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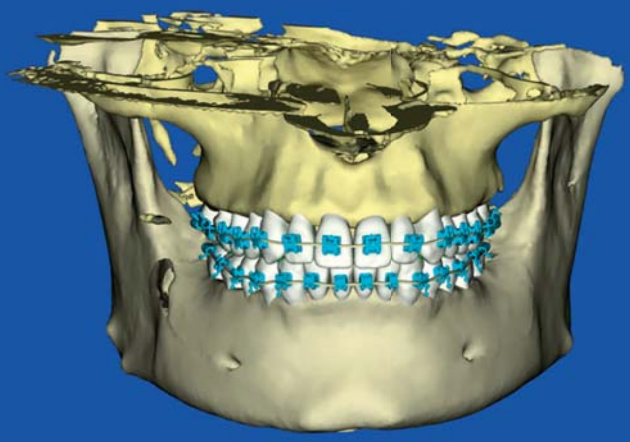

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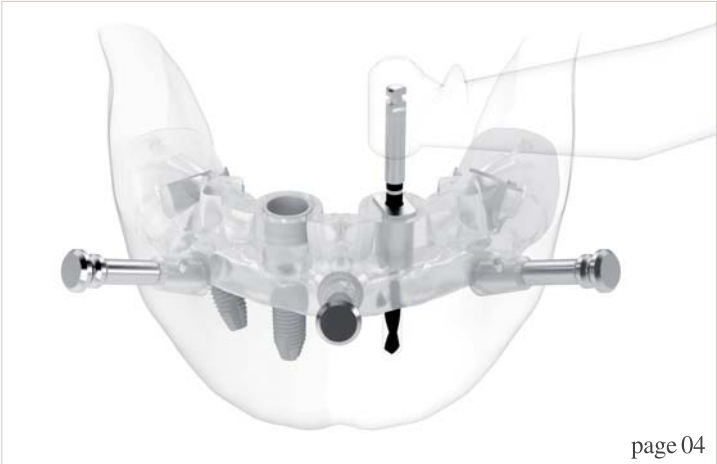

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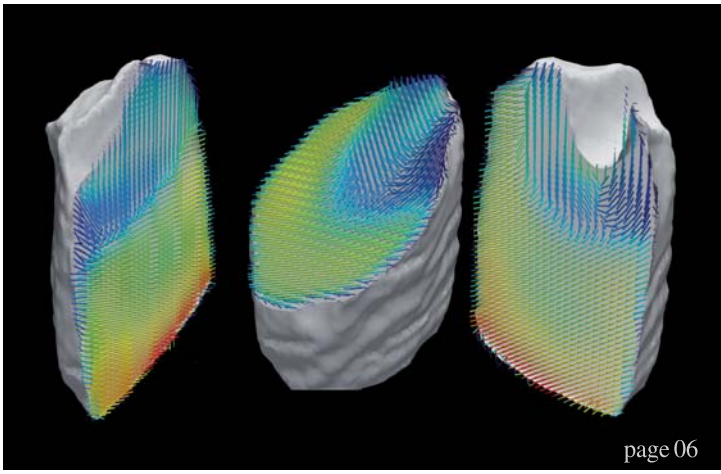

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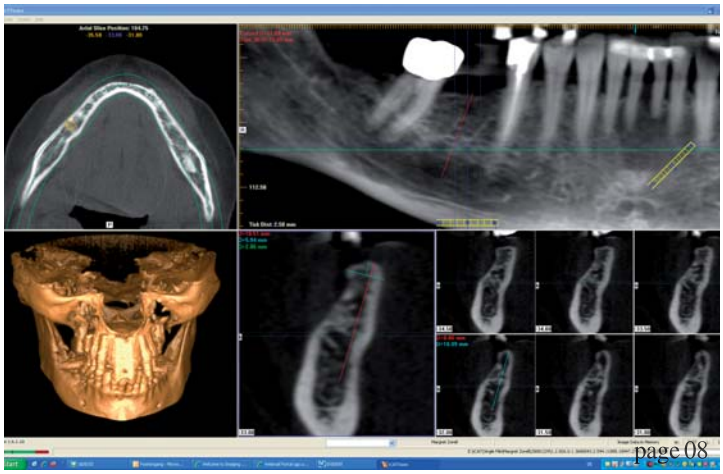

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Digital precision for all indications

Author_Suvi Rantanen, Nobel Biocare, Switzerland

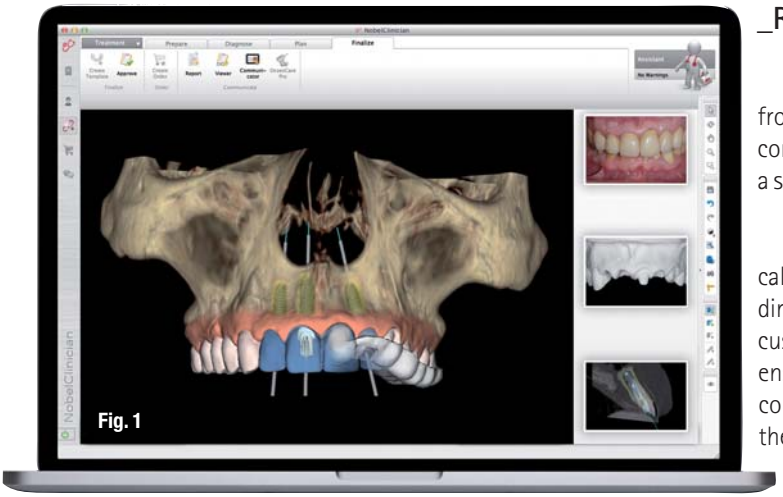


Fig. 1_NobelClinician is a user-friendly software for diagnostics, treatment planning and patient communication. It uses state-of-the-art technologies to help dental professionals improve all aspects of dental implant treatment.
Fig. 2_The easy-to-use surgical templates help to ensure correct angulation, direction and depth from the very first drill. The custom-manufactured surgical templates help ensure accuracy by guiding the initial drill according to the digital treatment plan created in the user-friendly NobelClinician Software.

_Ten years since its launch, the NobelGuide guided surgery concept has evolved from an ambitious idea to become a solution many clinicians find indispensable. NobelGuide is a complete treatment concept for diagnostics, treatment planning and guided implant surgery—from a single missing tooth to an edentulous jaw. It helps to diagnose, plan the treatment and place implants based on restorative needs and surgical requirements.

_Powerful diagnostics and treatment planning

Key to NobelGuide is the NobelClinician Software. It allows clinicians to plan dental implant treatment with precision and confidence by assessing detailed 3-D patient scans. Implant placement can be brought to life on screen and teeth can even be extracted virtually, meaning the surgeon can take into account important factors such as the availability of bone and prosthetic needs before actual tooth extraction. Precise measurements can be taken and the software even alerts the clinician when implants risk being placed too close to anatomical structures.

_Right from the start

NobelGuide offers a predictable solution—from start to finish. Clinicians can choose to complete the whole surgery fully guided, or to use a surgical template just for pilot drilling.

With the latter option the easy-to-use surgical templates help to ensure correct angulation, direction and depth from the very first drill. The custom-manufactured surgical templates help ensure accuracy by guiding the initial drill according to the digital treatment plan created in the user-friendly NobelClinician Software. The software provides safety margins and a warning system to help the clinician avoid critical anatomical structures, meaning implants can be placed in narrow spaces with greater confidence—even NobelActive 3.0. The clinician will then continue with freehand surgery once the initial drill has been used.

The range of surgical pilot drill templates has been extended to cover both partially edentulous and edentulous cases, allowing more patients to

Fig. 2

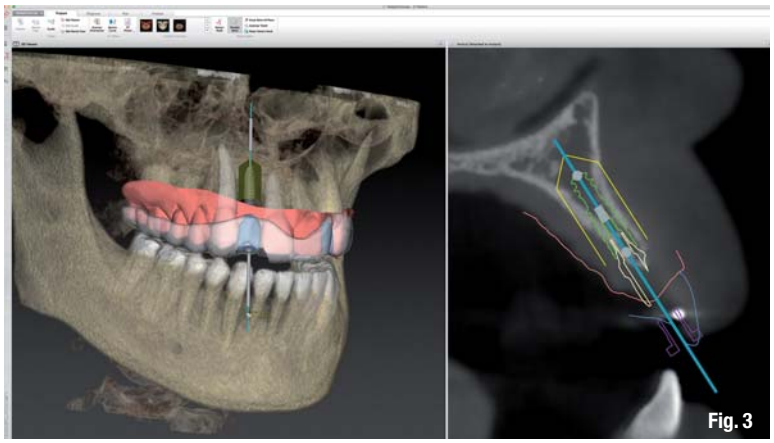


Fig. 3


Fig. 4

benefit from this predictable treatment option that helps to provide an optimised aesthetic and functional outcome. This means the templates can now be used for the All-on-4® treatment concept, helping the clinician to overcome challenges such as bone resorption, avoid critical anatomical structures and place implants deeper when treating edentulous patients.

This is made possible by the sleeve-offset function. It supports bone reduction and the deep placement of implants such as NobelParallel Conical Connection which are increasingly placed subcrestally. It also allows for the initial treatment plan to remain unchanged.

_A seamless workflow for every case

Every case is different. That is why NobelGuide offers a choice of treatment workflows—with and without the use of a radiographic guide.

Since partially edentulous patients do not need a radiographic guide, the clinician can save time with one less patient visit. They can also take advantage of the integrated treatment workflow. It connects Nobel Biocare's digital treatment planning software, 2G NobelProcera scanner, high-end production, guided implant surgery, Communicator iPad® app and OsseoCare Pro iPad®-operated drill unit to enable the treatment team to communicate, collaborate and perform with ease.

Once the clinician has marked the critical anatomical structures using the NobelClinician Software they collaborate with the lab technician to develop a precise model scan. The clinician can then confidently develop a treatment plan thanks to NobelClinician's SmartFusion technology, which provides the patient's (CB)CT data together with the intra-oral situation, soft tissue information and diagnostic setup. At this point they can increase patient acceptance by using the Communicator iPad® app to explain the treatment plan to their patient. Finally, they have the freedom to choose between guided pilot drilling and fully guided implant insertion at any point during the workflow, using a custom-manufactured surgical template.

For edentulous patients the workflow includes the radiographic guide with a double-scan protocol. Once the clinician has made a clinical diagnosis, they fabricate and clinically validate the diagnostic tooth setup, transforming it into a radiographic guide—their prosthetic reference during treatment planning. After making a (CB)CT scan of the patient and the radiographic guide, they define the implant position, order a custom-manufactured surgical template and proceed with guided drilling and implant insertion.

_A clinician's guide to success

From the initial diagnosis to the first guided drill, from partially edentulous to edentulous workflows, NobelGuide supports the clinician from beginning to end. It is no wonder that ten years since its launch NobelGuide has gone from strength to strength, improving treatment predictability and providing peace of mind to an ever-increasing number of clinicians._

Find out more at nobelbiocare.com/nobelguide

Fig. 3_In narrow spaces the guided pilot drill helps to ensure precise implant placement, thanks to NobelClinician's safety margins and a warning system that helps the clinician avoid critical anatomical structures.

Fig. 4_The integrated treatment workflow connects NobelClinician, the NobelProcera 2G System, NobelGuide, the Communicator iPad app and OsseoCare Pro to provide the treatment team with a seamless process from diagnosis to restoration.

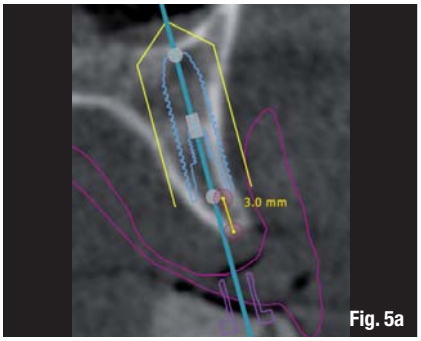


Fig. 5a

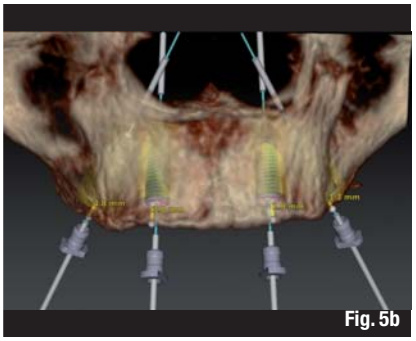
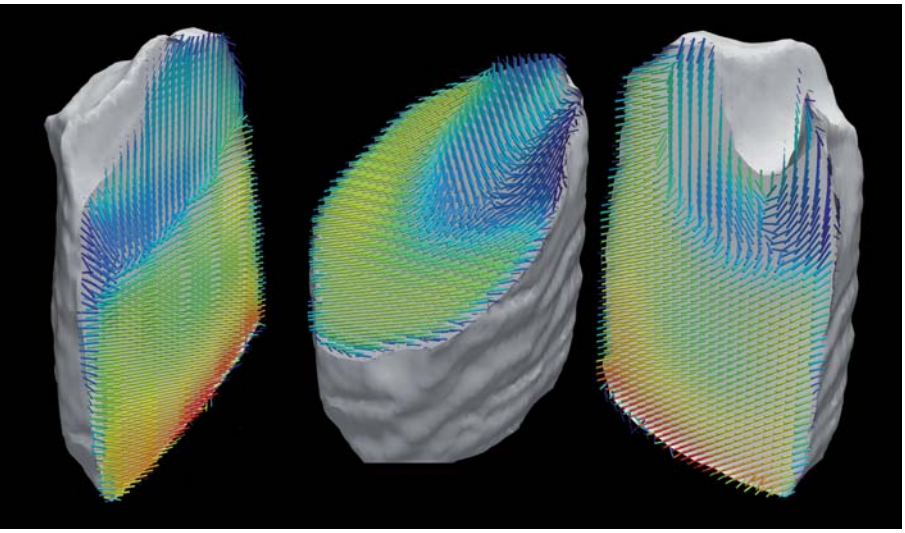


Fig. 5b

Fig. 5a & b_The NobelClinician Software together with the guided pilot drill helps to avoid complications when treating edentulous patients. The clinician can make use of all available bone and if bone reduction is needed, they can use NobelClinician's sleeve-offset function.

New X-ray imaging technique visualises teeth's nanostructures



Representation of the orientation of collagen fibres within a tooth sample. The new method makes it possible to visualise structures in the nanometre range in millimetre-sized objects at a high level of precision. (Image: Florian Schaff, TUM)

_**With the help of** a new computed tomography (CT) method that is based on the scattering of X-rays, a team of international researchers has been able to visualise nanostructures in objects measuring just a few millimetres for the first time. To demonstrate the potential of the technique, the researchers reconstructed the precise 3-D orientation of collagen fibres in a piece of human tooth.

The new method, which was developed by a team of researchers from Technische Universität München (TUM), the Charité hospital in Berlin, Lund University and the Paul Scherrer Institute in Switzerland, utilises the scattering of X-rays rather than their absorption.

Conventional CT methods calculate exactly one value, known as a voxel, for each 3-D image point within an object. The advantage of the new technique is that it assigns multiple values to each voxel, as the scattered light arrives from various directions.

"Thanks to this additional information, we're able to learn a great deal more about the nanostructure of an object than with conventional CT methods. By indirectly measuring scattered X-rays, we can now visualise minute structures that are too small for direct spatial resolution," explained Prof. Franz Pfeiffer, head of the Institute of Biomedical Physics at TUM.

By combining 3-D information from scattered X-rays with CT, the researchers were able to view clearly the 3-D orientation of collagen fibres in a piece of human tooth measuring around 3 mm. In order to do so, 1.4 million scatter images were taken and then processed using a specially developed algorithm that builds up a complete reconstruction.

"A sophisticated CT method is still more suitable for examining large objects. However, our new method makes it possible to visualise structures in the nanometer range in millimeter-sized objects at this level of precision for the first time," said Florian Schaff, a PhD student at the institute and lead author of the paper.

The new imaging technique could be of interest for the characterisation of not only biomaterials such as bone and teeth, but also functional materials such as fuel cell and battery components, the researchers believe.

The results of the study were published online on 19 November in the Nature journal in an article titled "Six-dimensional real and reciprocal space small-angle X-ray scattering tomography"._

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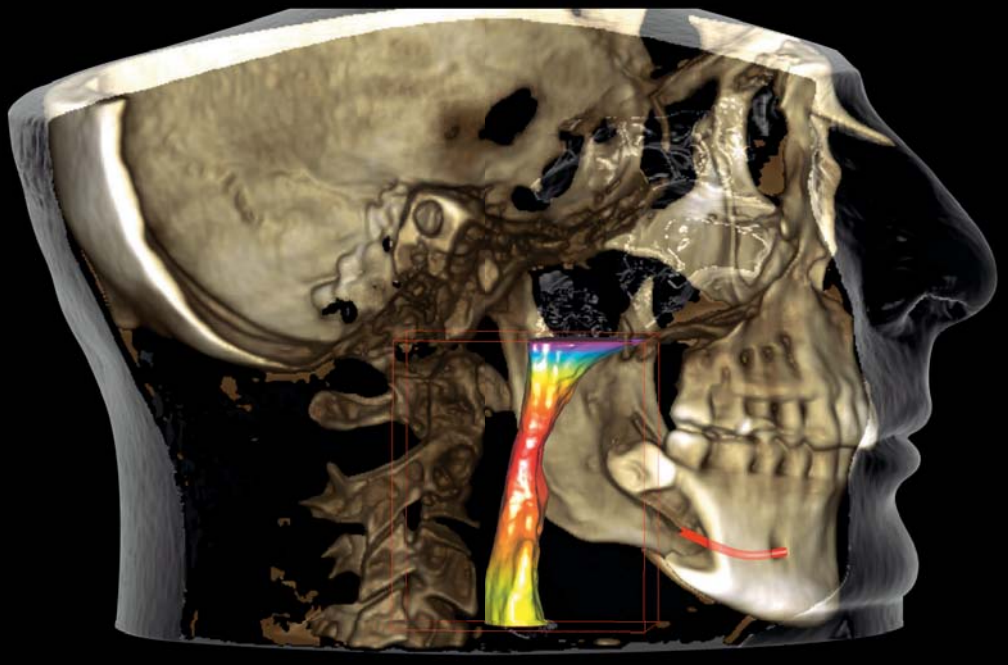

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Functional hard and soft tissue preservation in the sloped alveolar ridge

Author_ Dr Robert Nölken, Germany


Fig. 1a


Fig. 1b


Fig. 2a


Fig. 2b


Fig. 2c

Fig. 1a_Not providing support to the lingual bone leads to its resorption.
Fig. 1b_Risk of discolouration or necessitating augmentation.
Figs. 2a–c_The height of the slope from the lingual to buccal side varies between 1.5 and 1.7 mm, depending on the design and diameter of the implant.

_Summary

Patient

A 53-year-old woman presented with missing tooth 46. The alveolar ridge height at the site was uneven, sloping in a buccal direction by approximately 2 mm. The interdental papillae at tooth 45 and at tooth 47 were only marginally filled.

Challenge

To retain the hard and soft tissue structures around the implant to the greatest extent possible.


Fig. 3

Fig. 3_The CBCT images show the sloped atrophied alveolar ridge in region 46.

In order to reduce the risk of progressive vertical and horizontal alveolar ridge atrophy and subsequent loss of the papillae, an OsseoSpeed Profile (ASTRA TECH Implant System) was selected, with the expectation that its sloped implant design would optimally support the anatomical structures.

Treatment

Cone beam computed tomography (CBCT) was used for the planning of the case. After measuring the lingual and buccal preparation depth, an OsseoSpeed TX Profile was inserted. The final alignment of the sloped implant shoulder was carried out using the specially marked implant driver to ensure that the implant was placed flush to the bone. This allowed the marginal bone around the implant to be optimally supported. After approximately four months, the peri-implant mucosa was healed without irritation.

After making a final impression with a Profile Impression component, a TiDesign Profile Abutment (DENTSPLY Implants) was customised in the laboratory, and a metal ceramic crown was fabricated. About five months after implant placement, the ceramic veneered crown was cemented.

_Case study

Adapting to the anatomical situation using a sloped implant design

Long-term clinical and aesthetic success of implant therapy can only be achieved if peri-implant hard and soft tissue structures are preserved to the greatest extent possible. Bone resorption after tooth loss in the posterior region can occur in a oro-vestibular as well as in a mesio-distal direction. In both cases the OsseoSpeed Profile implant (DENTSPLY Implants) is adapted to the anatomical situation because of its sloped implant design.


Fig. 4a


Fig. 4b

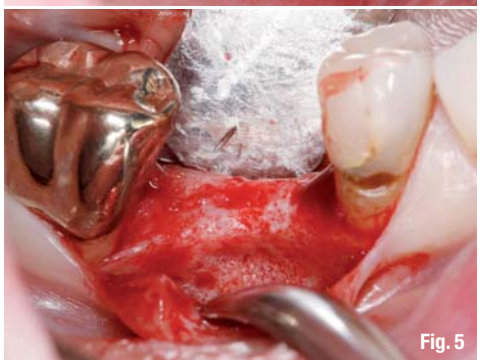
Fig. 5

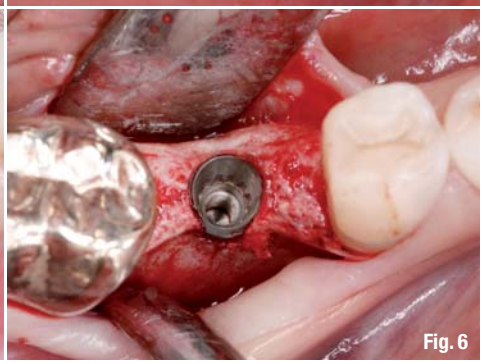
Fig. 6

Figs. 4a–b_Clinical images taken before implant placement show the pronounced buccal and slight lingual resorption of the alveolar ridge.
Fig. 5_After crestal incision and elevation of a mucoperiosteal flap, the atrophied alveolar ridge is clearly visible.
Fig. 6_The buccally insufficient ridge width caused a bone dehiscence.

The primary objective of implant therapy is to achieve lasting functional and aesthetic success with minimal risk and without complications. As a result of tooth extraction or loss, however, horizontal and vertical resorption occurs. Horizontal resorption starts at the thinner alveolar outer walls. Vertical bone resorption is characterised by being more pronounced buccally than lingually, which can lead to a difference of up to two mms from the lingual to the buccal bone lamella.[1]

Anatomically shaped implant shoulder

When bone loss occurs, conventionally designed implants with flat implant shoulders can only partially support the peri-implant structures. This can result in discolouration of the buccal soft tissue margin or the unsupported bone may be resorbed (Fig. 1).

In order to avoid such undesirable consequences, the OsseoSpeed Profile implant was developed. The OsseoSpeed Profile implant is supported by the ASTRA TECH Implant System BioManagement Complex: OsseoSpeed, MicroThread, Conical Seal Design and Connective Contour. The implant is available in different lengths and diameters. As a result of its construction, the anatomical features


Fig. 7a

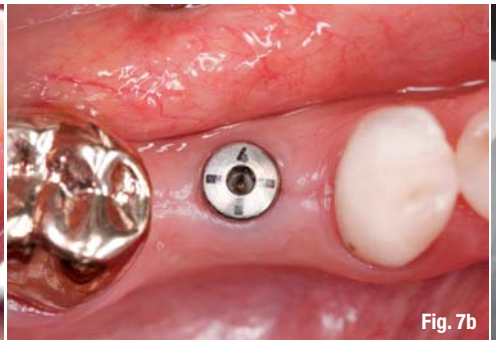
Fig. 7b

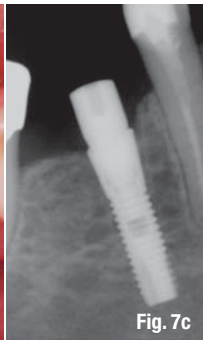
Fig. 7c

Figs. 7a–b_Nice transgingival healing of the OsseoSpeed Profile implant with support of the peri-implant hard and soft tissue structures caused by the anatomically natural contour of the implant neck.
Fig. 7c_X-ray after 16 weeks at re-entry.