

Scientific Review for Straumann® Roxolid® SLA® Implants.

MORE TREATMENT OPTIONS WITH SMALLER IMPLANTS

Roxolid® is a dental implant material combining both excellent biocompatibility and high mechanical strength. Roxolid® is a metal alloy composed of ~15 % zirconium and ~85 % titanium which leads to an increased mechanical resistance compared to pure titanium. A higher mechanical resistance of titanium-zirconium alloys compared to pure titanium has been reported by **Kobayashi et al. 1995**. Roxolid® Implants have an up to 21 % higher tensile strength than comparable titanium implants*. In addition, it has been shown that titanium - zirconium alloys have a better biocompatibility than titanium (**Ikarashi et al. 2005**). Thanks to the molecular structure of Roxolid®, the well-established SLA® surface can be created on the implant. These properties allow the clinician to cover more treatment options with smaller implants.

LESS INVASIVE PROCEDURES AND PRESERVING TISSUE**

Today, clinicians often select the widest and longest implant for therapy. This may lead to a loss of soft and hard tissues during surgery, which may require, bone grafting procedures to create sufficient bone volume around the implant. By using smaller-sized implants, biologic structures might be maintained during the surgical procedure reducing the need for guided bone regeneration procedures. In the clinical study by **Benic et al. 2013**, it was shown that Ø 3.3 mm Roxolid® Implants performed similar to Ø 4.1 mm titanium implants. The study reported 100 % survival rates for both implants after one year. This indicates that Ø 3.3 mm Roxolid® Implants can be placed in many situations where Ø 4.1 mm implants would usually be used instead. In a non-interventional study, which was

performed in 40 centers in 7 countries, 603 Roxolid® Implants were placed in 357 patients (**Al-Nawas et al. 2014**). The study reported a survival rate of 98 % and a success rate of 97 % after two years. Clinicians also documented that for 54 % of the placed implants a bone augmentation procedure could be avoided by using Ø 3.3 mm Roxolid® Implants. Various published clinical studies have documented the successful use of Roxolid® implants in numerous clinical indications:

- Edentulous mandibles, 99 % survival rate after one year (**Al-Nawas et al. 2012**)
- Horizontally resorbed ridges, 100 % survival rate up to 19 months (**Chiapasco et al. 2012**)
- Rehabilitation of atrophic maxilla supporting an over-denture, 100 % survival rate after 12-16 months (mean follow-up of 13.5 months). (**Cordaro et al. 2013**)
- Partially edentulous patients, 95 % survival rate after 2 years (**Barter et al. 2012**)
- Single-tooth replacement, 100 % survival rate after one year (**Benic et al. 2013**)

INCREASE PATIENT ACCEPTANCE WITH LESS INVASIVE PROCEDURES**

Every surgical intervention places a burden on the patient. Such intervention might not only lead to pain, trauma and discomfort during the healing process, but also fear and anxiety. Since less invasive procedures can help reduce trauma, time and cost of dental implant treatment, these procedures might be ideal to increase patient acceptance.

LONG-TERM RELIABILITY SUPPORTED BY STRONG EVIDENCE

The Straumann® SLA® surface is one of the most documented surfaces in dental implantology. The excellent osseointegration properties of the SLA® surface compared to machined surfaces were demonstrated first by **Buser et al. 1991** and **Cochran et al. 1996**. These studies have shown that the micro-rough SLA® surface leads to higher bone-to-implant contact and higher removal torque values than machined surfaces (**Buser et al. 1998**). Over the last 20 years more than 100 clinical and preclinical SLA® studies have been published in peer-reviewed journals including studies with 10 years of observation time. (**Fischer & Stenberg 2012, Buser et al. 2012, Rocuzzo et**

al. 2013). In these long-term studies, survival rates reached 95 % to 99 % and even in patients with moderate or severe periodontal disease an implant survival rate of 97 % was reported (**Rocuzzo et al. 2013**). To our knowledge, there is no other dental implant surface available on the market today which is supported by such extensive clinical long-term documentation.

In conclusion, it can be stated that the available evidence shows that Roxolid® Implants have a higher tensile strength than pure titanium implants and are highly biocompatible. In addition, the Straumann® SLA® surface is one of the best documented surfaces in dental implantology showing successful implant treatment outcomes over a period of 10 years. Straumann® Roxolid® SLA® gives patients a long-term solution and peace of mind.

*Norm ASTM F67 (states min. tensile strength of annealed titanium); data on file for Straumann cold-worked titanium and Roxolid® implants.

**If a Guided Bone Regeneration procedure can be avoided (put at bottom of page) Roxolid® implants.

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