Immediate implant placement with the NNC implant

_Author_ Joachim S. Hermann, Switzerland

_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 (PerioHealing™ 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.
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 tis-
sue 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 condi-
tions (Figs. 4–6). There had also never been the neces-
sity for simultaneous bone augmentation (Osteogenic
Jumping Distance).

Using the NNC profile drill, the crestal bone was ex-

tended minimally in the present type 2 bone prior to
implant placement of the two 10 mm NNC implants in
each case (Ø 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 tis-

tue loss following appropriate tissue maturation (Tis-

sue-directed Implant Placement1,2; Figs. 9–11). The
new NNC insertion device enables perfect aesthetic
analysis of the insertion depth in relation to the variable
thickness of the perimplant gingiva (Biologic Width:
2.25–3.75 mm1,2) and can be fixed at again in the im-

plant at any time for fine adjustment prior to suturing
due to the tapered press-fit design (Fig. 12), which al-

lows 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 di-
rection, so that the prosthetic abutment components
can be aligned precisely later on. Using 3 mm NNC heal-
ing 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 in-
tervention (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 dur-
ing initial healing. This can be checked with a silicone
paste (Fit Checker®). Five months post implantationen
the Biological Width1,2 has become perfectly established
in the healthy mouth (see comparison Figs. 13 & 16). Us-
ing a screw-retained, open implant impression (Fig. 17)
it was possible to fabricate the 4-unit PFM bridge
32xx42 with great precision (Fig. 18*), which allowed an
adequate outcome in terms of hygiene, chewing com-
fort, aesthetics and phonetics (Fig. 19). Here it is recom-

mended 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-
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). 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.


Figs. 3 & 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.

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.