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Case Report

All-On-4 Implants Supported Prosthesis of Immediate Function Concept: A Case Report

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Abstract: Nowadays, patients are more demanding for fixed implant-supported prostheses. But continuous residual ridge resorption after extraction of teeth is an inevitable mishap that cannot be avoided. Typically, five to ten dental implants are required for full arch rehabilitation of edentulous jaw. Sometimes, patients are not able to afford complex bone grafts and/ or a more number of dental implants. All-on-4 protocol treatment plan could be pivotal for full arch rehabilitation to increase the anterior-posterior spread and decreases the number of dental implants required. This case report describes the rehabilitation of a patient of failing dentition with fixed implant-supported prosthesis with respect to lower arch and fixed and removable prosthesis with respect to the upper arch. Significant increased in patient's self-confidence; improvement in the esthetics, phonetics, and masticatory function and patient satisfaction was excellent.

Keywords: Full arch Rehabilitation; Edentulous Jaw; Implant-Supported Prosthesis, anterior-posterior spread.

INTRODUCTION

Elderly patients who struggle to adapt sufficiently to removable complete or partial dentures may experiences severely compromised quality of life. Implant-supported prostheses are successful treatment modalities that can be used for single tooth replacement to full mouth rehabilitation. Depending on the number of the implants used in fully edentulous patients, the restoration can be removable or fixed [1, 2].

The factor deciding the type of prosthesis is the amount of bone available, interocclusal space, patient demand. With the All-on-4 treatment concept, extremely compromised edentulous and failing dentition condition can be restored in a predictable, promising favourable and long term result. An All-on-4 prosthesis is a screw-retained hybrid prosthesis supported by four dental implants [3]. This procedure is based on immediate loading and not requiring bone graft, can be performed in the available amount of bone.

The main advantage of this prosthesis is the ability to correct implant angulations while maintaining the passive fit and esthetics and substituting the lost tissues in severely resorbed ridges [4-6]. Distal most implants are tilted (17º-45º, not more than 45º) to increase the anterior posterior spread of the implants, thus allowing the use of longer implants and minimizing/ eliminating the complications related to distal cantilever.

This article reports the treatment procedure with full mouth rehabilitation using metal-resin hybrid prosthesis with 1.5 years follow-up.

CASE REPORT

A female patient 56 years of age, with non-significant medical history presented with complaint of difficulty in chewing food. On examination, patient had periodontally compromised carious teeth in lower jaw. Radiographic examination showed that bone volume in upper and lower jaw was inadequate to support the implants in the posterior region (Figure-1).

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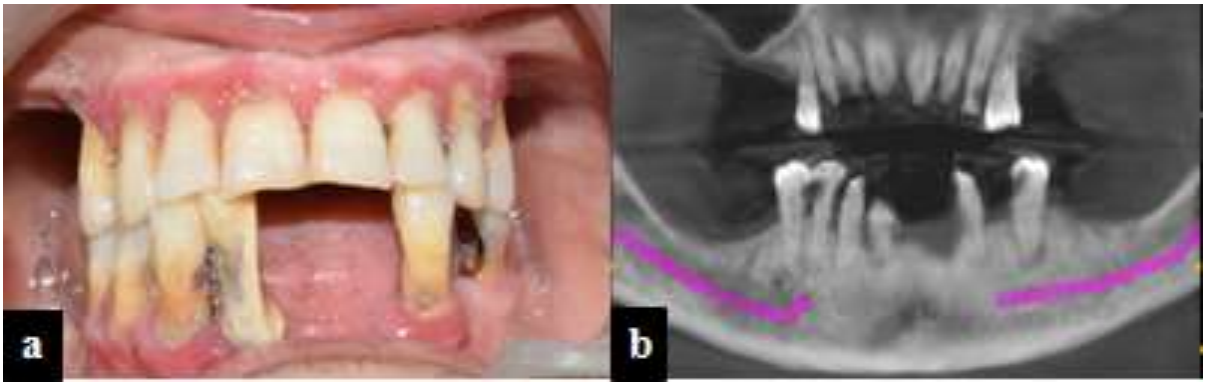

Fig-1: (a) Pre-op intraoral view (b) Radiographic view

On the basis of available bone volume, implant supported fixed prosthesis was planned and patient was willing for the same. For that, All-on-4 implant supported prosthesis was planned w.r.t lower jaw. All measurements for implant size selection were planned with CBCT measurements of patient using software of CS 3D imaging.

All steps of surgical phase were done under antibiotic coverage. The mandibular rehabilitation was initiated with surgical procedures under local anesthesia. Mucoperiosteal flap was reflected after extraction of mobile teeth (Figure-2a). Osteotomy at second premolar region was performed by keeping the drill at 35º with the help of Malo guide (Figure-2b). Selected implants were placed at osteotomy sites. Straight and angulated titanium multiunit abutments (30º) were placed on implant put at 33, 43 and 35, 45 regions respectively (Figure-2c). At each site insertion torque was achieved more than 35 Ncm. A postsurgical oral pantogram was taken. Sites were marked on tissue surface of interim denture and reliving holes were drilled. Titanium cylinders were secured over the TMA (Figure-2d).

Reliving hole should be prepared such that the placement of denture shouldn't interfere with titanium cylinder (Figure-3a). There should be a gap of 1-2mm between denture and cylinder. Interim denture was unscrewed along with cylinders after self cure resin (DPI, India) polymerization and further resin applied in deficient sites (Figure-3b).

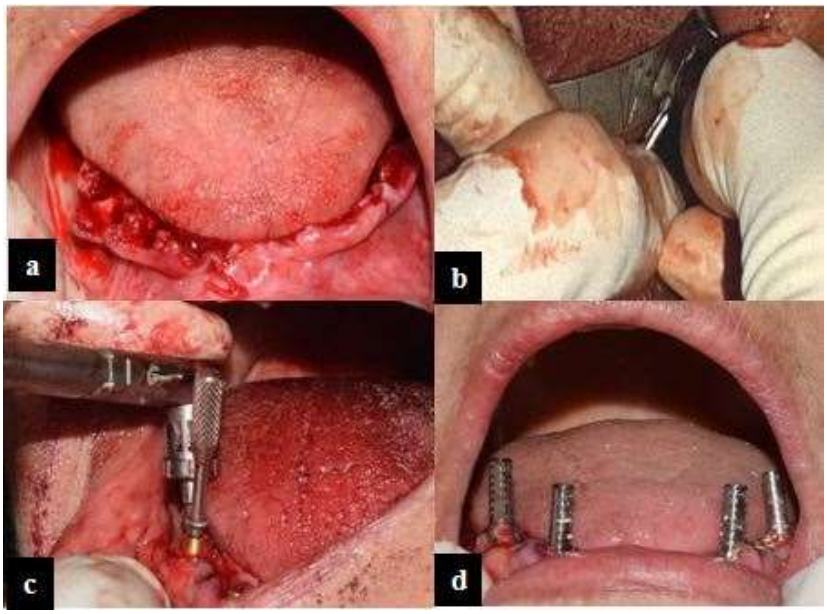

Fig-2: (a) Mucoperiosteal flap elevation (b) Osteotomy site preparation with Malo guide (c) TMA tightening (d) Titanium cylinder attachments

All flanges were trimmed; all areas were finished and polished to create a easily cleansable areas. A torque not more than 15 Ncm was used to screw the prosthesis for immediate function. Any premature interference adjusted and the first molar region kept out of occlusion during healing phase (Figure 3c).

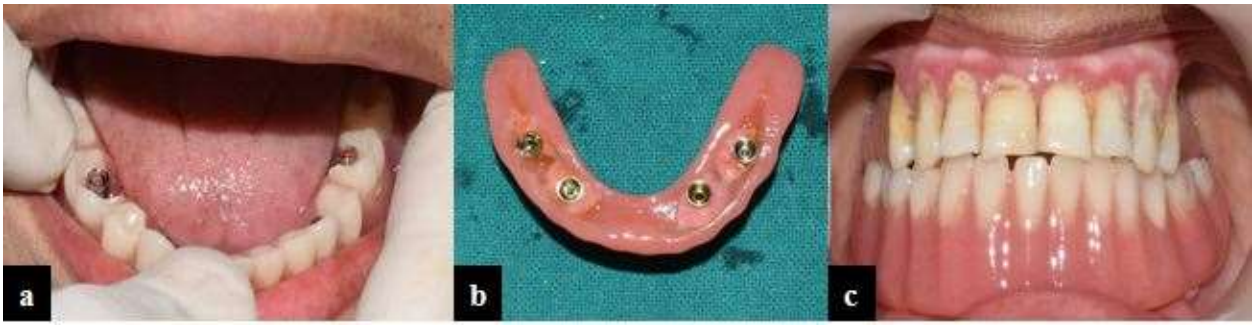

Fig-3: (a) Interim prosthesis placement (b) Interim prosthesis tissue surface (c) Interim prosthesis in occlusion

Patient was instructed for soft diet for a week and hygiene maintenance. After 1 week, patient was recalled; sutures were removed and evaluated for hygiene (Figure-4). Patient was evaluated clinically as well as radiographically every month. After 4 month of implant placement, prosthetic procedure was started after evaluation of osseointegration.

A custom tray was fabricated with a window extending anterio-posteriorly for open tray implant level impression. Open tray copings were secured with dental floss & pattern resin (GC pattern resin LS) to prevent any movement of copings while impression (Figure 5 a, b, c).

Fig-4: Post-op after 1 week

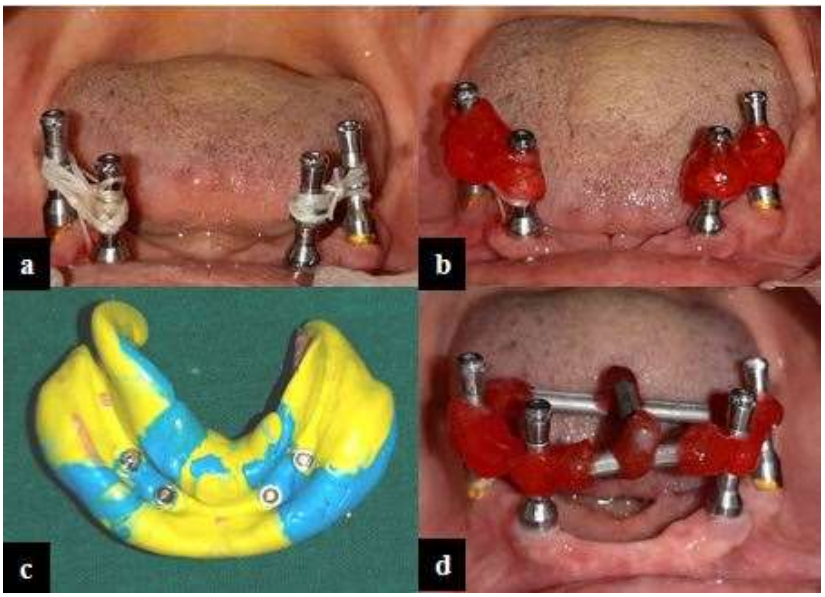

Fig-5: (a) Impression coping spinted with dental floss (b) Pattern resin splinting (c) Final impression (d) Verification jig trial

A verification index for was fabricated with pattern resin (GC pattern resin) and was checked intraorally to confirm the accuracy of the final impression (Figure-5d).

Occlusal vertical dimension was established and centric relation records were made with customized record bases and occlusal rims (Figure 6 a, b). The metal framework was fabricated and distal cantilever extended to first molar region on both sides. Esthetics and phonetics were evaluated, and the patient's acceptance was obtained at the trial insertion (Figure-6c).

Definite metal resin hybrid de prosthesis was fabricated [Figure 6(d)] and Occlusal adjustments were done intraorally.

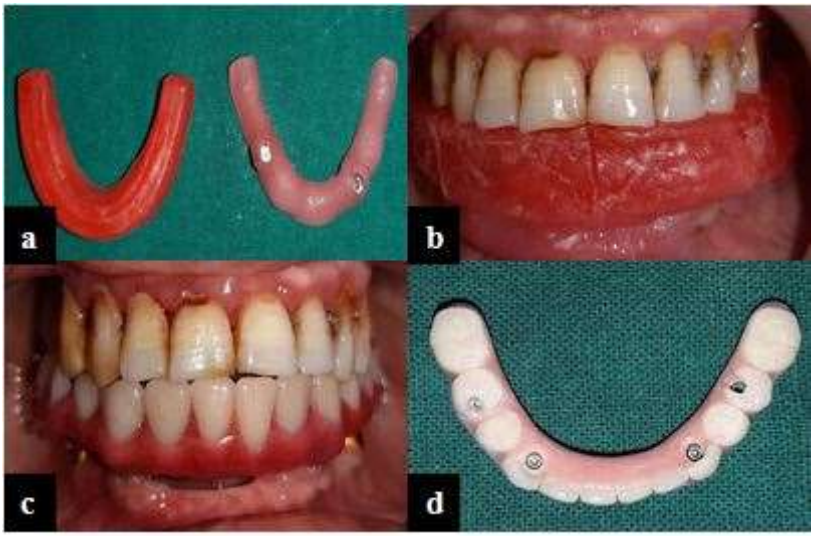

Fig-6: (a) Customized occlusal rim and adapted base (b) Occlusal relation record (c) Try-in (d) Definite prosthesis cameo surface

There should be access for proper hygiene measures between the tissue surface of definite prosthesis and mucosa (Figure 7 a, b).

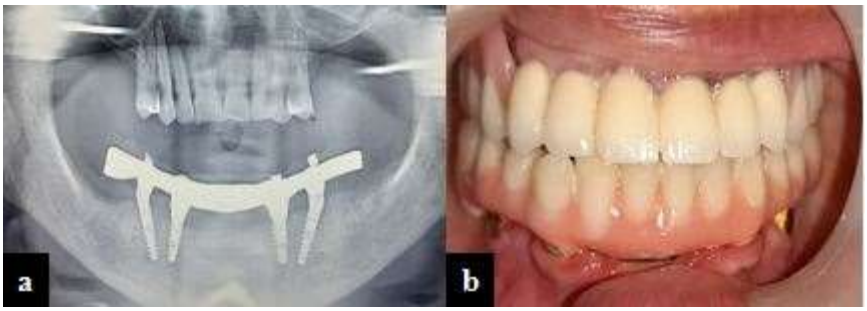

Fig-7: (a) Definite prosthesis radiographic view (b) Definite Prosthesis in occlusion

DISCUSSION

Implant supported hybrid prosthesis can provide satisfactory results where esthetic and functional requirements are demanding and challenging. Fixed implant-supported prostheses can be divided into screw-retained and cement-retained prostheses. The main advantages of cement-retained prostheses are esthetics and the passive fit, while screw-retained prostheses offer easy retrievability [7-10]. The patient's acceptance of the prosthetic treatment plan and restorative solution was certainly promoted by the fabrication of implant supported hybrid prosthesis.

Cantilever length is also an important parameter that is to be evaluated when deciding to fabricate implant supported acrylic screw-retained hybrid prosthesis [11-13]. The researchers suggested a mandibular extension of length between 15 and 20 mm to minimize the risk of framework fracture [13]. Besides, the opposing occlusion and the number and distribution of implants should also be considered, before the determination of cantilever length. Frameworks are made of metal alloys ranging from high noble to titanium or base metal alloys [12, 13].

CONCLUSIONS

With All-on-4 protocol, rehabilitation of the patients can be facilitated with significant improvement in the esthetics, phonetics and masticatory function. Advantages of all-on-4 implant procedures include immediate function, highly cost effective as compared to conventional dental implant procedures. Patients feel more confident in their smiles, improving their overall sense of self esteem and well being.

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