

Pterygoid Implants – A Review

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Abstract

Background: The anatomy of the atrophic posterior maxilla presents numerous limits to implant positioning. Variables influencing implant positioning incorporate helpless bone quality and amount, area of maxillary sinus. Posterior cantilevers on implant prostheses produce confusions, for example, prosthesis break, screw extricating, loss of osseointegration, and crestal bone loss. Pterygoid implants are an option in contrast to grafting blend for posterior maxillary restoration.

Aim: Methodical survey depicts different implant treatment choices for posterior maxillary restoration. It features the utilization of pterygoid implants as a graftless arrangement with its life structures, procedure of position, and benefits.

Conclusion: Pterygoid implants have high achievement rates, less bone loss, and great acknowledgment by patients along these lines being a superb choice to treat patients with serious atrophic maxilla.

Clinical Significance: Pterygoid implants keep away from the requirement for sinus lifts and grafting strategies. They permit anchorage in the posterior decayed/resorbed maxilla, accomplishing legitimate soundness, and high paces of long haul achievement. Further more, posterior cantilevers can be dispensed with and axial stacking is improved.

Keywords: dental implant, pterygoid, implant types.

INTRODUCTION

Implant dentistry has developing a wide margin as of late after the effective presentation of osseointegration idea By Prof. Private investigator Branemark in the mid 1960s. Recovery of the Maxillary anterior area has been far simpler than the maxillary posterior area due to different factors.[1] The posterior maxillary Area is portrayed by (1) insufficient leftover bone Stature because of maxillary sinus development or potentially alveolar bone Resorption and (2) helpless bone thickness (Type III or IV) concurring To Lekholm and Zarb order system.[2-4] Considering these difficulties presented by the anatomy, few Methods have been being used, for example, sinus lift techniques, Directed bone recovery grafting with bone autogenous and Allogeneous grafts; and later shifted implants(All-on-4), zygomatic implants were introduced.[5] However, these methodology have Intricacies, for example, sinus layer perforation, dismissal of graft, graft uprooting into sinus depressions, and screw releasing of tilted implants. To forestall such issues posterior most region of maxillary tuberosity; distal to maxillary sinus can be used for implant placement.[5] Implants put in the conservative bone of the pterygomaxillary district shows osseointegration and gives maintenance and stability.[6] This region is pterygoid or pterygomaxillary district. It was given out by Tulasne (1992).[6] Tulasne (1989) attributed Paul Tessier for proposing a thought of putting implants in the pterygoid area. Because of their long way, length of pterygoid implants goes from 15 mm to 20 mm.[6,7] Pterygoid implants take bicortical anchorage, because of which the pivotal stacking is improved and posterior cantilever is eliminated.[8] All through writing, a few terms are being utilized to characterize pterygoid implants. The expressions "pterygoid implants," "tuberosity implants," and "pterygomaxillary implants" are compatible. The maxillary tuberosity is characterized as "the most distal part of the maxillary alveolar process." [9-11]

Anatomy of pterygoid area

The tuberosity of maxilla is made out of Type III and Type IV cancellous bone. The pyramidal course of palatine and pterygoid cycle of the sphenoid are principally made out of thick cortical bone. The pterygoid fossa is lined by middle and parallel pterygoid plates.[12]. The pterygopalatine fossa (PPF) is considered as a vital region in the profound space, which needs to be assessed cautiously during head and neck imaging. The PPF is restricted by the intersection of three bones (maxilla, palatine, what's more, sphenoid). Fat, the pterygopalatine ganglion, the "maxillary division (V2) of the trigeminal nerve and its branches, the Vidian" (pterygoid) nerve, the distal parts of the maxillary supply route, also, a couple of emissary veins are the substance of the PPF.[13,14] The thickest buttress of bone is average to the alveolar edge. The ideal arrangement for the implant is through the pterygoid cycle into the pterygoid fossa.[12] The thickest space of supporting bone is situated in the center some portion of the pterygoid process between plates. This 3–4 mm average to the alveolar edge, the implant should point somewhat medially to divide thick place of bone in the pterygoid area. The hamular process on the average pterygoid plate is substantial in the oropharynx. Implants are set horizontally to this landmark.[12] The pterygoid implants, when utilized in full arch recovery, remove distal cantilevers, an expansion of posterior impediment, also, the best circulation of useful loads.[15-18]

Classification of the Posterior maxillary implant dependent on anatomic area by Reiser[11]

Tuberosity – pyramidal cycle , Tuberosity – pterygoid measure , Tuberosity – pyramidal cycle – pterygoid measure , Pyramidal cycle – pterygoid measure ,Maxillary tuberosity.

PARP (pterygoid anatomic radiographic prediction) Luis et al. proposed the arrangement of demonstrative forecast PARP for implantology in the pterygomaxillary area. Through the PARP, the decision of implant is

individualized for every persistent, going about as a manual for make implantology open in the pterygomaxillary area to the best number of subject matter experts. From the level of sinus intrusion acquired after a three-dimensional (3D) automated tomography (CT), the PARP sets up the forecast of the trouble suggested by implantology in this anatomical area, just as the fitting decision of the sort of implant and length with which to move toward it.

The PARP classification permits working just in the pterygomaxillary area with retromolar implants[19] [Table 1].

- PARP 1. It is the most straightforward situation when there is no sinus attack and we have a bone in the entirety of its course. In these cases, the length of the implant relies upon the bone thickness.
- PARP 2. The patient presents with a sinus intrusion yet still has >10 mm of the excess bone. If there should emerge an incidence of having great bone thickness, it would be more fitting to put a traditionally conceptualized retromolar implant.
- PARP 3. This is an instance of medium-high trouble, with sinus attack leaving a bone surface between 5 mm and 9 mm of staying bone. In these cases, because of the scant leftover of alveolar bone and the quality of the sinus intrusion, the pterygoid anchor will consistently be utilized in the apophysis of a similar name, with an appropriate thickness.
- PARP 4. In most of instances of a huge sinus intrusion, leaving just a leftover bone more modest than 5 mm, the plausibility of utilizing long pterygoid implants or choosing other careful methodologies will be assessed.

DISCUSSION

Treatment choices for posterior maxillary recovery : Maxillary sinus floor elevation, Zygomatic implants, Short implants, Tilted implants.

Maxillary sinus floor elevation

The diminished vertical bone tallness in the posterior maxillary area is frequently a significant impediment to the position of dental implant. Height of the maxillary sinus floor with or without grafting is the main answer for this issue. Different surgical strategies, for example, endoscopically controlled technique,[20] hydraulic tension technique,[21] and antral film expand rise technique[22] have been introduced to get to the sinus cavity and raise the sinus membrane.[23,24]

Zygomatic implants

The strategy delicate zygoma implants are shown for seriously resorbed maxilla this draws in zygomatic bone for anchorage.[8] These implants are screw-formed in industrially unadulterated titanium of variable lengths of 30– 52.5 mm.[25] The idea can be extended when needed by embedding two zygomatic implants in a more anterior position (quad zygoma).

Short implants

The short implant is considered as an option in a circumstance which is described by restricted vertical bone

elevation. It utilized to keep away from bone expansion techniques in maxillary and mandibular posterior areas. Standard implants have a length of around >8 mm, while short implants are normally alluded planned with intrabony lengths of ≤8 mm.[8]

Tilted implants

Since the nineteenth century, shifted idea in the posterior area of the maxilla was shown as one of the other options to bone grafting. Utilizing tilted implants, circulation of pivotal, shear, and cross over powers would not be destructive due to more noteworthy anterior-posterior inclusion of the plan, which has been demonstrated by 3D limited component examination of stress levels.[26,27] Tilting of the implants diminishes the cantilever length by expanding the between embed distance and diminishing compressive pressure. Numerous investigations have proposed the utilization of tilted implants for maxillary restoration utilizing prompt loading.[26,27]

Convention for pterygoid implant arrangement

Analytic level

Preclinical record: Clinical appraisal rundown/pertinent clinical history Pretreatment Photographs: Extraoral: Frontal, lateral,oblique“Intraoral: Frontal, right, left, upper, and lower occlusal ”View ,Radiographs: OPG, CBCT, RVG.

Surgical level

Presurgical stereolithography model: Pterygoid implant are fit to all age gatherings and fundamental conditions except if there is a blunt surgical contraindication. Patients with diabetes Type 2 (HbA1c<7%) are taken for pterygoid implants. To clinical lead of pterygoid implants surgical guide and stereolith replica are required, manufacturers of which is done by changing of patients CT scan images (Dicom) to STL format. Effectively planning of implant positioning and clinical angle measurement should be done. Surgical metal template is manufactured with markings of point of appearance and drilling angulation as per the plotted areas. The usage of surgical guide eliminate perforation into adjoining anatomical areas(palatal or buccal). The replica aids to identify the patient-specific anatomy, point of appearance, disappearance and mesiodistal, and buccopalatal angulation.

Surgical phase:The pterygoid implants is positioned using stilted idea i.e TTPHIL procedure, surgical metal guide manufactured using the stereolith replica. The implant positioned for the second to third molar edentulous area towards the link formed by the posteriorinferior elevation of the sphenoid,palantine process and the maxillary surface with distal angulation of 25-45 degree depending on maxillary floor and height of Tuberosity. The appearing point and angulation of drills are guided by metal template. The implant utilised is 18-25mm lengthy and 3.75mmor 4.2mm in measurement. To examine for stability of implant torque value of> 40N cm are to be gotten if quick stacking is wanted. Multiunit projections with shifting lengths (3–5 mm) and angulations (30°, 40°, and 50°) are set. Parallelism was acquired around the same time of a

medical procedure. Postoperative all encompassing radiographs affirmed the situation of the implants. Tulasne[7] proposed the pterygoid implants method utilizing a 22 mm long implant, which was anchorage to the pterygoid plate through maxilla and sense of taste with distal angulation somewhere in the range of 35° and 55°. The osteotome method limits the drills work with the arrangement of the implant bed, particularly in the thick cortical bone area.[28-31]

Prosthetic level

For incomplete or full curve recovery with posterior pterygoid implants and anterior implants, the prosthetic convention was as follows. A two-venture open plate direct impression procedure is utilized with putty and light body material in the wake of bracing of multiunit impression copings. Multiunit implants analogs are appended to the impression copings; gingival cover is poured around implant analog and die stone is poured to shape the last cast. Jig trail, Jaw relation, and bite registration are done, recorded and shipped off the lab for CAD CAM planning screw-held fixed prosthesis. Before conclusive cementation metal preliminary and bisque preliminary are finished.

CONCLUSION

Amazingly atrophic maxillae are the most difficult errand for helpful dental specialists. Pterygoid implants gives a sensible option in contrast to 3D maxillary recreation, sinus lifts, and bone increase strategy. Many studies have detailed achievement paces of pterygoid implants going from 90% to 100% after follow-up period going from 1 to 12 years with negligible difficulties. Aversion of a prosthetic distal cantilever with great strength fit immediate stacking is conceivable with this strategy.

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