

Full Mouth Rehabilitation with “All on Four Technique”: A Case Report

Abhishek Sharma^{1*} Shambhavi Shukla² Sumit Singh Phukela³ Mahima Dua⁴ Gaurav Setya⁵
Bhupender Yadav⁶

¹Senior Lecturer, Department of Prosthodontics, Teerthankar Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India.

²PG Student Department of Prosthodontics, Institute of Dental Studies & Technologies, Modinagar, Uttar Pradesh, India.

³Professor, Department of Prosthodontics, Faculty of Dental Science, SGT University, Gurgaon, India.

⁴Senior Lecturer, Department of Oral & Maxillofacial Pathology, Inderprastha Dental College, Sahibabad, Ghaziabad, India.

⁵Professor, Department of Conservative Dentistry and Endodontics, Faculty of Dental Science, SGT University, Gurgaon, India.

⁶Reader, Department of Prosthodontics, Faculty of Dental Science, SGT University, Gurgaon, India.

ABSTRACT

Background: Implant dentistry has progressed to a great deal in the recent times. Dental implants have become the first line of treatment option for replacement of missing teeth. The difficulty in adapting to complete dentures makes them a second-best choice for people who are completely edentulous. All on 4 treatment protocol has helped in achieving excellent treatment results economically in patients who are completely edentulous. The procedure involves placement of four dental implants in the maxillary arch and four dental implants in the mandibular arch. Two out of the four dental implants are placed in an axial position while the two implants are placed in an angulated position. A full mouth rehabilitation with all on 4 protocol helps improving the esthetic and functional requirements of a patient. This protocol can be followed in patients with insufficient bone levels in the posterior maxilla and mandible or in patients who are willing for an economical treatment option.

Keywords: All on four, Dental Implant, Full Mouth Rehabilitation, Hybrid Denture.

INTRODUCTION

Implant dentistry in the recent times has shown great advancements from techniques to implant designs and implant surface modifications. This has helped us in providing better prosthetic restorations with the finest esthetic and functional results.¹ Several parameters are the crucial requisites to achieve the finest results, these include, adequate bone height, adequate soft tissue quantity & quality and proper treatment planning.²

A full mouth rehabilitation process using dental implants is planned, keeping in mind the same parameters and also the economic capabilities of the patient. The number of dental implants and type of prosthesis to be placed during the process of rehabilitation depends on the patients requirements,

the availability of bone, soft tissue condition and the age factor of the patient.³

Inadequate ridge height may be due to long span of edentulousness. This can be treated by using short length implants in areas where the bone is deficient and the vital structures are near. Other options include giving a cantilever prostheses or doing a vertical ridge augmentation surgery followed by implant placement 6-8 months post augmentation.⁴ Short implant placements have considerably less success rates especially in posterior maxilla due to the bone being more porous. Vertical augmentation on the other hand is a more extensive surgical procedure and the outcomes are less predictable so the patient acceptance in such situation is generally less.

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*Correspondence Dr. Abhishek Sharma.

Department of Prosthodontics, Teerthankar Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India.

Email: drabhishek.smile@gmail.com

Due to the less predictable long-term prognosis associated with the above mentioned procedures, the “All-on-Four” technique was proposed by Dr. Paulo Malo in the year 1993 for the rehabilitation of edentulous jaws.^{5,6,7} The “All-on-Four” concept involved placement of four dental implants, two of which were placed axially and two implants were placed in a tilted position.^{8,9} The axial implants were placed in the anterior part of fully edentulous while the tilted implants were placed in the posterior, premolar region.

A Combination of straight and tilted implants to support a fixed prosthesis can be considered a successful treatment possibility.^{10,11} This treatment can be achieved in a simple and less time consuming way. Also the total financial costs of the treatment and the surgical procedure is less significantly, also postsurgical patient is more.¹²

CASE REPORT

A 89-year-old man who underwent extraction of all the natural teeth one year ago reported to the dental office requiring a fixed prosthetic rehabilitation. The patient had no significant medical history inspite of his age.



Fig 1:The panoramic radiograph revealed sufficient alveolar bone in both the maxillary and mandibular jaws.

The panoramic radiograph revealed sufficient alveolar bone in both the maxillary and mandibular jaws. The residual bone in the posterior maxilla was deficient bilaterally which could be managed using a direct sinus lift procedure, but the patient was not willing for the procedure and wanted a more easy option concerned to financial constraints.(Fig.1).

The “All-on-Four” technique was scheduled to rehabilitate the upper and lower jaw.

Under local anesthesia Four Dental Implants were placed in the maxillary and four in the mandibular jaws using a surgical stent (**Fig. 2- 7**). The rings in the stent were placed at an angulation to prepare the implant sites in the correct position, the angulation of the implants should not exceed 45°.

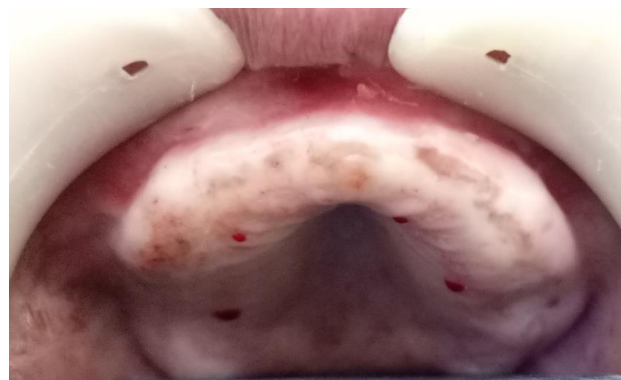


Fig 2: Implant positioning in maxillary arch.



Fig 3: Paralelling Posts.



Fig 4: 4 Implant placement wrt maxillary arch.



Fig 5: Mandibular edentulous arch.



Fig 6: Implant placement wrt mandibular arch.

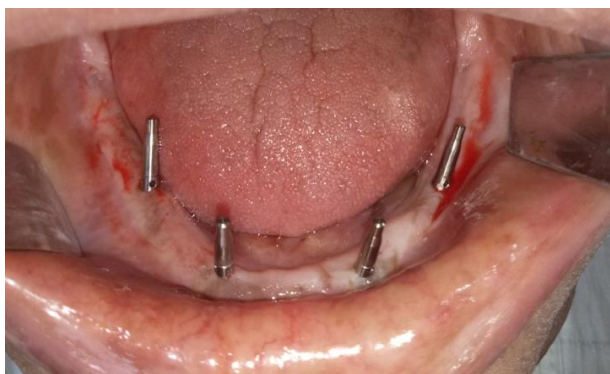


Fig 7: Paralleling Posts placed.



Fig 8: Maxillary framework.



Fig 9: Mandibular framework.

The two anterior implants (Dentium Superline) were placed in the lateral incisor areas bilaterally, whereas the two posterior implants were placed at an angle of 30 degrees in the premolar region mesial to the mental foramina.

Due to age concerns and patients acceptability a delayed loading protocol was followed. A second stage surgery was planned 3 months post implant placement and cover screws were replaced by healing abutments. Ten days after placement of healing abutments impressions were made in the maxillary and the mandibular arches with polyvinylsiloxane impression material using the closed tray impression technique.

The accuracy of impression was checked by doing a jig trial.



Fig 10: Maxillary Teeth arrangement.



Fig 11: Mandibular Teeth arrangement.

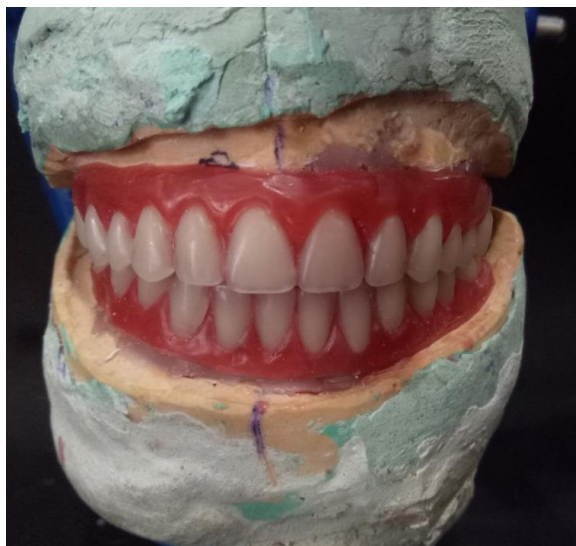


Fig 12: Complete teeth arrangement for hybrid prosthesis.

After the jig trial a tentative jaw relation was made followed by denture trial and trial of the maxillary and mandibular bar. A light weight CAD milled screw retained bar was made using titanium.

A trial teeth arrangement was done on the bar and was evaluated for proper esthetics, occlusion and patient comfort. **(Fig. 10-14)**



Fig 13: Complete Wax trial.



Fig 14: Complete wax trial done (intraoral view).

The final screw retained hybrid denture prosthesis was delivered to the patient four days post the trial procedure. **(Fig. 15-20)**



Fig 15: Maxillary complete denture.



Fig 16: Complete hybrid prosthesis wrt maxillary and mandibular arches.



Fig 17: Intraoral view of complete hybrid prosthesis wrt maxillary and mandibular arches.



Fig 18: Intra-oral view of complete hybrid prosthesis wrt maxillary arches.



Fig 19: Intraoral view of complete hybrid prosthesis wrt maxillary arches.

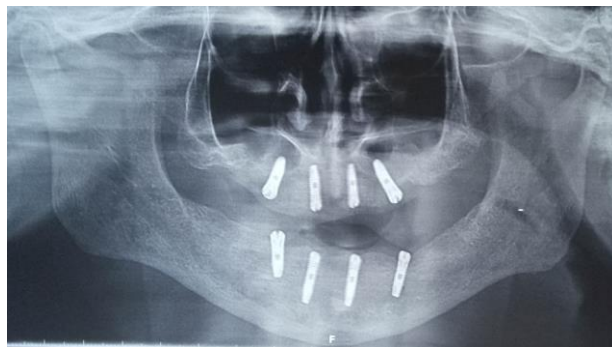


Fig 20: Post operative OPG of the patient .

DISCUSSION

In the recent times the scenario of dental practice has changed in such a way that the comfort of the patient and minimal treatment costs are the supreme requirements of the treatment plan. The treatment needs and patient demands for dental esthetics and function has highly increased in the recent times due to increased awareness of available treatment options. The “All-on-Four” treatment concept is economical, comfortable and faster treatment option and highly predictable to rehabilitate edentulous patients and provide good quality of life.

In this technique, the two posterior implants are placed in front of mental foramina in a tilted position distally. This in turn avoids injury to the inferior alveolar nerve. Placing the implants tilted helps in decreasing the distal cantilevers. The “All-on-Four” procedure has better cortical anchorage and primary stability which provides better success rate due to placement of long implants.

In the present case report due to age factors and financial constraints of the patient a treatment plan was needed for the patient which was more comfortable, economic and had considerably good results which would help the patient in proper mastication and also would provide good esthetic results.

CONCLUSION

The “All-on-Four” treatment concept is a highly predictable treatment option for completely edentulous patients who demand Fixed full mouth rehabilitation. The treatment is cost effective, the duration of treatment is less and the treatment is highly comfortable. The splinted implants provide better stability and long term success. Also the

placement of long tilted implants provides better bone support and avoids complications related to injury to vital structures.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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