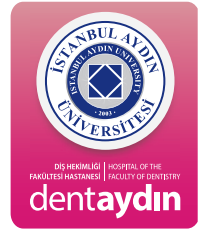




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Immediate Prosthetic Treatment of an Edentulous Patient With “All-On-4®” Concept

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Alper UYAR¹, Simel AYYILDIZ¹, Bülent PİŞKİN¹, Can DURMAZ²

ABSTRACT

Background: Protocols of immediate and early loading of dental implants are well documented and described. “All-on-4” technique has become an alternative option for fixed immediate rehabilitation of edentulism especially with severe bone loss.

Objective: In this case report it is aimed to present full mouth immediate restoration of an edentulous patient following the concept of “All-on-4”.

Case Description: After radiographs and pictures taken, a CT scan was performed and diagnostic models were prepared. Following the placement of the implants and ending the surgery, impressions were taken and dentures, fabricated before the surgical phase, were checked. These dentures were converted to screw retained prostheses in the lab and placed next day. After three months, hybrid prostheses were fabricated and screwed in place. After one-year follow-up, any problems were encountered.

Practical Implication: With immediate loaded screw retained provisional dentures, patient’s esthetic and functional expectations were met in the shortest time period possible.

Keywords: *Immediate loading, edentulism, all-on-4*

ÖZET

Giriş: Dental implantların immedat ve erken yükleme protokolleri ayrıntılı şekilde tanımlanmıştır. “All-on-4” tekniği özellikle ciddi kemik kaybı bulunan tam dişsizlik vakalarında bir immedat sabit tedavi seçeneği haline gelmiştir.

Amaç: Bu olgu raporunda tam dişsiz bir hastanın “All-on-4” konsepti kullanılarak immedat rehabilitasyonunun sunulması amaçlanmıştır.

Olgu Sunumu: Hastanın radyografilerinin ve fotoğraflarının alınmasının ardından Bilgisayarlı Tomografi görüntülemesi yapılmış ve tanı modelleri hazırlanmıştır. İmplantlar yerleştirildikten hemen sonra, cerrahi prosedürden önce hazırlanan tam protezler uyumlanmış ve ölçü işlemleri gerçekleştirilmiştir. Protezler model üzerinde modifiye edilerek immedat vidalı sabit protezler haline getirilmiş ve bir gün sonra ağza takılmıştır. Takip eden üçüncü ayın sonunda metal altyapılı porselen protezler için ölçü işlemleri tekrarlanarak hastanın daimi restorasyonları hazırlanmıştır. Bir yıl boyunca yapılan kontrollerde herhangi bir sorunla karşılaşılmaştır.

Klinik Uygulamalar: İmmedat yükleme ve vidalı implant destekli geçici protezler sayesinde hastanın estetik ve fonksiyonel beklentileri mümkün olan en kısa sürede karşılanabilmiştir.

Anahtar Kelimeler: *immediate yükleme, dişsizlik, all-on-4*

¹ Department of Prosthodontics, Dental Health Sciences Center, Gulhane Military Medical Academy, Ankara, Turkey

² Oral Surgeon, Private Clinic, Ankara, Turkey

INTRODUCTION

A certain part of the population suffers through non-restorable and unsustainable terminal dentition such as; failing restorations, multiple tooth losses and severe periodontal diseases. The remaining teeth of such patients are often in poor condition and not suitable for support. These patients usually become edentulous after a long and painful period and start wearing removable dentures. As an alternative to the complete dentures, osseointegrated implant supported fixed restorations give the patients their long lost life-quality back. Adequate number of implants to support fixed dentures for the rehabilitation of edentulous jaws is stated by the Bränemark protocol as 6 to 8.¹ Beside the financial burden, caused by the high implant numbers, rehabilitation of edentulous jaws that have poor bone quality or severe resorption may be challenging for surgeons and prosthodontists both.² Although there are many reconstructive techniques to increase the bone volume, particularly for reduced bone height in posterior region, and to establish suitable sites for the placement of required number of implants, patients generally avoid these techniques due to the long healing periods, multiple surgical phases and high costs.³

These limitations led to the researches for a solution with fewer implants. The All-on-4® concept, a surgical and prosthetic protocol, has been well documented and published with prosthetic survival rates of 93- 99%.^{3,4}

The method was based on using 4 implants of which distal two were placed tilted with an angle of 30° to 45° to prevent possible interferences with sinus or mental foramen during surgery, to minimize the need for reconstructive surgery and provide a higher anchorage and primary stability. Moreover,

these angulations increase the inter-implant distances for better prosthetic support by shorter cantilevers and improved load distribution.⁴

In the last years, the immediate placement and loading procedures of the implants for the rehabilitation of edentulous patients have become a common treatment protocol among the clinicians. The reason of the popularity is the need to regain aesthetics, function as soon as possible and the high success rates of the method, reported by previous studies.⁵⁻⁹

This case report aims to present the rehabilitation of an edentulous patient with concerns on appearance and hardships of using removable dentures.

CASE REPORT

A 55-year-old male patient with an unremarkable medical history referred to Gülhane Military Medical Academy, Department of Prosthodontics with the request of being treated with fixed prosthesis. Following the intraoral examination and radiographic evaluation, a CT scan was performed. It was seen that all teeth but a single lower left canine were lost and bone defects in maxilla were noted (Fig.1). Alginate impressions for diagnostic study casts were made and photographs were taken. Smile line and visibility of the periodontium were evaluated. Finally, implant supported hybrid prostheses were chosen for the rehabilitation of the patient and regarding treatment costs and patient's immediate treatment request, “All-on-4®” concept was used.¹⁰

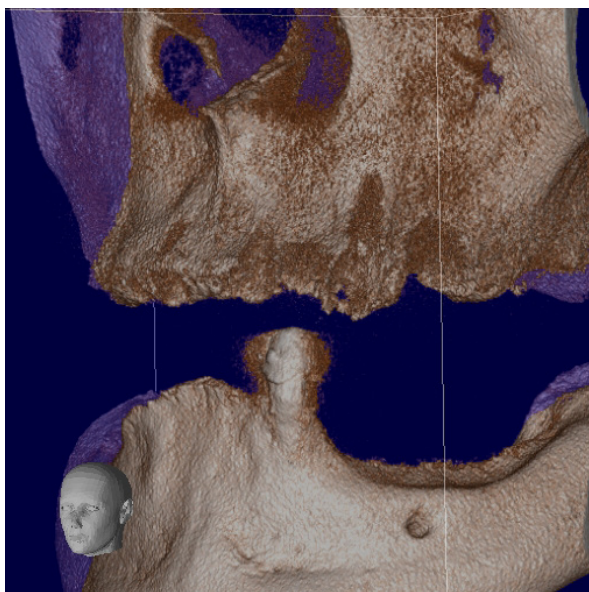


Figure 1. Bone defects and remaining tooth in CT scan image.

Diagnostic models and a wax-up were made, and transitional complete dentures and surgical stents were fabricated.

After flap elevation, the remaining tooth was extracted and alveolar ridges were reduced vertically, where needed, to establish a sufficient interarch distance and a platform like surface. 8 implants (Oxy OsseoNova Internal Hexagon, Colico, Italy) were placed according to the manufacturer's guidelines. Posterior implants (4,75x15mm) were inserted distally tilted to avoid maxillar sinus and foramen mentale between first and second premolar regions while anterior implants (3,75x11 for maxilla, 4,75x13mm for mandibula) were placed in to the lateral incisor regions. All implants were placed with primary stability using a manual torque wrench with 50 Ncm. 35° and 17° angled base abutments with different collar heights were chosen for each implant and screwed to the tilted and anterior implants respectively with a torque limit of 25 Ncm. The tissues were repositioned and

sutured after bone grafts were used for the augmentation of bone defects.

Between implant placements of maxilla and mandibula, upper interim denture was modified according to the implant locations and abutment positions. Occlusal relation was checked and the denture was relined. Following mandibular implantations and abutment placements same procedure was repeated for lower denture.

Multi-unit impression copings for open-tray technique were screwed onto the abutments and splinted with dental floss and auto-polymerizing resin (Pattern Resin, GC America, Illonis, United States). Impressions were made using a polyvinyl siloxane material (Zhermack Elite HD, Zhermack SpAVia Bovazecchino, Italy). Healing caps were screwed in place following the impressions and surgical stage was completed.

After the casts were made, temporary cylinders were screwed on the analogs and using autopolymerizing acrylic resin (Meliodent, Heraus-Kulzer, Germany) the transfers were splinted in to the denture. Before the insertion of the dentures, flanges and distal extensions were removed. Screws of the immediate prostheses were torqued to 15 Ncm and the occlusion was adjusted (Fig.2). Controls were made after one week and every month.



Figure 2. Immediate screw-retained acrylic prostheses after 1 month. Acrylic fracture at the left molar region of lower denture is seen.

Three months after the surgery, open tray impressions were made for the definitive restorations after the removal of the interim denture. Co-Cr metal frameworks were casted in laboratory. The frameworks were checked for passive fit then screwed on the abutments and maxillomandibular relation was recorded. Following porcelain veneering, occlusion, centric relation, aesthetics and phonetics were evaluated and necessary modifications were made at the try-in session. Completed restorations were inserted and screwed in place with a torque of 35Ncm (Fig. 3). The screw holes were filled with composite resin material that matches the porcelain shade (Filtek Z 250 Universal Restorative, 3M ESPE, St Paul, Minneapolis, United States).



Figure 3. Definitive prostheses.

After the placement of the dentures, hygienic measures were explained to the patient and control appointments were arranged as 1 day, 1 week, 3 months and 1 year. The patient was satisfied with the esthetic and functional outcomes of his prostheses. Implants and surrounding bone were examined with an OPG after three months and one-year (Fig.4). No problem of osseointegration, soft tissue profile, function or aesthetics was observed in one-year follow-up period.

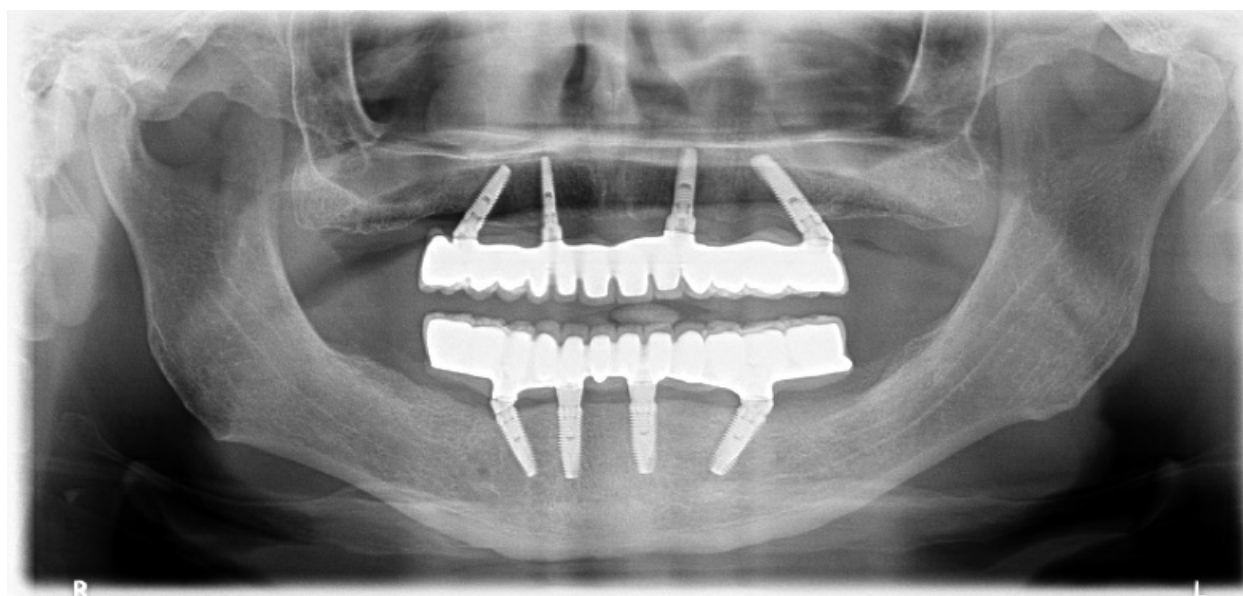


Figure 4. OPG after 1-year.

CONCLUSIONS

The All-on-4 concept is a successful treatment option with excellent clinical results and it is achieved without major reconstructive surgery. The reduced number of implants drags down the cost compared to traditional implant supported fixed restorations. However, careful considerations and a detailed pretreatment planning have to be made on aesthetic and functional outcomes. Therefore; smile line, amount of the vertical bone loss, and crown height space should be evaluated before the implant supported hybrid dentures were chosen for the rehabilitation of the edentulous patient. Advantages and disadvantages of fixed and removable options should be explained and discussed with the patient. An overdenture can be maintained with simpler hygiene practices, which may be beneficial for the elderly patients. Also a removable prosthesis would be more useful in case of a serious need of lip support, as the flange on a removable solution may assist in supporting the facial contours.

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