 in region of 35, 34, 33, 32, 31, 41, 42, 43, 44, 45 (Figure 5a). Maxilla had six implants (Xive Dentsply) between the sinus bilaterally, 3.8/11, 3.4/11, 3.5/9.5, 3.4/9.5, 3.4/11 and 3.4/13 in 15, 14, 13, 12, 11, 21, 22, 23, 24, 25 region (Figure 5b) .The postoperative OPG (Figure 5c) after the surgery describes the correct positioning and placement of implants.

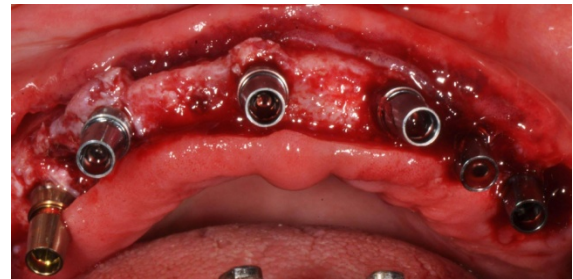


Figure 5 b. Bone level implants in maxilla

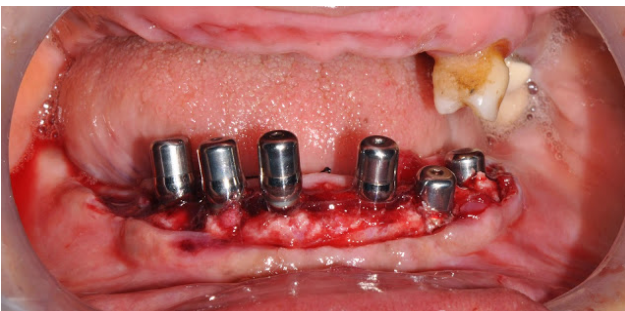


Figure 5 a. Tissue Level Implants in mandible

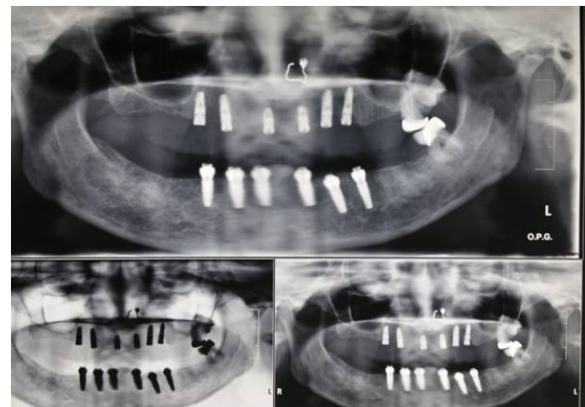


Figure 5 c. Post operative OPG

The second stage of surgery was performed ten weeks after the placement of dental implants for maxilla. Healing screws were attached on six Xive implants(Dentsply) (Figure 5d,e).



Figure 5 d. Gingival Formers



Figure 5e. Fabrication of Prosthesis

2. 1. Mandible

Three weeks after the second stage surgery, transfer caps were snapped on the tissue level implants (Myriad Connect) in the mandible (Figure 6 a,b). Direct impression with Aquasil (Dentsply) was taken and analogs were attached to the caps in the impression. The cast able sleeves provided by the manufacturer were used for fabrication of the framework. Maxilla had complete denture, when this prosthesis was being fabricated (Figure 6 c,d). Patients denture was copied and delivered to the lab with proper jaw relationship. Centric relation and protrusive records was checked with mandibular framework screwed in patient mouth after fabrication. Finally a detachable metal porcelain bridge was screwed in the mandible opposite maxillary denture (Figure 6 e,f).



Figure 6 a,b. Tissue level implants, Transfer caps



Figure 6 c,d. Analogs& Framework



Figure 6 e,f. Final Detachable Screw Retained Prosthesis For Mandible

2.2. Maxilla

Two weeks after mandible prosthesis delivery, impression transfers (Friadent, Dentsply) were attached to individual implants in maxilla with adequate torque and radiograph check. Dental floss were used to tie all impression posts together .Pattern resin (Pattern resin; GC America Inc) was flowed in liquid state to prevent over spilling and to prevent movement of transfers during

impression procedure (Figure 7a,b,c). After hardening of the resin, the assembly was sectioned and rejoined to allow for the polymerization shrinkage of the acrylic resin, direct impression was taken with a special tray fabricated chair side.

Further implant analogs were fitted in the posts which came out along with impression, and transferred to the laboratory after disinfection. Jaw relation records with midline, canine position, and the copied maxillary denture

for reference were sent along with it. The definitive casts were poured with Type IV dental stone (Silky Rock; Whip Mix Corp) with a double pouring technique (Figure 7 d,e). Casts were mounted on an articulator (Panadent; Panadent Corp) with a facebow transfer and CR interocclusal record. MP abutments with castable sleeve, (Xive and Friadent) were used for milled framework fabrication .

After the delivery of Screw retained detachable milled framework, it was checked in the mouth for passive fit. The frameworks were fabricated with palladium silver alloy (Aurolite 61 – 60.5 % Pd ,28% Sn).It was tested in mouth and with new centric occlusion records. (Figure 7 f,g,h). The metal ceramic prosthesis with canine guided occlusion for maxilla was fabricated as definitive prosthesis. Pink porcelain was used for gingival material. Anterior posterior spread for the prosthesis was evaluated before the final fabrication, cantilevers were given, not crossing

more than 1.5 times the distance between anterior and posterior most implants (Figure8, i,j ,k,l).

The prosthesis was tightened to individual implants with at least 25 N/cm² in maxilla. The occlusion was checked with protrusive and lateral movements and correction were done if required. The screw access holes were closed with Renamel Microfil (Cosmodent) after using hydrofluoric acid and silanization. Oral hygiene instructions and double floss below the framework were enforced with strict protocol. The patient was instructed to use the occlusal splint in the night to prevent overloading from possible parafunction. The patient was followed for week, one month, three months; six months and two years.

The patient had three months hygiene recall. The patient reported improvement of masticatory function and esthetics. No complications including fracture of prosthesis, loosening of prosthesis, abutments, or implants were found.



Figure 7 a,b,c. Impression Transfers, Floss, Pattern Resin



Figure 7 d,e. Special Tray Direct Impression ,Analog



Figure 7 f,g,h. Framework ,O bite Registration ,Cast Transfer



Figure 7 i,j,k. Maxillary Detachable Fixed Prosthesis

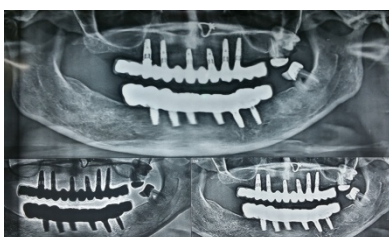


Figure 7 l. OPG

3. Discussion

Lots of studies have stated that long term prognosis of implants in chronic or advanced periodontitis cases are similar to patients with no periodontal disease patient [5,6]. However the incidence of periimplantitis was higher in patients with aggressive periodontitis as opposed to that of

chronic periodontitis [7]. After extraction of all the teeth, abundant periodontal pathogens could still be found in the edentulous subject [8]. In addition to that immune factors could not be adequately controlled after the implant treatment. Therefore patient motivation and maintenance care are the important requisites for the long term success. Although high survival rate of a fixed detachable prosthesis over a 15 year period has been reported [9], but complications do exist. Panos Papanaylidakis [10] et al did a systematic review on biological and technical complications with fixed implant rehabilitations for edentulous patients. He stated that there were both kinds of complications associated with these kinds of prosthesis. The reasons are not yet fully understood. Thus leading to clinicians select treatment options based on personal experience and observational studies because of scarcity of evidence based information. Fracture of prosthesis design, framework, functional and occlusal wear and chipping of veneering material are the most common complications associated with metal ceramic implant supported fixed prosthesis. These events may not lead to implant loss but lead to several repair and maintenance issues. Edentulous patients treated with implant supported fixed prosthesis should be informed about the high incidence of complications when considering initial treatment plan that includes fees for definitive prosthesis replacement and about the need and responsibility to continue with customized maintenance protocol for long term stability.

4. Conclusion

This case report presented the treatment procedures and results of a patient who was suffering from advanced periodontitis. To select adequate treatment option, bone resorption, jaw relation, vertical space and esthetic problems should be considered. After thorough clinical examination, radiographic assessment and provisional treatment, fixed detachable prostheses were selected. Multidisciplinary recall program is necessary to prevent maintenance complications. Thus supportive periodontal therapy and regular recall with patient motivation to

maintain the oral hygiene becomes the most important requisite for survival of a complex implant prosthesis.

Conflict of Interest

None.

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