

# Treatment of Severely Atrophic Maxilla by Using Zygomatic, Pterygoid, and Transnasal Implants

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**Abstract:** For many decades the success of dental implants has been considered to be dependent predominantly on the quality and quantity of the patient's alveolar bone. Grafting procedures have been commonly used to rehabilitate severely atrophic jaws but these procedures have disadvantages such as long treatment duration, major surgery, the risk of morbidity in the donor area, and high treatment costs. Recently, the use of 4 zygomatic implants has become an important treatment option in the rehabilitation of extremely atrophic maxilla. The quad zygoma technique is a method applied in cases where conventional implants cannot be used in the anterior maxilla. However, the technique has some difficulties and requires surgical experience. An alternative to the use of quad zygomatic implants is the placement of transnasal with zygomatic implants and subperiosteal implants. The aim of this case report was to present the treatment of a patient with severely atrophic maxilla with zygomatic, pterygoid, and transnasal implants.

**Key Words:** Atrophic maxilla, pterygoid implant, quad zygoma, transnasal implant, zygomatic implant

Dental implant placement is difficult in the severely resorbed maxilla for a variety of reasons. Bone volume decreases due to advanced periodontal diseases, excessive pneumatization of the sinus and there is usually not enough bone to place conventional implants.<sup>1</sup>

Advanced surgical procedures have disadvantages such as long treatment duration, major surgery, the risk of morbidity in the donor area, and high treatment costs. In recent years, implants that are anchored from anatomic structures adjacent to the maxilla have been used to prevent these disadvantages.<sup>1</sup>

In cases where there is insufficient bone volume in the premolar region and posterior maxilla, rehabilitation of the maxilla is provided without the need for advanced augmentation with 1 zygoma and 1 conventional implant bilaterally.<sup>2</sup> However, in cases without adequate anterior maxillary bone volume, 4 zygoma implants (quad zygoma) are recommended to be used. The concept of quad zygoma involves the insertion of

4 zygomatic implants, with adequate anteroposterior spread and correct inclination for the distribution of forces, as a means of rehabilitating patients presenting with insufficient bone height in the anterior and posterior maxilla.<sup>3</sup>

Although this technique is predictable and well-documented in the literature, it has some limitations. Zygomatic bone width is reported to be at least 1.8 to 2 mm for the use of the technique. In cases with insufficient zygomatic bone volume, there is an increased surgical risk due to the possibility of the anterior zygomatic implant penetrating the orbit. Too close placement of the implant apex may result in implant failure. Gingival recession has been reported in patients with an excessive concavity in the maxillary bone.<sup>4</sup>

An alternative to the use of quad zygomatic implants is the placement of transnasal implants with zygomatic implants and subperiosteal implants. The aim of this case report is to present the treatment of a patient with severely atrophic maxilla using zygomatic, pterygoid, and transnasal implants.

## CLINICAL REPORT

A 53-year-old female patient was referred to our department for the rehabilitation of her previous failed implants. In the patient history and clinical examination, 8 implants had initially been placed, 5 of which were removed over the next 10 years.

Radiologic examination revealed that the patient had severe maxillary atrophy (Fig. 1). Virtual implant planning was performed on cone beam computed tomography, but it was observed that there was insufficient bone volume in the zygomatic bones of the patient for the placement of quad zygoma implants. As an alternative to quad zygoma, 1 zygoma and 1 transnasal implants were planned bilaterally along with 1 pterygoid implant to eliminate the need for a cantilever. Before proceeding to transnasal implant osteotomy, the nasal mucosa is elevated with sinus curettes from the distal and inferior nasal walls. Osteotomy is performed after the determination of the inferior nasal concha where the apex of the transnasal implant will be located. In the meantime, the nasal mucosa is protected with periosteal elevator or sinus curettes so that the drills do not tear the mucosa. The target of the transnasal implant is the inferior concha, which is dense in the cortical bone between the nasal cavity and the maxillary sinus. Drilling starts from the canine or lateral teeth. After the inferior nasal base is drilled, the drill pathway is directed to the inferior nasal concha. After drilling 3 to 4 mm in the inferior nasal concha, a 4.0×24 mm JD nasal implant (J Dental Care) was placed bilaterally and 80 Ncm of torque was obtained from the implants

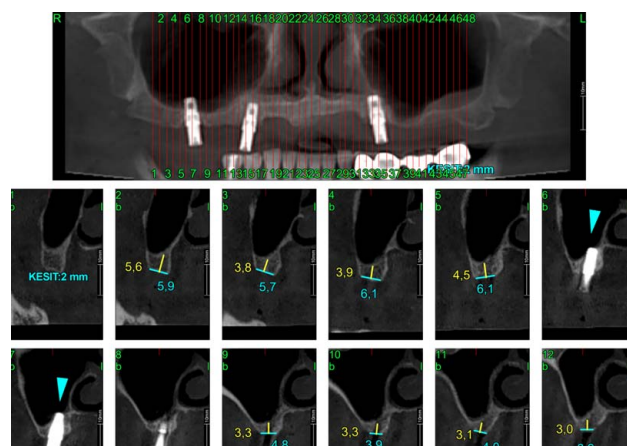


FIGURE 1. Preop CBCT images of the patient. CBCT indicate cone beam computed tomography.

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