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Case Report

Rehabilitation ofthe severely resorbed maxillaby using quad zygomatic implant-supported prostheses in a Systemic Lupus Erythmatosus patient: A case report

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INTRODUCTION

Systemic lupus erythematosus (SLE) presents as a chronic inflammatory autoimmune disease that canoften demonstrate multisystem involvement.SLE affects women 10 times more than men and manifests as oral lesions (red macula or plaque to ulcerations, which may be surrounded by white irradiating striae, and white plaque on a pigmented mucosa involving the hard palate, lips, and buccal mucosa) in 10% cases. SLE involves treatment with immune-suppressive drugs which can possess an elevated risk of infection and delay healing. Moreover, damage to the salivary glands in this disease leads to reduced salivation. Together, these complications can be a primary concern in dental treatment procedures owing to inability to maintain oral hygiene and risk of implant failure.Even though endosseous implants play a pivotal role in replacing missing teeth, their success rate in completely edentulous-severely atrophic maxillary arch remains highly unpredictable. Conventional implant treatment cannot be performed in the edentulous maxilla in some patients because of advanced bone resorption and/or the presence of extensive maxillary sinuses, leading to inadequate amounts of bone tissue for anchorage of the implants.Zygomatic implants use the zygomatic bone foranchorage in the posterior maxilla, which is helpful in patients with complete edentulism and significant sinus pneumatization. The zygomatic implant was originally used in the rehabilitation of discontinuous maxillae to anchor an obturator prosthesis to the zygomatic bone.[1]Currently, zygomatic implant insertion in patients with severely atrophic maxilla for oral rehabilitation is considered as a successful treatment modality for improved function and esthetics. Compared with major bone grafting, it is still a less invasive technique and can be used in cases where bone grafts cannot be harvested for some reason.

For over three decades, bone grafting prior to, or simultaneously with, implant placement hasbecome routine in oral rehabilitation. Various bone-augmentation techniques, such as sinus floor augmentation and onlay bone grafting, have been described with the common goal of increasing the volume of load-bearing bone. Because zygoma implants gain bicortical stability through the malar bone, their design permits surgeons to place them even in cases wherethere is a complete deficiency in themaxillary bone. An extra-sinusal approach to the placement of zygomatic implants is a modification of the standard technique reported in 2008 by Aparicio et al.[2]Studies have stated that the extra-maxillary pathtechnique reduces morbidity and provides better stability with the advantage of immediate loading

implants.[3]The use of multiple zygomatic implants (e.g. two tothree in each side) to support a prosthesis was suggested by Bothur et al.[4] For the most common indication, the zygomatic implants are combined withtwo to four anterior maxillary axial implants. Thus, the aim of this case study was to report the outcomes of zygomatic implant insertion without any graft placement for the aesthetic and functional oral rehabilitation of the patient with a severely atrophic maxilla.

CASEREPORT

A 49-year-old female patient affected with Systemic lupus erythematosus (SLE), wearing a removable prosthesis in the maxilla and an implant-supported prosthesis in the mandible, presented for treatment at the Dr Hiremath Hospital, Vijayanagar, Bengaluru (Fig. 1).She reported the failure of basal implants in the maxilla 6 months ago and instability of the upper prosthesis as the main complaint, which negatively affected her speech and masticatory function.Clinical and tomography examination, showed extreme maxillary bone atrophy, with horizontal atrophy of bone in zone 1 (anterior maxilla), and absence of alveolar bone in zones 2 (premolars) and 3 (molars) of the maxilla (Fig. 2). Implant planning was completed using the CBCT.Following analysis, a maxillary prosthesis based on quad zygomatic implants was planned, and the patient was scheduled for surgery following all haematological investigations.A supracrestal and oblique incision, followed by detachment of the gingival flap were performed, obtaining sufficient visualization of the zygomatic arch.The osteotomy was performed following thedrilling protocol recommended by the manufacturer. Four zygoma implants (Quickdent implants) 4.2 x 40mm (in the right posterior region, close to 16), 4.2 x 45mm (left the posterior region, close to 26), 4.2 x 45mm (in the right premaxilla, close to 13) and 4.2 x 50mm (in the left premaxilla, close to 23)were positioned using handgrip instruments according to ZAGA technique. Two basal implants (4.2 x 16 mm) were placed in the anterior maxilla. All implants reached final torque of approximately 50Ncm (Fig.3).Regular healing caps were attached to the implants with 15Ncm of torque and a continuous suture was performed. Analgesics and antibiotics were prescribed for the duration of one week. After one week, the scan abutments were placed on the maxillary implants and both arches were recorded using intraoral scanner (Runyes 3ds intraoral scanner) (Fig. 4). Angulated multiunit abutments 60° (1.5 mm transmucosal height) were screwed over the four Zygoma implants and two straight abutments were placed on the anterior implants with a torque of 20 Ncm. After performing the jig trial, screw- retained metal framework (Co-Cr) was confirmed for passive fit in the maxilla andinterocclusal bite registration was done. All implants were functionally loaded with full arch zirconia prosthesis (Fig.5) , and the occlusal adjustment was done. A panoramic radiograph was obtained postoperatively (Fig. 6). The patient was recalled for clinical follow-up after 1 month and every 3 months for the first year, and then twice a year. To this day, the patient presents a good result functionally and aesthetically. No complications such as sinusitis, difficulty in hygiene maintenance, speech impairment, or mobility of the implants were detected. Masticatory function was restored, and the patient was satisfied with her appearance.

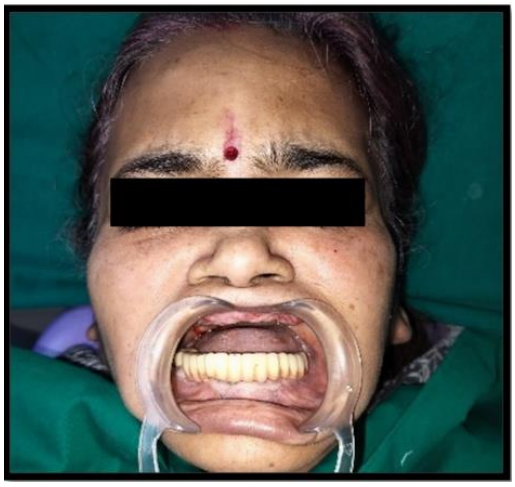

Fig.1: Patient with severely resorbed maxilla

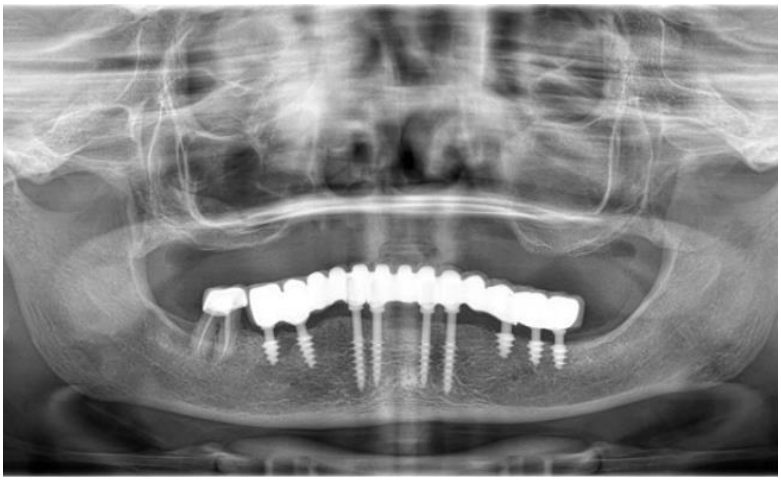

Fig.2: Pre-op OPG of the patient

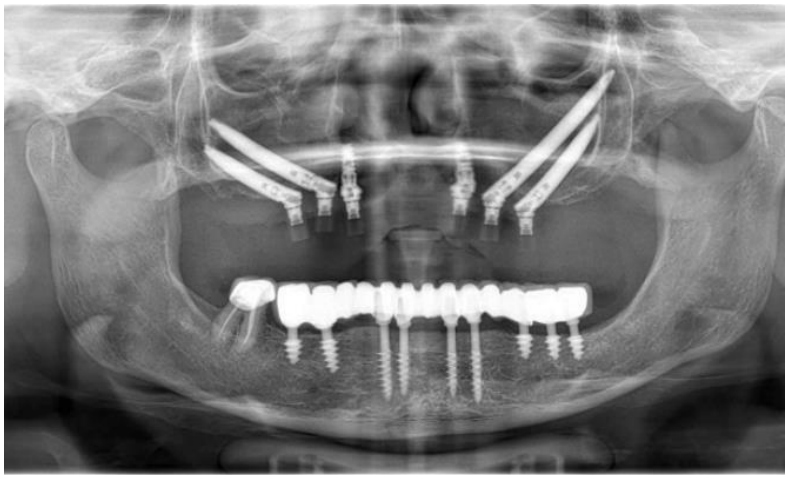

Fig.3: Quad Zygoma Implants in maxilla

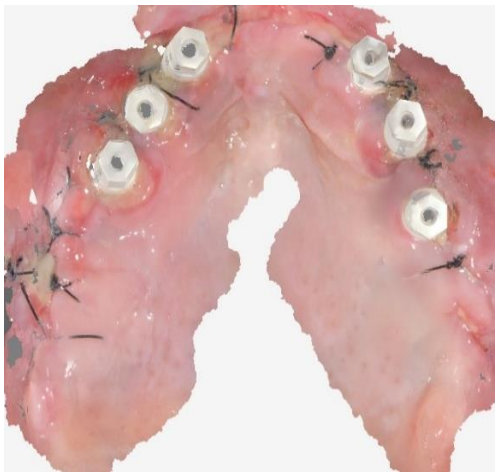

Fig.4: Intraoral scanned image of the maxillary arch

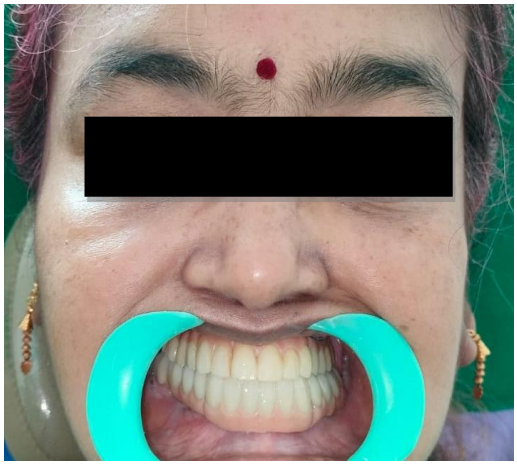

Fig.5: Zirconia Prostheses

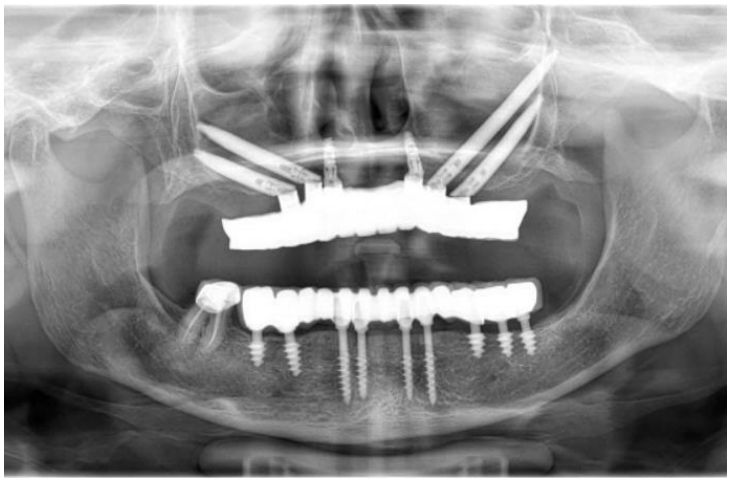

Fig.6: Post -op OPG of the patient

DISCUSSION

Decreased salivary flow can often lead to periodontal disease and early loss of dentition inpatients with SLE.Moreover, Patients on the steroid therapy are often osteoporotic.In order to guarantee satisfactory success rates for conventional dental implants in the absence of bone augmentation techniques, the maxilla's posterior portion must have a minimum bone height of 10 mm. Bone grafting treatments, have drawbacks related to the process and patient waiting times. For these reasons, patients may find it more difficult to choose the conventional dental implants. In basal implant therapythe basal implants are anchored in basal cortical bone which isnot prone to resorption. The basal cortical bone is resorptionfree as they are more mineralized due to muscle attachments. In cases of severe alveolar atrophy, zygomatic implants provide a reliable substitute for bone augmentation procedures.[5]Rehabilitation using zygomatic implants, especially if those implants are extra-maxillary, is relatively new and different from treatment with conventional implants as zygomatic implants differ in biomechanics and clinical treatment procedures. Aparicio et al. had developed a newer technique called the" Zygomatic Anatomy Guided Approach" (ZAGA). Thus, depending on the relationship between the zygomatic buttress and the intra-oral starting point of the zygomatic implant, the path of the implant body will vary from being totally intrasinus to being totally extra-sinus. The implant itself seals the wall osteotomy, which minimizes the risk of sinuscontamination.This technique focuses on interindividual anatomical differences between patients and the anatomy of the maxilla guides the implantplacement, therefore there is no preparation of window on the lateral surface of the sinus cavity.[6]For precise reporting on prosthesis success, anatomic measurements to assess the position of the head of thezygomatic implant with regard to the middle of the crest of the alveolar ridge in the horizontal axial dimension should be included. The exteriorized technique produced significantly longer drilling holes than the Branemark technique, suggesting that the exteriorized technique may provide higher initial mechanical stability. Studies have stated that theextra-maxillary path technique reduces morbidity and provides better stability with the advantage of immediate loading implants.[7]Placement of the longimplant following the ZAGA principles optimizes support provided by the bone, even at the level of the maxillary wall, which is critical in a patient suffering from extreme bone atrophy. In order to treat patients who, appear with inadequate bone height in the anterior and posterior maxilla, the"quad zygoma" concept entails the insertion of four zygomatic implants with appropriate anteroposterior spread and proper inclination for the distribution of stresses.[8] Nkenke et al. suggested that the success seen with zygomatic implants is probably a result of the engagement of four cortices (the lingual cortex of the maxillary alveolus, the cortical floor of the maxillary sinus at the crestal portion of the implant and the zygomatic bone cortices at the apex).[9]Moreover, the clinician will be able to use the available crestal bone, allowing also for bone integration at the implant body and neck level in most ZAGA types. The zygomaticimplant has an increased tendency to bend under horizontal loads. This is related to two factors: the greatly increased length of these implants (30–52.5 mm) and the fact that in some circumstances there is limited or no bone support in the maxillary alveolar crest.[10] Consequently, these implants have to be rigidly connected to stable conventional basal implants in the anterior maxilla.A cone beam computed tomography approach is also requiredprior to surgery to evaluate whether sinuses are healthy.

CONCLUSION

Despite unfavorable functional load direction and limited anatomy, clinical follow-up indicated that zygomatic implants provided excellent anchorage for various prostheses.Zygomatic implants can be used as a reliable alternative to restore masticatory function in the complete or partially edentulous maxilla with a high degree of predictability and satisfactory long-term outcomes.However, placement of zygomatic

implants should be considered as a major surgical procedure wherein proper training is needed.

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