

## TTPHIL-ALL TILT™ Concept – An Innovative Technique in Immediate Functional Loading Implant Placement in Maxilla

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**Abstract:** Implants are placed either immediate or delayed loading protocol when adequate bone is available. It is difficult to place implants in compromised bone conditions especially posterior maxilla without sinus augmentation. Although these procedures are having highly success rates but requires long treatment period. In compromised bone situations, it is difficult to place axial implants without grafting. Even long cantilevers are required to compensate biological complications. Various alternative methods like zygomatic implants and Pterygoid implants are showed higher success rate in compromised bone situations. But these procedures are highly invasive. To overcome these problems, a newly innovative TTPHIL-ALL TILT™ concept is introduced. This case report highlights TTPHIL-ALL TILT™ concept and also the principles.

**Keywords:** Tilted implants, immediate loading, functional loading

### INTRODUCTION

Immediate loading is a therapeutic intervention for patients who require their appearance and function in a short period of time [1]. Traditional treatment plan, large number of implants is required to restore the entire arch [1]. But, the posterior maxilla has several limitations associated with this axial approach of placing implants. In the maxilla, it is not uncommon to see resorption in the posterior regions and also enlargement of the sinuses [2]. In these situations, it is not only difficult to place axial implants alone without

sinus augmentation but also lengthy cantilevers are required to compensate biological limitations. Extensive posterior cantilevers are biomechanically unfavourable because of increased occlusal forces per unit area [3-5]. So, alternative methods such as sinus augmentation [6] or pterygomaxillary implants [7, 8] are required to achieve adequate stability for axial implants and also decrease number of cantilevers.

The introduction of tilted implants<sup>2, 9</sup> has provided a significant alternative for restoration of maxillary and mandibular posterior segments without bone grafting. According to Krekmanov *et al.* [2] posterior tilting of distal implants will reduce cantilever lengths, broaden the prosthetic base, and improve implant-to-bone surface areas because longer implants can be used.

TTPHIL-ALL TILT™ concept is the innovative technique which overcomes the limitations of axial implants, also the disadvantages of All-on-4 concept and All-on-6 concept. Here, Tall (16mm-20mm), tilted (TT) implants (with angulations of 30<sup>0</sup>-70<sup>0</sup>) are used. Tall implants provide more surface area for osseointegration and are also engaged to the cortical

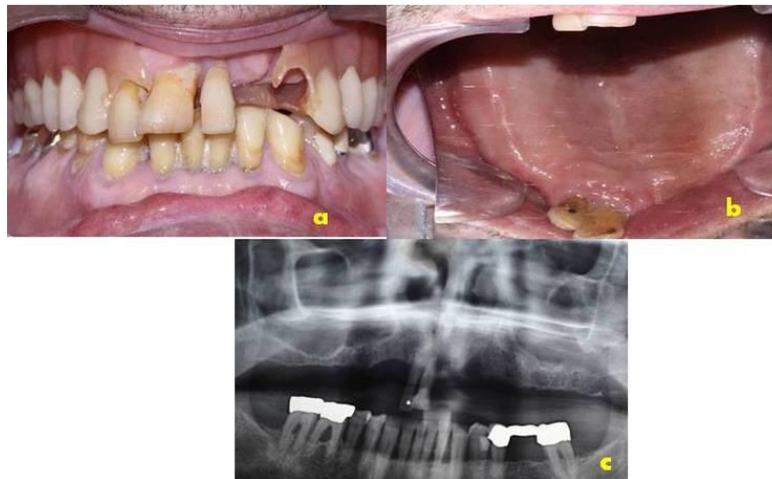
bone (bi cortical anchorage). The implants are placed in pinhole (PH) manner i.e flapless. All implants are immediately loaded (IL) within 48 hours with CAD/CAM (Computer-aided design and computer-aided manufacturing) prosthesis.

### CASE REPORT

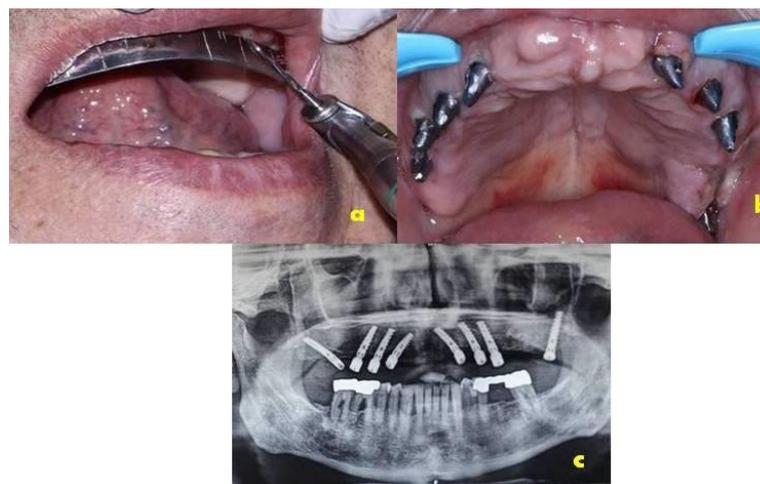
A 66 years male patient complains of inability to chew and also desire for rehabilitation in maxilla was selected. Orthopantomograph (OPG) radiographic examination revealed atrophied maxilla and expansion of sinuses at posterior maxilla region (**Figure.1a-1c**). Cone beam Computerized Tomography (CBCT) was undertaken to detect the available bone. After giving adequate amount of local anesthesia, periodontal compromised teeth were extracted a traumatically with the help of periostomes. Implants were placed with help of surgical template. Marking on surgical template was done by evaluating the radiograph and then transferred the markings to intra orally to place the implants in precise location in the maxilla (**Figure.2a**). Osteotomy preparation was started with initial pilot drill (1.2mm) up to 6 mm based on OPG findings. Sequential radiographs were taken with radiovisiography (RVG) checking whether it was perforated the sinus and also to

check mesio distal, bucco lingual tilt of pilot drill. Once desired placement and angulation was achieved, prepare the osteotomy till the desired length with pilot drill and also nick the cortical bone with pilot drill. Sequential drills were used to complete the osteotomy preparation (2.5 mm drill for 3.25/3.5 implant, 2.75mm drill for 3.75 mm implant and 3.2mm drill for 4.2mm implant).

Implants were placed in higher insertion torque to engage the cortical bone. All the implants were placed in pinhole i.e flapless (**Figure.2b-2c**). Because of the cortical anchorage and higher primary stability, Implants were loaded within 48 hours with definite prosthesis which was made up of metal ceramic CAD-CAM Prosthesis (**Figure.3a-3b**).



**Fig-1a: Pre op Frontal, 1b. Occlusal view, 1c. Orthopantomo gram (OPG)**



**Fig-2a: Surgical template for implant placement, 2b. Immediate post op implants 2c. Immediate post op OPG**



**Fig-3a-3b: Metal Ceramic CAD-CAM Prosthesis**

## DISCUSSION

In TTPHIL-ALL TILT™ concept, Implants are placed in such way that to engage the inner and outer diameter of the implant with bone and also engaged to bicortical bone for high primary stability. Implants are placed in higher insertion torque (45N/cm). Due to high primary stability, it is possible to load the implants immediately and also the procedure is flapless which provides better wound healing. In this technique, the remaining dense trabecular bone is used for placement of tilted implants. This procedure is devoid of bone grafting, sinus augmentation and alveolar bone augmentation. Finite element analysis has shown that the use of tilted implants is much more favourable biomechanically than using shorter implants with axial inclinations [10].

Tilted implants requires short cantilevers to restore the posterior occlusion which prevents crestal bone loss, unretained restorations, the fracture of prosthetic components and finally complete implant and prosthetic failure [11-13]. Inclination of distal/posterior implants does not have any deleterious biomechanical effect on abutments and also reduce the cantilever effect on force magnitude from short arch to long arch [14] which is the advantage of TTPHIL-ALL TILT™ concept over All-on-Four and All-on-Six concepts. The success rate of tilted implants was more than 90% in the available literature [15].

The implant prosthesis is rigid, retrievable, passive fit and also follows cross arch stabilization which makes this technique unique among the all other techniques both biomechanically and functionally.

## CONCLUSION

TTPHIL-ALL TILT™ concept provides predictable method to restore edentulous jaws. The implants are placed in flapless and tilted direction makes this concept predictable in both biomechanical and functional manner. However, a large sample and long term follow-up study is needed to explore the success rate of implants in this technique.

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