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Full-Arch Rehabilitation with the All-on-6 Implant Concept: A Contemporary Two-Case Series

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Abstract

Complete edentulism adversely affects mastication, speech, facial esthetics, and overall quality of life. Although conventional complete dentures remain a common treatment option, many patients experience compromised retention, stability, and comfort. Implant-supported full-arch fixed prostheses have emerged as a predictable and effective alternative for the rehabilitation of edentulous arches. Among these treatment modalities, the All-on-6 concept offers enhanced biomechanical support, improved stress distribution, reduced cantilever length, and greater prosthetic stability.

This case series presents the rehabilitation of two completely edentulous patients using the All-on-6 implant-supported fixed prosthetic concept. Both patients were dissatisfied with their existing complete dentures and desired a fixed treatment solution. Comprehensive clinical and radiographic examinations, including cone beam computed tomography (CBCT), were performed for treatment planning. Six implants were strategically placed in each arch based on available bone volume and quality. Following successful osseointegration, digital impressions were obtained using scan bodies, and verification jigs were fabricated to ensure passive fit. Definitive screw-retained full-arch prostheses were then fabricated and delivered through a digital workflow.

Clinical and radiographic evaluations demonstrated successful implant integration, satisfactory peri-implant tissue health, and stable prosthetic outcomes. Both patients reported significant improvements in masticatory efficiency, speech, esthetics, comfort, and overall satisfaction compared with their previous conventional dentures. No biological or mechanical complications were observed during the follow-up period.

The findings of this case series suggest that the All-on-6 implant concept is a predictable and effective treatment option for full-arch rehabilitation in completely edentulous patients. The combination of strategic implant placement and digital prosthetic workflows can provide favorable functional and esthetic outcomes while enhancing patient satisfaction.

Keywords: All-on-6, Dental Implants, Full-Arch Rehabilitation, Implant-Supported Fixed Prosthesis, Digital Dentistry, Edentulism, Case Series.

Introduction

Complete Edentulism significantly compromises mastication, phonetics, facial esthetics, and overall quality of life. Conventional complete dentures, although widely used, often fail to provide adequate retention, stability, and patient satisfaction, particularly in cases with advanced ridge resorption. Implant-supported fixed full-arch prostheses have therefore become a predictable and preferred treatment modality for the rehabilitation of edentulous arches [1,2].

The concept of full-arch rehabilitation using a reduced number of implants was introduced to minimize surgical morbidity, treatment time, and cost while maintaining favorable clinical outcomes. While the All-on-4 concept has been extensively documented, increasing evidence suggests that the placement of six implants per arch (All-on-6 concept) offers biomechanical advantages, including improved stress distribution, reduced cantilever length, enhanced posterior support, and potentially improved long-term prosthetic stability [3,4].

Recent clinical studies and systematic reviews have demonstrated comparable or superior implant survival rates and prosthetic success for full-arch prostheses supported by six implants when compared with four-implant designs, especially in maxillary rehabilitations and cases with compromised bone quality [4–6]. The use of additional implants allows greater flexibility in implant positioning, improved load sharing, and reduced mechanical complications such as screw loosening, framework fracture, and peri-implant bone loss [6,7].

Advancements in digital dentistry, including computer-aided design/computer-aided manufacturing (CAD/CAM), guided surgery, and high-strength prosthetic materials, have further enhanced the predictability of All-on-6 rehabilitations. Recent case reports and clinical studies have highlighted favorable functional outcomes, esthetic results, and high patient satisfaction associated with All-on-6 implant-supported full-arch prostheses [1,3,8].

Despite growing evidence, literature documenting detailed clinical protocols and outcomes of All-on-6 rehabilitations remains limited, particularly in the form of well-documented case series. Reporting such cases contributes to the existing body of evidence and aids clinicians in decision-making regarding implant number selection for full-arch rehabilitation [4,9,10].

Therefore, the purpose of this article is to present a case series of two patients rehabilitated using the All-on-6 implant-supported full-arch prosthetic concept, highlighting the clinical workflow, prosthetic protocol, and short-term clinical outcomes.

Case Report 1

A 62 year old male patient reported with completely edentulous maxillary and mandibular arches to the prosthodontics department. He was using complete dentures for a period of 6 months and was not satisfied and wanted a fixed prosthesis. After a complete examination of the bone, which was D2 type in both the arches (porous cortical and coarse trabecular according to Misch classification), a treatment plan was decided to place six implants in the maxilla and six implants in the mandible. Implant planning was done after OPG and the

cone beam computed tomography (CBCT) examination as shown in (Fig 1A and B.)

Figure 1A: Pre operative OPG

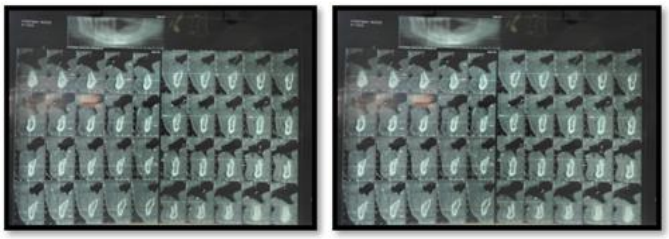

Figure 1 B: CBCT (Cone Beam Computed Tomography)

Six implants were placed in the 13, 14, 16, 23, 24, and 26 regions of Maxillary arch and six implants were placed in mandibular arch in 32, 35, 36 and 42, 45, 46 region according to the availability of the bone. Multiunit abutments were placed at the time of surgery and comfort caps were placed on them. (Fig 2.) showing implant placement in maxillary and mandibular arch. While (Fig 3.) showing Post operative OPG

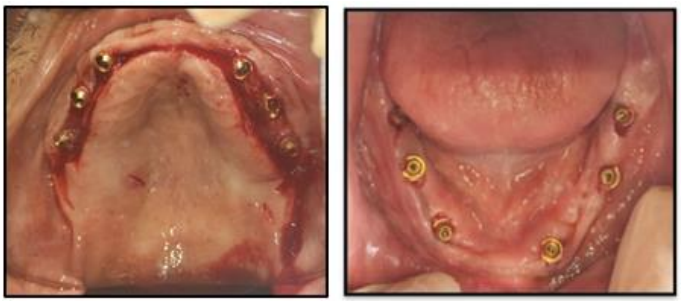

Figure 2: Placement of implants with Multiunit abutments in maxilla and mandible

Figure 3: Radiograph showing six implants each in maxilla and mandibular arch

After 3 months patient was recalled, digital impressions were made with maxillary and mandibular arch with scan bodies and the files were transferred to the laboratory as shown in (Fig 4). After that Jig was made with pattern resin. (Fig 5) showing Jig trial in maxillary and mandibular arch for which pattern resin was used.

Figure 4: Making of Digital impression by Intraoral scanning

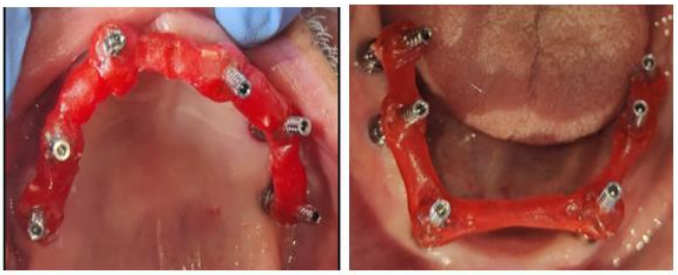

Figure 5: Fabrication of Jig in maxillary and mandibular arch

Following the jig trial, a metal bar was fabricated, its passiveness was checked and further denture base and occlusal rims were send by laboratory on which the vertical dimension and centric relation of patient was

recorded. After which resin trail was done (Fig. 7) in which esthetics and phonetics was evaluated. Final Prosthesis was made with HIPC. Occlusal adjustments were performed. The patient was scheduled for regular recall (Fig. 8)

Figure 6: Fabrication of Metal Bar in maxillary and mandibular arch

Figure 7: Resin trial verification

Figure 8: Final prosthesis made with HIPC

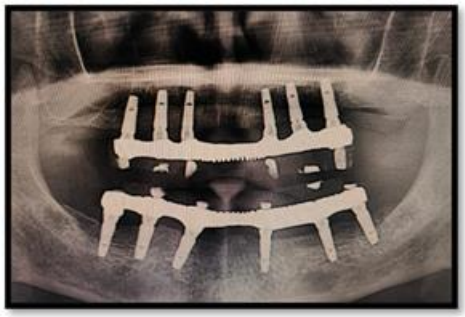

Figure 9: Post Operative OPG

Case Report 2

A 75 year old male patient reported to clinic complaining edentulism since 2 years. A full arch implant supported maxillary arch prosthesis was planned.

The patient was given a complete denture and was asked to use it for 2 weeks after that the denture was duplicated and used as surgical stent for implant placement. (Fig.2)

Six implants were placed in the 13, 15, 17, 23, 25, and 27 regions of size in the maxilla and 33, 36, 37, 43, 46, 47 in mandible. (Fig. 3) Multi unit abutments were placed at the time of surgery covering them with comfort caps.

Jig verification was performed intraorally which was made on the diagnostic cast with the use of pattern resin after Jaw relation was recorded using record base and occlusal rims. (Fig. 5) The entire assembly was articulated and evaluation of inter ridge distance was done. Implant-supported fixed prosthesis (FP-3) was planned accordingly. The resin trial was performed (Fig. 6) followed by Bisque Trial (Fig. 7). Final Prosthesis insertion was completed and a torque of 20 Ncm was given for screw-retained prosthesis. Occlusal adjustments were performed. The patient was scheduled for regular recall (Fig. 8)

Figure 1: Pre Operative OPG

Figure 2: Using Surgical Stent in maxillary and mandibular arch for preapartion of the Ostetomy site

Figure 3: Implant placement in maxillary and mandibular arch

Figure 4: Post implant placement OPG

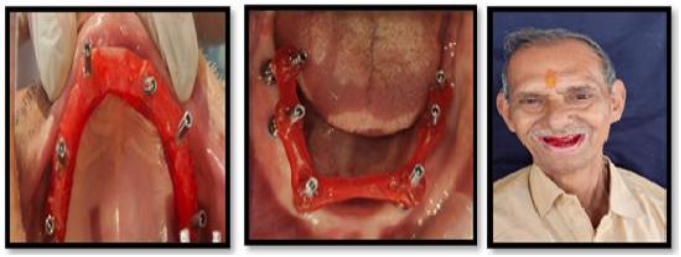

Figure 5: Jig trial and recording of jaw relation

Figure 6: Resin Trial

Figure 7: Bisque Trial

Figure 8: Final Prosthesis

Conclusion

The All-on-6 implant-supported full-arch rehabilitation concept provides a predictable and effective treatment option for completely edentulous patients. The strategic placement of six implants offers favorable biomechanical support, improved stress distribution, enhanced prosthetic stability, and reduced cantilever effects, thereby contributing to successful functional and esthetic outcomes.

In the present case series, both patients demonstrated significant improvements in mastication, speech, comfort, and overall quality of life following rehabilitation. The incorporation of a digital workflow further enhanced treatment precision and efficiency. Within the limitations of short-term follow-up, the All-on-6 concept proved to be a reliable contemporary approach for full-arch rehabilitation, warranting further evaluation through long-term clinical studies.

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