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# Prosthodontic Management of Atrophic Posterior Maxilla Using Multiple Single Piece Implants At Pterygoid Region – A Case Report

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***Abstract***
*Edentulism is one of the common dental problems in the aging population. Implant therapy has emerged as one the valid and effective solutions to this problem. Replacement of missing teeth in the posterior maxilla is always a challenge for the treating implant surgeon as the posterior maxilla has several obstacles in the form of quality, quantity, the anatomy of the maxillary sinus, and inaccessibility. To overcome these deficiencies, several surgical procedures such as sinus lift, bone augmentation, tilted implants, short implants, and zygomatic implants were tried. Since these procedures have their own limitations, pterygomaxillary region provides us an excellent place for placement of implant and rehabilitation of posterior maxilla.*
*This case report describes the usage of the pterygomaxillary region for placement of the implant to restore atrophic posterior maxilla, without any additional surgical procedure.*

***Keywords:*** *Pterygo-maxillary implants*

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## I. Introduction

Implant dentistry has grown leaps and bounds in recent years after the successful introduction of osseointegration concept by Prof. P. I. Branemark in the early 1960s. An edentulous situation in the posterior maxilla, poses a challenge to the restorative dentist. The reason is largely due to anatomic factors like bone quality often type III or IV quality bone according to Lekholm and Zarb [1], quantity, location of the antrum and poor accessibility inthe area [2, 3].

To overcome these difficulties, sinus lift procedures, GBR grafting with both autogenous and allogenous materials, tilted implants (all on four concepts), zygomatic implants were introduced. However, these procedures are not without complications such as tear of sinus membrane, bone grafts into sinus cavities, rejection of bone grafts, screw loosening of tilted implants, and morbidity of patients with the usage of general anesthesia for zygomatic implants.

To prevent these problems, posterior most of the maxilla near the tuberosity and behind the maxillary sinus can be utilized for placement of implants. This area is called the pterygoid or pterygomaxillary region. Placement of implants through the maxillary tuberosity and into the pterygoid plate is called as pterygoid or pterygomaxillary implants. It was introduced by Tulasne in 1992.[4]. Placement of pterygoid implants involves origination of implants in the tuberosity region and follows an oblique mesiocranial direction proceeding posteriorly toward the pyramidal process. It subsequently proceeds upward between both the wings of pterygoid process of sphenoid bone.

This aim of this case report is to elaborate the placement of the implant into the pterygomaxillary region and its use in future for prosthetic rehabilitation of atrophic posterior maxilla.

## II. Case Report

A 57 year old female patient reported with a complaint of extracted maxillary 14 ,15,16,17 ,26 and 27 due to dental caries about 8 years back and difficulty in mastication with right side.(Figs.1,2,3). On intraoral examination, ridges were well formed and the interarch space was adequate on right side. Radiographic picture (Fig. 5) and the computed tomography (CT) (Fig. 4) demonstrated very little bone to be present in the maxillary sinus region. Considering the amount of residual bone, it was decided that the pterygoid implants were the best

alternative. CT scans were carefully studied for the thickness and height of bone in the tuberosity region. The mouth opening was assessed and found to be adequate for placing implants in the tuberosity region. Routine blood investigations were done and fitness obtained for surgical procedure. Since there was severe atrophy of posterior maxilla patient was given a choice with two implants in premolar areas and one in the pterygoid region on right side.

After obtaining consent from the patient, implant surgery was planned in relation to 14, 15, and pterygoid region. Under local anesthesia implants were placed in the premolar and pterygoid regions by tapping method with dimensions 4*10mm, 4*10 mm and 4.5*14 mm respectively [fig6,7,8]. Implant placement in the pterygomaxillary region was done at an angulation of 45°–60° relative to the maxillary plane as described in the literature.[3] Postoperative instructions were given. The patient was evaluated with radiographs periodically and after 6 months prosthetic evaluation was done [fig 9,10]. Impressions were taken and rehabilitated with a cement -retained prosthesis [Fig 11,12]. A final radiograph was taken along with the prosthesis at the end of the prosthetic phase [Fig 10]. Mandibular left posterior teeth replacement also done with cement retained implant supported restoration.(fig 13)

## III. Discussion

The posterior maxilla has been described as the most difficult and problematic intraoral area confronting the implant practitioner, requiring a maximum of ingenuity for placement of implants in this region. The posterior atrophic maxilla has limitations such as poor bone quality and quantity, the presence of maxillary sinus, difficulty in accessibility, maintenance of proper oral hygiene, and in some cases, extreme occlusal loading in the molar regions are evident. To overcome these limitations and deficiencies, several procedures such as sinus lift with augmentation (direct and indirect), bone augmentation with autogenous grafts (both vertical and horizontal), tilted implants (all on 4), zygomatic implants have been reported widely in literature and in our day to day practice.

Placement of implants into the pterygo maxillary region opens new vistas in rehabilitating atrophic posterior maxilla. Due to the disadvantages such as tear of sinus membrane during sinus lift procedures, seepage of bone grafts into the sinus, loss of bone grafts due to resorption during bone augmentation procedures, high morbidity seen in zygomatic implants, screw loosening or breakage in tilted implants, a simple but effective method of replacing posterior maxilla is placement of implants in the pterygomaxillary region (pterygoid implant).

This case report shows us the simple way of replacing the atrophic posterior maxilla with the pterygoid implant. In this case report, two implants (one in first premolar biccal root and another in the palatal root of the second premolar) and one implant placed in pterygo maxillary region. This case report supports the fact placement of the implant in the pterygo maxillary region has same or higher success rate as that of other techniques.

Moreover, the implants placed in the pterygomaxillary region are at an angle, there is the nonaxial direction of forces to the implant. However, once osseointegrated, reports have shown that these pterygomaxillary implants resist all axial and nonaxial forces better than any other implants placed in the maxilla.

Furthermore, in this case report, the patient tolerated the distal position of the implant, showed neither difficulty in speech nor difficulty in maintenance of oral hygiene.

## IV. Conclusion

Implants placed at pterygoid region have high success rates, similar bone loss levels to those of conventional implants, minimal complications, and good acceptance by patients. So restoring posterior maxilla with implants at pterygoid region is beneficial . These implants are stable biomechanically and there is no cantilevering of pontics. Implants placed in the pterygomaxillary region gives us excellent posterior bone support without augmenting maxillary sinus nor with additional bone grafting. Within the limitation of this case report, it can be concluded that implants at pterygoid region have high success rate with minimal complications.

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Fig 1: Pre operative intraoral frontal

fig 2: pre operative right lateral

Fig 3: Pre operative right lateral

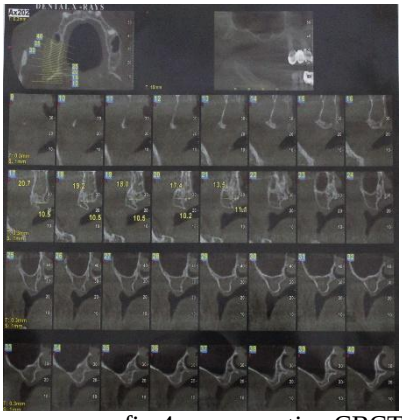

fig 4: pre operative CBCT

**Fig 5:Pre operative OPG**

**fig 6: Osteotomy at pterygoid region**

**Fig 7: Pterygoid implant in situ**

**Fig 8: Implants in retation to first ,second premolar and pterygoid region**

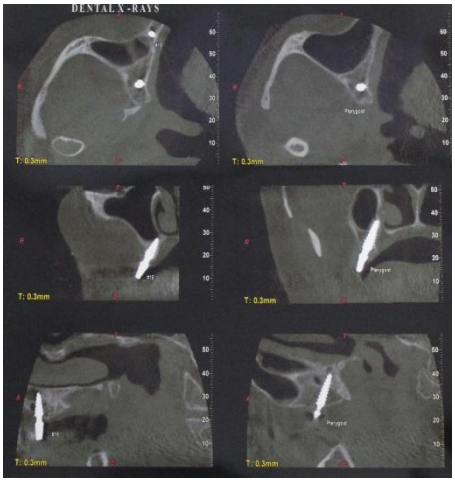


**Fig 9: Post operative cbct**

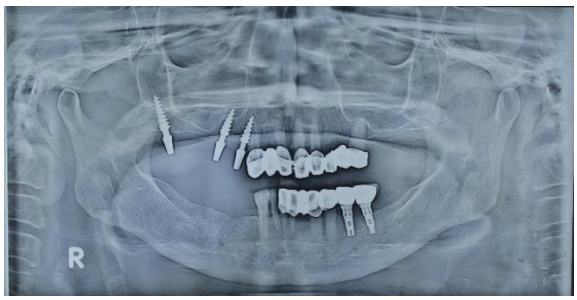


**fig 10: post operative opg**

**Fig11 :Abutment preparation**

**fig 12: prosthetic rebabilitation**

**Fig 13: prosthetic rebabilitation**

**fig 14: post perative frontal**