

A Case Report: Zygomatic Implant Treatment in the Edentulous Mouth

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ABSTRACT

As a result of periodontal or endodontic diseases; local and systemic factors such as tooth extractions, early tooth loss, tumor resections, traumas, and some other types of developmental anomalies may lead to advanced horizontal and vertical bone resorption in maxilla. Jaw bones that have horizontal and vertical resorption, the retention and resistance of the prosthesis is negatively affected, which disrupts the stabilization of the prosthesis and reduces patient comfort. On the other hand, the reconstruction and rehabilitation of the atrophic maxilla by using grafts is challenging for several reasons. It requires a good surgical technique, high-quality soft tissues covering the graft, and a favorable overall health standard for repair, as well as patient cooperation, which involves risk factors. In this case presentation, a 36-year-old male maxillary edentulous patient with history of long-term prosthesis use presented to our clinic with a desire for improved prosthesis retention and a request for fixed prostheses. After evaluating the patient's all blood tests and CBCT image, total of 2 zygomatic implants were placed where the level of teeth numbers #24 and #14, under general anesthesia. The bone was determined to be D4 in softness, so to increase the retention region dental implants were placed in the regions of teeth numbers #12, #22 and #18. On the same day, temporary fixed prosthesis were placed with surgical procedures. The patient was edentulous for many years and used removable denture; so in his clinical images there were oral epulis fissuratum. After the osseointegration is complete, epulis fissuratum are removed with diode lasers and vestibul deepening is made at the same session. The patient is given the new total prosthesis after 2 weeks of soft tissue healing.

This case report's purpose is to give newsworthy information about a zygomatic implantation made in an edentulous mouth, its indications, advantages, and methods.

INTRODUCTION

Tooth losses in the maxilla cause alveolar bone resorption because of systemic and local factors such as, periodontal diseases tumor resection. Composed buccopalatal or vertical bone loss as a result of it, account for the toothless area in the maxilla ^[1]. In that area, alveolar bone's atrophy effects, first alveolar ridge's wideness and then the alveolar ridge's aspect ^[2] Insufficient alveolar bone often leads to problems when placing implants in the maxillary sinus area ^[3]. Several techniques have been improved in case of a severe alveolar bone insufficiency. These include a variety of techniques, such as bone grafting, guided bone regeneration, onlay bone grafting, crest separation, crest widening, distraction osteogenesis, interpositional bone grafting, and sinus lifting by using bone grafts^[4,5]. In addition to these, zygomatic implants presented by Branemark are used especially in cases where maxilla has an advanced level of resorption in the posterior region and dental implants are insufficient on their own. This technique presented by Branemark later was improved by Weischer et al.'s. with studies focusing on the usage of zygomatic bone as a support in the rehabilitation of the patients who have had maxillectomy and ended up building the fundamentals of the zygomatic implants we used today. Zygomatic implants are aimed at improving patient rehabilitation by providing retention for prostheses in severely atrophic maxilla where dental implants and sinus lifting procedures are not indicated ^[6]. Zygomatic implant procedures offer advantages such as reducing cost and treatment time for both patients and physicians and eliminating the morbidity associated with autogenous bone grafts ^[7]. Zygomatic implant surgery is generally performed under general anesthesia, although conscious intravenous sedation has been reported in some publications. Zygomatic implants are designed with a 45-degree angled head, a diameter of 4.5 mm at the widest part, and lengths ranging from 30 to 50 mm ^[8]. Despite their high success rates, zygomatic implant surgeries are challenging and risky due to their proximity to critical anatomical structures, and only specially trained and experienced surgeons should perform them.

CASE REPORT

A 36-year-old male maxillary edentulous patient with history of long-term prosthesis use applied to our clinic with a desire for improved prosthesis retention and a request for fixed prostheses. The orthopantomography and conic photon computed tomography taken for the radiographic examination of a patient who uses a lot of alcohol have shown that maxillary bone has advanced level of resorption. **(Figure 1)** Following consultation with the prosthodontics department considering the patient's age, amount of bone resorption, and soft tissue profile, it was decided to perform zygomatic implantation under general anesthesia with additional dental implants to provide extra retention due to the presence of D4 type soft tissue in the posterior maxilla. In the posterior mandible, it was decided to place 4 standard implants after serial extractions for the purpose of stable rehabilitation ascribed to insufficient vertical dimension of the bone. Following stabilization of the patient's systemic condition, the procedure was applied under general anesthesia in the Oral and Maxillofacial Surgery operating room of Istanbul Kent University. In the first place, the patient was administered an

adrenaline-containing local anesthetic (Maxicaine Fort; articaine + epinephrine) via bilateral infraorbital, tuber, and infiltrative injections. Mucoperiosteal flap was removed after incision by no 15 bisturi from the top of the alveolar crest to the whole jaw to expose the surgical site. After exposure to the zygomatic arch, Branemark drilling protocol was applied. Following the drilling protocol, two zygomatic implants were placed at the level of teeth #24 and #14. Since there was a 2mm reflection in the bone on the body of the zygomatic implant, the bichat fat tissue was removed due to post-op gingival risk. Nasal lifting and 0.5cc grafting were performed in the region of tooth #22. Standard dental implants were placed in the regions of teeth #12, #22, and #18. The zygomatic field was covered with a 2.5 cc graft and 14x25 membrane because of the alveolar crest reflected on the vestibule is very thin (**Figure 2**). The surgical site was primarily closed using 3.0 Pegelak sutures (**Figure 3**). On the same day temporary fixed prosthesis were placed. Immediately after the procedure, the patient was administered diclofenac 75 mg/IM injection. Postoperatively the cold compress to the patient and the patient was prescribed diclofenac 75mg/IM, cefazolin 1g/IM, dexketoprofen 25mg p.o, topical benzydamine hydrochloride mouthwash, and xylometazoline nasal spray for medical treatment. Postoperative instructions were provided, and the patient was discharged on the same day. The patient was edentulous for many years and used a removable denture; so in his clinical images there were oral epulis fissuratum. After the osseointegration is complete, epulis fissuratum are removed with diode lasers and vestibul deepening is made at the same session (**Figure 4**). The patient is given the new total prosthesis after 2 weeks of soft tissue healing (**Figure 5**). No complications were encountered during follow-up visits.



Figure 1



Figure 2



Figure 3

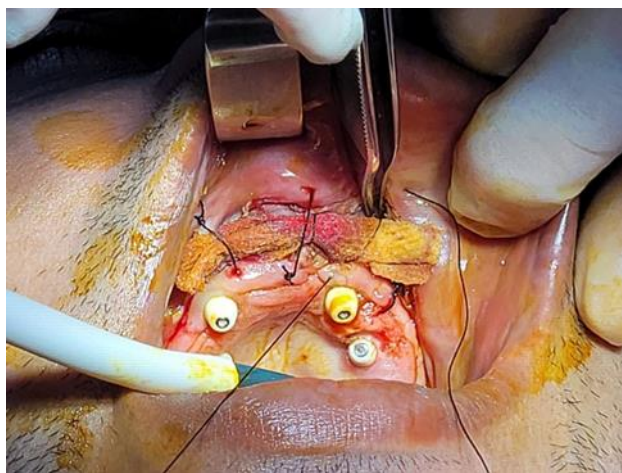


Figure 4



Figure 5

DISCUSSION

Zygomatic implants are successful methods used for patients who have an atrophic maxilla. It is particularly preferred due to its ability to offer a faster treatment option than augmentation techniques ^[9,10]. However, it is recommended to be done by surgeons due to the need to protect many anatomical structures and potential complications that may arise later.

In zygomatic implant surgery, two different methods are used 'extra-sinus and intra-sinus'. It is believed that the extra-sinus method causes less sinusitis than the other method ^[11]. In this study, the 'intra-sinus' method was used because of the limited field of view, and no sinusitis was observed in the post-op period. Vega, et al. propose that four zygomatic implants are not conditioned to have a successful result. Two zygomatic implants were used to have enough stability, retention, and resistance on the upper part of the implant in this research.

Since this type of atrophic jaw that should be seen in older patients was seen at this young age, and the patient was rehabilitated with zygomatic implants instead of the augmentation methods that are presented in most studies, this research was done. The fact that no complications were faced during the 7-month follow-up period proves this is true.

Conclusion

Zygomatic implants are considered a valuable alternative to conventional augmentation and implant treatment for patients with advanced atrophic jaw. It also decreases treatment time since there's no need for an operation like sinus lifting. It's shown that suitable treatment method for patients with maxillary resorption, patients with syndromes, partially edentulous patients, and patients with acquired and congenital defects in zygomatic implant applications have a high success ratio.

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