More flexibility and treatment options with Roxolid®

Straumann’s small-diameter implants in clinical use

Narrow implants are very beneficial in reduced width crests, as they may avoid systematic horizontal bone augmentation if the remaining bone is in the correct prosthetic axis. Roxolid® small-diameter implants from Straumann also offer more flexibility and can provide dentists with new treatment options. Depending on the specific case, they can be placed more lingually or buccally than a regular implant which helps to adjust possible eccentricity of the remaining bone (see Case 2).

Originally, I did not use small-diameter implants frequently because I did not feel confident doing so, owing to the higher risk of fracture reported for narrow implants in the literature. Another concern was the reduced surface for osseointegration compared with regular-diameter implants.

The combination of higher strength and excellent osseointegration properties of Roxolid compared with the features of commercially available pure titanium implants gave me new confidence. Roxolid implants allow me to benefit from all the specific advantages of small-diameter implants but with the necessary degree of predictability. In non-aesthetic regions, it may allow avoidance of GBR procedures and less time-consuming treatment.

Another reason was Straumann’s approach in launching the product. I saw a slow and safe product introduction, based on extensive testing and clinical data. The strength of the material was proven by laboratory tests. Various clinical and preclinical studies ultimately convinced me. It will be interesting to observe the long-term behaviour of this new material and the clinical data it generates. We have to remain cautious, however, even if the results of the mechanical testing are very promising.

Case 1: Partially edentulous patient with a narrow bone ridge in a non-aesthetic zone (premolar)

Two implants had to be placed in positions #44 and #45. In the region of #45 there was sufficient bone height over the VII canal. By contrast, the ridge width was very narrow (Fig. 1).

An augmentation procedure was needed as a prerequisite for the placement of a regular-diameter implant (e.g. Ø 4.1 mm). In this case, the Ø 3.3 mm Roxolid® implants were a valuable alternative in order to use the existing bone substance better—particularly as the remaining bone was in the right prosthetic axis. As there was not much space, the drilling had to be precise. The bone walls were very thin and the implant shimmerned through slightly. A small dehiscence of 1 mm was visible at the buccal plate of #45 and #44, but it did not need any augmentation (Figs. 2a & b), as there was no aesthetic issue (Fig. 4).

The polished implant neck was intentionally placed above the crest in order to avoid bone loss around the neck. A two-element bridge was placed on the implants (Figs. 3a & b). The implant neck was slightly visible clinically on the vestibular side. The inter-implant papilla was absent. Even when the patient smiled broadly (Fig. 4), the border of the implant neck was not visible, as this region was hidden. It is very important to analyse the smile line of the patient before placing implants in this way.

In this case, Roxolid® allowed less complicated surgery to be performed by avoiding a larger augmentation in a non-aesthetic zone. The patient benefited from a shorter treatment time.

Case 2: Partially edentulous patient with eccentric bone

The X-ray measurement in region #44 showed a crestal width of over 7 mm. Therefore, there was sufficient bone to place a Ø 4.1 mm implant. However, the bony substance was eccentric in relation to the prosthetic axis and the emergence profile. The gutta-percha spot on the DentaScan was in a more buccal position than the available bone (Figs. 5a–19). The root of the adjacent #45 was also placed very buccally (Figs. 5a–21). A vestibular bone concavity was clinically visible on #44 (Fig. 5b). After preparing the implant bed for a Ø 5.5 mm implant, the buccal bone wall thickness was up to 1 mm and the lingual wall thickness was over 2 mm.

The choice of a Straumann Standard Plus Ø 5.5 mm Roxolid® implant instead of a regular-diameter implant allowed place-
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ment of the implant in an ideal position, particularly when anticipating the future prosthetic restoration and avoiding vestibular bone augmentation (Fig. 6).

The small dehiscence of 2 mm was not compensated for. Thanks to an initial lingually displaced incision, a large and thick band of keratinised gingiva was preserved buccally (Fig. 7) at the end of the surgery to prevent further buccal recession of the gingiva. Prior buccal gingival recession on #45 could be observed. The preoperative scan (Figs. 5a–21) offered an explanation in form of a large bony dehiscence of the buccal plate on this tooth. The patient did not want any mucogingival surgery for root coverage. Eight weeks after surgery, a three-unit premolar bridge was seated on implants at teeth #44 and #46.

A Roxolid® Ø 3.3 mm implant, in this case, made it possible to place an implant in an ideal position without performing an augmentation procedure, allowing for a less complicated surgical procedure. The patient received an aesthetic solution that would not have been recommended in the anterior aesthetic zone (teeth #13 to #23), where a bone augmentation procedure would have been a prerequisite.

Case 3: A bone-preserving solution for an elderly, fully edentulous patient

A fully edentulous 83-year-old patient was to be given an implant-retained removable denture. Two implants were to be placed inter-foraminally in the #43/42 and #33/32 regions. There was sufficient bone height, but the crest was very thin, which would have required a larger augmentation (bone block) or major grinding of the ridge (Figs. 9a & b).

The placement of Ø 3.3 mm implants allowed the vestibular dehiscence defect in region #33 to be limited to 3 mm (Fig. 10a) and to 1 mm in region #43 (Fig. 10b). Two small flaps were elevated in order to minimise the surgical trauma. Two Straumann Standard Plus Roxolid® implants (l. 12 mm) were placed.

The initial lingually displaced incision preserved a nice amount of keratinised gingiva that was repositioned buccally around the polished implant necks and the healing screws (Fig. 11). After a six-week healing period, two LOCATOR® abutments were placed. The clinical check at three months showed good healing of the soft tissues, with a thick and wide band of keratinised gingiva around the implants. The panoramic X-ray (Fig. 13a) demonstrated that there was enough bony substance around the implants to prevent the risk of a mandibular fracture.

Even though there was sufficient bone height, the ridge was very thin in this case. Therefore, Roxolid® small-diameter implants were a valuable solution in order to avoid a more traumatic and more invasive solution.