From the President

Hans Geiselhöringer, President of Nobel Biocare and Dental Imaging

At Nobel Biocare, we are preparing for a new era in patient-focused innovation. We will be pairing our industry-leading implant assortment with a renewed digital dentistry and CAD/CAM offering that will be significantly enhanced.

We are expanding the capabilities of our treatment planning software and—in addition to the improved access we are already giving dental professionals to our CAD/CAM offering—we will have even more exciting developments to disclose at the Nobel Biocare Global Symposium in New York this June.

You can already expect to experience enhancements in key areas like software and new material solutions, including multi-layered full-contour restorations that will help deliver the quality, predictability and efficiency that both you and your patients desire. And there is so much more to come.

Our focus on the patient remains steadfast and constant. With our counterparts at KaVo Kerr Group, we are now in the position to soon unleash a complete offering for every step of patient treatment. From products and solutions to training and education, we look forward to opening up many more possibilities and opportunities for you. <

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Editor-in-chief Frederic Love
Managing Editor Jim Mack
Associate Editor Michael Stuart

Editorial offices
Nobel Biocare News
Herdevägen 11
702 17 Örebro, Sweden

Telephone: +46 19-330680
Telefax: +46 19-330681
email: news.editors@nobelbiocare.com
web: nobelbiocare.com/news

The Symbiosis of Esthetics, Health and Structural Stability

The advantages of using the Angulated Screw Channel ASC abutment system

An honored lecturer on the international dental meeting circuit, Dr. Chandur Wadhwani is a prosthodontist in private practice in Bellevue Washington, USA. An adjunct assistant professor at Loma Linda University's School of Dentistry, he is also affiliate faculty at the University of Washington School of Dentistry in Seattle. He has written the first evidence based textbook dedicated solely to implant cementation and frequently contributes to *Nobel Biocare News* with tips and techniques.

By Dr. Chandur Wadhwani

There are many reasons why the cement-retained implant restoration gained popularity over the last few years, which can be attributed to esthetics, ease of use and familiarity with cementation techniques. However, Pauletto, Gapski (see references) and others reported that cement excess was problematic; then Wilson's study established a positive relationship between excess residual cement and peri-implant disease.

Surveys on cements used for implant restorations indicated a diversity in material selection, application technique and volume. This suggested a lack of conformity and understanding of cement usage within the dental profession. To overcome the cement problem, it became evident that improved understanding was required for cement material selection, abutment design and he determination of cement margin depths. Even with the very best intentions, however, the residual excess cement can lead to disease affecting the health of the implant/tissue interface and remains a dominant risk factor.

Figure 1. Failed, removed implant, cement extrusion is noted on multiple threads.

Fig. 2. (A) The anterior teeth present a challenge to the screw retained restoration unless an Angulated Screw Channel (ASC) abutment is used. (B) In cases where the surgical placement is less than ideal, the ASC may help limit further compromise to the site.

The association of residual excess cement and peri-implant disease has resulted in the need to re-examine alternatives such as the screw retained implant crown. For many implant systems, the ability to use a screw retained implant restoration is limited to regions where the screw access channel emerges in an esthetically "safe" site.

Usually the anterior maxilla and mandible present the greatest challenges, as the long axis of the implant often projects through the proposed incisal edge or even facial to the final restoration. (Fig. 2A.) Occasionally, when the surgeon places the implant in a compromised site—or the implant is inappropriately placed—the traditional screw retained implant restoration may seem to provide more of a challenge than a solution. (Fig. 2B)

T&T
Tips and Techniques

ASC saves the day

An innovative solution to the off-axial implant is the Angulated Screw Channel (ASC) abutment system developed by Nobel Biocare. (Fig. 3.) With the ability to alter the screw channel up to 25 degrees it eliminates the need for cementation in the vast majority of cases like these.

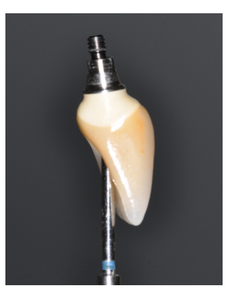

Figure 3. The ASC shows the angle re-direction of the screw access channel.

Fig. 4. (A) Even with shallow margins and minimal cement, the elimination of cement extrusion still presents a clinical challenge. (B)

The ASC provides for an active symbiosis of health, esthetics, and excellent structural and mechanical abutment joint stability.

Health:

With use of the ASC abutment system, cement extrusion into the fragile peri-implant soft tissues is eliminated. The ASC puts an end to the insult of cement fluid pressure and unset chemicals from the cement material.

It also gets rid of the potential for foreign bodies being pushed around the implant site, which can jeopardize implant health. (Fig. 4.) In addition, the use of zirconia abutment superstructures in combination with titanium bases provides optimal materials for biocompatibility and health.

Esthetics:

With the ASC, the screw access channel can be projected away from high esthetic risk areas and placed appropriately at a variety of different angulations. CAD/CAM design enables the restorations to be efficiently designed and quickly manufactured at Nobel Biocare's Procera laboratories. (Fig. 5.) Milled zirconia is highly esthetic especially useful at the soft tissue emergence site.

Mechanical Stability:

CAD/CAM utilization (Fig. 6 A–C) allows for ideal screw access site planning, and the machining of components provides the most secure, dedicated connection, optimized for the implant-abutment joint. As with all implant to abutment connections, the ideal passive fit results when these surfaces are in intimate contact and forces distributed universally. Casting abutments cannot always provide even connection joint contact, as they are often inadvertently damaged through cleaning and polishing which alters the consequent fit. (Fig. 7.) When this occurs, the joint connection may fail, with screw loosening or even catastrophic failure of the implants as result.

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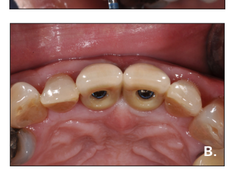

Fig. 6. (A) The screw access from Fig. 2A has been redirected using the ASC abutment and crown (B), producing a pleasing natural appearance thanks to a screw–retained implant restoration. (C)

Science matters

10+ Years and counting

Excellent biological and technical long-term outcomes for zirconia abutments. (Ekfeldt et al., Clinical Oral Implants Research. 2016 Sep; doi: 10.1111/clr.12975)

This retrospective study confirms the technical and biological excellence of zirconia abutments for single-implant restorations over more than 10 years of function. It investigated the clinical outcomes of 30 Procera customized zirconia abutments in 23 patients, with a minimum of 10 years' follow-up. Restorations were either one-piece with veneering porcelain baked directly onto the screw-retained zirconia abutment (n=16) or a cemented alumina crown (n=14). No fracture and only clinically insignificant chipping was observed.

Peri-implant mucosa covered the crown-abutment connection around all but four restorations. The peri-implant bone level after 10 years showed only minor changes from placement (–0.26mm±0.6). Patients and dentists alike were extremely satisfied with the esthetics (significantly correlated) and function of the single-implant restorations.

→ www.ncbi.nlm.nih.gov/pubmed/27663724

Superior micro-stability

NobelProcera shows a reduced implant-abutment micro-motion. (Karl and Taylor, Int J Oral Maxillofac implants. 2016 Aug; doi: 10.11607/jomi.5116.)

Large micromotion at the abutment-implant interface increases the risk of screw loosening and joint instability, and can potentially alter the size of the microgap. This study showed significantly lower mean micromotion for NobelProcera CAD/CAM titanium implant abutment assembly prior to cyclic loading compared with all other tested products ($p \leq 0.001$) in-vitro.

Furthermore, mean micromotion for NobelProcera abutments was not significantly altered ($p=0.463$) by cyclic loading (100,000 cycles; 100 N) indicating a low settling effect. In this regard, NobelProcera performed better than Straumann CAD/CAM Zirconia and Dr. Ihde Dental implant-abutment assemblies, both of which had significantly reduced micro-motion after cyclic loading ($p<0.05$).

The authors suggest high-quality abutments like NobelProcera remain close to their position at insertion and thus provide a higher stability and lower risk of screw loosening compared with the other products..

→ www.ncbi.nlm.nih.gov/pubmed/27525518

Bone gain with creos xenoprotect

Head-to-head comparison of bone-gain dynamics with creos xenoprotect and Bio-Gide in dehiscence defects. (Wessing et al., 2016 Sep; EAO Paris)

This ongoing prospective, multi-center RCT compares the clinical performance of creos xenoprotect (CXP) and Bio-Gide (Geistlich) collagen membranes for the treatment of dehiscence defects. Both membranes facilitated bone growth during the six months of healing. Defect height at re-entry reduced by 81% for creos xenoprotect and 62% for Bio-Gide. The maximum membrane exposure rate observed at week three was 8.7% with creos xenoprotect compared with 16.7% with Bio-Gide. Although differences between the two brands were not significant, creos xenoprotect showed a trend toward higher bone gain and a lower membrane exposure rate. Clinical results with creos xenoprotect to support implant placement in dehiscence defects were not inferior to the standard Bio-Gide. Studies with larger sample sizes may validate that the previously reported superior in-vivo results of creos xenoprotect (Bozkurt et al. 2014, Dahlin et al. 2015) are clinically relevant.

→ www.dentalcongressposters.com/eao2016/wessing.pdf

Patient Testimonial

"The very best thing since sliced bread!"

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By Frederic Love

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Structural components

Titanium alloy abutment bases provide the most accurate fit with machining tolerances readily controlled. Abrasive wear, i.e. the release of titanium metal into the peri-implant tissues from the inside of the implant, is not an issue.

The zirconia abutment, with its well-designed circumferential wall strength, is held through the abutment screw, optimizing the ceramics ability to withstand forces that have been seen to fracture non-titanium base abutments.

Conclusion:

The benefits of the ASC abutment system are numerous, reflecting a multiple symbiosis of engineering ingenuity and biocompatible materials, and allowing for the combination of good esthetics and excellent health.

The author wishes to acknowledge and personally thank the following dental laboratories for their assistance with this material: Avots Dental laboratory, Nakanishi dental laboratory and Myron Choi. <

→ More to explore!
For the complete references to his article please visit:
nobelbiocare.com/news

Figure 7. An actual case: Note cast abutment has been damaged through routine laboratory procedures.