

Pterygoid Implant: A Graftless Approach for Maxillary Rehabilitation using TTPHIL-ALL TILT® (Tall Tilted Pin Hole Placement with Immediate Loading) Technique

Dr. P. Venkat Ratna Nag¹, Dr. P. Sarika² and Dr. Tejashree Bhagwatkar³

¹ S.B. Patil Dental College and Hospital

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Abstract

Edentulism is a common dental problem in the elderly population. The maxillary posterior edentulous region offers a unique and challenging condition in implant dentistry. The maxillary posterior region presents with numerous anatomic complications in terms of bone quantity, quality, maxillary sinus pneumatization, and poor approachability. Most remarkable surgical approaches include sinus lift, bone grafting, pterygoid implant, considered as valid solutions to this problem. Pterygoid implants require lot of skill of the dentist and also is proven to be statistically superior. In this case series, the pterygoid implants placed and restored using TTPHIL (Tall Tilted Pin Hole placement with Immediate Loading)- ALL TILT® technique in the patients with atrophic posterior maxilla are discussed.

Index terms— pterygoid implants, graftless solutions, immediate loading, TTPHIL-ALL TILT®.

1 Introduction

Oral health plays important role to uphold proper mastication, digestion, phonation, aesthetic, and emotional well-being. The loss of permanent teeth can occur for a variety of reasons, ranging anywhere from hereditary factor, congenital absence, diseases of the dentition (e.g., caries or periodontal disease) and trauma. 1 An edentulous condition existing in the posterior maxilla poses a challenge to all the clinicians. The reasons behind this are the anatomic factors like bone quality (type III or IV) according to Lekholm and Zarb 2, quantity, location of the maxillary sinus, and poor accessibility in the posterior region 3,4.

The pterygoid implants was introduced by Tulasne JF (1992). The advantage of a pterygoid implant is that it allows anchorage, eliminates posterior cantilever and improved axial loading in the posterior atrophic maxilla. 5 It eradicates the need for O lesser and implant placement in zygoma 9. Placement of implants in the pterygoid region provides posterior bone support, bypass sinus augmentation, or bone grafts. Because of inadequate accessibility, placement of pterygoid implants is more technically demanding than placing short implants anterior to the maxillary antrum. However, there are no risks associated with implant placement in pterygoid area 3.

The TTPHIL-ALL TILT® -(Tall Tilted Pin Hole Immediate Loading) concept has evolved from various ideologies in implantology: basal, pterygoid and angulated/tilted implants under immediate loading. To maximize the success of rehabilitation, the TTPHIL technique utilizes the use of long tilted bicortical implants by engaging the pterygoid region. Pterygoid implants were intended to pass through maxillary tuberosity, the pyramidal process of palatine bone and the pterygoid process of the sphenoid bone. 3,10,11 In the literature, success rates of pterygoid implants for maxillary rehabilitation have been more than 94 to 99%. Thus, the TTPHIL-ALL TILT® technique is a novel approach for the placement of implants; it was derived from established schools of thought in implantology. 12 In this article, following cases are examples of patients indicated for pterygoid implants using TTPHIL-ALL TILT® in partially edentulous and completely edentulous maxilla.

2 II.

3 Case Report

4 Case 1: Partially Edentulous Maxillary Arch (Immediate Implantation)

A 42-year-old male patient reported with a chief complaint of loose teeth in the upper left back region of the jaw. Clinical examination revealed Grade II mobility about tooth 27, gingival recession, missing 26, and poor oral hygiene status. (Fig: 1 a, b) The patient was willing to go ahead with a fixed prosthesis for the same region. TTPHIL-ALL TILT ® technique was planned for the same; a thorough radiographic evaluation was suggested to the patient. These studies included panoramic films, CBCT, and stereolithography models. The mouth other techniques like sinus lifts or bone grafts 6,7 , increased implant diameters or short implant of 8mm or a. b.

5 Discussion

Treatment of edentulous patients has always been a challenging task for the dentists. In the modern era, implant dentistry gained popularity and considered as the best alternative, irrespective of resorbed bone, reduced bone density in the maxillary posterior regions and systemic conditions. Krump et al and Barnett et In the literature, several articles have assigned many labels for implant placement in the posterior maxillary region. Implants placed in the posterior maxilla have been discussed as pterygoid plate implants 11 , tuberosity implants [15][16] , and pterygomaxillary implants 17 .

The structures that offer support for implant placement are the tuberosity of the maxillary bone, the pyramidal process of the palatine bone, and the pterygoid process of the sphenoid bone 18 .

Conventionally, because of the anatomic factors and biomechanical factors 19 , the success rates for implants placed in the atrophic posterior maxilla was lower than that for other locations.

In literature, few studies were carried out on pterygoid implants for the survival of implant and prosthesis. Bahat 15 performed a study on 45 patients, 72 implants were engaged in the tuberosity region, and they noted 93% survival rate over an average loading time of 1.7 years. Balshi 16 reported satisfactory 3-year results for 51 implants placed in the pterygoid area supported fixed prostheses in partially edentulous patients. Khayat et al 20 reported on cases of implants placed in the pterygoid region with four years of follow up. Graves 11 described forty-three implants in the pterygoid plate area.

The subcrestal implant placement decreases the stress in the crestal cortical bone around dental implants. Flapless guided implant placement helps in mucointegration, good aesthetics, reduces the time of treatment, and improves patient satisfaction. Nowadays, practice-driven implantology has been evolved the dimensions (lengths 15-25mm) of implants. 28 Multi-unit abutments, and their components help dentists to correct the angulations caused by the tilted implant. 29 This aids in immediate loading of the fixed prosthesis. 30 IV.

6 Conclusion

Based on the outcomes of the case reports, Immediate/Delayed implant placement with immediate loading is considered as a feasible treatment option for the patients with the severely atrophic maxilla. The TTPHIL-ALL TILT ® technique considered as a graftless solution which is characterized by Tall, tilted implant with bicortical engagement, minimal invasiveness (flapless approach), screw-retained prosthetic solutions with rigid cross arch stabilization with no cantileverage can be delivered in 2-5 days. However, this technique is highly sensitive and requires experts in implant dentistry for its execution. Careful selection of patients, thorough radiographic evaluation, proper treatment planning, and adequate follow-up of surgical and prosthetic protocols are the keys to success. TTPHIL-ALL TILT ® (Tall Tilted Pin Hole Immediate Loading) technique [21][22][23][24][25] was evolved after studying and analyzing all the advantages and shortcomings of other traditional and advanced techniques. Using this concept two tall tilted implants engaged the pterygoid region (junction of the palatine process of maxilla, the pyramidal process of palatine bone and pterygoid process of the sphenoid bone), thus eliminating distal cantilever, avoiding sinus encroachment and other augmentation procedures in the posterior maxilla. Tilting of implants avoids anatomical structures like the maxillary sinus. In literature, many studies were carried out on tilted implants, the success rates were found to be 95.7 to 100% 26 , which have been improved by bicortical engagement. Tall implants with bicortical engagement offer primary stability which improves implant success. 27 ¹

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Figure 1: Fig. 1 a



Figure 2: Fig. 2 a



Figure 3: Fig. 2 c



Figure 4: Fig. 3 a



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Figure 5: Fig. 5 c

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