Case 1 - Carico immediato in implantologia un caso di agenesia dei laterali con insufficienti parametri dimensionali (articolo in inglese)

Drs. Silvano Umberto Tramonte and Aldo Daniele Dominici find an implant solution for a patient with minimal space

Implant bracing has become an unsurpassed advantage in immediate loading, with respect to rehabilitation with separate implants, because it allows a more balanced dissipation of functional loads and, as a consequence, a lower risk of implant loss during and after osseointegration.1-17 For that purpose, the most frequently used methods are the production of a cast and threaded bar to be fastened to the implants with screws or the placement of a metal reinforced screwed/cemented temporary prosthesis.
An interesting alternative is provided by the use of a syncrystallizer. This technique allows the practitioner to effectively brace all the implant posts with each other by welding a titanium bar to them. The process used by this type of welder consists of a sharing of atoms to form a crystallized lattice in the junction area. This junction is generated by an instantaneous flow of electrons through the two surfaces.

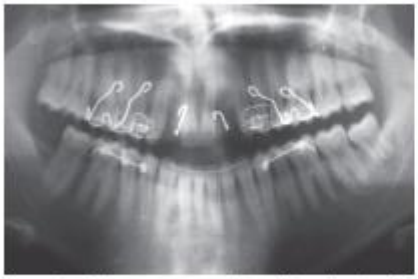

Figure 1: Orthopantomography with orthodontic retainer, before surgery

Figure 2: Front view before surgery

This technique allows the construction of multiple implant units (bipeds, tripods) that, in our experience, have shown their biomechanical advantage with respect to single implants or units made by a single implant. In this case, the possibility of building a two-implant unit (a biped) may be the basic element for a successful outlook, given that the available bone is so thin that it does not allow the use of implant diameters greater than 2.5 mm.

Clinical case

In October 2006, a 20-year-old woman, affected by agenesis of the upper laterals, came to our clinic after wearing an orthodontic retainer (Figures 1-4). She refused any form of invasive surgery or continuation of orthodontic treatment.

A careful clinical and radiographic examination highlighted the difficulty of this case: minimal space available between the contiguous roots of canines and centrals, especially on the right side. The CT scan, performed with 95 oblique sections of 1 mm each, presented only two sections free from roots, both on the right and on the left side, equivalent to an average of 2.5 mm of free space between the apex of each root of the canine and the central.

Treatment plan

The proposed clinical case is a fixed, immediate-load rehabilitation with surgery in a case of agenesis of the laterals, with reduced bone crest and very reduced space in the vertical dimension. After the patient repeated that she was unwilling to undergo any reconstructive surgery or to continue her orthodontic therapy, Italian School implants and techniques were chosen. In fact, the authors considered that this was an effective instrument to be used for the individual patient's anatomy. The only possibility was to place a 2.5-mm diameter screw-shaped implant, very angled to the palate, to avoid the two root apexes. This implant would have been placed in a very angled direction with respect to the actual load, therefore very disadvantageous from a biomechanical point of view.

Figure 3: Right side before surgery

By using the techniques and instruments of Italian implantology, it would have been possible to insert in the extremely narrow vestibular space a 1.2-mm diameter Scialom needle, with its apex placed in the intraosteal vestibular bottom, with its emergence very close to one of the screw-shaped implants. This would allow the two posts to be welded together by using the syncrystallizer to form the vestibular pillar parts of the bipodal structure destined to counterbalance the transverse loads representing the majority of the applied loads.

Immediate load

According to the patient's request, the implant rehabilitation in both sites No. 7 and No. 10 was performed with immediate loading. In order to avoid the presence of scars as much as possible in a very esthetic area, and considering that the patient was a very young woman, only a very small crestal incision was made, with a very slight opening of flaps, barely sufficient to see the bone crest, but without detaching the flaps from the bone surfaces.

Prosthetically guided

The entrance point of the implants in the bone was defined according to the guidelines of prosthetically guided implantology, so that each post would correspond to the element to be rehabilitated. The correct positioning of each post with respect to the contiguous teeth was achieved by bending it, according to this type of protocol. Instead, the angle of each implant followed the principles of anatomically guided implantology, with screw-shaped implants inserted at the angle that best exploited the greater available bone, in a non-parallel geometry, to create a basic support surface as large as possible, and to allow for a correct dissipation of lateral loads.

Figure 4: Occlusal view before surgery

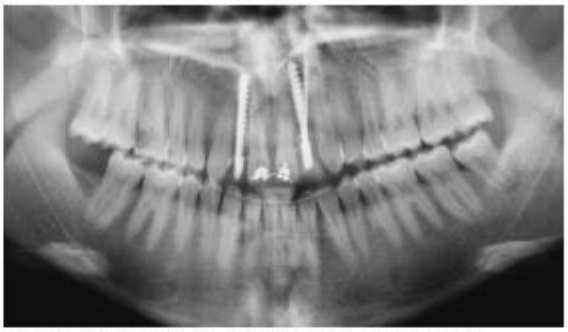

Figure 5: Orthopantomography immediately after surgery

Figure 6: 2.5-mm diameter implant and needle inserted in position for tooth No. 7

Figure 7: 2.5-mm diameter implant and needle inserted in position for tooth No. 10

Figure 8: Sectional radiography of implants inserted in position No. 10

Figure 9: Provisional crown immediately after surgery on tooth No. 7

Figure 10: Provisional crown immediately after surgery on tooth No. 10

Figure 11: Frontal view of the definitive crown 7 months after surgery

Tramonte implants and trans-mucosal Scialom needles were used. The screw and needle implants were braced together immediately by using a direct syncrystallizer welding of their emerging posts (Figures 5-8). An instrumental control of the primary stability of all the implants was performed with the aid of a Periotest M® (Medizintechnik Gulden, Modautal, Germany).

Post-op

Postoperatively, the patient received 400 mg of ibuprofen and ice, to reduce any postoperative edema. Immediately after the surgery, the temporary prosthetic elements were prepared and tried in. They were made with an ovoidal profile to shape the gum during healing. The central disclusion was maintained only on the central elements (Figures 9-10). After 2 months, the temporary prostheses were removed, the implant osseointegration was tested by

Figure 12: Right view of the definitive crown 7 months after surgery

Figure 13: Left view of the definitive crown 7 months after surgery

using a Periotest M, and the permanent prostheses were built in zircon-ceramic. No complications have occurred, and no implant has been lost 7 months after the surgery. The patient maintains appropriate oral hygiene and is pleased with the functional and esthetic results. The x-ray does not show any peri-implant bone loss. The clinical and radiological control performed 1 year after surgery did not reveal any alteration (Figures 11-13).

Conclusions

The rehabilitation of this clinical case highlights how intraoral welding, a technique used for more than 30 years, is an effective and predictable therapeutic choice in cases of immediate-load implantology and implantology with high esthetic expectations. The creation of a solid implant structure of a bipodal configuration, to support axial and lateral loads, has been shown to be able to withstand functional forces applied after immediate loading, by dissipating them over large surfaces of bone supports.

This rehabilitation technique, documented in the literature during the last few decades,30-38 is advantageous in every case where the patient's anatomical features cause implant placements to be rather uncertain or impossible without a previous site preparation by bone augmentation or orthodontic repositioning, as in this case. The authors agree that further studies are necessary to document an effectiveness that is already proven, to precisely delimit its uses and limitations.

Bios

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