
The use of zygomatic implants for the rehabilitation of atrophic maxillas with 2 different techniques: Stella and Extrasinus

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The zygomatic implant anchorage is a surgical technique that provides a new perspective for patients with severe maxillary atrophy, increasing predictability and reduced cost of treatment, besides being a tool for the hardships of the rehabilitation of such a challenging region. This article describes 2 clinical cases with zygomatic implants with different techniques (Stella and Extrasinus) and both with immediate loading and accompanying clinical radiographic follow-up procedures of 12 and 24 months, respectively. (**Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011; 112:e49-e53**)

The rehabilitation of patients with severely atrophied maxillas presents a major challenge owing to the complexity of its implementation. The problem presents itself because of the lack of height and width of the alveolar ridge, this being a result of insufficient bone, extractions, trauma, infection, or maxillary sinus pneumatization.¹⁻³

Several surgical techniques have been developed to successfully increase the volume of bone: iliac crest graft, Le Fort I, guided bone regeneration, sinus lifting, and combinations of these procedures.⁴⁻⁹ These treatments also reduce patient comfort, increase morbidity, require several surgeries, and require the use of removable prostheses for a long period of time.^{10,11}

Implants placed in grafted areas have various success rates, with the literature suggesting a rate of 82% to 84% with a clinical follow-up of 12 to 60 months.¹²

Aiming to simplify the treatment of these patients, increasing the predictability of outcomes and decreasing morbidity, treatment time, and avoiding bone grafts,

Brånemark and his team¹³ in 1988 implemented the anchoring technique known as zygomatic implants (ZI) in some research centers.

Initially this technique was designed to treat victims of trauma, tumor resection, or congenital defects. These patients present with a considerable loss of bone structure¹⁴ and few regions offering anchorage for the implants. These regions consisted of the body of the zygoma or the frontal portion of the zygomatic bone¹⁵ presenting a great alternative. With time, the technique has been refined, allowing patients with severe bone resorption to be restored predictably to proper function and esthetics and with a success rate similar to implants placed using the conventional technique.¹⁶

There are different techniques for fixation of zygomatic implants. The technique developed by Brånemark¹⁷ calls for a Le Fort I incision, allowing the displacement of a large flap to facilitate exposure of the zygomatic bone, and the realization of a window for the displacement of the sinus membrane. The technique of Stella and Warner¹⁸ differs from the original technique, as there is no need for a window opening on the wall of the maxillary sinus, only 1 channel orientation, and there is no concern for the integrity of the sinus membrane. The third technique¹⁹ has no need for a window opening or a channel in the wall of the maxillary sinus because of the externalization of the zygomatic implants in relation to sinus. This article reports 2 clinical cases that were rehabilitated with different fixation techniques, with a radiographic follow-up of 24 and 48 months, respectively.

CASE DESCRIPTION

Case 1

A 65-year-old female patient at the Center for Teaching and Research in Dental Implants (CEPID) at the Federal University of Santa Catarina (UFSC) presented to perform an

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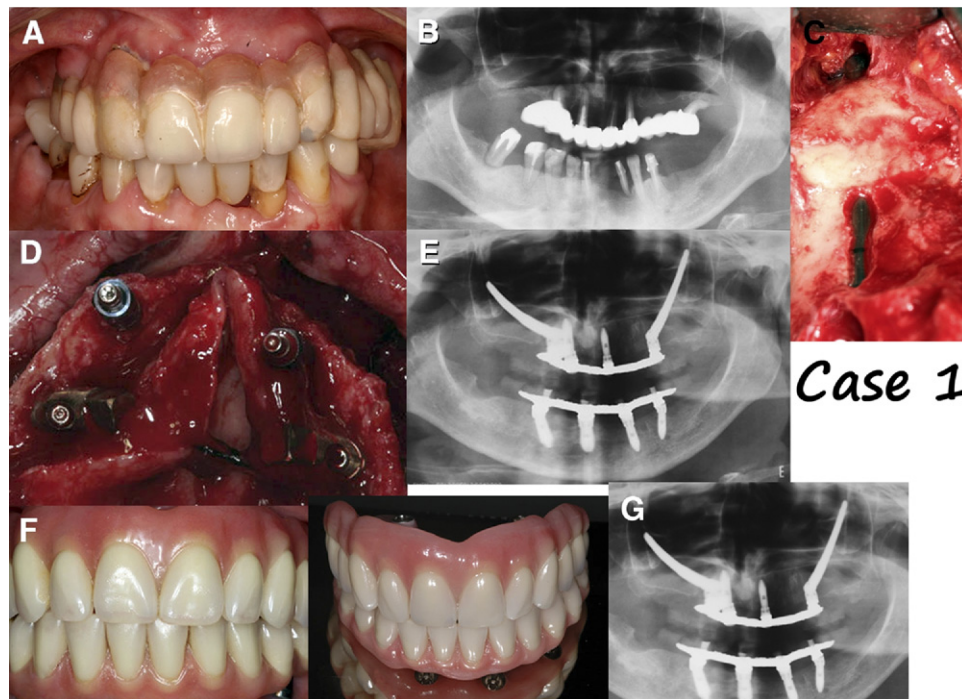


Fig. 1. Patient 1. **A**, Intraoral photograph. **B**, Initial radiograph. **C**, A channel or slot was completed to define the orientation of the trajectory of the drills. **D**, Zygomatic and conventional implants installed. **E**, Postoperative radiograph. **F**, Clinical photograph showing the final prosthetic result. **G**, Radiographic follow-up at 24 months.

implant reconstruction. Examining the panoramic radiograph revealed bone loss around the upper and lower teeth, observed clinically. With the impossibility of keeping these teeth, treatment options were introduced in the upper arch that would use 4 implants, 2 anchored in the zygomatic bone and 2 in the anterior region. The lower jaw had a treatment plan to place 4 implants. Both treatments had the possibility of immediate loading.

The procedure was performed under general anesthesia and was initiated by tooth extractions and smoothing maxillary and mandibular alveolar ridges. Once the tissue was reflected and the body of the zygoma was located, drilling was initiated. With a round bur, a channel or slot was completed to define the orientation of the trajectory of the drills. Then, the following sequence was used: 2.9-mm drill bit, 2.9-mm twist drill, 3.5-mm pilot drill, and 3.5-mm twist drill, always aiming the position of the platform of the implant to lie as close as possible to the crest of the ridge. The next step was the installation of the zygomatic implants, 4.1 diameter \times 52.0 mm in the posterior left ridge and 4.1 diameter 45.0 mm in the right posterior border. Two implants measuring 4.1 \times 13.0 mm were placed in the anterior. We used the posterior multiunit abutments on 17° (right side) and 30° (left side), both with a height of 4 mm, in order to have the emergence profile located in the molar region. Because the torque was greater than 40 Ncm for the implants in both arches, an immediate loading protocol was initiated, tissue was sutured, and acrylic resin (Duralay, Reliance) was used to secure the abut-

ment transfers in both arches and an impression for manufacturing the prostheses was completed. After 48 hours, the prostheses were installed, restoring function and esthetics for the patient. Panoramic radiographs were performed at 12 and 24 months for the control treatment (Fig. 1, A-G).

Clinical case 2

A 68-year-old male patient presented to the CEPID at UFSC for rehabilitation of the upper jaw. On clinical examination there was a fixed prosthesis supported by implants in the lower jaw and upper jaw with a thin ridge. It was suggested that the patient have implants anchored in the zygomatic bone owing to the desire not to undergo a complex reconstruction with extraoral donor sites. The procedure started in the hospital with a LeFort type I incision, using the ZI externalized technique. After the flap was reflected, the sequence of drilling included 2.9-mm pilot drill, 2.9-mm twist drill, 3.5-mm pilot drill, and 3.5-mm twist drill. After the placement of the implant platform directly over the ridge, the installation of four zygomatic implants was completed, two on the left side: 4.1 diameter \times 48 mm and 4.1 diameter \times 45 mm; on the right side 4.1 diameter \times 45 mm, 4.1 diameter \times 48 mm. We used a microunit-type abutment 17 with a height of 4 mm, so as to have the emergence profile located in the molar region. Because the torque was greater than 40 Ncm for the implants in both arches, an immediate loading protocol was initiated, tissue was sutured, and acrylic resin (Duralay, Reliance) was used to secure the abutment transfers in both

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