

Palatal implant placement, crestal sinus lift and palatal bone regeneration in a severely atrophic maxilla – nine years of follow-up

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Maxillary edentulous patients often present with severe horizontal bone atrophy, which can rule out standard implants as an option, unless extensive bone reconstructions are performed.

This case report shows how a minimally invasive augmentation procedure combined with narrow-diameter Straumann® Roxolid® SLActive® Bone Level Implants produced a predictable and successful outcome, as demonstrated by nine years of follow-up documentation.

Initial situation

The patient, a 58-year-old female non-smoker in good general health, presented at our dental practice with an already edentulous maxilla (Figs. 1, 2). A CBCT scan was recorded for diagnosis and treatment planning. We observed severe atrophy in bone height and width in the posterior segment (Fig. 3).

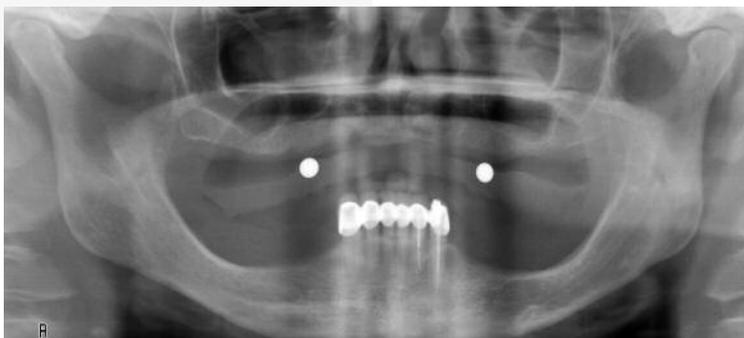


Figure 1



Figure 2

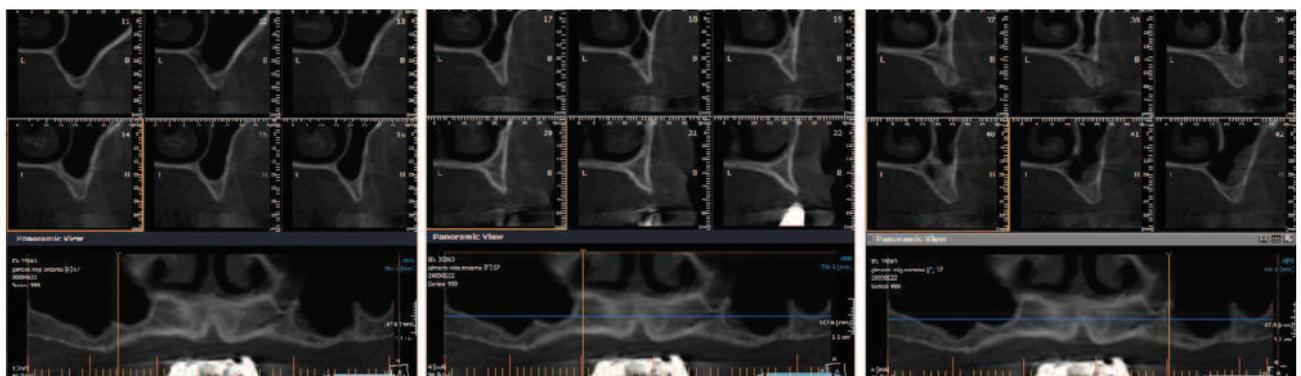


Figure 3

Treatment planning

In these types of clinical cases it is possible to draw up separate plans for the bone reconstruction and the arch rehabilitation.

For the bone reconstruction, some professionals opt for bone block grafting from the iliac crest, but our patient preferred to avoid additional invasive surgeries. We suggested a less traumatic alternative with implant placement via a palatal approach with palatal bone reconstruction. In this technique the crestal bone (between 2-3 mm wide) remains as the new buccal plate. The implants are placed in the palatal area with the rough surface exposed to the palatal side, followed by bone regeneration in this area to cover the exposed surface.

The planning includes the placement of five Roxolid® SLActive® 3.3 mm implants, which reduces the invasiveness of the procedure while keeping the implant resistance together with the SLActive® surface, which is proven to optimize GBR procedures and improve the outcome in such difficult clinical cases. A crestal sinus lift using osteotomes was also planned for the posterior implants. Since the patient required improved lip support, the restorative planning included the fabrication of an overdenture with retentive bar and metal retainers without plastic attachments or similar. With this prosthesis, the feeling for the patients is similar to that with a hybrid fixed prosthesis, without any type of

mobility, but with the advantage of being able to take it out and clean it. After one year of maxilla restoration, four implants were placed in the mandible and restored with a Locator®-retained overdenture.

Surgical procedure

After incision, a muco-periosteal flap was raised in the maxilla (Fig. 4), and the osteotomy was started in the palatal area taking care to leave at least 2 mm of crestal bone as a buccal plate. After using the first drill, we continued expanding the bone with osteotomes to maintain more bone around the implant while lifting the sinus floor for the bilateral crestal sinus lift (Fig. 5). This type of surgery requires careful prosthetically-driven thinking with the aim of avoiding excessively palatal placement of the implant, which can impair the subsequent correct emergence of the abutments.

Four 3.3 x 10 mm Straumann® Bone Level (Roxolid® SLActive®) implants and one 3.3 x 12 mm Straumann® Bone Level (Roxolid® SLActive®) implant (Figs. 6, 7) were placed in total. After the implant placement, the palatal area of the implant was regenerated with Straumann® Bone Ceramic®. The palatal tissue thickness provides excellent retention and stability for the biomaterial. The flap was closed free of tension (Fig. 8), and a postoperative radiograph was taken after the surgery (Fig. 9). After four months of healing, a second stage procedure was

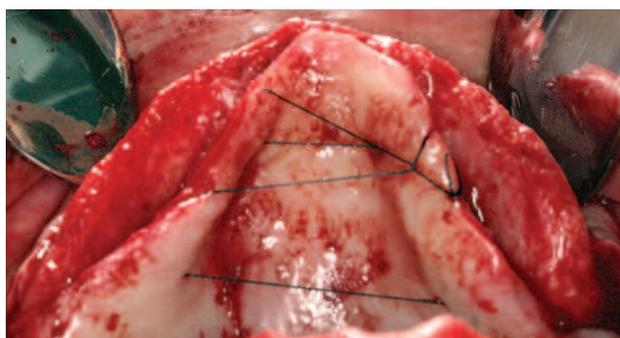


Figure 4



Figure 5



Figure 6



Figure 7



Figure 8

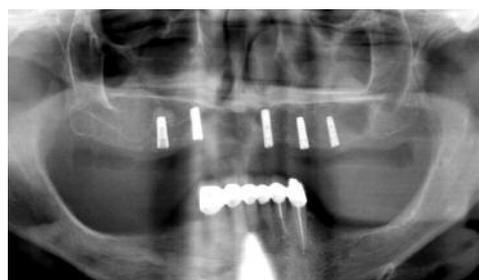


Figure 9



Figure 10



Figure 11



Figure 12



Figure 13

performed to expose the implants and place the healing abutments.

Two weeks later, the soft tissues were observed to be well structured with a substantial regenerated area around the implants (Fig. 10).

Prosthetic procedure

An overdenture prosthesis with retentive bar was designed by Javier Ortola. This had three metal support points with friction retention and two metal retainers (Figs. 11, 13). This type of prosthesis provides excellent stability and never loosens, in contrast with classical bars with plastic retentions. It functions like a hybrid fixed prosthesis, with the advantage

that the patient can easily remove and clean the bar and the prosthesis, which is better for the maintenance of the implants and peri-implant health.

The bar was adapted to the implant using the multi-base abutment from Straumann® which, according to the literature, is better for bone maintenance around the implants. The patient can remove the prosthesis using a key that pushes the metal retainer located between the canine and first premolar, or between the two premolars, normally in the vestibular to palatal direction (Fig. 12). When the patient wants to lock the prosthesis, it only needs to be placed on the bar and the retainer pushed with the finger in the palatal to buccal direction (Fig. 14).



Figure 14

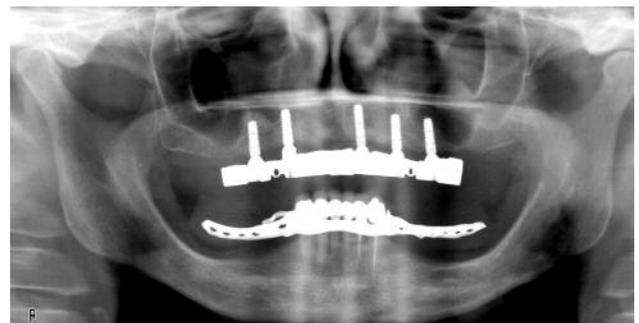


Figure 15

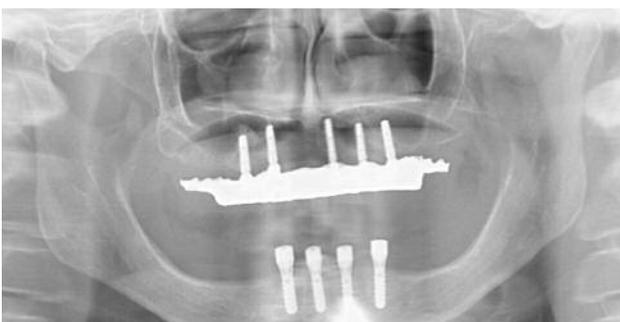


Figure 16

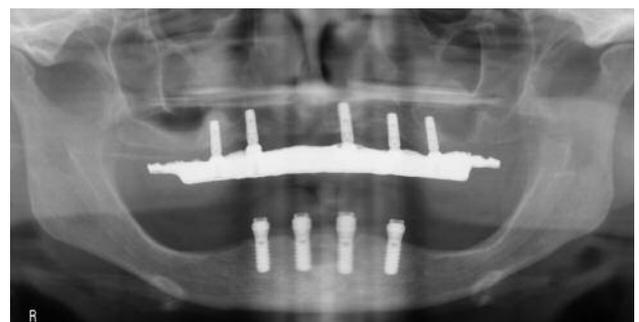


Figure 17

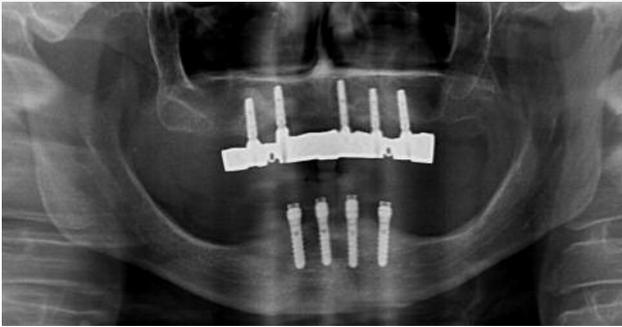


Figure 18

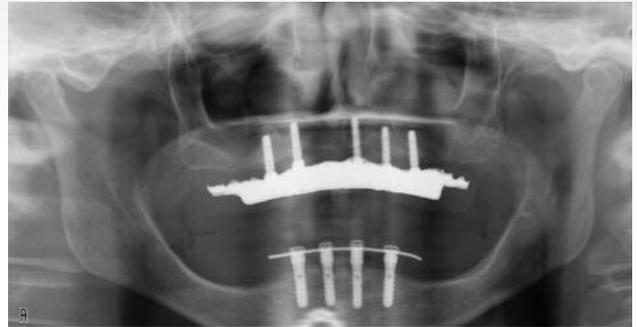


Figure 19

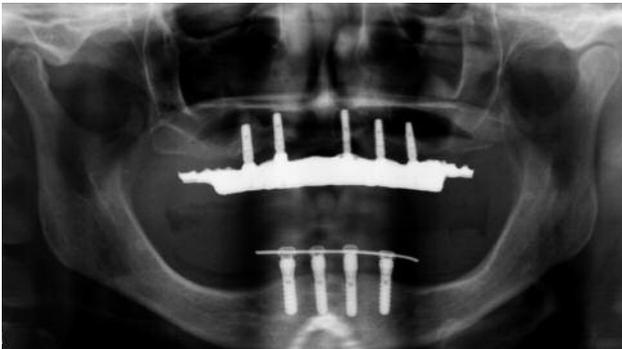


Figure 20

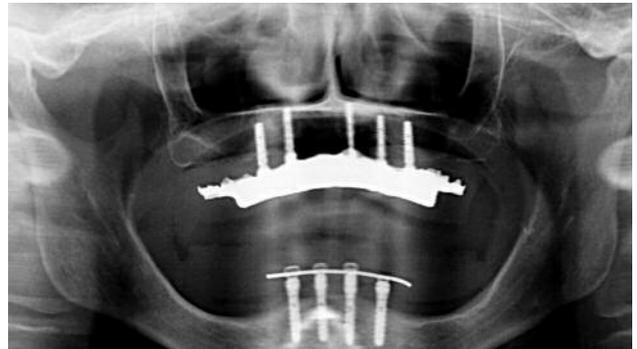


Figure 21

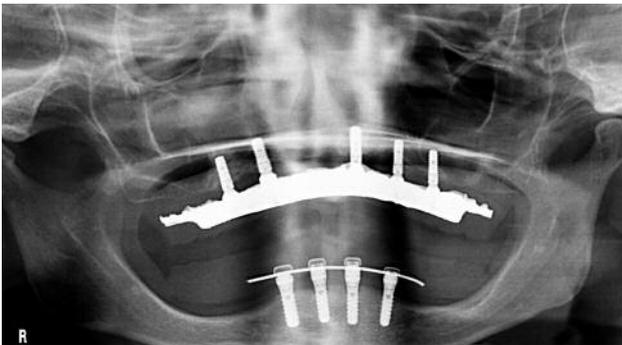


Figure 22

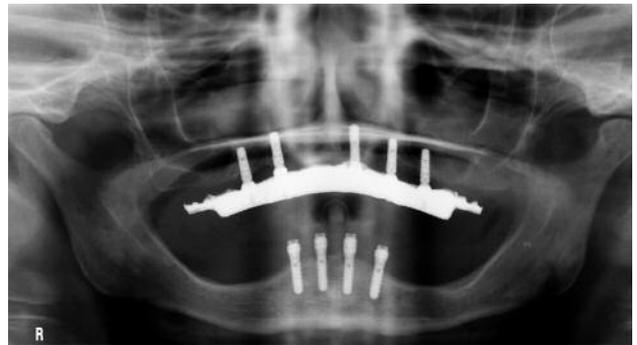


Figure 23

Treatment Outcome

The finished full-arch rehabilitation prosthesis showed good results, as regards both functional and aesthetic parameters, and the patient was highly satisfied (Fig. 14). Clinical follow-up was done every six months, and radiological follow-up every 12 months. We currently have nine years of follow-up and can observe good maintenance of the bone around the implants, making the treatment plan a good option using Straumann® Bone Level implants with platform switching (Figs. 15-23).

Conclusion

With Straumann® Bone Level Implants, we can obtain sufficient primary stability in cases with severe maxillary atrophy. Roxolid® allows us to reduce the diameter of the implant, keeping the occlusion resistance while avoiding the fracture of the implant, and preserving more bone around the implant. With this type of implant and surgical technique, after nine years of follow-up we observed good bone maintenance around the implants.

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