

Nobel Biocare N1™ implant system: Precision engineering for clinical predictability

Predictability of clinical outcomes is crucial for both patients and clinicians.

This is also why Nobel Biocare invests in science, quality assurance, and clinical evaluation of our innovations. Case in point: the Nobel Biocare N1™ implant system.

The neck of the Nobel Biocare N1 Implant has a trioval shape, and thus the implant-abutment connection, unlike other systems in the market, is also trioval. This design was introduced, to bring the best of both worlds together: better sealing and strength of the Nobel Biocare conical connection,¹ combined with the ease of use of a self-aligning trilobe connection.



Strength in focus

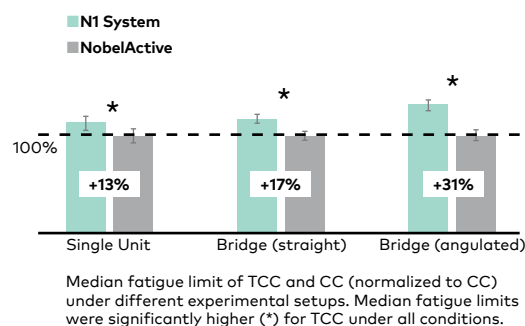
Fatigue strength of trioval conical connection (TCC) was tested according to ISO 1480 and in two different scenarios simulating:

- Single-unit crown indication (n = 24)
- Wide-span bridges (n = 48)

and it was compared to the clinically proven internal conical connection (CC).¹⁻⁴ Chewing was simulated by 2 million cycles of loading in a saline solution.

The fatigue limit of TCC was superior in all scenarios: 13% higher compared to CC in the single unit scenario, while in the bridge setup, it outperformed the CC by 17% with two straight implants and by 31% when one implant was angulated.

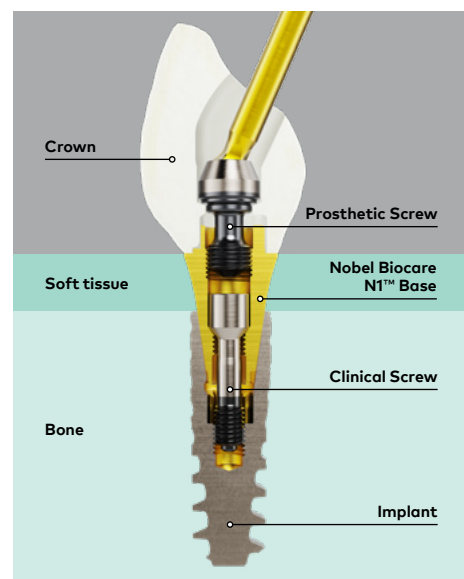
The median fatigue limits were also significantly higher for the TCC in all experimental setups compared to the CC ($p < 0.001$).



Restorative flexibility

N1 Implants can be restored at both implant and base levels.

- At the implant level, the Universal Abutment, Esthetic Abutment, or customized abutment is fixed to the implant using the clinical screw.
- At the base level, the N1 Base is tightened to the implant with the clinical screw and is restored using a Universal Abutment, Esthetic Abutment, or NobelProcera Zirconia N1 Base. All these restorative parts use Prosthetic Screw N1 Base.
- The clinical and prosthetic screws are both tightened to a maximum torque of 20 Ncm, to allow clinicians to immediately provisionalize the implant as soon as it has reached the final insertion torque of 20 Ncm.

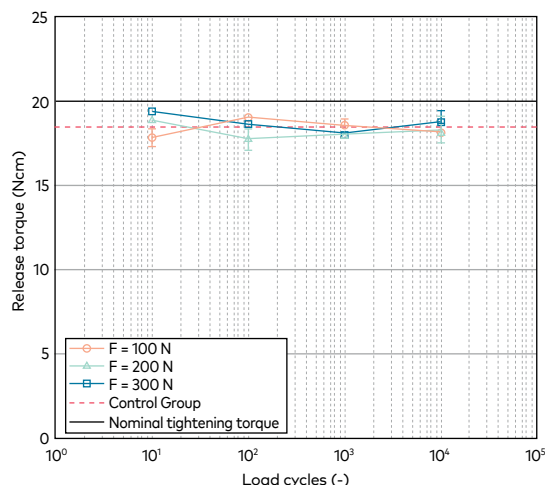


Does a lower screw torque mean higher risk of screw loosening?

Not at all, as studied in our biomechanics lab in Zurich.⁵ Systems were assembled using tightening torques of 20 Ncm. The implants were clamped at 3 mm below bone level and sinusoidally loaded at 30° angulation in air and at room temperature for 10, 100, 1000, or 10,000 cycles to the maximum load of 100, 200, and 300 N (n=3).⁴ Subsequently, samples were disassembled, and the release torques of the prosthetic screws were measured and compared to the release torques of control samples, which were not subjected to cyclic loading.

Independent of the applied load and the number of cycles, the release torque of the Prosthetic Screw N1 Base remained stable and comparable to that of the control group (18.5±0.4 Ncm), suggesting that screw loosening of the N1 system prosthetic screw is very unlikely in a clinical setting.

Why is screw loosening important? While in most cases it requires only retightening of the screw, it can also lead to a catastrophic failure such as screw, abutment or even implant fracture. Using appropriate and precisely engineered materials and tools can significantly mitigate the risk of this complication.

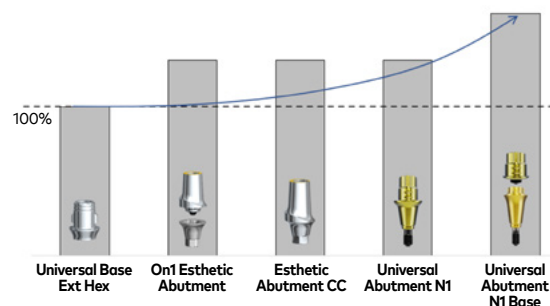


Dr. Flavio Brunner, Switzerland

"With N1™ implant system, Nobel Biocare offers a system that lets me treat almost any indication with a very small number of additional parts. The trioval connection allows an easy and safe positioning of prosthetic elements. Considering the low torque of 20 Ncm even for single-unit restorations, screw loosening has been very rare: I have only seen it twice in 3 years."

Continuous improvement

Nobel Biocare invests in high-quality research and development for solutions that bring continuous improvement. Today, the 2-piece N1 abutment (Universal Abutments trioval conical connection (TCC) and N1 Base RP) outperforms the older systems, such as Esthetic Abutment CC and Universal Base External Hex, which have been in clinical use for many years and are proven by various tests and standards,⁶ to fulfill our mission of improving clinical productivity, while safety and predictability stay the main focus.



Higher fatigue limit of N1 universal abutment and N1 Base (two-piece), and N1 Universal Abutment (one-piece), than the Universal Abutment Ext Hex and Esthetic Abutment CC which have been in clinical use since the 2000s

More to explore



Clinical study with 95 patients



N1 Clinical cases



SciConnect-Interview with Dr. Bahat



Nobel Biocare N1 system webpage

1. Zipprich H, et al. Int J Oral Maxillofac Implants. 2016;31(1):37-44; • 2. Velikov S, et al. V 30, I 19 Special Issue: 28th Annual Scientific Meeting of the EAO, 26-28 September 2019. Page 216 • 3. Schmitt CM, et al. Journal of Biomedical Materials Research. Part A. 2014;102(2):552-574 • 4. ISO 14801:2016 Dentistry – Implants – Dynamic loading test for endosseous dental implants • 5. Zemp J, et al. IADR abstract and presentation June 2022 • 6. Data on file

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