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ALL-ON –4 CONCEPT: A CASE REPORT

Prosthodontics

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ABSTRACT

The "All-on-Four" concept is based on the placement of four implants in the anterior part of fully edentulous jaws to support a provisional, fixed, and immediately loaded full-arch prosthesis.

Combining tilted and straight implants for supporting fixed prostheses can be considered a viable treatment modality resulting in a more simple and less time consuming procedure, in significantly less morbidity, in decreased financial costs and a more comfortable postsurgical period for the patients.

In this article, a case report with maxillary and mandibular implant supported prosthesis with all-on-4 concept is discussed.

KEYWORDS

edentulous jaw, dental implants, implant placement

INTRODUCTION

The "All-on-4" technique has evolved from original work of Branemark and colleagues in 1977, whereby they utilized 4 to 6 vertical implants placed within the anterior segment of the edentulous maxilla and mandible, cantilevered to accommodate a full-arch fixed prosthesis. [1,2,3]To overcome the drawbacks of increased cantilever length, some authors have suggested using tilted implants in such anatomic regions as the anterior or posterior sinus wall, the sinus septa, the palatal curvature and the pterygoid process, between mental foramen.[4,5,6]

Paulo Malo [7,8] et al in 2003 introduced the "All-on-4 "treatment modality and recommended its development as a standardized concept and observed it to be a good strategy. This concept was based on the results from load analysis which have demonstrated that 4 implants is an advantageous number. The All-on -4 protocol requires the placement of four inter-foraminal implants, with the distal implants tilted distally by maximum 45 degrees to achieve a more favourable antero-posterior distribution of implants, thereby minimizing cantilever extensions that could jeopardize osseointegration of the distal implants.[9,10]

Case report

A 65 year old patient visited the department of prosthodontics with the chief complaint of inefficient mastication with previous dentures. Although new dentures were made for the patient, he showed an inclination for fixed prosthesis. He was then evaluated for fixed prosthesis from CBCT findings which showed that enough bone was present in height and width (Fig 1). His past medical history was uneventful and past dental history too revealed no bleeding abnormality and uneventful healing.

Bleeding time and clotting time were found to be normal from blood investigations. The "all-on-four" technique was scheduled to rehabilitate the upper and lower jaw.

Under local anaesthesia , two Myriad Connect implant both of dimensions 3.8x9.5mm were placed in 13 and 23 region and two Adin Touareg™- implants one of dimension 4.2x11.5 mm and the other of 4.2x13 mm dimension were placed in 15 and 25 region respectively. Implants in 15 and 25 region were tilted at 45 degree(Fig2).

One week later surgery in mandibular arch was performed and three Myriad Connect implants of dimension 3.8x9.5 mm were placed in 33, 43 and 45 region respectively one Myriad Plus implant of dimension 4.5x8mm was placed in 35 region (Fig3). The polyvinylsiloxane impression of the complete removable prosthesis was made. Immediate loaded prosthesis was given to the patient after 36 hours (Fig 5)

Patient was recalled after 3 ½ months to evaluate for osseointegration. ISQ readings were measured using Ostell which were found to be 72.12,74.34,72.15,73.10 in the upper arch from right to left and 73.10,71.23,71,25,74.0 in lower arch from right to left.

Healing abutments were removed and yellow colour retention sleeve were placed over Myriad Connect and open tray impression post was screwed to Adin Touareg™- implant, implants were splinted with dental burs and stabilized with pattern resin(Fig 6 &7). Final impression was recorded with polyvinylsiloxane impression material using closed tray in lower arch and open tray in upper. Resin jig was fabricated with the help of pattern resin with definitive abutments in place and verified both clinically and radiographically for marginal discrepancy(Fig 8). Cobalt chromium metal framework was fabricated and tried in patient's mouth and verified for midline, visibility, vertical dimension at rest and occlusion and freeway space (Fig9). Interoccusal record was made in patient's mouth with addition silicone at the desired vertical dimension. After that according to the selected shade, ceramic build up was carried out .Bisque trial was done one week later and occlusal correction were made. Final prosthesis was screwed to the patient after glazing(Fig 10). Mutually protected occlusion is an occlusal scheme in which the anterior teeth protect the posterior teeth and vice-versa .Mutually protected occlusion was the scheme selected in protrusion and canine guided occlusal scheme in lateral excursions.

DISCUSSION

Brånemark et al pioneered the modern era of implant dentistry in mid 1960s.However , implant supported restorations have hitherto been a challenge in atrophic jaws because of because of small quantity and low quality of bone, proximity to nasal cavities, maxillary sinus or inferior alveolar nerve[1,2]. Although bone augmentation and sinus elevation are proven treatment options, they are least accepted by patients because of their invasive nature, high cost, donor site morbidity and surgical non-predictability.[3] The All-on-4 protocol immediate function approach to rehabilitate edentulous jaws combines immediate function techniques: 4 implants (2 straight medially and 2 tilted distally) to support a fully fixed prosthesis. There has been a paradigm shift from traditional approach of replacing all the 28 teeth to

only replacement of adequately functional teeth i.e. upto 1st molar. [10,11] Kayser and Witter suggested that the anterior and premolar teeth are the strategic part of the dental arch and are essential for satisfactory oral function and oral comfort. Thus, in the Shortened Dental Arch concept, the treatment is directed at preserving the anterior and premolar teeth. [12] DJ Witter et al have opined that restorative therapy may be functionally adequate when restored upto 1st molar.

In the present case report, Angulated implants were placed in maxilla owing to the close approximation to the anatomical structures and to increase the anteroposterior spread…..

And then multiunit abutments of 30 degree angle were placed to make the implant parallel and to get tissue level prosthesis. Then after three months prosthetic procedures were carried out. Impressions were recorded using polyvinyl siloxane putty light body single step impression. using open tray technique. Passive fit of the maxillary and mandibular resin jig were checked. Cobalt chromium metal framework was fabricated and tried in patients mouth and verified for midline, visibility, vertical dimension at rest ,occlusion, freeway space and interoccusal record was made in patients mouth with addition silicone at the desired vertical dimension .After that according to the selected shade, ceramic build up was carried out. Bisque trial and occlusal adjustmnts with articulating paper was carried out followed by glazing prosthesis and again verified for the occlusion.

Occlusal schemes was organic occlusion i.e mutually protected on protrusion and canine guided on lateral excursion.

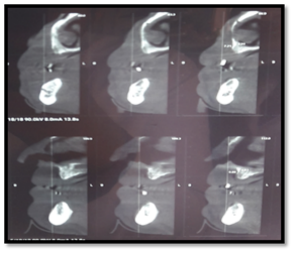

Fig 1.Pre-operative CBCT

Fig 2. Four implants placed in the maxillary arch

Fig 3. Four implants placed in the mandibular arch

Fig 4. Post-operative OPG

Fig 5. Temporization

Fig 6.Splinting of the implants

Fig 7. Splinting of the implants

Fig8.Centric relation recorded

Fig 9.Metal trial in centric relation

Fig 10. Fixed prosthesis in centric occlusion

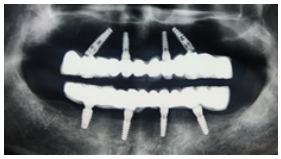

Fig 11. Post- operative OPG

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