

Rehabilitation of an atrophic maxilla with Straumann® Bone Level implants and Straumann® BoneCeramic

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Background

A 60-year-old healthy female patient came to our dental clinic in the hope of restoring her maxilla with a fixed dental prosthesis. She had high functional as well as esthetic expectations. Her mandible had been restored with dental implants in 2005, but due to severe atrophy of the maxilla, the fixed prosthetic restoration was postponed.

Clinical examination revealed the patient had had an edentulous maxilla (Figure 1) for over 20 years, treated with

a full denture, a thin gingival biotype in the second quadrant, and an implant screw-retained metal-ceramic prosthesis in the mandible. Radiographic examination with a panoramic x-ray (Figure 2) and a cone-beam CT (Figures 3, 4) scan revealed an atrophic edentulous maxilla, in both horizontal and vertical dimensions. Using the SAC Assessment Tool (ITI) to aid in making clinical decisions, this case was considered to be “complex” both in terms of the surgical and restorative aspects.

After the clinical and radiographic examination, the following treatment plan was outlined: **1.** Placement of three implants in the first quadrant, accompanied by guided bone regeneration (GBR) with Straumann® BoneCeramic and a regenerative titanium-reinforced membrane (non-resorbable). **2.** Rebased of the full denture with a temporary acrylic relining material. **3.** Placement of three implants in second quadrant with concurrent sinus-lift surgery and guided bone regeneration (GBR) using Straumann® BoneCeramic, collagen membranes and a regenerative titanium-reinforced membrane. **4.** Rebased of the full denture with a temporary, acrylic relining material. **5.** Screw-

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Figure 1.

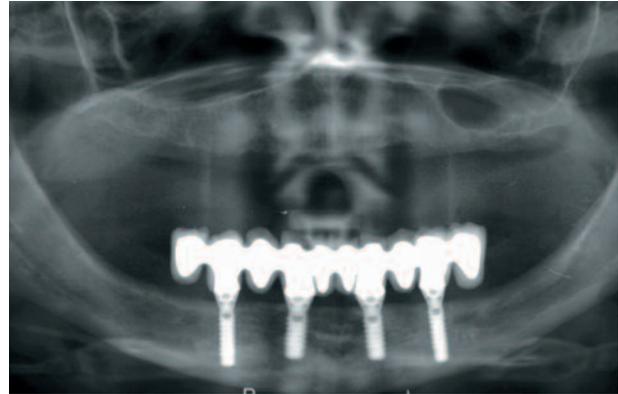


Figure 2.

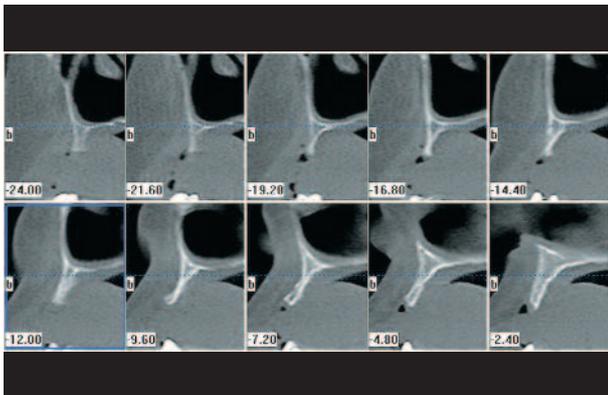


Figure 3.

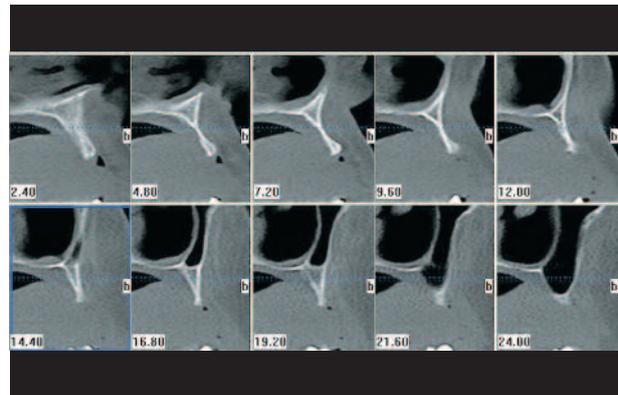


Figure 4.

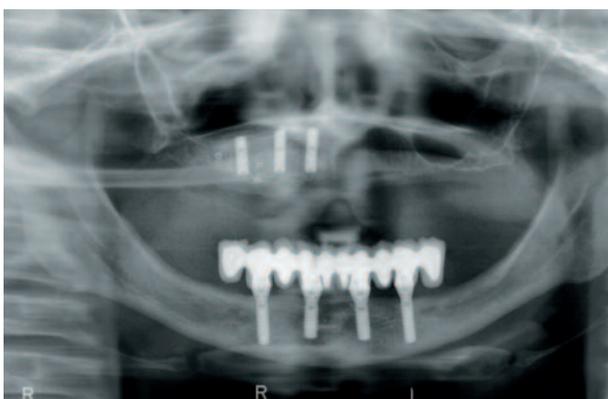


Figure 5.

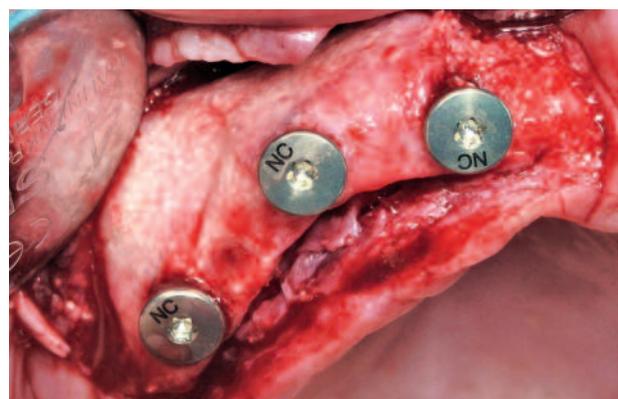


Figure 6.

retained metal-reinforced acrylic provisional prosthesis, 9 months after implants placement. 6. Screw-retained metal-ceramic full-arch prosthesis, 2 months after insertion of the provisional prosthesis.

1. Surgical procedure – implant placement in the first quadrant

Three Straumann® NC Bone Level implants (ø 3.3 mm, 12 mm, SLActive) were placed in the in the first quadrant, with

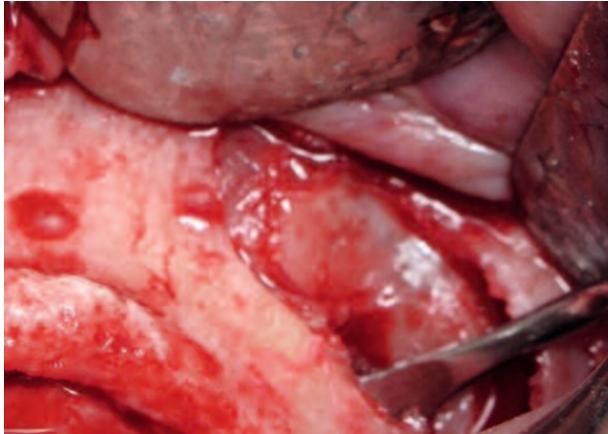


Figure 7.



Figure 8.



Figure 9.

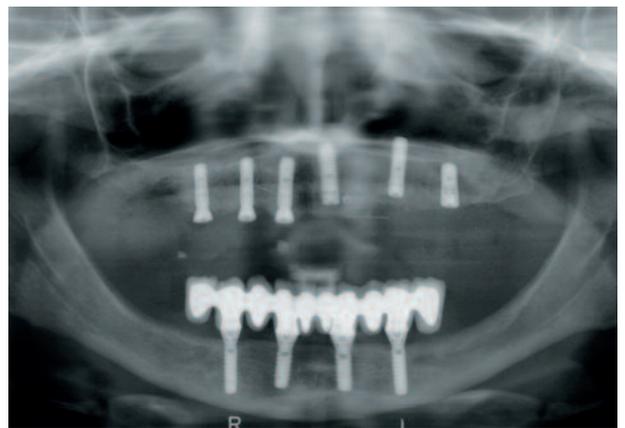


Figure 10.



Figure 11.

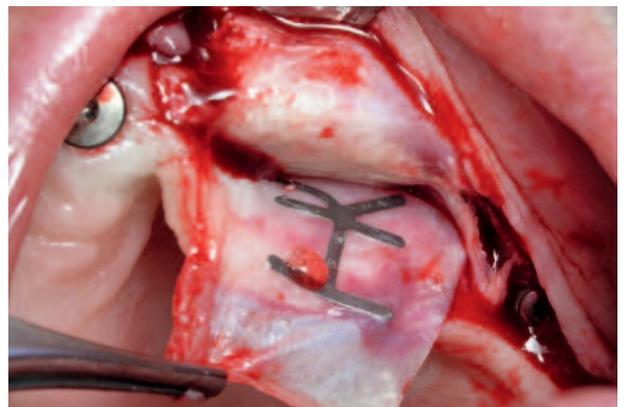


Figure 12.

concurrent GBR using Straumann® BoneCeramic. A regenerative, titanium-reinforced membrane was also placed (11, 13 and 15) laterally (buccal) due to the residual size of the alveolar crest. The residual crest was so thin that the

implants had to be inserted through the buccal wall. Six months after the implant surgery, the titanium-reinforced membrane was removed, and the implants were exposed (Figures 5, 6).

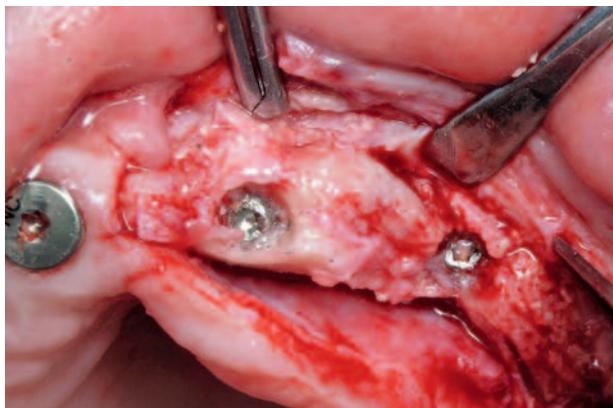


Figure 13.

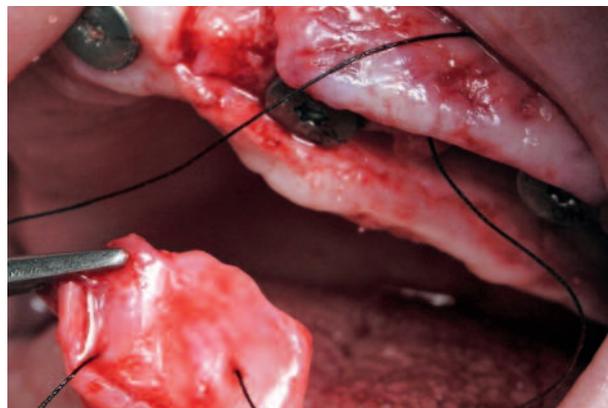


Figure 14.

Implant placement in the second quadrant

Two months after the surgery in the first quadrant, a sinus lift procedure was performed in the second quadrant with concurrent implant placement (Straumann® NC Bone Level \varnothing 3.3 mm, 12 mm, SLActive on 21 and 23; Straumann® RC Bone Level, \varnothing 4.1 mm, 10 mm, SLActive® on 26) along with GBR using Straumann® BoneCeramic, a collagen membrane and regenerative titanium-reinforced

membrane (Figures 7 – 9).

Six months after implant placement in the second quadrant (Figures 10, 11), the titanium-reinforced membrane was removed and the implants were exposed (Figures 12, 13). During the same surgery, a connective tissue graft was removed from the palate and sutured into the second quadrant in order to increase the thickness of a thin gingiva (Figure 14).

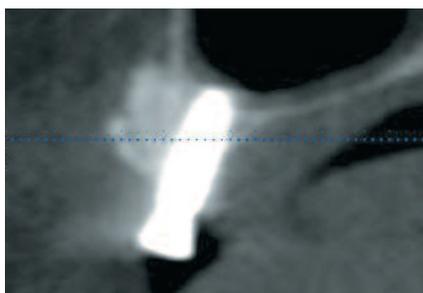


Figure 15.

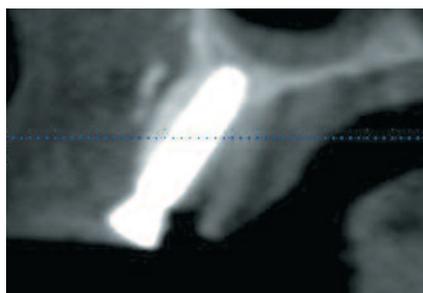


Figure 16.

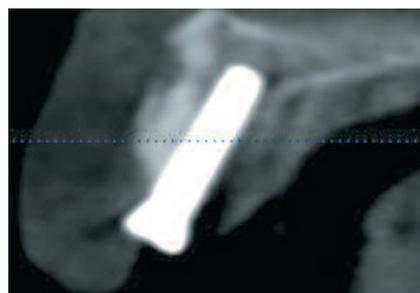


Figure 17.

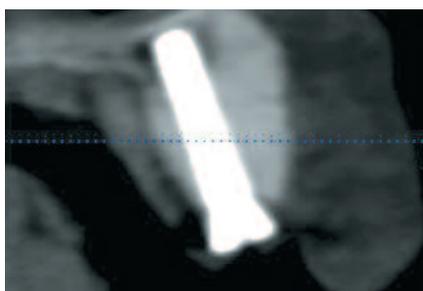


Figure 18.

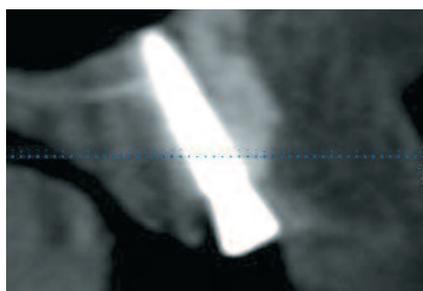


Figure 19.

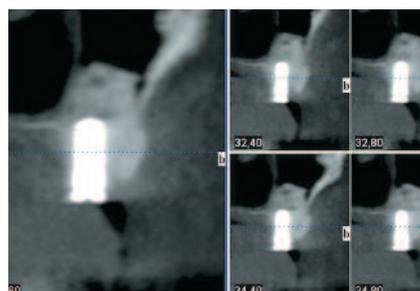


Figure 20.



Figure 21.



Figure 22.

A new CBCT scan was performed to evaluate the stability of the bone augmentation and sinus lift procedures (Figures 15 – 20). The augmented bone, achieved using Straumann® Bone Ceramic, exhibits a lighter gray tone. All of the implants are completely surrounded by bone. The outcome of the sinus lift procedure with augmented bone surrounding implant 26 is clearly visible (Figure 20).

2. Prosthetic procedure – provisional restoration

One month after the periodontal surgery, six Straumann® Bone Level impression copings were used with an open tray impression, applying a double-mix technique with addition silicones.

One week later, the patient was given a fixed metal-reinforced acrylic provisional prosthesis. This prosthesis was

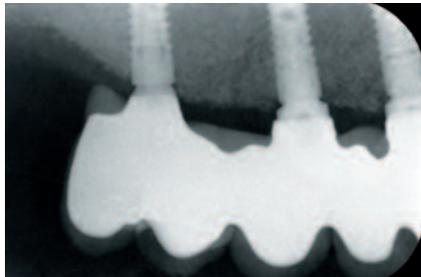


Figure 23.



Figure 24.

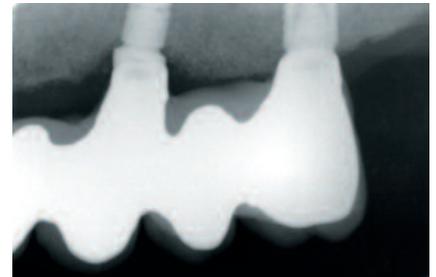


Figure 25.

intended to replace the patient's full denture, to help evaluate esthetic and masticatory functions and to model the gingival tissues. Clinical observation of this prosthesis revealed the need for crowns with large vertical dimensions.

Final restoration

Three weeks after the provisional prosthesis placement, the first clinical steps were taken to fabricate a metal-ceramic, screw-retained prosthesis: **1.** Taking a double-mix impression with silicone on the implants. **2.** Modeling of inter-maxillary dimensions in the stone cast replica for the implant. The provisional prosthesis was removed from the patient's mouth, and screwed onto the stone cast for articulator mounting. **3.** Functional complete wax-up and try-in (assessment of occlusion, phonetic and esthetic parameters). **4.** Metal framework try-in. **5.** Bisque-bake try-in (final occlusal and esthetic

adjustments). **6.** Fixed, screw-retained, metal-ceramic full-arch prosthesis.

3. Treatment outcome and conclusion

The insertion of the metal-ceramic full-arch was possible one year after the first surgical procedure. Due to the vertical discrepancy, gum ceramics were used (Figures 21, 22). The periapical radiographs (Figures 23 – 25) illustrate the perfect crossfit connection and stability of the hard tissues around the Straumann® Bone Level implants. In this case, the restoration of an atrophic maxilla with Straumann® Bone Level implants, together with GBR using Straumann® BoneCeramic has proven a reliable solution with outstanding stability of both hard and soft tissues, as was shown by the one-year follow-up.

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