

Immediate implant placement with the NNC implant

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_Introduction

In the past, the restoration of narrow tooth gaps with Straumann® Soft Tissue Level implants (maxillary lateral incisors/mandibular incisors) was only possible with the Straumann® Narrow Neck Implant (NN). Due to the prevailing external, hexagonal connection geometry and correspondingly larger dimensioned abutment components it was somewhat difficult to achieve hygienic and aesthetically demanding restorations, particularly in the anterior region of the mandible. The new Straumann® Narrow Neck CrossFit® implant (NNC) now offers an established internal taper connection which allows more intricate prosthetic work in the emergence profile region. Due to the harder implant material—NNC made of TiZr (Straumann® Roxolid®) vs. NN made of pure titanium grade 4, cold-worked—one can expect multi-unit bridges, as described in this case, to also have

a better long-term prognosis from a biomechanical point of view.

_Initial situation

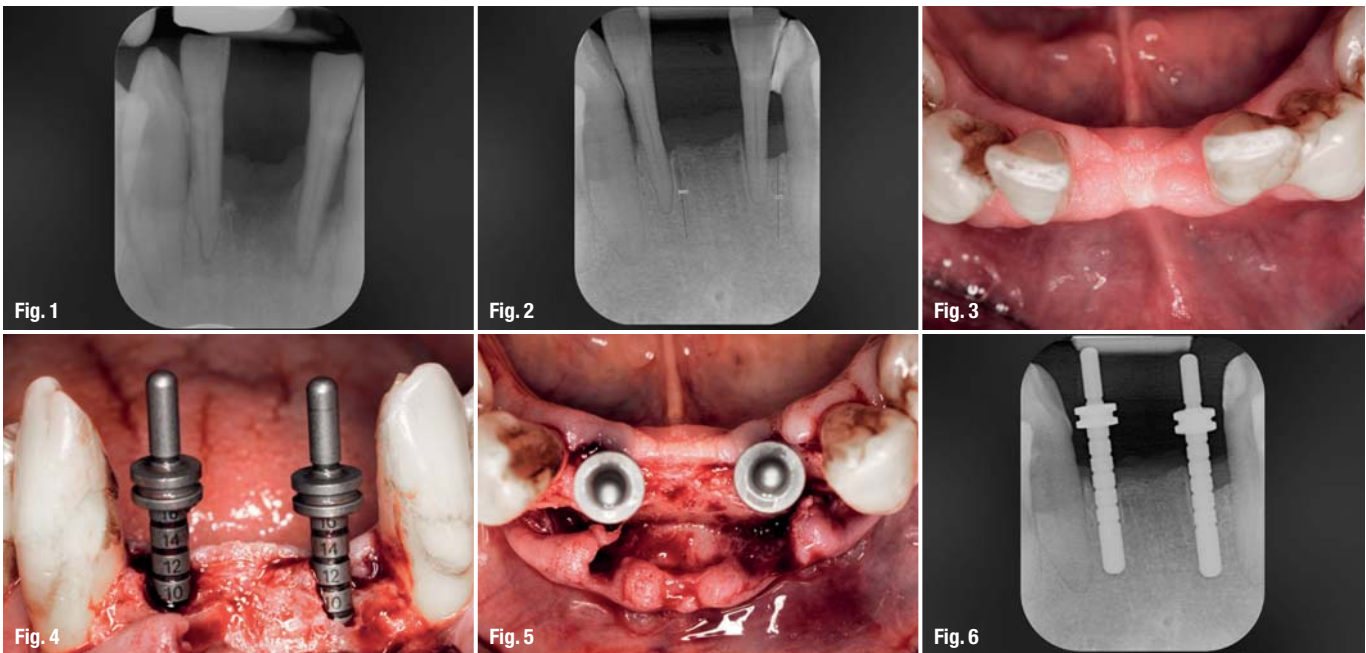
At the beginning of the treatment, the patient was 48 years old and in good general health. For decades, the patient had suffered from a severe, aggressive, generalised periodontitis (type III B, Fig. 1), which could be healed completely prior to implant restoration (Perio-Healing™ Concept; Fig. 2).

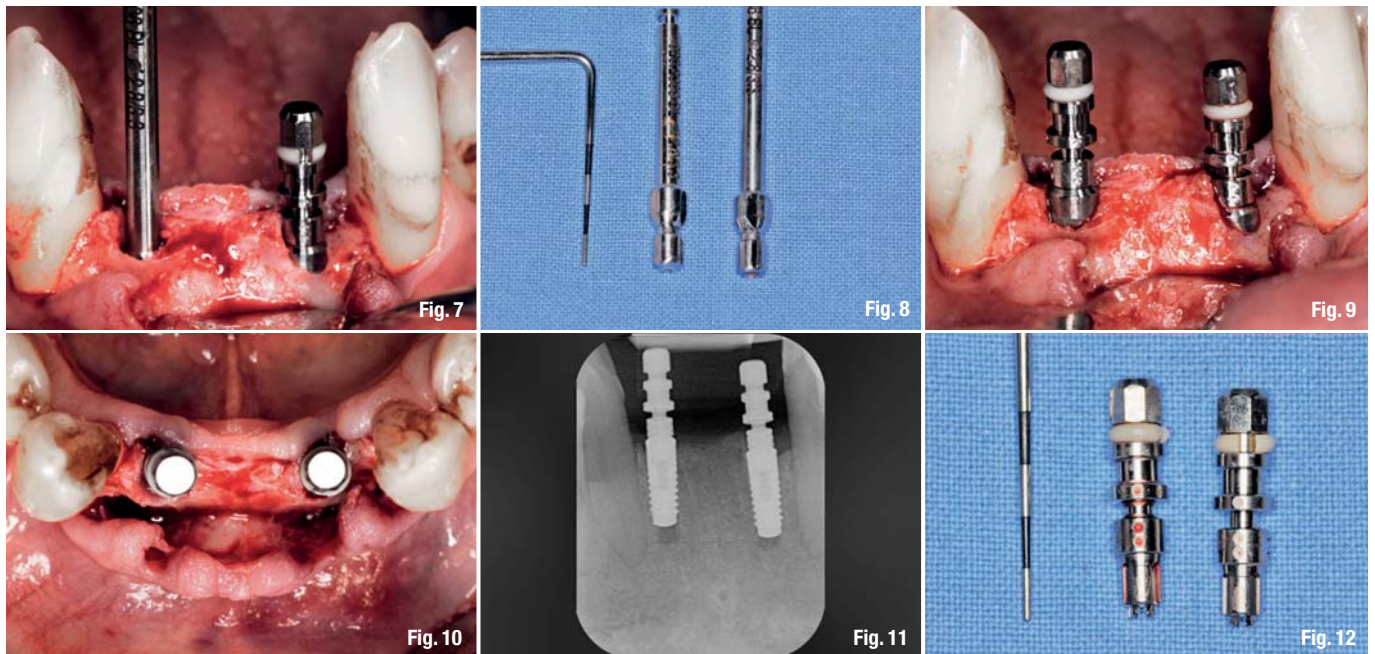
_Procedure

Treatment planning

At first, the diseased anterior mandible was to be healed in a regenerative and biological manner and without bone replacement materials, among others

Fig. 1 _Initial situation.
Fig. 2 _Radiographic status after periodontal healing.
Fig. 3 _Clinical situation after periodontal healing.
Figs. 4-6 _Clicinal and radiographic status with depth gauges *in situ* immediately after extraction.





Figs. 7 & 8 _New NNC crestal profile drill adjustment.

Figs. 9–11 _Tissue-directed Implant Placement.^{1,2}

Fig. 12 _New NNC press-fit insertion devices.

by employing enamel matrix proteins (Straumann® Emdogain) in the sense of 'Socket Preservation' prior to immediate implant placement at 32 and 42 (Fig. 2).

From the Cone-Beam Computer Tomogram (CBCT) it could already be presumed preoperatively that simultaneous augmentation in the sense of a less invasive procedure could be dispensed with by precise implant placement at the soft tissue level, and that a four-unit fully functional porcelain-fused-to-metal bridge (PFM) could be inserted without difficulties due to the more stable implant material (Roxolid®).

Surgical procedure.

Following periodontal healing (Fig. 3), teeth 32 and 42 could each be extracted in toto from the healthy tissue without fracturing, in particular of the buccal lamellae. The clinical and radiological examination employing combined depth gauges showed a four-unit anterior bridge to be possible under these conditions (Figs. 4–6). There had also never been the necessity for simultaneous bone augmentation (Osteogenic Jumping Distance).

Using the NNC profile drill, the crestal bone was expanded minimally in the present type 2 bone prior to implant placement of the two 10 mm NNC implants in each case (\emptyset 3.3 mm to 3.5 mm; Figs. 7 & 8).

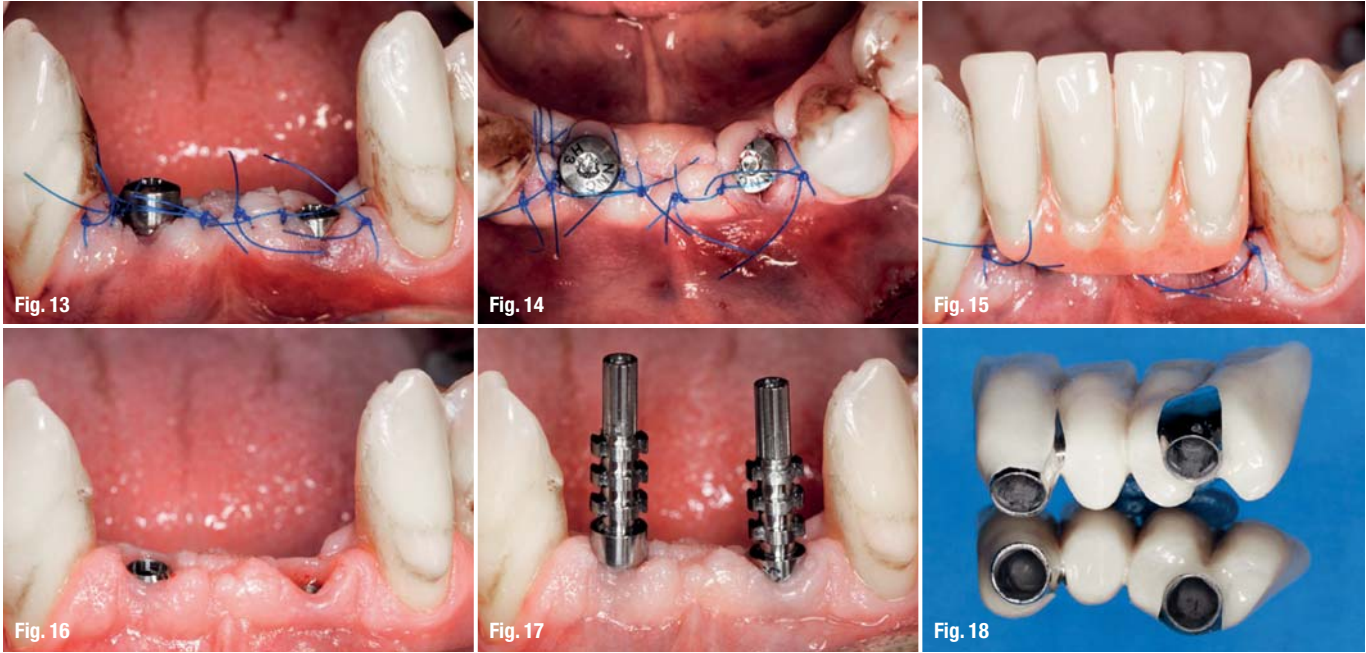
Attention was paid during the implant placement of the two NNC implants, that the Microgap could be placed precisely 2 mm coronal of the buccal *limbus alveolaris*, so as not to obtain crestal bone or soft tissue loss following appropriate tissue maturation (Tissue-directed Implant Placement^{1,2}; Figs. 9–11). The new NNC insertion device enables perfect aesthetic

analysis of the insertion depth in relation to the variable thickness of the periimplant gingiva (Biologic Width: 2.25–3.75 mm^{1,2}) and can be fixated again in the implant at any time for fine adjustment prior to suturing due to the tapered press-fit design (Fig. 12), which allows obtaining an optimal, biocompatible intrasulcular position of the Microgap following complete healing and remodeling.

During the final alignment of the implants, one then needs to again ensure that the semi-spherical recesses on the insertion devices are placed precisely in buccal direction, so that the prosthetic abutment components can be aligned precisely later on. Using 3 mm NNC healing caps (Figs. 13 & 14) provides ideal conditions for soft tissue maturation (up to six months) in combination with an appropriate temporary restoration (Fig. 15). This also dispenses with the need for a second surgical intervention (uncovery).

Prosthetic procedure

The base of the temporary prosthetic restoration, which should be supported occlusally (Fig. 15), must not touch the healing caps statically and functionally during initial healing. This can be checked with a silicone paste (Fit Checker®). Five months *post implantationem* the Biological Width^{1,2} has become perfectly established in the healthy mouth (see comparison Figs. 13 & 16). Using a screw-retained, open implant impression (Fig. 17) it was possible to fabricate the 4-unit PFM bridge 32x42 with great precision (Fig. 18*), which allowed an adequate outcome in terms of hygiene, chewing comfort, aesthetics and phonetics (Fig. 19). Here it is recommended to communicate the exact dimensions of the individually determined interdental tooth brushes (Fig. 19), which are to be tested *in vivo* on the patient and re-



Figs. 13 & 14_3 mm healing caps *in situ*.

Fig. 15_Temporary restoration.

Fig. 16_Clinical status five months post-op.

Figs. 17 & 18_Fabrication of the porcelain-fused-to-metal-ceramic bridge using a screw-retained, open implant impression technique.

evaluated during try-in (gingiva resilience vs. plaster cast).

_Final outcome

The one-year long-term follow-up showed stable and healthy hard and soft tissue conditions analogue to established biological principles for Soft Tissue Level implants (Figs. 20 – 22).^{1,2}The probing measurements were all at ≤ 3 mm with negative BOP bleeding values (Bleeding-on-Probing) as well as a broad band of attached periimplant gingiva. Surprisingly, the implant mobility values (PTV Periotest Values) were significantly lower (i.e. reduced mobility) than known from the Straumann® Narrow Neck implants (NN) to date, which may be due to the harder implant alloy and/or better hard tissue integration of the hydrophile SLActive® surface.

_Conclusion

Straumann® Narrow Neck CrossFit® implants are a further asset to the comprehensive Straumann® product portfolio and extend the indication field, particularly in very narrow spatial conditions. As Soft Tissue Level

implants they provide good aesthetics, while at the same time offering good preservation of the periimplant hard and soft tissue architecture.

Editorial note: A complete list of references is available from www.straumann.com/stargetref. Capitalisation is subject to the author.

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Fig. 19_Insertion of the bridge with the use of individually determined interdental tooth brushes.

Figs. 20–22_Follow-up showing stable hard and soft tissue conditions.

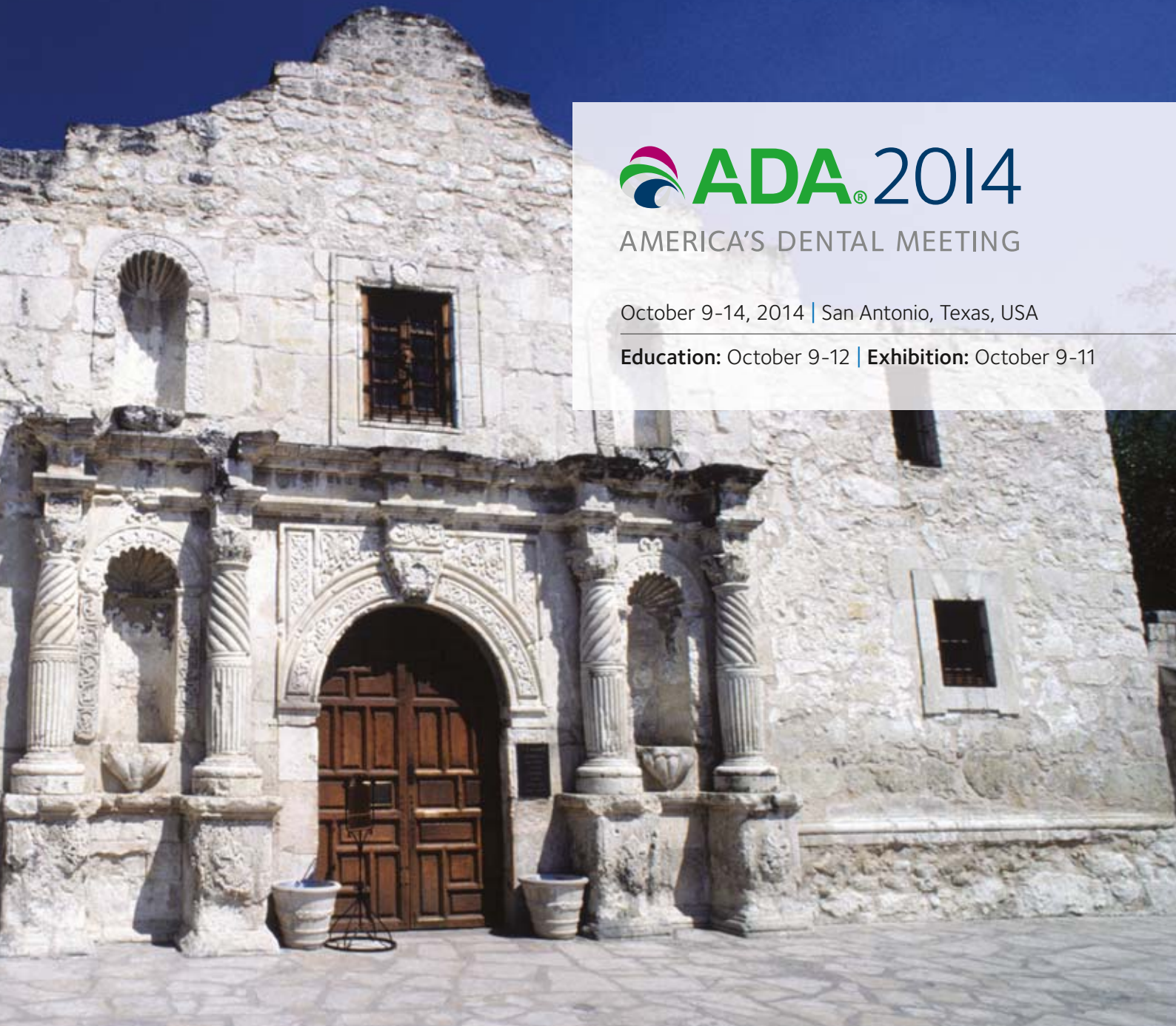


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