STARGET

INTERNATIONAL MAGAZINE FOR CUSTOMERS AND PARTNERS OF STRAUMANN 2/2014

Straumann and botiss: More than a partnership. A synergy of strengths.

Straumann® Bone Level Tapered Implant
Taking primary stability to the next level

Fixed prostheses for edentulous patients
Restoring quality of life with solutions by Straumann

60 YEARS

straumann
simply doing more

Cover image SEM picture of botiss cerabone® (Ruhr University Bochum, Germany)

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Editorial

Oral tissue regeneration – a key success factor in implantology

Dirk Probst
Head Product Management Regenerative

Oral tissue regeneration products are indispensable for implantology: market research studies and clinical practice show that regenerative procedures are required in half of all implant-borne solutions to ensure success, or even to enable an implant placement. At Straumann, we strive to offer our customers better, integrated solutions from a single source – from digital impressions to the final crown – where regenerative products play a crucial role.

Today, we know the biological fact that there is no single bone augmentation material or membrane to suit all indications. Therefore, a more versatile and comprehensive system is required to offer solutions that are tailored to specific needs. We have now found a competent and dynamic partner in the shape of botiss which offers just that. The young Berlin-based company has been impressive in recent years with strong performance, and has already worked its way up to become a significant competitor in numerous international markets – in some cases market leader in the regenerative sector. You can find out more about this exciting new chapter at Straumann in the feature article of this issue.

You can also expect new surgical and prosthetic products from Straumann that take into account the increasing demands of implantology. The focus here is on the new Straumann® Bone Level Tapered Implant portfolio, which offers a flexible surgical protocol and increased primary stability in relevant indications, e.g. in the case of screw-retained immediate restorations.

I hope you find this a fascinating read.

Sincerely

Dirk Probst

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A synergy of strenghts

6 Straumann and botiss have announced a co-operation agreement, covering distribution and development. Founded in 2008 by Oliver Bielenstein and Dr Drazen Tadic, the company has become an innovative, clinically oriented biotech company with an exclusive focus on oral regeneration and a broad portfolio for the different needs of oral regeneration.

Taking primary stability to the next level

38 Implants with tapered design are becoming increasingly popular due to patients' growing demand for shorter treatment times and the good primary stability such implants offer in cases of softer bone classes as well as for immediate placement/loading procedures. Straumann's new Bone Level Tapered Implant (BLT) is the answer to today's clinical and anatomical challenges.

Restoring the quality of life of edentulous patients

50 The unique product combination of tapered implants comprising Roxolid®, a screw-retained prosthetic portfolio and custom-milled frameworks will enable dental professionals to improve their patients' quality of life by providing a fixed restoration that is less complex but at the same time reliable.

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Innovative, clinically oriented, and growing very fast

dental
bone & tissue
regeneration

botiss
biomaterials

About botiss

botiss, founded in 2008 by Oliver Bielenstein and Dr Drazen Tadic, is an innovative, clinically oriented biotech company with an exclusive focus on oral regeneration. Its headquarters are in Berlin, Germany, with development and production sites in Germany, Austria, and the UK.

The company, which currently has a workforce of 65 employees, was a success story from the beginning and is today's fastest-growing company in the field of oral regeneration: in the dental bone/tissue regeneration field, botiss has advanced to no. 2 in Europe and is the market leader in Eastern Europe/Middle East, with a growing global market share. botiss products are available in more than 90 countries through a global network of distribution partners.

At the ITI World Symposium 2014 (April 24–26 in Geneva, Switzerland), Straumann and botiss announced a cooperation agreement, covering distribution and development. The formal agreement between the two companies gives Straumann exclusive rights to distribute botiss regeneration system products, initially in most Western and Central Europe countries and the Americas, with co-distribution in Germany. At the same time, botiss obtained rights to distribute the regenerative product Straumann® Emdogain in Germany as well as in parts of Eastern Europe and the Middle East.

Proven, reliable, and predictable

The botiss regeneration system was designed to achieve optimal and predictable results. botiss products have proven their success in a multitude of preclinical and clinical studies, and in daily clinical work with hundreds of thousands of patients worldwide. The system utilizes long-term proven biological materials (bovine, synthetic, allografts, collagen, granules, blocks, membranes, soft-tissue matrix), matched to each other for specific indications.

The products are made to the highest quality standards and are all strictly biological (e.g., no chemical cross-linking). Patient safety, ease of use, reliable and predictable treatment results – these are the top priorities of botiss and its customers. Since the company's founding, more than one million patients have been treated successfully with botiss products.

A strong scientific network

botiss invests substantially in research and education. As an innovation-driven company, the flat organizational structure and close cooperations with universities and clinical users interested in research and development are very important. Over the last few years, these cooperations have led to completely new therapeutic approaches.

Unique innovations and new clinical solutions, such as mucoderm®, maxgraft® bonebuilder, and maxresorb® flexbone, and the concept of high-quality learning and education with the botiss academy and at the "botiss international bone & tissue days" are the result of partnerships with world-renowned academic research institutions, global opinion leaders, and practitioners in their daily clinical environment.

Different indications and needs, a broad portfolio to cover them

Progress in the science of oral regeneration has made clear that there is no single bone graft or soft-tissue biomaterial that is able to suit all medical needs, biological situations, and indications.

A variety of factors (indication, age, hygiene, biotype, bone height, treatment plan) require a sophisticated approach with different, coordinated products. It is the broad product portfolio and the permanent development of new innovative biomaterials for hard- and soft-tissue augmentation that make the botiss regeneration system stand out. Clinical users may select their own individual portfolios based on different aspects, knowing that in case of need, there are always other prominent alternatives within the system to rely on.

Continuing education is the key to success in regeneration

Such a broad product portfolio requires a complex system of continuing education and training. botiss continuously recruits experts to give lectures and courses at different levels: for assistants and students, as well as advanced clinicians; discussing their clinical and scientific results. Here, botiss puts the emphasis on a pleasant atmosphere and good communication, which is particularly welcomed by younger clinicians just starting their career in implant dentistry.

The annual "botiss bone & tissue days" have become Germany's leading regenerative congress (photographs from the 2013 event).

Left to right: Dirk Probst, Marco Gadola, Oliver Bielenstein

Cooperation between Straumann and botiss

Two firms, one focus

An interview by Dirk Probst with Marco Gadola and Oliver Bielenstein.

The motto behind the collaboration between Straumann and botiss is: "More than a partnership. A synergy of strengths." Dirk Probst, Head of Regeneration at Straumann, spoke to Straumann CEO Marco Gadola and botiss Managing Partner Oliver Bielenstein about motivations and prospects.

How did you decide to join forces in the field of regeneration?

Gadola: For a leading implant manufacturer like Straumann, which aims to offer a complete portfolio, regenerative solutions are an important element. There is no other way, as we know that regenerative products are needed and used in almost every second implant treatment. And this is exactly what we strive to achieve: to offer the customer a complete solution from a single source. Straumann, of course, has not only just started work in the complex field of regeneration. On the contrary, we are still one of the few companies in the dental implant market that also has its own regenerative portfolio – for example with Emdogain® as a highly interesting and scientifically extremely well documented product in the field of periodontal regeneration.

In order to help us achieve this ambition of a complete portfolio a little more quickly, however, we made some new strategic decisions six months ago. We would like to continue with existing products and projects, and invest in them further – in identifying new indications for Emdogain®, for example. When it comes to bone substitutes or membranes, however, we believe that the only efficient and targeted way to complete our portfolio is to collaborate with a strong partner such as botiss.

« For a leading implant manufacturer and distributor like Straumann, which aims to offer a complete portfolio, regenerative solutions are an important element. There is no other way, as we know that regenerative products are needed and used in almost every second implant treatment. *Marco Gadola* »

Bielenstein: A collaboration with Straumann offers a great opportunity to increase our share of existing markets or obtain faster access to other markets such as North and South America via Straumann. We will now be able to do this much more quickly than we would on our own. The support we receive in the areas of market access, marketing and sales will enable us to focus more closely on our core competencies: product development, clinical research, training and continuing education. The prospect of working together on regenerative projects such as the further development of Emdogain® is also highly appealing.

« The support we will receive in the areas of market access, marketing and sales will enable us to focus more closely on our core competencies: product development, clinical research, training and continuing education. *Oliver Bielenstein* »

Marco Gadola, why botiss? After all, here in Switzerland there's another clear candidate who is a leading player in this area.

Gadola: It's not just about size. botiss has already established itself in a number of major regenerative markets such as Europe and the Middle East, as well as certain Asian countries, all under its own steam. In Europe, botiss is now Number 2. Naturally, a young firm like botiss can't be compared with the market leader just yet. But if we look at the company's product portfolio, then I think we can say it's considerably more comprehensive than that of the market leader.

Bielenstein: Despite having only been on the market for five years, we're already Number 1 in various countries and a strong contender in others. Our company has therefore achieved in just a short time what others take decades to achieve. This fills us with confidence that a partnership with Straumann will generate a great deal of market power for us to be setting new benchmarks together.

botiss's portfolio is broadly based, and at first glance appears highly complex. What is the principle behind its structure, Oliver Bielenstein?

Bielenstein: Our product range has been composed in a systematic approach, with nothing having been left to chance. This means that we offer a coherent regenerative system in which none of the products are "coincidental" – all indications are taken into account. Based on the current state of scientific knowledge, of course, we all know that there is no single regenerative material that meets all needs. Instead, the broadly based botiss system provides medical professionals with the possibility to choose between and use hard and soft tissue products depending on the indication and the patient's biological situation, as well as other factors. And this is precisely why we need this broad range, which may well seem a little complex at first glance. We will be providing further illustration of this concept in the summer when we launch our "Regeneration Matrix", which will also include concrete indication recommendations. Why? Bovine material is unsuitable for building vertical bones, for example – it just doesn't work on a biological level. Allografts, however, do.

> « Based on the current state of scientific knowledge, of course, we all know that there is no single regenerative to meet all needs. Instead of this, the broadly based botiss system now provides dentists with the possibility to choose according to the indication and the patient's biological situation. *Oliver Bielenstein* »

At the same time, bovine material is the product of choice in various indications, such as preserving the alveolar ridge contour in aesthetic treatment. When it comes to soft tissue materials, we now need membranes with varying life cycles, depending on the size of the defect and the healing time. Or take soft tissue regeneration in recession treatment, for example: here I need various materials with various properties and capabilities. And it is precisely this diversity that we have incorporated in a conscious and systematic approach. This can be compared very well with a modern implant system. Here too, it takes more than just one implant with just one diameter and one length – various models with various properties are needed: various diameters and lengths at the bone and soft tissue level, but also, depending on individual preferences, various finishes and materials. After all, dentists don't choose the patient to fit the product, the product must be right for the respective indication. This is precisely where the dentist has to have a choice. And this is precisely what we have to offer.

> « We have systematically and consciously incorporated diversity into our system. This can be compared very well with a modern implant system. Here too, it takes more than just one implant with just one diameter and one length – various models with various properties are needed. *Oliver Bielenstein* »

Gadola: Diversity in regeneration is nothing new for our sales force, whose members are well aware of the significance of regenerative solutions in implant therapy. I am therefore convinced that, given the appropriate training and support for our staff, we will learn how to apply this broad range to the benefit of everyone involved.

How about the scientific evidence behind botiss's products?

Bielenstein: botiss has an outstanding internal and external team and a network of scientists, clinicians and academic institutions. Our scientific activities are based on the highest possible standards – this is essential both for us and for the field in which we work. botiss's products have been used successfully several thousand times over, and are currently being tested and researched in numerous studies with renowned clinicians. Naturally, after just five years we are not yet in a position to provide the kind of data that other companies have spent decades collecting. At the same time, however, we would all still be driving around in VW Beetles had it not been

for continuous development and competition – progress would have come to a complete halt. botiss has its roots in orthopaedic surgery. The materials we work with have all been tried and tested, and our motto is: "Predictability and a high success rate". Dentists who work with botiss products know that they have something that has been proven to work and can reliably be expected to do so.

Were botiss's products all developed in-house?
Bielenstein: Around 85 percent of the products we sell were developed by us in collaboration with universities and other academic research institutes – the Fraunhofer Society, for example – and are also manufactured by us.

Where do you both see the concrete synergies in a collaboration such as yours?
Gadola: botiss has a series of patented solutions that are extremely interesting for Straumann, such as its "bonebuilder" technology that can be adapted to suit the individual patient. A perfect symbiosis of regenerative material and digital technology, a field in which Straumann is well represented. Here, therefore, the dentist can put together a holistic and comprehensive plan for any given situation – not only when it comes to implants and reconstruction, but also including all regenerative aspects. This is helping us to go one step further in our efforts to become a holistic solution provider.

> « We will continue to maintain our efforts with Emdogain®, and will by no means ease off in this area. I am confident that botiss will contribute valuable ideas here for driving the success of this product forward. *Marco Gadola* »

Bielenstein: The bonebuilder is indeed a fascinating product. Just to explain things a little: we receive a DVT or CT scan of a defect and design a bone block tailored to the individual patient using CAD/CAM software, which is then milled from human donor bone at our tissue bank in Austria. Four to six weeks later it arrives in a sterile condition with the dentist, who opens the defect, inserts the bone block, screws it in place and covers it again. Within a period of approximately 20 minutes, therefore, the dentist is able to carry out an extremely complex augmentation, naturally on the condition that the dentist has the corresponding skills in soft tissue surgery. This procedure enables the length of surgery, as well as the risk of infection and error, to be reduced dramatically, thereby significantly increasing the chance of success in the case of large defects. This process of integration into the digital workflow, into preoperative planning, is absolutely fascinating. And we will be continuing to look into other materials and material classes in this context.

When and in which markets will the botiss products be available via Straumann, and how will botiss ensure that the necessary know-how transfer takes place?
Gadola: We will start with Europe and be in a position to distribute botiss products via our Straumann sales force by the end of this year. In larger markets such as Brazil, the USA and also Japan, we will first have to complete the registration process, which unfortunately tends to take a longer. Our aim, however, is to be able to make botiss products available worldwide by the end of 2017.

Bielenstein: We are currently already present in around 90 countries – botiss therefore already has extensive experience of training sales staff, product managers, clinicians and other specialists on an international level – this is one of our core competencies. We currently have an internal team of ten scientists who are able to provide this training in multiple languages, in real time and above all in parallel. In addition, various clinicians are also in the process of putting all the material together for e-learning purposes.

How would you describe your collaboration on Emdogain®?
Gadola: Emdogain® is sold in Germany via both the Straumann and the botiss sales force, and botiss operates its own direct sales in Germany. In certain Eastern European countries we are also discussing the possibility

of using botiss or botiss distributors to sell Emdogain® in the future. We will continue to maintain our efforts with the product, and will by no means ease off in this area. I am confident that botiss will contribute valuable ideas here for driving the success of this product forward.

« Clinicians can now achieve significantly better results with the materials currently available, provided they are prepared to learn about the appropriate indication and handling. This calls for improved abilities in soft tissue surgery in particular, and we at botiss have to offer learning and teaching content that actively communicates this necessity of active continuing education to the clinician. *Oliver Bielenstein* »

Bielenstein: For us, Emdogain® is a fascinating product that has previously been missing from our portfolio. I believe that it offers significant potential, particularly in combination with our soft tissue substitute product Mucoderm.

Will Straumann continue to run its own regenerative projects in future, or can we expect to see a development partnership with botiss?

Gadola: As I said, there is still potential for expansion in connection with Emdogain® that we would like to look into together. With a strong partner at its side, however, Straumann now no longer needs to develop collagen membranes or xenograft or allograft solutions. Our aim is not to compete with one another, but to pool and concentrate our resources in the field of development.

Bielenstein: When I look at Straumann's general product pipeline, I feel excited and know that this is really going to be a rewarding partnership. Our company has grown up around collaboration and cooperation, and has developed so quickly not least due to the fact that we are so open, transparent and partnership-oriented. We believe that really great results can be achieved when two strong partners with varying competencies join forces in a focussed approach based on openness and trust. There is a great deal of know-how within our company, and particularly in the networks established by both parties. In any case, to put it bluntly I think the perception that development takes place primarily within a single company is rather outmoded. No – in our business, development takes place primarily in the networks we are now bringing together. And the lack of complexity that we are consciously aiming to achieve will also help to increase the pace of this development. Watch this space…

What will be the greatest challenges to come in the near future – for Straumann and for botiss?

Gadola: We have to ensure that we also remain focussed in our sales activities. This means keeping the regenerative portfolio on the radar at every visit, identifying needs and actively informing our customers about the wide range of new possibilities. As I said earlier, we are now in a position to provide everything from a single source, and this is what we intend to do.

Bielenstein: Training is a challenging issue. Clinicians can now achieve significantly better results with the materials currently available, provided they are prepared to learn about the appropriate indication and handling. Naturally, as a manufacturer we will also continue to improve and optimise existing concepts, materials and products, as well as their handling. But this is an evolutionary process. There are no technological leaps, or rather: there must not be any leaps in our field, as dentists and patients must not be used as test objects. Here we have to work with an extremely high level of predictability and reliability. This calls for improved abilities in soft tissue surgery in particular, and we at botiss have to offer learning and teaching content that actively communicates this necessity of active continuing education to the clinician, via e-learning, courses, congresses or cadaver courses. We will address this challenge via the botiss academy. Naturally, we now have another strong basis with the ITI: an organisation of clinicians that teaches and learns on its own initiative. Here too, we can make our contribution, and fully intend to do so.

Designed to rebuild.

Straumann® Emdogain®.

- **Cost effective treatment option**
- **Combine with various* bone grafting material**
- Excellent clinical results[1,2,3]
- Long-term clinical benefit[4,5]
- Improved patient satisfaction[6,7]

www.straumann.com

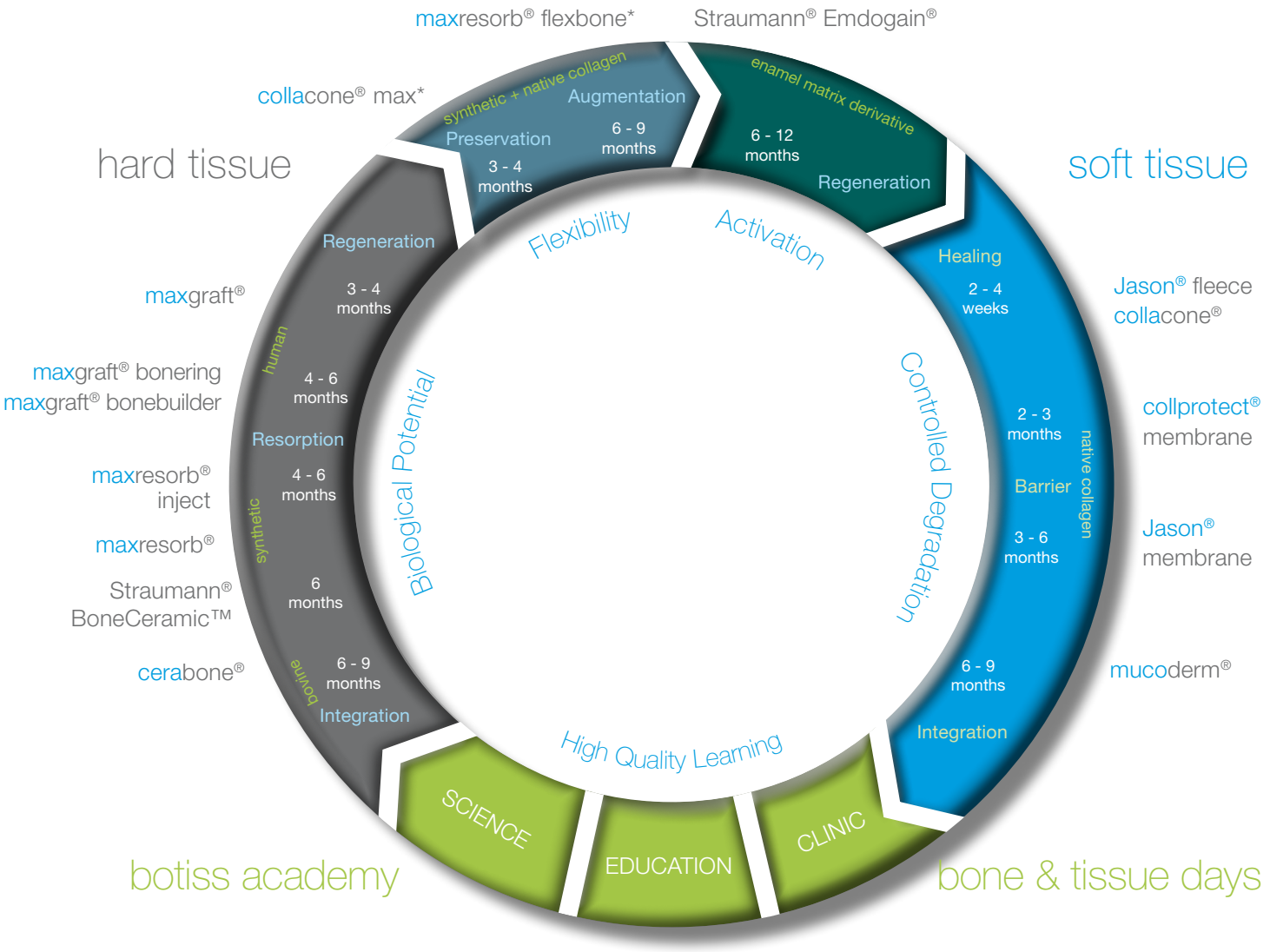
* BoneCeramic™, autograft, allograft, bone-derived xenograft, ß-Tricalcium phosphate or bioactive glass

1 Tonetti et al. J. Clin. Periodontol. 2002;29:317–325 **2** Froum et al. J. Periodontol. 2001;72:25–34 **3** McGuire et al. J. Periodontol. 2003;74:1110 & 1126 **4** Heden et al. J. Periodontol. 2006;77:295–301 **5** Sculean et al. Int. JPRD. 2007;27:221–229 **6** Jepsen et al. J. Periodontol. 2004;75:1150–1160 **7** Sanz et al. J. Periodontol. 2004;726–733

60 YEARS

straumann
simply doing more

botiss regeneration system



cerabone®

Natural bovine bone graft

Straumann® BoneCeramic™

Synthetic biphasic calcium phosphate

maxresorb®

Synthetic biphasic calcium phosphate

maxresorb® inject

Synthetic injectable bone paste

maxgraft® bonebuilder

Patient matched allogenic bone implant

maxgraft® bonering

Processed allogenic bone ring

maxgraft®

Processed allogenic bone graft

collacone® max*

Cone (CaP / Collagen composite)

maxresorb® flexbone*

Flexible block (CaP / Collagen composite)

Straumann® Emdogain®

Enamel matrix derivative

Jason® fleece / collacone®

Collagenic haemostypt (Sponge / Cone)

collprotect® membrane

Native collagen membrane

Jason® membrane

Native pericardium GBR / GTR membrane

mucoderm®

3D-stable soft tissue (Collagen) graft

* Coming soon

The growing importance of biomaterials

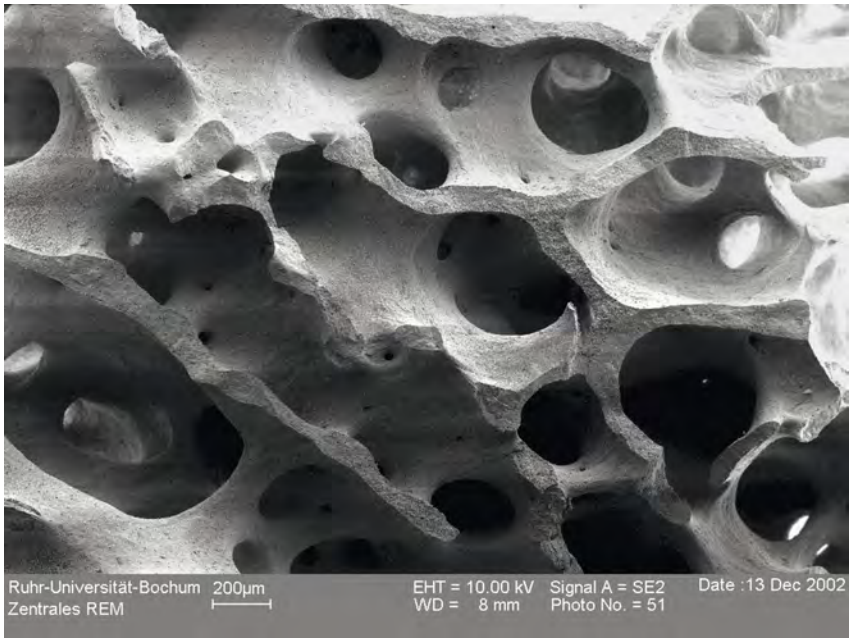


Fig. 1: *SEM picture of cerabone® showing natural porous bone structure*

cerabone® – predictable long-term volume stability without the risk of recurring resorption

Among bone graft materials, bovine bone has a very long tradition and well-documented use. The bovine bone graft cerabone® is produced from the femoral heads of cattle destined for the food industry. The unique high-temperature treatment during the production process lays the basis for its absolute safety, turning the bovine bone into a pure hydroxyapatite ceramic of such high crystallinity that it is insusceptible to complete degradation by the body's own processes.

The cerabone® particles become completely integrated into the newly formed bone matrix, offering the advantage of predictable long-term volume stability without the risk of recurring resorption. This feature is of importance in several indications, e.g. augmentations of the buccal wall in the anterior ridge where the bony support of the soft tissue is critical for a long-term aesthetic result. cerabone® is especially useful in maintaining the contours of the ridge when no implantation is planned, and hence no functional loading will take place after augmentation, or in patients that have a compromised regenerative potential.

Each situation and patient is individual – and so is the clinical user

Today, a multitude of different bone-grafting materials are available that offer attractive alternatives to patients' autologous bone. In addition, there is widespread use of various membranes and other collagen-based materials that support bone and soft tissue regeneration. All of these materials demonstrate distinctive properties, based on their origin and the production process, that result in certain advantages or disadvantages, depending on the specific situation. Each patient is individual and the same applies to the clinical users.

Consequently, the treatment plan and applied materials should be chosen with regard to the individual indication, defect configuration, the preferences of the patient, as well as the experience and skills of the surgeon. Hence, the many expectations with respect to the "ideal" bone graft or the "ideal" membrane cannot be met by one single product. This is the reason why botiss offers a broad portfolio of different biomaterials – the botiss regeneration system – enabling the clinical user to achieve optimal and predictable results in every situation.

Fig. 2: *maxresorb®*

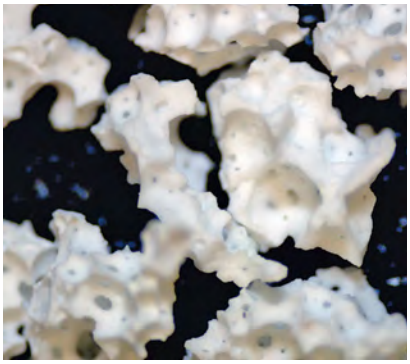


Fig. 3: *the porous structure of maxresorb®*

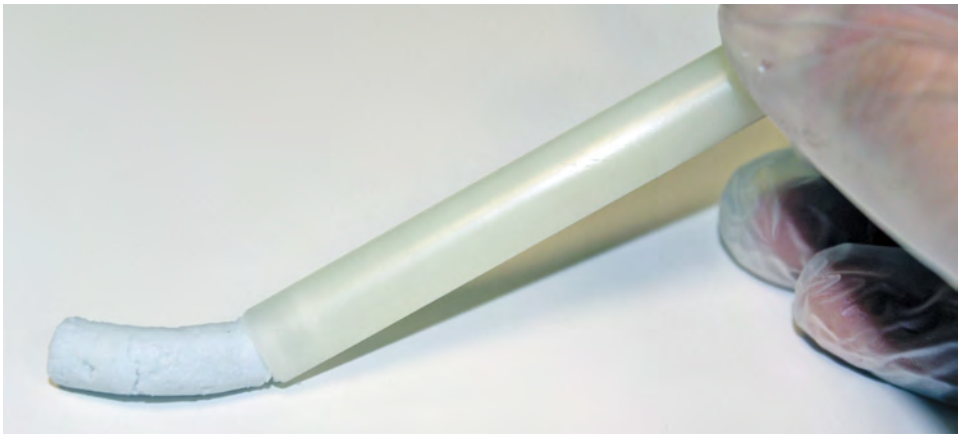


Fig. 4: *maxresorb® inject*

maxresorb® – easy handling for regeneration of smaller defects

While many doctors are successful and satisfied with the application of bovine products, others prefer fully synthetic bone-grafting materials. Synthetic materials provide solutions for patients that oppose the use of xenogenic materials, and are also favorable in cases where the patient's own regenerative capacity allows complete resorption of the biomaterial. The purely synthetic bone graft maxresorb® is completely resorbed and replaced by the body's own bone within about two years. Due to its biphasic composition of 60 % HA and 40 % beta-TCP, the material is gradually degraded, providing space for new bone formation while ensuring mechanical stability over a longer time period. By mixing maxresorb® particles with a nano-HA gel, an injectable and non-hardening bone paste is obtained; the maxresorb® inject. The large surface area of the nano-HA particles facilitate interaction with bone cells, thus promoting rapid regeneration. It also increases the particles' susceptibility to degradation, which results in the low stability of the paste. Due to its moldability and excellent surface adaptation, maxresorb® inject offers easy handling for regeneration of smaller defects, and defects supported by bony walls.

Fig. 5: *maxgraft® blocks and granules*

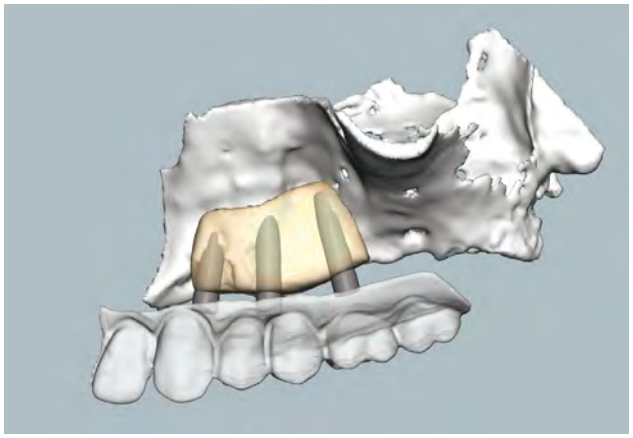


Fig. 6: *Virtual planning of the maxgraft® bonebuilder block*

maxgraft® – excellent handling in terms of shaping and screwing

If the focus is on an especially natural regeneration, fast and complete remodeling may be achieved with allogenic materials from human donors. Even complex, three-dimensional defect situations may be treated with allogenic bone blocks; this is made especially easy by using the sophisticated maxgraft® bonebuilder concept.

The allogenic blocks and granules of the maxgraft® product line contain natural collagen that is preserved within the mineral phase of the bone during the production process. Collagen is a versatile protein that exerts chemotactic influence on osteoblasts and endothelial cells, thereby supporting the rapid incorporation and complete remodeling of the biomaterial. In addition, blocks of mineralized collagen offer excellent handling in terms of shaping and screwing, and have therefore become the current material of choice for block augmentation. The new maxgraft® solutions further demonstrate that botiss not only pursues established approaches, but also focuses on individual concepts and problem-oriented individual solutions.

The maxgraft® bonebuilder technology is an important innovation in the field of block augmentation. Based on the three-dimensional radiological data of the defect/ridge, the allogenic bone transplant is designed and shaped into an individual construct. The exact fitting of the individualized bone block to the surface contours of the bone bed promotes optimized healing and improves the predictability of the augmentation. The shortened surgical time as compared to traditional block grafts (no intra-operative adaptation of the block) further adds to its advantages.

Fig. 7: *maxgraft® bone ring*

maxgraft® bone ring – simultaneous augmentation and implantation in a one-stage procedure

The maxgraft® bone ring is a prefabricated allogenic bone ring that enables simultaneous augmentation and implantation in a one-stage procedure. The so-called bone ring technique can be applied for many indications and is of particular benefit for vertical augmentations and one-stage sinus lifts.

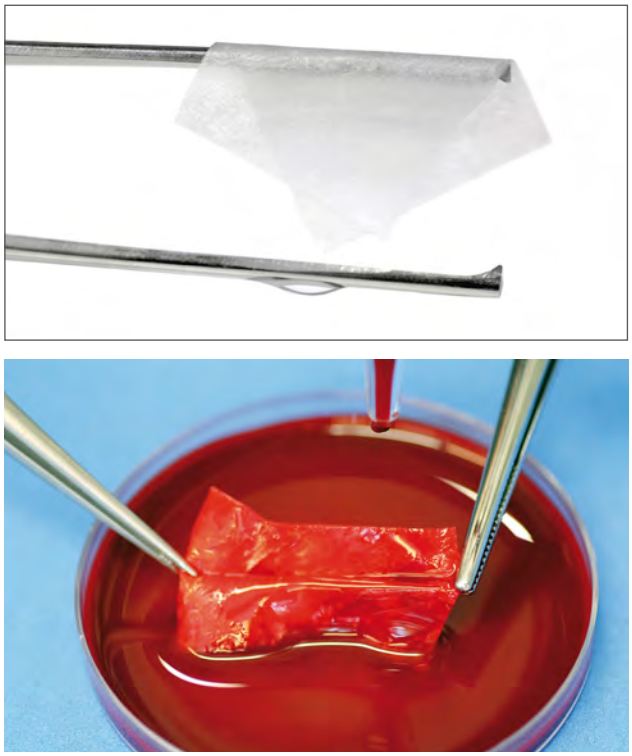


Fig. 8: *the Jason® membrane is very thin but exhibits an excellent multidirectional tear resistance.*

Jason® membrane – a natural multilayer structure for aprolonged barrier function

The botiss soft tissue portfolio also takes account of different treatment concepts. For instance, there is currently a general agreement that barrier membranes of collagen, which exhibit a long barrier function and can support rapid vessel penetration, lead to especially successful GBR.

botiss has picked up on both ideas in its soft tissue product line. The Jason® membrane, which originates from porcine pericardium, offers a prolonged barrier function of 4 – 6 months due to its natural multilayer structure. Accordingly, it guarantees an undisturbed bony regeneration, in particular for larger augmentative procedures. Due to its inherent architecture based on collagen type-III, the Jason® membrane demonstrates excellent tear resistance and its low thickness supports excellent surface adaptation and aids in achieving tension-free wound closures.

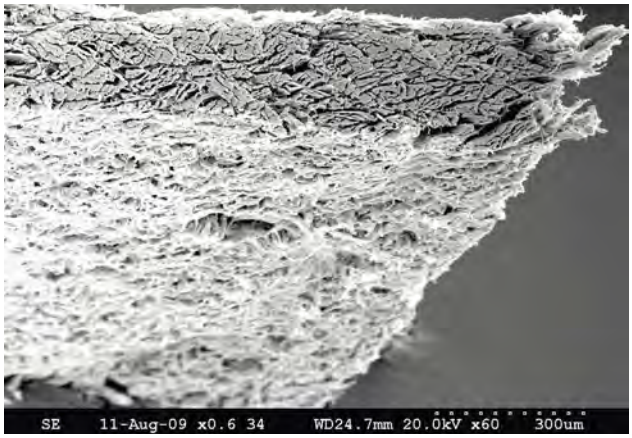


Fig. 9: *SEM picture of the collprotect® membrane*

collprotect® membrane – for medium barrier function with excellent angiogenic features

With the launch of the collprotect® membrane, botiss has extended its range of membranes to include a membrane with a medium barrier function of 2–3 months that displays excellent angiogenic features. The collprotect® membrane originates from porcine dermis. Its transmembraneous pore structure supports the rapid ingrowth of blood vessels, offering adequate protection for regeneration of most defects.

Jason® fleece – for protection of the Schneiderian membrane or covering extraction sockets

In situations that do not require a particular barrier function, the Jason® fleece offers a cost-effective alternative, e.g. for protection of the Schneiderian membrane or covering extraction sockets. Due to its open porous collagen structure and its eminent hemostyptic effect, the Jason® fleece supports wound healing and is especially useful for application at biopsy harvesting sites.

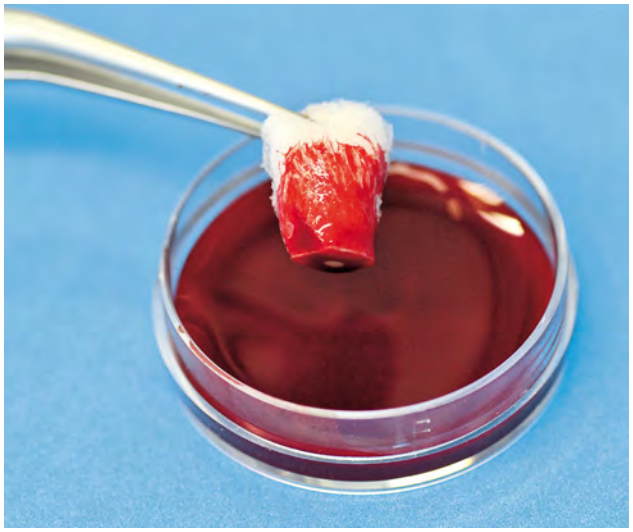


Fig. 10: *collacone®*

collacone® – a cone-shaped collagen fleece to fit in the extraction socket

collacone® is a cone-shaped collagen fleece that was designed to fit in the extraction socket and specifically aimed at stabilization of the blood clot following tooth extraction.

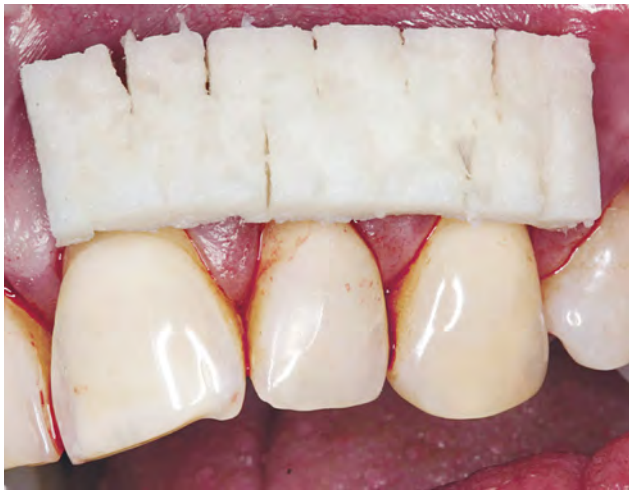


Fig. 11: *mucoderm® trimmed for application with the mesh-graft-technique*

mucoderm® – a three dimensional collagen matrix

Another innovative product from the botiss portfolio is mucoderm®, which is made from porcine dermis, developed for soft tissue augmentation. The complex collagen structure serves as a scaffold for ingrowing vessels and soft tissue cells, and is gradually remodeled into the patient's own tissue.

The application of mucoderm® circumvents the need for harvesting autologous gingival or subepithelial transplants during recessions coverage, regeneration of soft tissue defects and augmentation of attached gingiva.

Accordingly, post-operative pain and risk of complications may be reduced, while the patient's acceptance of the surgical intervention may increase.

Innovation and education

In the future, we will continue to work on the development of new and innovative products and concepts. Currently, a composite material made of biphasic calcium phosphate and porcine collagen is going through the approval process (collacone® max, maxresorb® flexbone). It is the broad product portfolio and the ongoing development of new innovative biomaterials that makes the botiss regeneration system stand out.

The clinical users may select their own individual portfolios based on different aspects, knowing that in case of need there are always other prominent alternatives within the system they can rely on. Moreover, a broad product portfolio requires a complex system of ongoing education. botiss continuously recruits experts to give lectures and courses at different levels and to discuss their clinical and scientific results.

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EHRET

botiss maxgraft® bonebuilder technology

Paving the way for a patient-friendly, minimally invasive approach in alveolar ridge augmentation

Dental implantology is currently one of the most important treatment strategies for the replacement of missing teeth. The aim is to achieve a functionally stable, long-lasting, and esthetic outcome. Due to the reduced mechanical challenge, tooth loss induces progressive bone tissue atrophy. Thus, it is often necessary to reconstruct alveolar ridges before implants can be inserted.

Autografts

For three-dimensional augmentations in cases of extensively atrophic ridges, onlay block grafting is the method of choice. Autologous bone is still considered the gold standard in block grafting. However, the intra-oral availability of autologous bone for transplantation is limited. Therefore, bone harvesting from the iliac crest is required in cases of large defects.

Tissue harvesting, however, involves a second surgical site that is frequently associated with potential donor site morbidity and increased risk of pain. Furthermore, the harvesting of bone from the iliac crest is often associated with pronounced and long-term neurological symptoms.

Allografts

Alternatively, allogenic bone (human donor tissue, allograft) may be applied to avoid the additional risks that come with harvesting autologous bone. Due to its physiological structure, allogenic bone provides an ideal matrix for revascularization and new bone formation. Since it is fully resorbable, it supports natural bone remodeling. Moreover, allografts are biocompatible and, like autografts, do not induce immunological reactions[1].

Histological studies of the final stages of graft incorporation identified no difference between allografts and autografts[2,3]. The allogenic bone tissue originates from living donors who are undergoing total hip replacement surgery and are willing to donate their femoral heads to support the supply of bone graft material for medical use. Donors have to meet high standard criteria in terms of their health status in order to be selected; systemic and neurological diseases, acute or chronic infections, and existing or past malignancies are only a few of the exclusion criteria.

Every single donor undergoes serological testing to detect the presence of virus antigens by nucleic acid testing (NAT). The donated tissue is processed in a multi-level cleaning process, which removes organic components and non-collagenous proteins from the mineral phase of the bone. This process is also validated for its effectiveness to reliably inactivate potentially present viruses and bacteria. The unique processing of the donor tissue preserves the natural collagen content of the allograft bone, rendering a material with increased flexibility, simple handling, and more potential applications as compared to synthetic or bovine bone substitutes.

Classical onlay block grafting

The most important application for allografts is onlay block grafting; in the three-dimensional reconstruction of large defects, the block allograft ensures the necessary volume stability during graft incorporation. However, it is crucial during this initial phase of vascularization and graft incorporation to establish the largest possible contact area between the block and the local bone bed.

During conventional block grafting, a standardized square block has to be manually modified for adaptation to the surface of the local bone during the surgical procedure. It is a technique-sensitive and time-consuming process. Moreover, the prolonged exposure of the surgical site to saliva and air increases the risk of infection and delayed wound healing.

◄ *C+TBA (Cells and Tissuebank Austria) in Krems, Austria (see p. 22)*

Customized allogenic bone transplants for onlay block grafting

botiss offers a new technology which provides the clinical user with a pre-fabricated, customized allogenic bone block, individually designed to match the patient's defect. The individual maxgraft® bonebuilder block **(Figs. 1, 2)** is designed using three-dimensional digital radiographs (CT/CBCT) of the defect and CAD/CAM (computer-aided design/computer-aided manufacturing) technology. The radiological data is transferred into CAD/CAM planning software that builds a three-dimensional digital model of the scans (**Figs. 3-6**, patient data provided by Dr Markus Schlee, Forchheim, Germany). Based on this virtual model, the botiss specialists design the allograft block directly on the virtual defect with the use of a digital backward planning concept (**Figs. 7-10**, patient data provided by Masoud Memari, Budapest, Hungary). Starting with the design of a possible superconstruction, the approximate implant position may be mimicked and virtual implants inserted. If the implants are digitally planned by the clinical user, these data can be transferred and the exact implant positions can be displayed in the 3D model. The block graft is subsequently designed to fit around the virtual implants, according to the final bone bed needed for stable implant insertion.

Individually designed in close cooperation between clinical user, CAD specialist, and tissue bank

The complete planning process is a product of direct interaction between the clinical user, the CAD specialist, and the producing tissue bank. Bone blocks are individually designed to meet the requirements for sufficient augmentation of the alveolar ridge in careful consideration of the soft tissue situation of the patient, which can only be assessed by the attending surgeon himself. The final 3D version of the bone block is converted into a *.stl file and transferred to the botiss partner tissue bank C+TBA (Cells and Tissuebank Austria, Krems). The block is produced under cleanroom conditions in accordance with pharmaceutical standards. The *.stl file is imported into a CNC-milling machine in which, after a simulated test run **(Figs. 11, 12)**, the final graft is produced from a partially processed allogenic block. After packaging and final sterilization, the

Fig. 1

Fig. 2

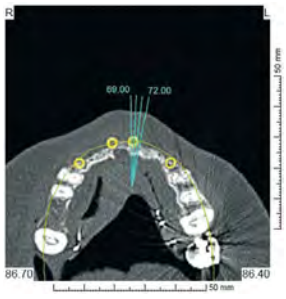

Fig. 3

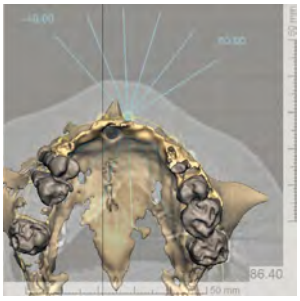

Fig. 4

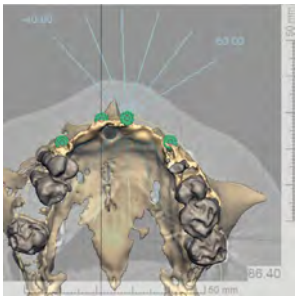

Fig. 5

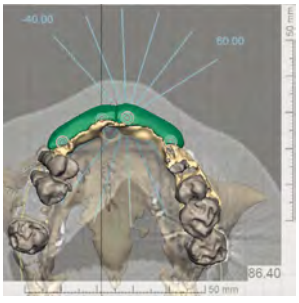

Fig. 6

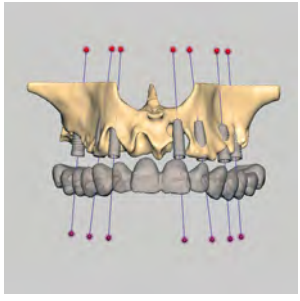

Fig. 7

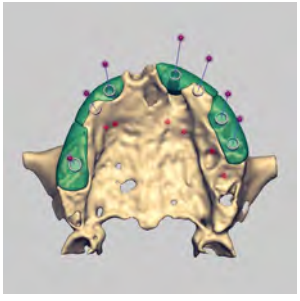

Fig. 8

maxgraft® bonebuilder block is sent directly to the clinical user. In surgery, after it is brought into position, the maxgraft® bonebuilder block is fixed with regular osteosynthesis screws. Residual gaps can be filled with bone regeneration material and the augmentation site is covered with a collagen membrane before the wound is closed tension-free **(Figs. 13-15)**.

Reduced surgery time, quick and uneventful wound healing

The pronounced fitting accuracy of the bone builder block facilitates optimal revascularization and graft incorporation. The operation time during block grafting is significantly reduced, thereby promoting quick and uneventful wound healing. It also allows the surgeon to focus on the management of the soft tissue, which is the actual key for success[4,5,6].

Due to the significant reduction in operating time, costs and, most importantly, patient morbidity, the unique maxgraft® bonebuilder technology paves the way for a patient-friendly, minimally invasive approach in alveolar ridge augmentation.

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▸ *Scientific references of this article: www.straumann.com/stargetref*

Figs. 1/2: maxgraft® bonebuilder – from the CAD/CAM-based 3D design to the customized allogenic bone implant.

Figs. 3-6: Conversion of a CT/CBCT scan into a 3D model. Digitally planned implants can be transferred into the planning software and the customized bone block can be designed according to the alveolar ridge required in order to achieve stable implant positioning (patient data provided by Dr Markus Schlee, Forchheim, Germany).

Figs. 7-10: Complex reconstruction of the maxillary ridge by digital backward planning – from superconstruction to customized bone blocks (patient data provided by Masoud Memari, Budapest, Hungary).

*Figs. 11/12: Digital simulation of the milling process after import of the *.stl file in the CNC-milling machine.*

Figs. 13-15: Handling of maxgraft® bonebuilder in surgery. Fixation by osteosynthesis screws, filling of residual gaps with bone regeneration material (here: botiss cerabone®), covering of the augmentation site with a collagen membrane (here: botiss collprotect® membrane), and tension-free wound closure.

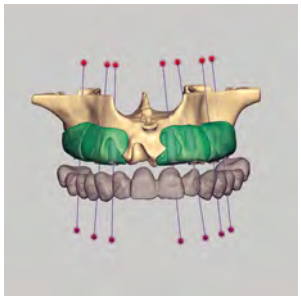


Fig. 9

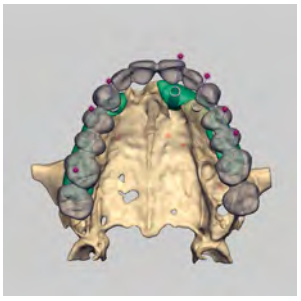


Fig. 10

Fig. 11

Fig. 12

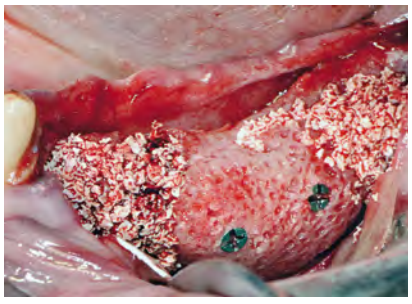


Fig. 13

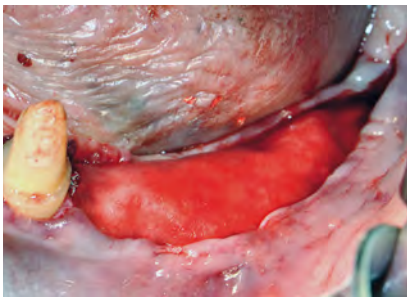


Fig. 14

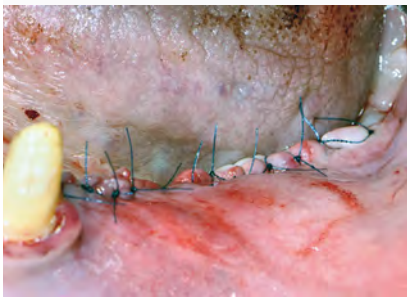


Fig. 15

botiss mucoderm®

Treatment of multiple recessions with a modified coronally advanced flap

Adrian Kasaj, Germany

Initial situation

A 29-year-old female patient presented at our clinic with the desire for an esthetic improvement of her teeth.

Teeth 1.2 to 1.4 showed multiple Miller class I recessions with a particularly deep recession of >6mm at tooth 1.3 **(Fig. 1)**. The patient was healthy with good oral hygiene.

She raised concerns against the harvesting of a connective tissue graft from the palate; therefore, we decided to treat the recessions with botiss mucoderm®, an acellular dermal collagen matrix which is derived from the dermis of pigs through a multi-stage wet-chemical cleaning process.

It can be applied instead of an autologous tissue graft in various situations, including the augmentation of attached gingiva and covering of gingival recessions.

Procedure

The exposed tooth roots were prepared with an air scaler and then treated with 24 % EDTA for 2 minutes. The flap was performed according to Zucchelli with two angular incisions, avoiding the need for vertical incisions **(Fig. 2)**.

The anatomical papillae were de-epithelialized. The mucoderm® was rehydrated for 7 minutes in sterile saline solution to enable sufficient flexibility for the adaptation of the matrix to the tooth roots. The matrix was then fixed to the periosteum with cross sutures **(Fig. 3)**.

Subsequently, the flap was coronally repositioned and fixed with polypropylene 6-0 sutures (Premilene by B. Braun Melsungen AG). The surgically created papillae were sutured over the de-epithelialized anatomical papillae. Particular attention was paid to complete coverage of the collagen matrix **(Fig. 4)**.

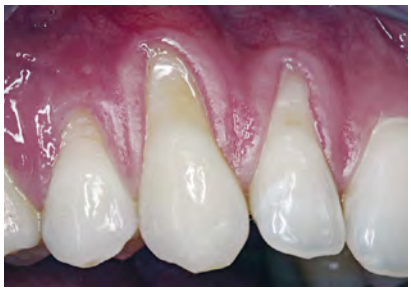


Fig. 1

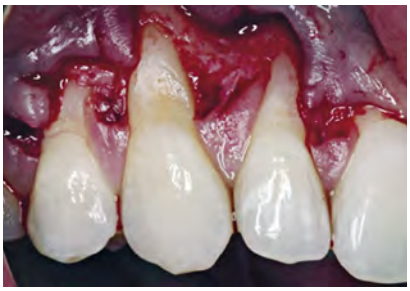


Fig. 2

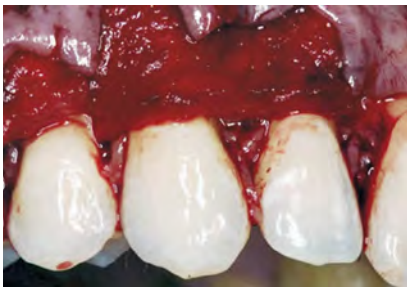


Fig. 3

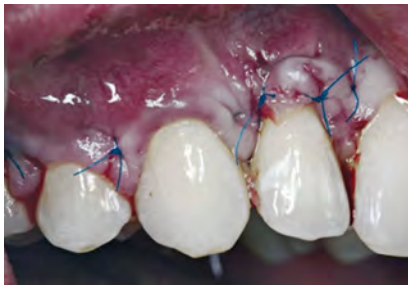


Fig. 4

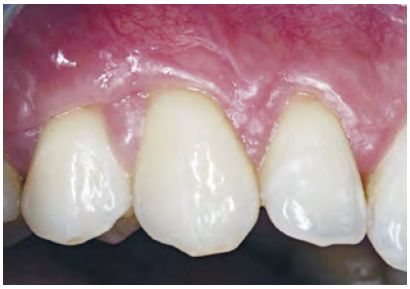


Fig. 5

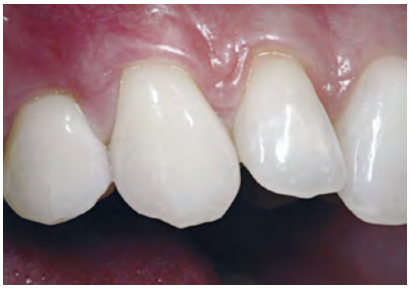


Fig. 6

Post-operative care included rinsing with 0.12 % CHX solution twice a day and 600 mg ibuprofen if needed. Furthermore, the patient was briefed to avoid tooth brushing in the affected region for 14 days.

Sutures were removed 10 days post-operative. The healing time was uneventful. The control at 3 months post-op demonstrated almost complete coverage of the previously exposed tooth roots as well as clear thickening of the marginal gingiva **(Fig. 5)**.

In region 1.3 to 1.4, an area of dense connective tissue was visible with a cleft marking the area were the mucoderm® matrix was sutured. Eighteen months post-op, this irregularity has disappeared, without the need for gingival plastic surgery. The gingiva were homogenous and bright **(Fig. 6)**. The patient was very satisfied with the esthetic result.

Discussion

In the last two years, we have treated more than 50 patients with the mucoderm® membrane. Due to very good and predictable results, we prefer applying the matrix using either the tunnel technique or the Zucchelli approach.

In any case, good flap mobilization is very important to allow for complete coverage of the matrix and a tension-free closure, both of which are essential for a successful and esthetic outcome. mucoderm® is an acellular matrix which needs to be revitalized. As revitalization from the underlying tooth roots is not possible, an ingrowth of vessels from the covering flap should be ensured.

Insufficient mobilization with tensions on the flap could lead to early exposure of the matrix and hence its degradation. An interesting observation that we made in many cases was an improvement in the esthetic outcome progressing for several months after the surgical treatment.

A kind of creeping substitution as well as the leveling of irregularities in the thickness of the gingiva without any plastic surgery intervention can be observed.

Adrian Kasaj
Dr med. dent/PhD

Specialist in periodontology (European Dental Association). Associate Professor at the Department of Operative Dentistry and Periodontology, University of Mainz, Germany. Vice Chairman of the "Neue Arbeitsgruppe Parodontologie e.V" (NagP). Author and co-author of more than 80 scientific publications within the field of periodontology. Numerous national and international courses and lectures in the fields of regenerative periodontal therapy and plastic periodontal surgery.

botiss Jason® membrane/Straumann® BoneCeramic

Predictable GBR procedures in sites with high esthetic compromise

Jorge M. Galante, Argentina

Initial situation

The patient, a 45 year-old female in good general systemic health, had undergone some unsuccessful dental treatments, with failed restorations resulting in the loss of multiple maxillary teeth. Teeth 1.2 to 2.2 were extracted after failed endodontic treatments and periapical complications. The aim of the patient was to replace the removable partial prosthesis with a fixed implant supported restoration.

Procedure

Treatment planning: The clinical examination showed a significant horizontal deficiency of the anterior **(Figs. 1, 2)**. Panorex Rx **(Fig. 3)**. Study models mounted on a semi-adjustable articulator were taken and a diagnostic wax-up of the four incisors was made with a modeled gingiva **(Fig. 4)** to provide an idea of the amount of tissue to be regenerated. In the axial slices and the 3D reformatted CT images, the lack of bone in the horizontal and vertical dimensions could be evaluated precisely.

A stepwise surgical approach was planned: in a first step, a GBR procedure would be performed. In a second step, two submerged implants should be inserted and, if necessary, an additional GBR procedure performed. In a third step, implants should be uncovered together with a soft tissue augmentation. The initiation of the prosthetic phase was planned 30 days after the implant activation surgery.

Surgical procedure: Under local infiltrative anesthesia, a full thickness horizontal incision was made at the keratinized tissue, on the buccal 2.5 mm apical to the most coronal aspect of the residual ridge, extending intrasulcular to the distal papilla of teeth 13 and 23. Two vertical releasing incisions were performed distally to 13 and 23.

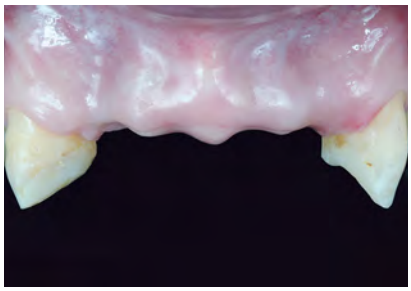


Fig. 1

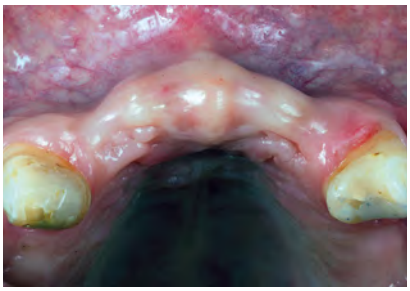


Fig. 2

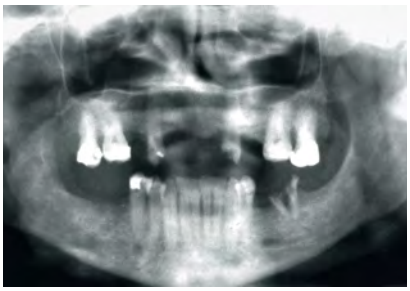


Fig. 3

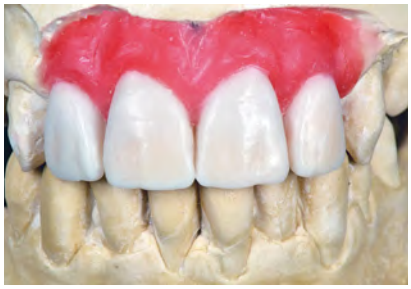


Fig. 4

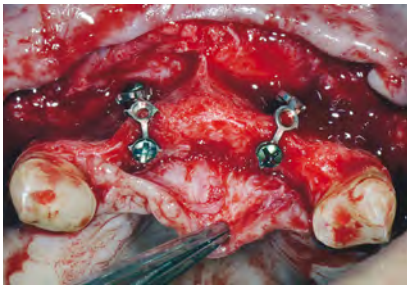


Fig. 5

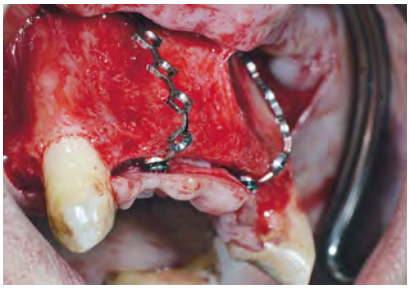


Fig. 6

A full thickness flap was elevated to expose the alveolar ridge. At the inner aspect of the flap, a split thickness incision was made to allow a complete mobilization of the flap in order to achieve a tension-free closure of the flap by primary intention. Two mini osteosynthesis plates were placed at the projection of the crestal peak of bone, corresponding to the interdental papilla between 12/11 and 21/22 **(Fig. 5)**.

These mini plates were used as tent poles and support to avoid the collapse of the collagen membrane. Each mini plate was fixed with two self-tapping micro screws (Walter Lorenz, 1.2x4 mm). The mini plates were shaped to reproduce the ideal anatomic profile of the ridge, creating a space underneath for the biomaterial and preventing collapse of the overlaying membrane **(Fig. 6)**.

The space under the mini plates was filled with Straumann® BoneCeramic. After that, the augmentation site was covered with two pericardium membranes (Jason® membrane, 20x30) placed at each side and fixed mesially and distally with 2 mini titanium pins **(Figs. 7, 8)**.

A suture was performed with a nylon monofilament 5.0 (Ethicon). The first suture was at the vertical incisions distal of 13 and 23, replacing the papilla with a vertical mattress suture. Another three vertical mattress sutures were placed mesially of both teeth and at the midline. Two horizontal mattress sutures were performed at each side. Both vertical and horizontal mattress sutures cause eversion of the flaps to face connective tissue at each side of the wound. The closure was completed with an interrupted simple suture along the horizontal and vertical incisions **(Fig. 9)**.

The healing process was uneventful; sutures were removed three weeks post-op. Six months post-op, the clinical evaluation demonstrated a nice macroscopic contour of

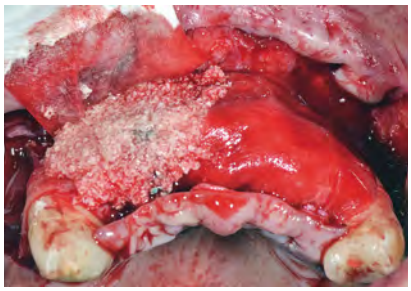
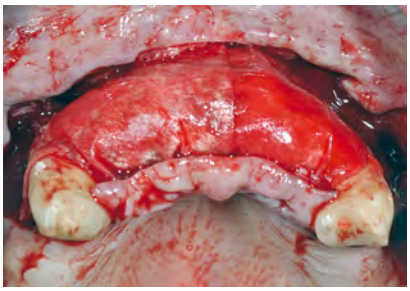


Fig. 7



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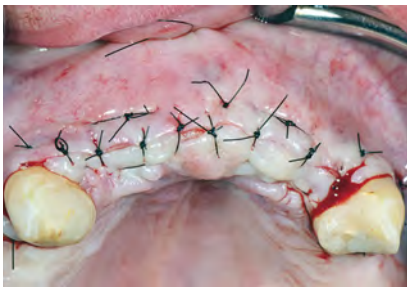

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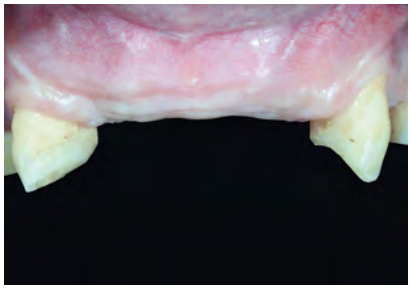

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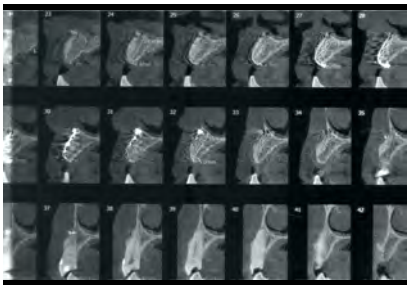

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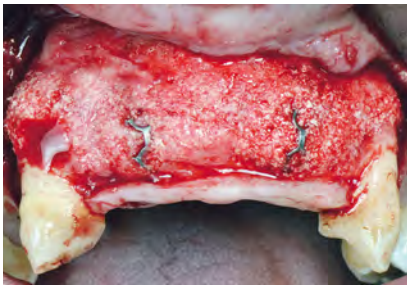


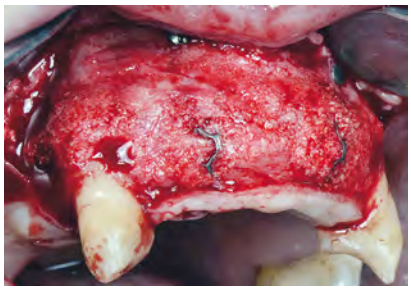
Fig. 12

the regenerated area **(Fig. 10)**. Images of paraxial slices and 3D reformatted CT **(Fig. 11)** showed very good integration of the biomaterial, adopting the shape predetermined by the mini plates. The second surgical approach consisted of a horizontal incision and two verticals, the same as in the first surgery. The full thickness flap elevation revealed homogeneous, well-vascularized hard tissue. The mini plates were partially covered by newly formed bone **(Figs. 12, 13)**.

Once the plates were retired, two Straumann® Bone Level, implants (4.1/14) were installed in region 12 and 21 with the help of a surgical stent **(Figs. 14, 15)**. Biomaterial and a Jason® membrane were added in the midline with the intention of gaining extra volume for esthetic reasons. Wound closure was performed according to the first surgical intervention. Again, the healing was uneventful and sutures were removed three weeks post-op. Three months later, uncovering of the implants was performed with a soft tissue management to improve the peri-implant esthetics **(Fig. 16)**. Healing screws were installed at implants. A ramp suture was made to promote coronal advance of the entire flap **(Fig. 17)**.

Prosthetic procedure: Two weeks later, sutures were removed, and the temporary fixed screw-retained partial prosthesis was placed **(Fig. 18)**. Teeth 13 and 23 were prepared for full crowns **(Fig. 19)**.

As the patient was under orthodontic treatment, it was decided to make a new resin fixed screw-retained prosthesis in order to have ideal conditions for the placement of the two implants to replace teeth 24/25, and to delay the definitive porcelain restorations once the case was completed **(Fig. 20)**.



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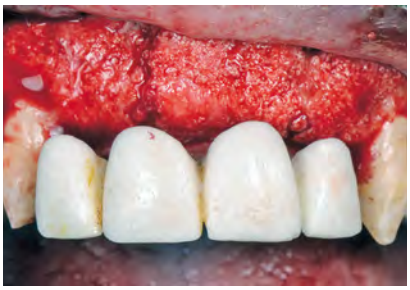

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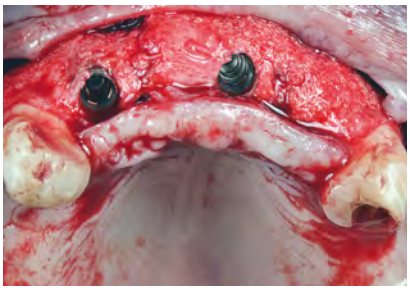


Fig. 15

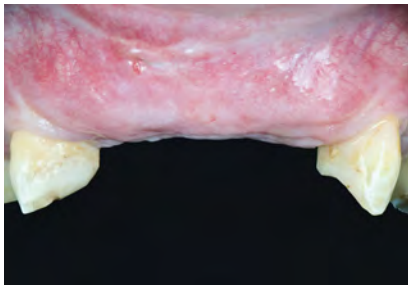


Fig. 16

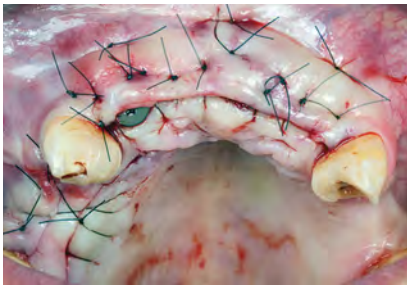


Fig. 17

Fig. 18

Conclusion

Final result: The treatment planning of complex cases like this one, with a young patient and high esthetic expectations, is challenging. Although the total treatment time is longer, the results obtained by this stepwise approach allow the interdisciplinary team to interact in a more secure and precise way **(Figs. 21, 22)**.

Findings: A remarkable finding was the extent of the regenerated tissue, taking into consideration the extended three-dimensional horizontal and vertical defect. The other significant aspect is that only synthetic biomaterial was used with no need for autologous bone. The fact that the mini plates prevent a collapse of the membrane may be favorable for regeneration. In addition, the pericardium membrane provides a long-term barrier function, giving the biomaterial sufficient time to integrate. Further investigation should be made in the field to encourage this kind of method to be applied as a valid procedure in the treatment of three-dimensional defects.

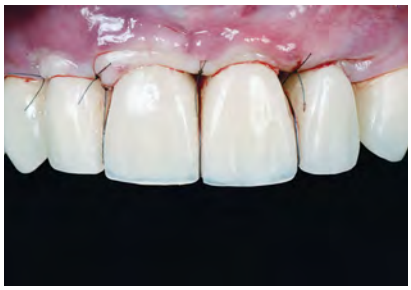
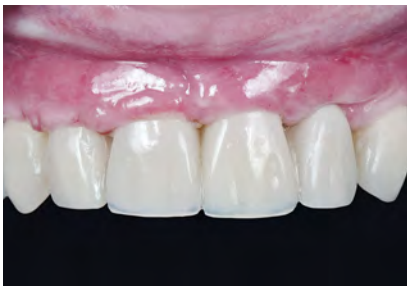


Fig. 19



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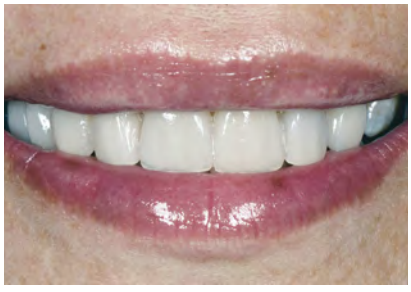

Fig. 21

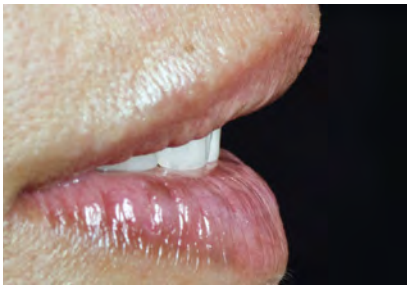

Fig. 22

Jorge M. Galante
Prof. Dr

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Unlocking the full potential

A look into the existing bone graft portfolio and the pipeline proves that the goals in Regeneration at Straumann remain unchanged: to extend the boundaries and making implant therapy and oral regeneration faster, more predictable and more successful.

Toward a new-generation bone substitute material

Straumann® BoneCeramic – a benchmark in synthetic bone grafting materials
Since our synthetic bone substitute Straumann® BoneCeramic was launched in 2005, more than 25 published studies in all major indications have earned the product wide recognition and acceptance by clinicians around the globe (see: www.straumann.com/science). Today, Straumann® BoneCeramic can be regarded as one of the reference products for dental synthetic bone grafting procedures. Excellent biocompatibility without any foreign body reaction combined with controlled, slow resorbability allows predictable volume maintenance and ensures mechanical stability over a long time period. The distribution of more than 320 000 units of Straumann® BoneCeramic has allowed for a significant insight on the needs and selection criteria of clinicians.

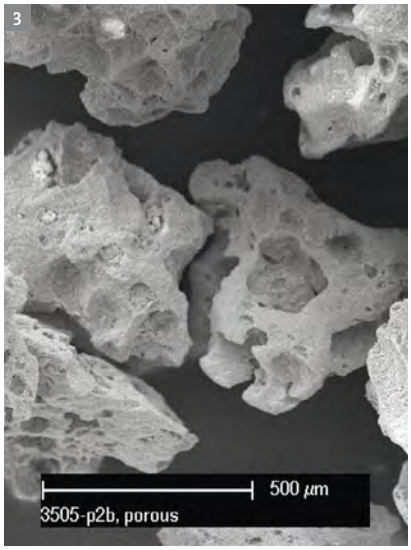
Fig. 1: *Straumann® BoneCeramic*

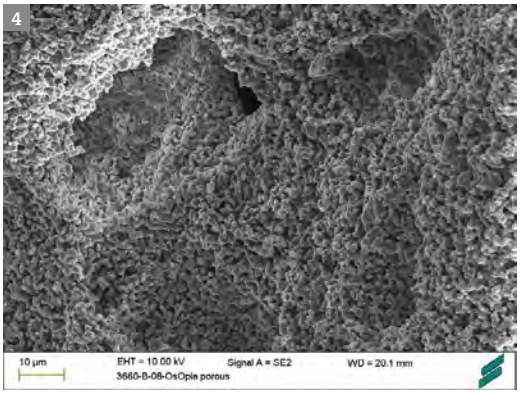
Successful allograft portfolio for the North American market
To meet local clinicians' preferences, Straumann successfully introduced a range of allograft particulates in the North American market in 2009. This has led to an extended allograft portfolio of different types and granular sizes. The cooperation with LifeNet Health, one of the world's most trusted providers of transplant solutions, and a clear focus on our customer's requirements have lead to a significant market share in the allograft market within a very short period of time.

Fig. 2: *Straumann AlloGraft Ground Cortical*

New possibilities with synthetic alloplastic bone substitutes

The possibilities to improve materials derived from nature, such as allografts and xenografts, by changing the composition and structure are rather limited. Thus, developments within this product group to increase regenerative potential are rare. In comparison, material composition and particle size and structure of synthetic materials can be reengineered to develop new and better solutions. In this way, synthetic alloplastic bone substitutes are able to provide new exciting possibilities since controlled production steps allow for the development of different product characteristics, leading to a new degree of precision down to a granular micro- and nano level.





Figs. 3/4: *Innovative surface structure of Straumann® VivOss for improved cell response allowing faster bone remodeling.*

Kick-starting the biologic process of new bone formation by using the surface structure
Within the group of biphasic calcium phosphates, the balance of the most clinically effective ratio of volume-preserving hydroxyapatite (HA) and vital bone-regenerating beta-tricalcium phosphate (β-TCP) has been an important research focus in the past[1]. Actual findings at cellular level indicate that the surface structure can be used to trigger cell differentiation and thus initialize bone regeneration. Understanding of biological cell-to-cell communication and the corresponding influencing factors for bone regeneration combined with technical improvements in production made investigating a second-generation bone substitute evident. The hypothesis of kick-starting the biological process of new bone formation by using the surface structure is already backed up by the results of several pre-clinical studies, which will be published in due time[2].

VivOss® – accelerated bone regeneration
The extensive knowledge and experience of Straumann in surface textures on dental implants (SLA® and ZLA®) as well as input from research partners enabled the development of Straumann® VivOss, a second-generation bone substitute which is currently being tested in a clinical environment. Initial results indicate significantly higher bone regeneration activity within the early healing period, especially in contained defects.

Straumann® Osteogain – a new chapter in the clinical application of enamel matrix proteins

The history of Emdogain® dates back to the late 1980s when Prof. Lars Hammerström at Biora in Sweden suggested using enamel matrix derivative (EMD), the active principle of Emdogain®, to induce the regeneration of lost periodontal tissues. Soon after the Swedish market launch in 1995, Emdogain® was cleared for the US (1996) and Japan (1998). Today, after almost 20 years of market availability, Emdogain® is sold in nearly 50 countries around the globe, with its main markets in the US, Japan, Germany and Italy. Emdogain® is available in various sizes, allowing clinicians to offer the best treatment option to their patients in every treatment condition.

From a scientific point of view, enamel matrix derivative can certainly be considered as one of the best researched biologics in the dental field. Over 800 scientific publications, of which 200 have been published on the clinical (human) level, confirm the convincing biological rational of Emdogain®: enamel matrix derivative contains mainly amelogenin, which absorbs on the tooth root surface and is able to induce the processes involved in tooth formation by triggering new cementum formation and regeneration of the periodontium[1]. Based on long-term data, Emdogain® promotes additional and more predictable gain of clinical attachment combined with better wound healing and fewer complications compared to procedures without Emdogain®, while patients treated with Emdogain® report less pain and swelling and hence an increased quality of life[2, 3].

An early discovery: the hidden potential of EMD

Besides these well-known facts, a very basic question remains, which is related to the unique and astonishing capability of EMD to regenerate and restore the original architecture of periodontal tissues: is the ability of EMD to regenerate periodontal tissues based on a more general biological potential and, if so, can this potential be used in clinical applications beyond periodontal regeneration? Very soon after its discovery, it became evident that EMD is a scaffold which has the capacity to modulate the wound healing processes that lead to regeneration instead of scar tissue formation[4]. This is an remarkable capacity.

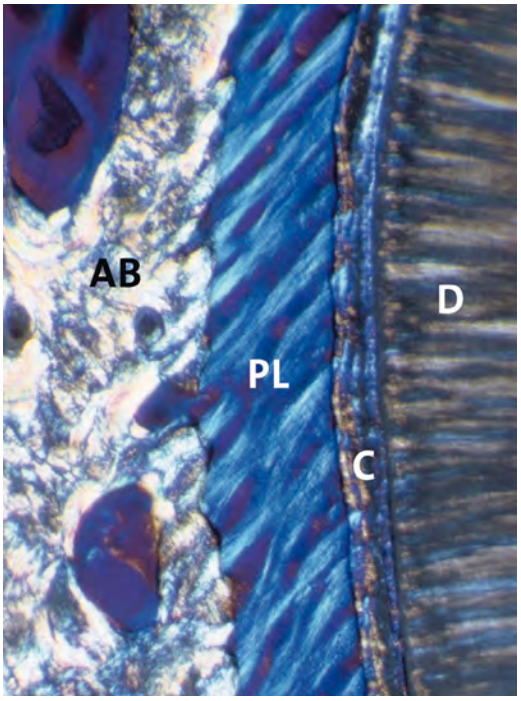


Fig. 5: Micrograph of the periodontal ligament (PL) with its perfect organization of collagen fiber bundles spanning the area between the root covered with cementum (C) and the alveolar bone (AB). D: dentin.

The majority of higher organisms, especially vertebrates, have mostly lost their capacity to regenerate injured or deteriorated tissues. Rapid repair and faster wound closure with non-functional fibrotic scar tissues instead of slower regenerative processes to restore original tissues apparently represented an evolutionary advantage, since the body was able to ward off pathogens from its environment more quickly. As a result, our genes have been programmed in a way that our wounds repair but do not regenerate[5].

Literature reports that mainly appeared after 2000 have quickly pointed out that the ability of EMD to regenerate the periodontium is probably only a special case, which is related to a more general capacity of modulating the biological mechanisms involved in soft and hard tissue wound healing[6]. If this is the case, then it might be speculated that periodontal regeneration is just a glimpse of the full potential of EMD and that more fields of application need to be established and documented.

Fig. 6: Axolotls belong to the few organisms that can regenerate lost body parts perfectly. The biological mechanisms for regeneration of salamanders like the Axolotl have been conserved in humans. The goal is to research those mechanisms and learn how to induce them for human benefit.

A component of embryonic tissue: does EMD have intrinsic potential to stimulate and modulate the healing process?

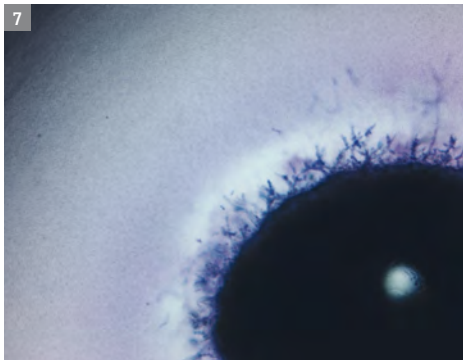
The biological model and functions of EMD have been reviewed and postulated more extensively in the last five to six years[7]. Amelogenin is a hydrophobic protein that self assembles into nanospheres. Under physiological conditions, these nanospheres assemble and form an insoluble matrix on tooth root surfaces and bone graft materials. This matrix is able to stimulate cell adhesion and colonization on the root surface or on bone graft materials.

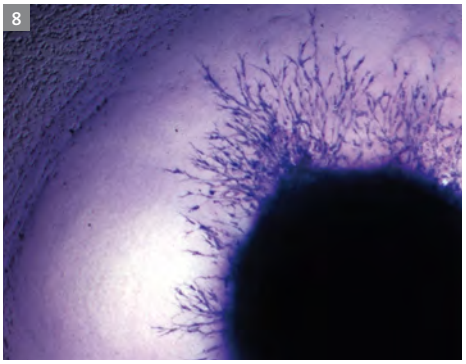
More importantly, depending on the biological context, EMD seems to be able to provide a microenvironment to stimulate the differentiation of precursor cells into cementoblasts, periodontal ligament cells, fibroblasts or osteoblasts and to stimulate these cell types to proliferate and to express key factors that modulate the inflammatory cascade associated with soft and hard tissue wound healing[7]. And that is not all: inflammation and pain are physiologically linked processes. According to a customer survey, more than 80 % of experienced Emdogain® users confirm improved wound healing of the soft tissue when using Emdogain®, while clinical studies indicate that patients treated with Emdogain® report less pain and swelling compared to alternative procedures without the use of Emdogain®[3].

The standard of care in oral soft tissue wound healing?

Based on these evident properties, Straumann is focusing on two new development approaches for EMD. By generalizing the application of Emdogain® for mucoperiostal flaps, we are aiming to extend the use of Emdogain® for oral soft tissue procedures in general. Clinical needs for such an application have arisen from invasive procedures or procedures with high esthetic demand, where improved wound healing would clearly bring a benefit to the patient.

With its hydrogel-like consistency, Emdogain® is today already well suited to serve as a wound dressing. Preclinical studies have shown that when exposed to Emdogain®, fibroblasts are stimulated to migrate, proliferate and express growth factors and extracellular matrix molecules that promote soft tissue healing and angiogenesis[7]. Further preclinical studies indicate that EMD can even prevent fibroblasts from apoptosis under challenging conditions. All these features support our efforts in establishing Emdogain® as the standard of care in oral soft tissue wound healing.





Figs. 7/8: Chick aortic arch assay demonstrating stimulation of capillary sprouting and angiogenesis by EMD (left without EMD, right with EMD). Courtesy of Prof. Magnus Ågren, Copenhagen, Denmark.

Using biological cues to challenge current implant treatment standards

With the development and introduction of Straumann® SLActive surface, the development of implant surfaces seems to have culminated in a maximum level of performance that can be achieved by pure physicochemical implant surface modification. Further improvements in implant integration, secondary stability and ultimately reliability might, however, still be achievable. One possible route to achieving this goal is to use biological cues to enhance bone formation and maturation associated with bone grafting procedures around implants.

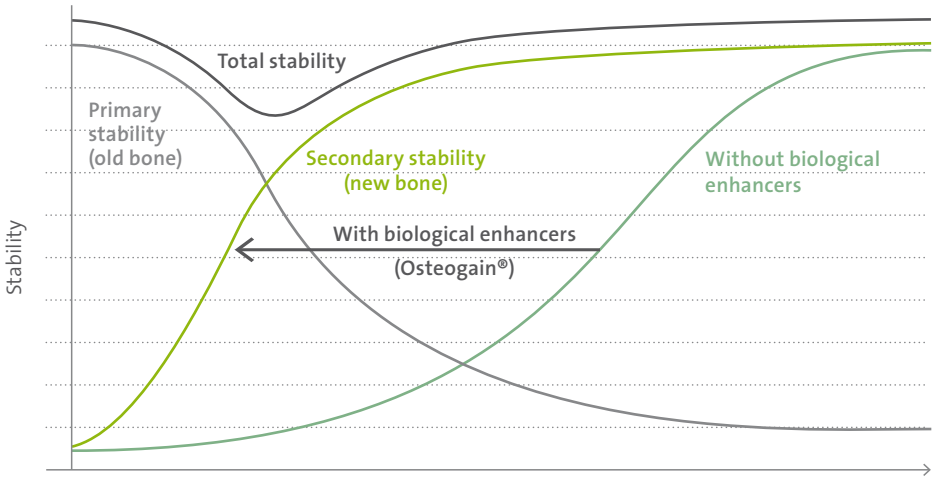


Fig. 9: Schematic illustration of the hypothetical effect of faster bone maturation around dental implants leading to earlier secondary stability, as induced by biological enhancers (Osteogain®).

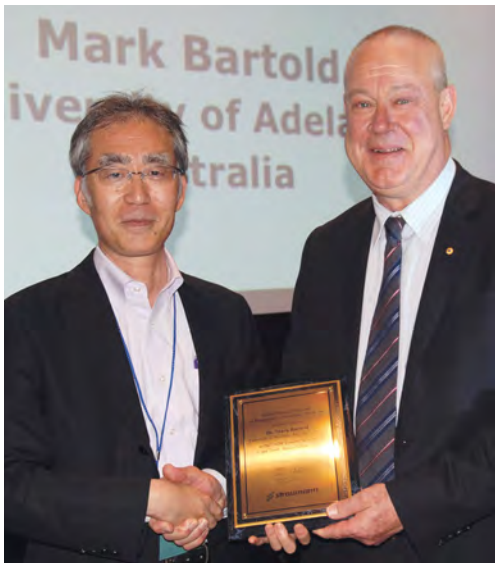
The osteopromotive "side effect" of enamel matrix proteins

Despite the fact that Emdogain® gel has been designed for application on tooth root surfaces and not for mixing with bone graft materials, more than 30 clinical publications demonstrate the advantages of the combined use of Emdogain® with various bone graft materials for the treatment of bony periodontal defects. The clinical use of this combination is not only supported by the reported ability of EMD to stimulate periodontal regeneration, but also by the recent literature reporting on the ability of EMD to enhance bone healing and bone maturation when combined with bone graft materials. It is this osteopromotive effect of EMD, i.e. the ability to speed up bone formation and maturation, that could make it a clear game changer when it comes to bone grafting procedures.

Osteogain® – pushing the limits of current implant therapy associated with GBR

With Osteogain®, a new liquid formulation of EMD that has been optimized for application with porous bone substitutes, Straumann intends to push the limits of current implant therapy associated with GBR procedures: improving the overall outcome, allowing new and faster treatment options and, at the same time, improving safety and predictability in clinically challenging situations[11]. The bottom line is that even after 20 years of Emdogain® market availability, the full clinical potential still remains to be unlocked.

▸ *Scientific references of this article: www.straumann.com/stargetref*



Professor Shinya Murakami, President of the IADR Periodontal Research Group and Chairman of the Periodontology Department at Osaka University Graduate School of Dentistry (left), presenting the award to Professor Mark Bartold in Cape Town.

Prestigious Straumann/IADR Award goes to Mark Bartold

At the General Session of the International Association for Dental Research (IADR) held in Cape Town in June, the 2014 Straumann/IADR Award in Regenerative Periodontal Medicine was presented to Professor Mark Bartold from the University of Adelaide in recognition of his remarkable achievements in the field.

Prof. Bartold has authored more than 230 scientific articles, a number of which focus on his research into the use of periodontal stem cells and the fabrication of bioactive scaffolds for periodontal regeneration.

Worth USD 5000, the Award is sponsored by Straumann and administered by the IADR. It was created in 2010 to honor significant contributions to research in regenerative periodontal or peri-implant medicine.

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More than pure esthetics.
The natural and strong solution.

The Straumann® PURE Ceramic Implant is based on decades of experience and offers you a unique esthetic solution to treat patients with specific needs.

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- High predictability with revolutionary osseointegration features equivalent to the established SLA® surface
- 100 % proof test ensuring reliable implant strength
- High end esthetic solution thanks to ivory-colored material.

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60 YEARS

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Straumann® Bone Level SLActive® Implants

More Than Evidence – a Commitment to Science

The Straumann® Dental Implant System is one of the best documented systems in implant dentistry. Our dedication to research provides the information you need to know: **our products work**. What we have learned in more than 60 years of research in different scientific fields has been the source of inspiration for our numerous innovations. Scientific data provided by long-term studies confirm the reliability of Straumann products, and continue to drive the development of new quality standards.

Visit our Science section on:
www.straumann.com/science

Tooth replacement with implants in esthetically demanding sites are clinically challenging tasks. Straumann® Bone Level Implants can be effectively used to restore both function and esthetics – to satisfy the high expectations of the dentist and the patient. Over the last years the Straumann® Bone Level Implant has been extensively researched in preclinical and clinical studies.

The preclinical studies assessed the **effectiveness of the horizontal offset** of the implant-abutment interface. **Less inflammatory reactions and a higher stability** of the marginal bone level compared to butt-joined connections could be shown. Also assessed was the **optimal distance of adjacent implants**.

A number of 7 clinical studies have been performed. In general the clinical studies have demonstrated an excellent performance of Straumann® Bone Level Implants in different clinical indications and in different patient conditions. The implants have been used also in cases with very challenging indications, such as early placement in the anterior maxilla or implant placement in augmented sites. In all of these studies the implant survival rates after 1 year have always reached between **98 % and 100 %**. In a recent review of the published literature by den Hartog et al. 2008, an overall implant survival rate of other implants in comparable indications has been documented with 95.5 %. Marginal bone loss in the first year ranged between **0.1 mm and 0.5 mm**, and more importantly, **very stable marginal bone level** conditions were observed over the years in function. As a consequence the **esthetic outcome** was very pleasing, and the satisfaction of the patient and dentist was always at a very high level.

The following statements for **Straumann® Bone Level SLActive® Implants** are proven by scientific evidence:

- The **horizontal offset** of the interface eliminates inflammation. Excellent marginal bone stability is supported by the design of the implant-abutment connection **(Jung et al. 2008, Cochran 2009, Heitz-Mayfield et al. 2013, Cochran 2013).**
- Excellent clinical performance, outstanding esthetics and high patient satisfaction **in daily dental practice (Filippi et al. 2013, Furze et al. 2012).**
- **Flexibility during placement** of adjacent implants **(Elian et al. 2011).**

- Long-term proven **clinical performance** and **pleasing esthetic** outcomes in the anterior maxilla (**Buser et al. 2009, Buser et al. 2011,** (Buser et al. 2013, not published)).
- Proven evidence for **one-stage surgical procedure** in the esthetic zone. A second surgery can be avoided also in augmented sites, resulting in reduced treatment time, lower costs and higher comfort for the patient **(Hämmerle et al. 2011, Cordaro et al. 2012, Sanz et al. 2013).**
- High predictability of **implant placement in augmented sites (Santing et al. 2013, Chiapasco et al. 2012 a, Chiapasco et al. 2012 b).**

In conclusion, based on the available evidence, Straumann® Bone Level Implants can be recommended in all kinds of clinical indication, but especially in esthetically challenging indications like the anterior maxilla.

The new Straumann® Bone Level Tapered Implant line

Taking primary stability to the next level

Implants with tapered design are becoming increasingly popular due to patients' growing demand for shorter treatment times and the good primary stability such implants offer in cases of softer bone classes as well as for immediate placement/loading procedures. Also, an increasing number of clinical case documentations and scientific publications on immediate loading procedures is becoming available, helping to boost the practitioners' confidence. In the United States, tapered design implants have a share of 73 % in the market[1] and rising popularity can also be observed in Europe[2].

Why tapered design?

Tapered implants have a smaller diameter at the apical part and were designed primarily to provide a better adaptation in immediate extraction sockets, where they engage better in the socket bone at the apical portion and the alveolar socket walls at the crestal portion. The goals of this approach are to reduce – or even avoid, if possible – the need for accompanying bone augmentation procedures and to improve primary stability by engaging more of the socket wall than an equivalent cylindrical-shaped implant. Thus, tapered implants can be particularly useful in areas where primary stability may be otherwise difficult to achieve, e.g. in type 4 (low density) bone. Furthermore, surgeons are seeking for the optimization of treatment procedures, asking for implant solutions that work in all types of challenging clinical and anatomical situations such as facial undercut, mandibular undercut and convergent root tips.

Challenging clinical and anatomical situations where the tapered design is beneficial

a. Limited anatomy

Fig. 1: Facial undercut

b. Where improved primary stability for soft bone (class III and IV), sinus lifts and immediate placement is needed in underprepared osteotomies.

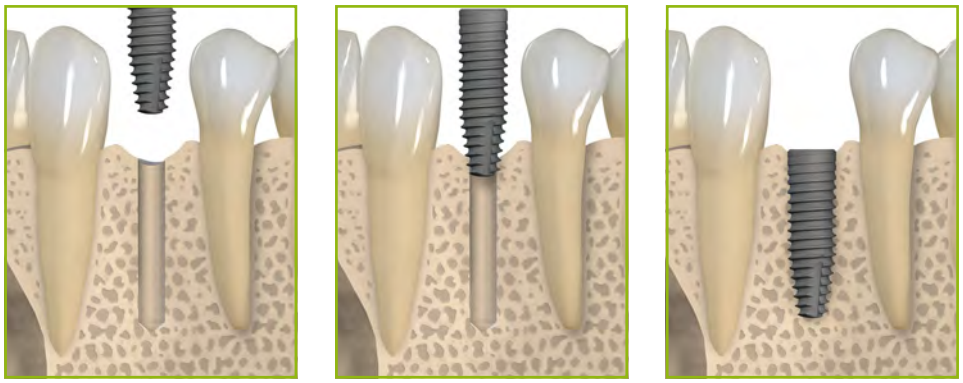


Fig. 2-4: Placing an implant in an underprepared implant bed results in increased primary stability since the bone is compressed in the procedure.

Features & benefits of the BLT Implant

Technological progress makes it possible for Straumann to address customer needs better. The new Straumann® Bone Level Tapered Implant (abbr. BLT) is therefore the answer to today's clinical and anatomical challenges, as described before. The BLT combines three powerful features to provide outstanding stability and strong performance from the beginning of the osseointegration process.

Material: superior strength with Roxolid®
Roxolid® from Straumann is a unique implant material combining both excellent biocompatibility and high mechanical strength. It is a metal alloy composed of ~15 percent zirconium and ~85 percent titanium, which leads to increased mechanical resistance[3] and up to 40 percent higher fatigue strength compared with titanium implants[4].

Mechanics: ease of use and enhanced primary stability
The BLT is a hybrid implant with a parallel wall implant body, but tapered in the apex region. The familiar Straumann® Bone Level Implant drilling protocol and its alignment pins can be applied. The three cutting notches generate a moderate self-cutting while the convex apex protects the anatomical structure.

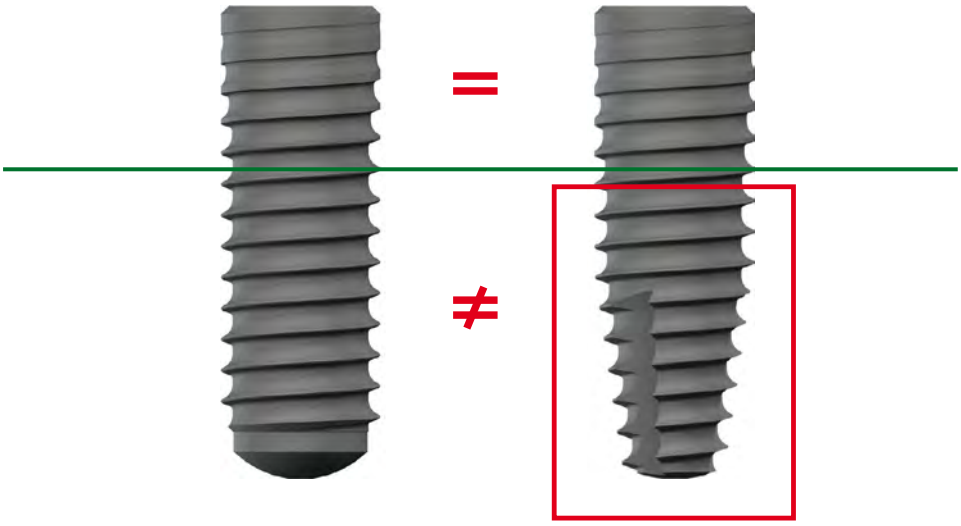


Fig. 5:
Straumann® Bone Level Implant, Straumann® Bone Level Tapered Implant

Biology: excellent osseointegration with proven surface technologies
The BLT will be available with SLA® or SLActive®, the proven Straumann surface technologies. The SLActive® surface offers higher security and faster osseointegration for every indication[5,6], cutting down healing time from 6–8 weeks to 3–4 weeks and increasing treatment predictability in critical protocols[7].

The BLT product portfolio
Straumann® Bone Level Tapered implants will be available in two materials, Roxolid® and titanium, and with two surfaces, SLA® and SLActive®. The different lengths are 8, 10, 12, 14, and 16 mm and the diameter options 3.3, 4.1 and 4.8 mm. Please note that these combinations are country-specific, therefore some products or product combinations may not be available in all countries. Please check with your local Straumann sales representative for specific details.

The Straumann® Bone Level Implant acted as the model for the new BLT
The BLT comes with the outstanding design properties and benefits of the existing and successful Straumann® Bone Level Implant line.

Bone maintenance through Bone Control Design™, ensuring optimized crestal bone preservation and soft tissue stability.

The **CrossFit® Connection** features four positions, with a conical portion that makes handling easier. It provides confidence for component repositioning, ensures precision against rotation and offers restorative flexibility and long-term mechanical stability.

The **emergence profiles of the soft tissue management components** are geometrically matching, optimizing the process of soft tissue management, easing the production of temporary and final restorations, minimizing complications and making the final result more predictable.

Bone Level features

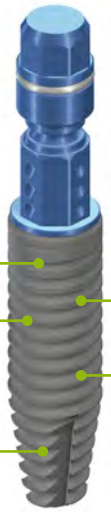
- Bone Control Design™
- CrossFit® Connection
- Consistent Emergence Profiles™

Hybrid design

- Tapered apex

Self cutting

- 3 cutting notches
- Soft tip



Material

- Roxolid®: titanium-zirconium alloy
- Titanium grade 4

Surface

- SLActive®
- SLA®

Proven features of the Straumann® Bone Level Implant line:

- BoneControl Design™
- CrossFit® connection (NC and RC)
- Consistent Emergence Profiles™

Thread and taper

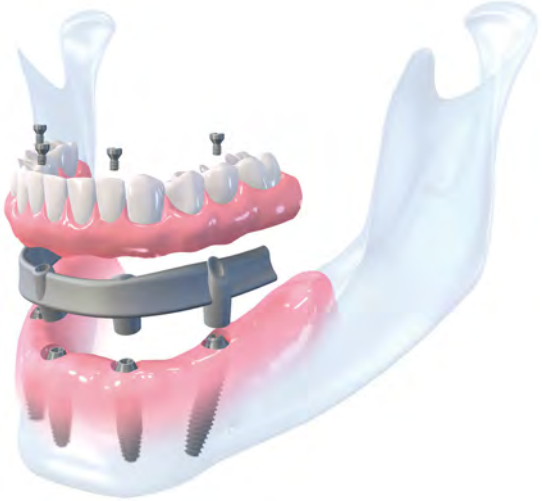
- Straumann® Bone Level Implant design
- Apically tapered

Self-cutting design

- Three cutting notches
- Soft tip

Maximum functionality and clinical efficiency

The BLT line is fully compatible with the Straumann® prosthetic system. A wide range of options is available, enabling the BLT line for use in single/multiple tooth and edentulous cases (see also p. 47 on the Straumann® Screw-Retained Abutment portfolio).



Time saving in soft bone surgical procedures
With the BLT, practitioners can chose shorter surgical protocols for soft bone class 3 and 4, without having to use the profile drill and tap for implant bed preparation.

The guiding principle of the Straumann® Dental Implant System is well known: "One system, one surgical kit, all indications" – and the BLT makes no exception here. It is fully integrated in the **Straumann® Surgical Cassette**, allowing for straightforward surgical workflows and operational ease of use.

Availability: the Straumann® Bone Level Tapered Implant will be available in Europe as of January 2015. North America is slated for Q1 of 2015 (currently subject to regulatory clearance). Please contact your official Straumann sales representative for further details.

▸ *Scientific references of this article: www.straumann.com/stargetref*

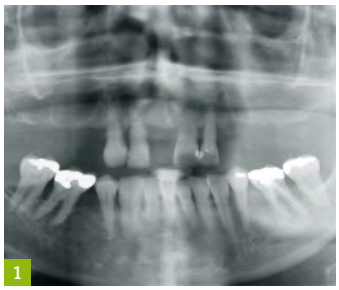
Restoring patients' quality of life with solutions by Straumann

Patients' rising expectations for less complex treatment options are challenging dental professionals

When it comes to esthetics and functionality, patients suffering from impending loss of teeth or even edentulism are no longer willing to compromise. When removable dentures are not the preferred option, dental professionals are faced with the challenge of providing a solution that is stable, esthetic and fully functional. In addition to this, patients nowadays want the solution to be found quickly and implemented within a short period of time. This also entails avoiding additional bone grafting procedures and addressing the individual anatomical situation.

Four steps toward a new quality of life

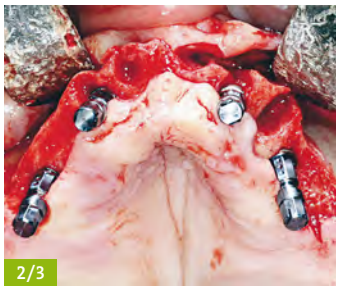
The overall procedure requires close collaboration between surgeon, prosthodontist and the dental lab, and includes four major steps: planning, implant and abutment placement, temporary restoration and final restoration.



1

Step 1: Planning

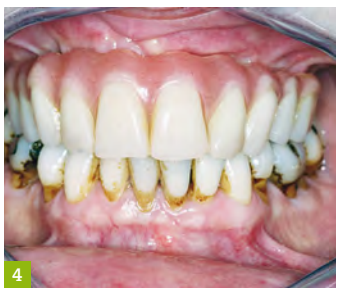
In the planning phase, the overall medical state of the patient is examined, patient expectations are discussed and a treatment decision is made. If the plan is to opt for an immediate one-stage treatment protocol based on a reduced number of implants, usually a guide made of acrylic is prepared by the dental lab.



2/3

Steps 2/3: Implant placement/Temporary restoration

During the surgical appointment, the implants are placed and, depending on the treatment decision, the abutments may be placed within the same session. The acrylic guide helps to transfer the clinical patient situation to the dental lab, where the temporary restoration is prepared in parallel. Within a few hours, the temporary restoration is finalized at the lab and can be placed into the patient's mouth.



4

Step 4: Final restoration

In order to ensure proper osseointegration and soft tissue healing, the temporary restoration is replaced by the final restoration after approximately 3–6 months.

Pictures courtesy of Dr Dennis Rohner, Aarau/Switzerland (see p. 50).

Small component portfolio, lots of possibilities

At the ITI World Symposium in Geneva, Straumann introduced the new Straumann® Screw-Retained Abutment portfolio. These new abutments are available with different angulations (17° and 30°) and various gingival heights. The abutment connector can be used for either multi- or single-unit restorations; it has the same geometry throughout all platforms, which allows for a small component portfolio.

Reduced complexity, shorter procedure

Compared to standard procedures, this treatment proves to be less complex: by tilting the posterior implants, the existing patient's bone anatomy can be used and additional bone augmentation can be avoided. This helps to reduce overall discomfort for the patient and at the same time offers the possibility to provide a fixed and reliable solution within a short period of time.

What you need for a successful restoration

To provide this kind of treatment, the following components are required:

- Dental implants with sufficient and reliable primary stability
- Prosthetic components that allow for screw-retained restorations and compensate implant divergences
- Custom-milled frameworks for reliable final restorations

◂ *Implant-borne restoration in lower jaw.*

Availability of the complete product portfolio

Optimization of restorative components
The prosthetic portfolio for Straumann screw-retained full arch restorations was optimized and relaunched in spring 2014. The sleek abutment design offers increased prosthetic flexibility for fixed screw-retained restorations, even in challenging clinical situations where tilting the implant is necessary. In addition to this, the custom-milled portfolio was extended: with the CARES® Visual Software 8.8, customers now have the possibility to design different bar frameworks on implant level as well as on abutment level.

Completing the portfolio with the new Straumann® Bone Level Tapered Implant
As a next step, Straumann will introduce the new Straumann® Bone Level Tapered Implant portfolio in January 2015. This comprises an apical tapered and self-cutting design, which provides consistent primary stability and an efficiency gain in anatomically and clinically challenging procedures – for example, in soft bone or in fresh extraction sockets. This comes in combination with the high-strength Roxolid® material, excellent osseointgeration due to the unique SLActive® surface and the proven benefits of the Straumann® Bone Level, such as Bone Control Design™ and the CrossFit® connection.

This unique combination of benefits will make the new implant a valuable extension of the existing Straumann implant portfolio.

The benefits from an outstanding product combination

This new product combination of tapered implants comprising Roxolid®, a screw-retained prosthetic portfolio and custom-milled frameworks will enable dental professionals to improve their patients' quality of life by providing a fixed restoration that is less complex but at the same time reliable.

Roxolid® SLActive implants

Roxolid® SLActive is Straumann's outstanding material/surface combination. Roxolid® has been specifically designed for the use in dental implantology and offers outstanding mechanical strength[1]. This allows dental professionals to use reduced diameter implants to preserve bone and reduce the amount of invasive grafting procedures[2]. In combination with the unique SLActive® surface, Straumann implants offer increased predictability even in challenging protocols[3, 4, 5, 6, 7, 8, 9], broader treatment possibilities even for patients with compromised health[10, 11, 12, 13, 14, 15], as well as safer and reduced treatment times (from 6–8 weeks down to 3–4 weeks) in all indications[16, 17, 18, 19, 20, 21, 22, 23, 24].

▸ *Scientific references of this article: www.straumann.com/stargetref*

Screw-retained solutions for residual dentition not worth preserving

Dennis Rohner, Switzerland

A prosthetically-driven concept implemented with the new Straumann components

In the past, treatment options for patients whose residual dentition was not worth preserving were frequently limited to removal or very complex and therefore costly restorations. These solutions were not always acceptable to patients, either for esthetic or financial reasons. For a number of years, demand has been increasing among patients for fixed restorations with immediate loading and a minimal number of implants. This has involved providing a fixed restoration both in the maxilla and the mandible with a minimum of four implants and without bone augmentation.

Relevant clinical experience has been gathered for this concept, an immediate restoration with at least four primarily stable implants that can withstand loading. To ensure optimal biomechanical support, the two rear implants are inserted at a slanting angle. This means that sinus augmentation in the maxilla can be avoided and a sufficiently long implant aligned with the premolar region can be inserted in front of the mental foramen in the mandible.

Thanks to the launch of the new Straumann abutments for screw-retained solutions with an angulation of 0.17° and 30°, this application is now also possible with Straumann® Bone Level Implants (with SLActive® surface). In the following section, we present two pertinent clinical cases (one maxilla and one mandible restoration).

Case 1: A 55-year-old female patient with dental phobia was referred by her treating psychiatrist for the purpose of creating a maxilla restoration with masticatory function **(Fig. 1, 2)**. We therefore planned a single-phase procedure with immediate restoration. Prior to the operation, an optimized tooth setup was transferred to a drill and

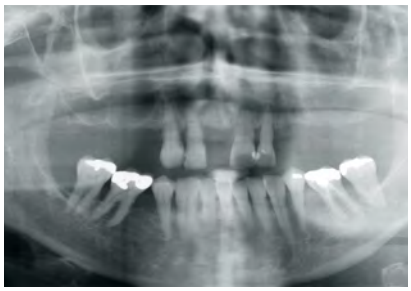


Fig. 1

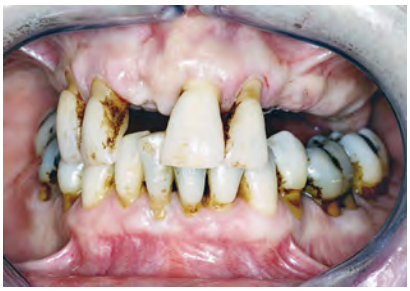


Fig. 2

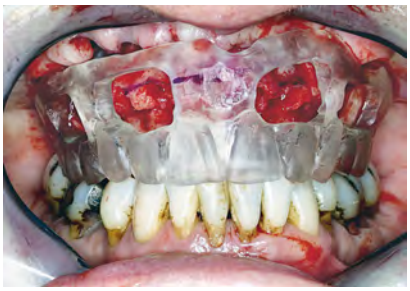


Fig. 3

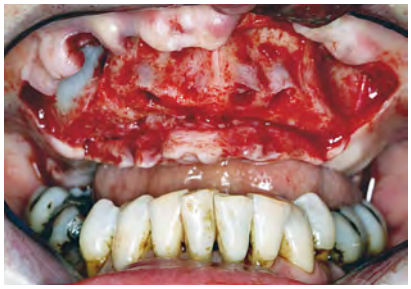


Fig. 4

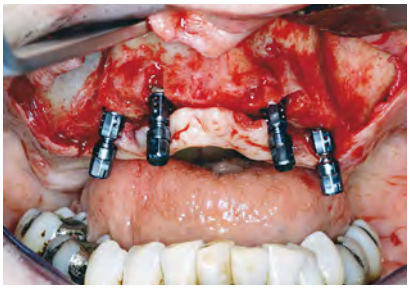


Fig. 5

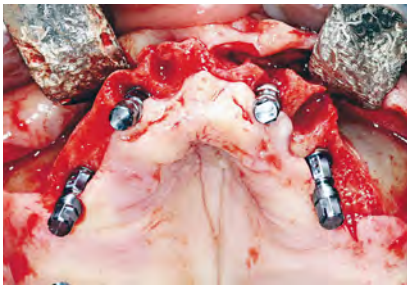


Fig. 6

impression template together with the technician and the patient. The template was used to determine the extent of and carry out the required bone height resection following the extraction of the patient's teeth **(Fig. 3, 4)**.

Four Straumann® Bone Level Implants with SLActive® surface were inserted in positions 14, 12, 22 and 24, with the front implants straight and the implants in the number four positions slanting backwards **(Fig. 5, 6)**. The abutments (angulation 30°, height 2.5 mm) were then screwed onto the number four implants. The titanium caps were screwed onto the abutments and fixed directly at implant level in the frontal area. After closure of the soft tissue, an impression was then taken with the template **(Fig. 7, 8)**. The titanium-reinforced temporary restoration was then manufactured by the dental laboratory and screwed onto the four implants within 12 hours **(Fig. 9, 10)**. This temporary bridge will be worn by the patient for six months before the final suprastructure is fitted **(Fig. 11)**.

Case 2: After losing abutment tooth 43, a 62-year-old female patient with residual dentition in the mandible and a full denture in the maxilla no longer had sufficient anchoring possibilities for the removal mandible prosthesis. If the patient wishes to have a fixed restoration in the mandible, the situation is ideal for a solution with posterior angled implants **(Fig. 12, 13)**.

After the extraction of the residual teeth in the mandible, the soft tissue was folded back and occlusal reduction carried out on the alveolar process bone to create sufficient space for the prosthesis and a broad bone level **(Fig. 14, 15)**. The four Straumann® Bone Level implants were then inserted, once again straight in the number two position and slanting in the number four position.

Abutments angled at 30° (height 4 mm) were screwed in the number four position and fixed to 35 Ncm. The abutments were then screwed onto the implants in the

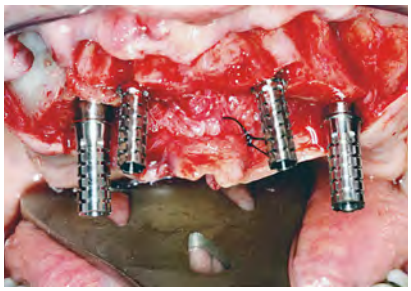


Fig. 7

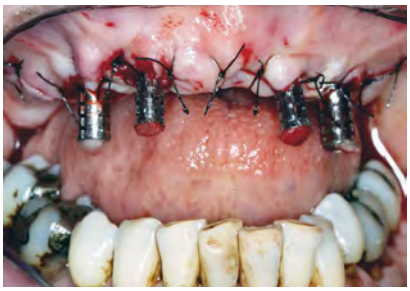


Fig. 8

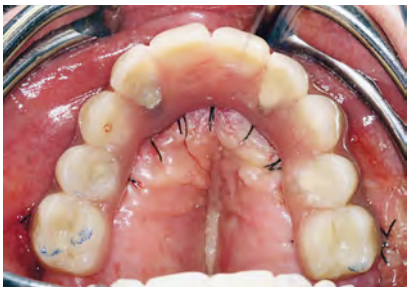


Fig. 9

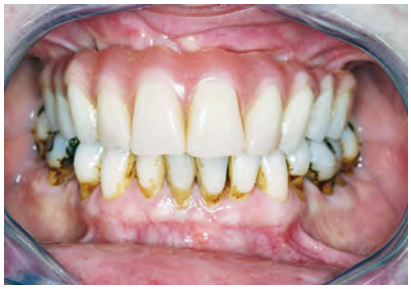


Fig. 10

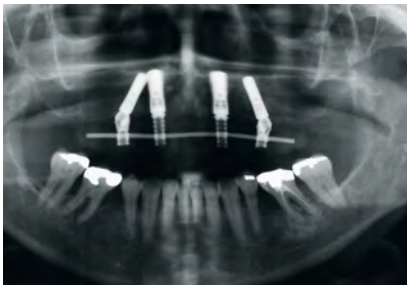


Fig. 11

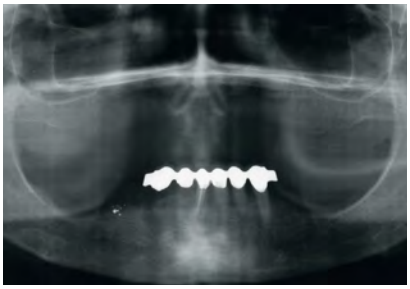


Fig. 12

number two area and fitted onto the titanium caps **(Fig. 16, 17)**. Using the prepared template, an impression was taken in correct occlusion – which was determined using an occlusal key – with Qu-resin.

The template was then sent together with the polymerized titanium caps to the laboratory, where the titanium-reinforced temporary bridge was manufactured. This was inserted within twelve hours and screwed. As a result, (limited) immediate loading is possible within the first four weeks **(Fig. 18-20)**.

In the further course of treatment, the bridge will be unscrewed for the first time after two weeks to remove the threads and check the peri-implant soft tissue situation. The bridge will be fixed again and left in position for three months. The patient will be instructed to eat soft foods for the first 4 – 6 weeks, after which she can switch to full loading. After three months, a control OPT will be carried out and the bridge removed again.

If no irregularities are discovered, the manufacture of the final suprastructure can be planned and carried out after a further three months, provided that the soft tissue and bone situation is stable.

Conclusion

Initial experiences with the new angled components for applying the 'all-on-four' technique with Straumann® Bone Level Implants are extremely encouraging and show that the indication 'immediate restoration with four implants without bone augmentation for the maxilla and the mandible' has become a viable new option.

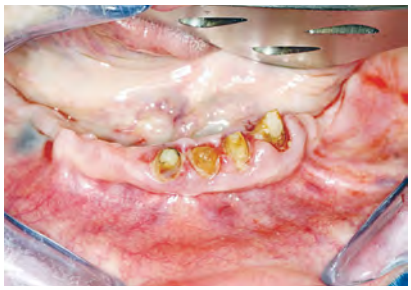


Fig. 13

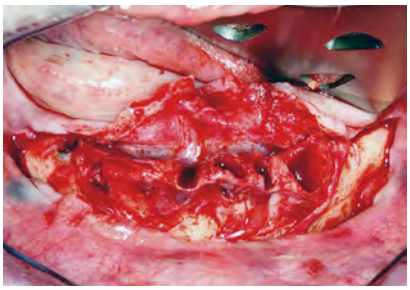


Fig. 14

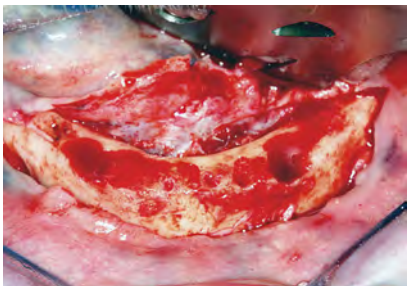


Fig. 15

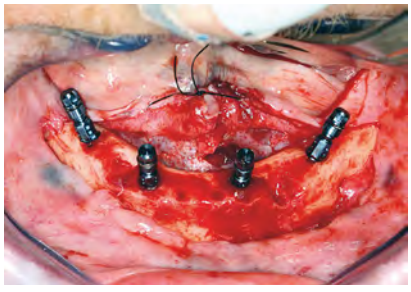


Fig. 16

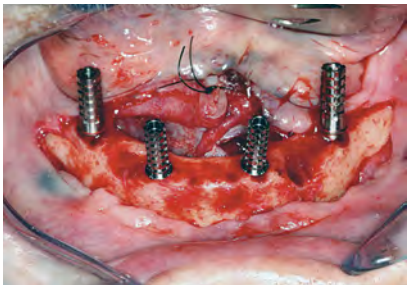


Fig. 17

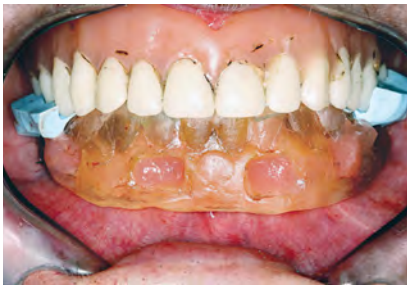


Fig. 18

Event announcement

Would you like to know more about the topic of screw-retained prosthetics on four or more implants?

Take advantage of the opportunity and find out more at the 2014 EAO Congress (25 to 27 September in Rome) about the new Straumann components for screw-retained solutions:

'New surgical and prosthetic solutions for the treatment of fully edentulous patients: a simplified prosthetically-driven protocol.'

Dr Paolo Casentini and **Dr Sergio Piano** present their treatment protocol for edentulous patients whose residual dentition is not worth preserving. The treatment concept includes immediately loadable temporary and also final restorations based on a reduced number of implants.

In addition, participants have the opportunity to experience the individual steps for themselves in the practical part of the workshop.

What?	Workshop
Where?	At the EAO 2014 in Rome/Italy
When?	Saturday 27 September 2014 at 1:15 p.m.

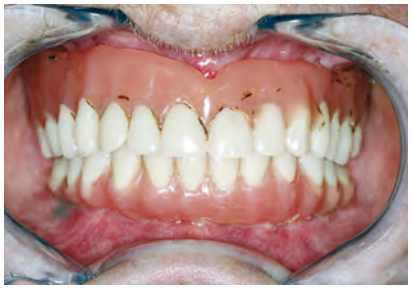


Fig. 19

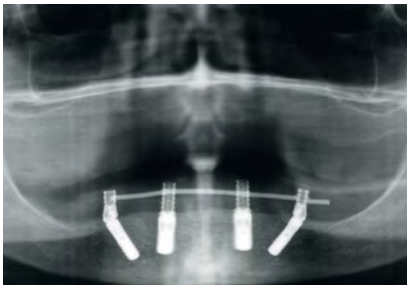


Fig. 20

Dennis Rohner
PD Dr Dr med.

Founder and co-owner of Cranio Faciales Centrum (cfc) Hirslanden in Aarau, Switzerland (since 2003). Core capabilities: Treatment of jaw malformations and deformities (dysgnathia surgery), treatment of head and neck tumors in interdisciplinary cooperation with the Tumor Center, reconstructive surgery with microvascular techniques, pre-prosthetic surgery with bone augmentation and implantology, temporomandibular joint surgery and oral surgery.

Interview with J.-L. Zadikian about the new Straumann® Bone Level Implant

“Straumann has succeeded in reconciling biology and mechanics”

“Un jour, un sourire”* – new teeth in just one day

For the second time, Dr Jean-Louis Zadikian in Sarcelles, France, together with his team, has treated edentulous patients free of charge for three days, from 17 to 19 July 2014. 14 patients were selected beforehand and operated on in his clinic which is also home to the AFOPI Campus (Association Française des Omnipraticiens Pratiquant l'Implantologie). All patients were given a bridge fixed to implants in both the mandible and maxilla. The remaining damaged teeth were removed and immediately afterwards the implants were placed. Immediately after the surgery, the prosthetics laboratory made the new temporary teeth which were fitted in the patient the same day. The temporary remains in the mouth for 3-6 months before it is replaced by the final prosthesis.

* French: “One day, one smile”

Dr Zadikian‘s event attracted great attention in the French media and the television recordings went out at prime time. Not only because of the fast treatment procedure but also because “one day, one smile” is a charitable project. None of the participating patients were in a financial position to pay for such treatment and they received everything free of charge. This was possible only because the teams – dentists, dental technicians and clinic staff – gave their time and the industry partners provided all the material free of charge. For this action, all implants and the corresponding components were provided by Straumann. For years, these patients struggled with their old prosthesis for various reasons, suffered pain and neglected their social life. The moment they were able to look in the mirror and approve of their new teeth compensated these people for all the stress during the surgery as they know that a new life has begun for them.

Dr Zadikian, could you tell us something about the AFOPI?

I’d be happy to. The AFOPI is the French society of dentists working in implantology and was founded in 2004; this year we celebrate the 10-year anniversary. The aim of the AFOPI is to develop implantology in France. For this purpose, private training courses at different levels and on various topics are offered and about 120 dentists take part in these every year. The strength of the AFOPI is the learning support which is based on the value of sharing.

The AFOPI Campus is a place where students are able to put into practice what they have learned. This offers them an invaluable opportunity to gain hands-on experience after training. The support also continues after the conclusion of the course. Ours is an “open” clinic where colleagues can come to fit their patients with implants. We also organize operations, like right now, so that our colleagues can practice implantology at a really high level. 94 % of practicing dentists who have registered for our courses insert implants.

« One of the aims of this platform is that a patient who has lost his teeth will no longer leave after his extractions with a removable temporary restoration but will directly receive his temporary implant-loaded teeth the very same day. We develop and practice methods that involve specialized areas of extraction, implantation and immediate restoration. »

You are set up here like a dentist's office?
The AFOPI Campus is an eight hundred square meter technical platform consisting of ten operating rooms, a prosthetic laboratory and two scanners. We therefore have everything we need, in one place, to enable us to replace damaged teeth immediately. There is a dedicated conference room for courses and for viewing live transmissions of surgical operations.

Where do your patients come from?
We have patients from all over France because we provide solutions that meet their expectations. For instance, there are cases of patients whose teeth are all irreparably damaged. 10 years or so ago I would extract the teeth and use a removable prosthesis during the healing process, which is the conventional way. Then I would place the implants and we had to wait another six months before these could be restored with a fixed denture. But, since 2006, due to the discomfort of this method and the length of waiting time, I have been offering my patients quite a different protocol which involves extraction and implantation in one session, followed by immediately fitting temporaries, in just one day, either in the mandible or the maxilla, or both at once. We have developed a procedure that allows us to make great headway in this area. On the AFOPI Campus, in a parallel restoration of both the maxilla and mandible: we get the patient to come in at 10 o'clock in the morning and by 6 p.m., the teeth have been extracted and the implants placed. This service is offered by very few and that is why we have patients from all over France and some even from abroad, who would like to benefit from this.

Please tell us about "One day, one smile".
Now, this is already the second edition. We organize this "One day, one smile", because these procedures are our core competence – we perform these procedures all year round. We therefore offer selected patients this one day to find their smile again and naturally get back their chewing function. We named this action "Un jour, un sourire" in French. In our clinic we regularly see patients who do not have the means for these relatively expensive treatments. Because things are going very well for our team, we asked ourselves what we could do to pass on the happiness we experience with other patients to patients who cannot afford implant-borne restorations. We therefore decided to make three days available once a year when we would operate on as many patients as possible and fix their teeth for free.

Jean-Louis Zadikian
Dr

Dr Zadikian is an oral surgeon specializing in pre-implantology, implantology and paradontics. He is chairman and head of education of the "Association Française des Omnipraticiens Pratiquant l'Implantologie Dentaire" at the AFOPI Campus in Sarcelles, France, and is visiting professor at Rio de Janeiro State University with which the AFOPI Campus is twinned. The AFOPI thanks all dentists, prosthetic dentists, dental nurses and industry partners who have made this action possible. Their generosity has enabled us to offer fourteen patients a full bimaxillary implant-borne rehabilitation in these three days and load them the very same day. These were treatments that these patients would not have been able to afford. After the media broadcast reports of our first surgery series, we received hundreds of enquiries from people in precarious financial circumstances.

As many patients as possible in three days – that sounds a bit like an assembly line…

That's true: bimaxillary treatments in 14 patients in three days are a real challenge. However, I am not alone at the helm but we have succeeded in assembling 60 dentists from France and not least from abroad for this occasion. Since our campus maintains a partnership with Rio de Janeiro State University, two professors came from Rio and a professor from New York University was also there. So this is by no means "mass production" – everyone has his own patients. Moreover, an action like this is possible in this clinic because we have ten ORs and in this way we can treat 14 patients in three days.

There is personal care, as I have seen. You have someone who receives the patients and assists them with their concerns and questions.

Yes, that is important for us. We already carried out a detailed pre-implant study, drew up implant plans and recorded the data pertaining to each patient that we needed in order to make the new teeth and produce the multi-functional guide necessary to insert the implants, capture their positioning and transfer the data using a corrected model (method taught at the AFOPI Campus). We had therefore done a lot of work in advance. In addition, we were assisted by of one of the patients who was treated when we performed the first operation. This is a woman who has a beaming smile today and is now the operation's godmother so to speak. She looked after all the patients, saw them before the surgery, chatted with them and reassured them. We tried to do everything so that these patients really experienced a VIP treatment just like paying patients and follow-up care is just the same. Their aftercare is no different because this treatment was free of charge.

« A year and a half ago we performed the first surgery series and this was reported in all the media in France. It was on the television news on many TV channels, in the newspapers, and many patients called us afterwards and said: "Oh, we didn't know about it and we missed it! Will it be repeated?" »

What are the criteria for selecting the patients?

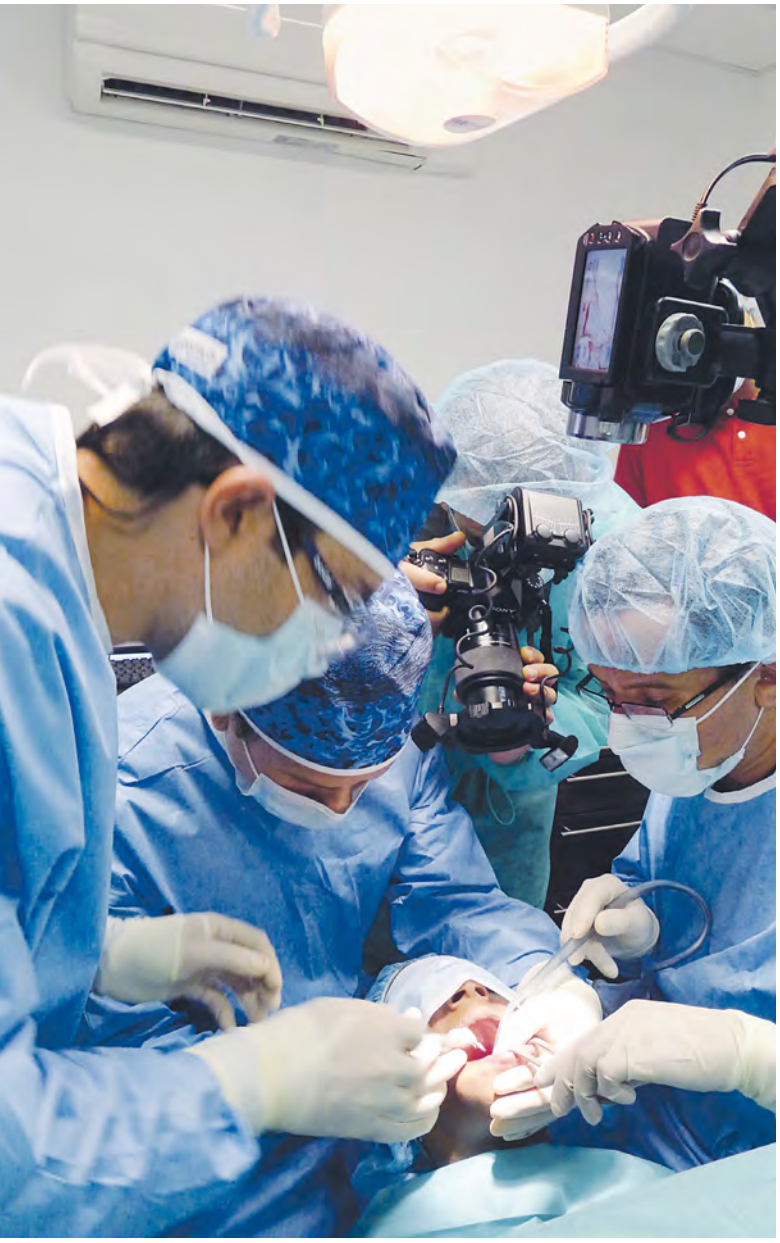
A year and a half ago we performed the first surgery series and this was reported by all the media in France. It was on the television news on many TV channels, in the newspapers and many patients called us afterwards and said: "Oh, we didn't know about it and we missed it! Will it be repeated?" Finally, more than 90 people contacted us about this. And there was a lot of work with these 90 people as we examined each one of them in the clinic. We took X-rays and CT scans, did a preimplant examination and then chose 14 of these patients. We selected these 14 carefully. The clinical selection criterion was to identify the most severe cases – with regard to the patient and the surgical difficulty. We really did take "hopeless" cases – patients who, under the classical protocol, absolutely had to leave us with a denture even if this meant bone grafts for some of them. We will try to treat the candidates who were unsuccessful in another series of surgeries.

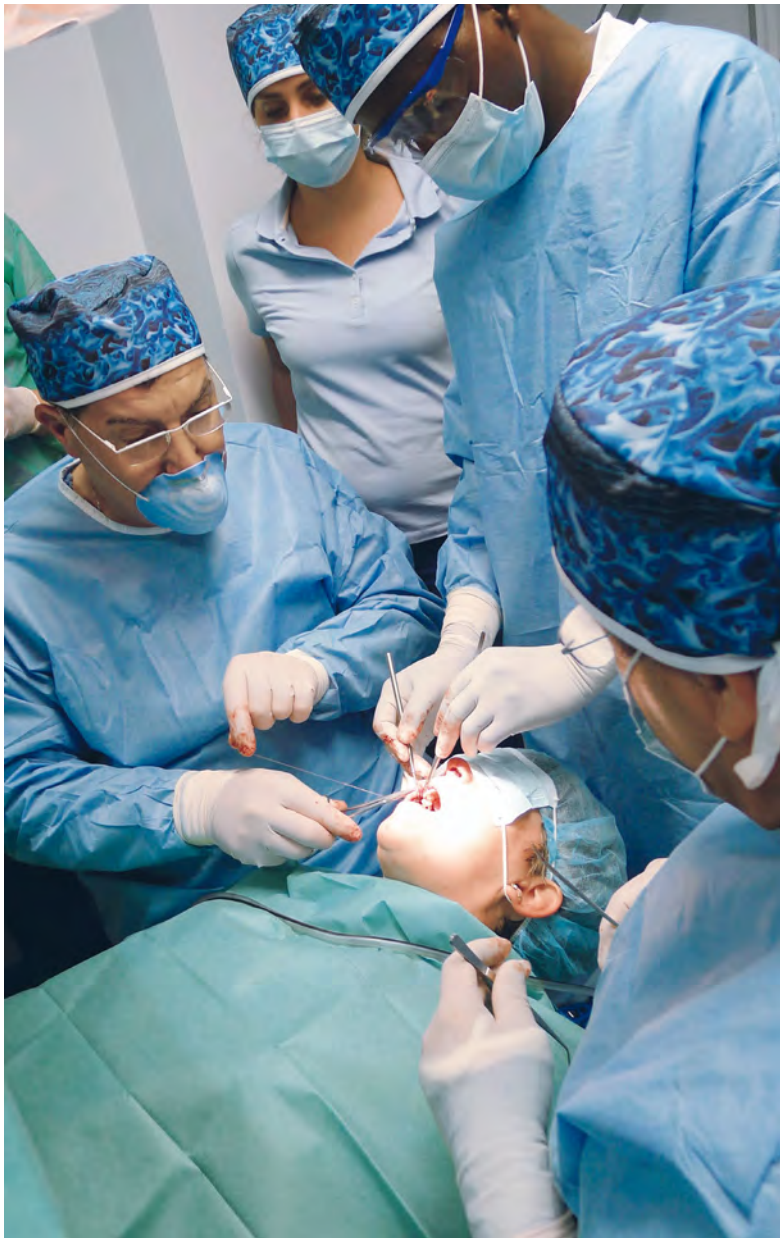
Apart from the immense technical resources that the AFOPI Campus offers, are there other factors that make such an action possible?

For this action to be possible, we needed industry partners to provide us with the material free of charge, as treatment even in a favorable case costs at least 25,000 Euro. These patients cannot afford such treatments. We therefore turned to our suppliers, and in particular to implant

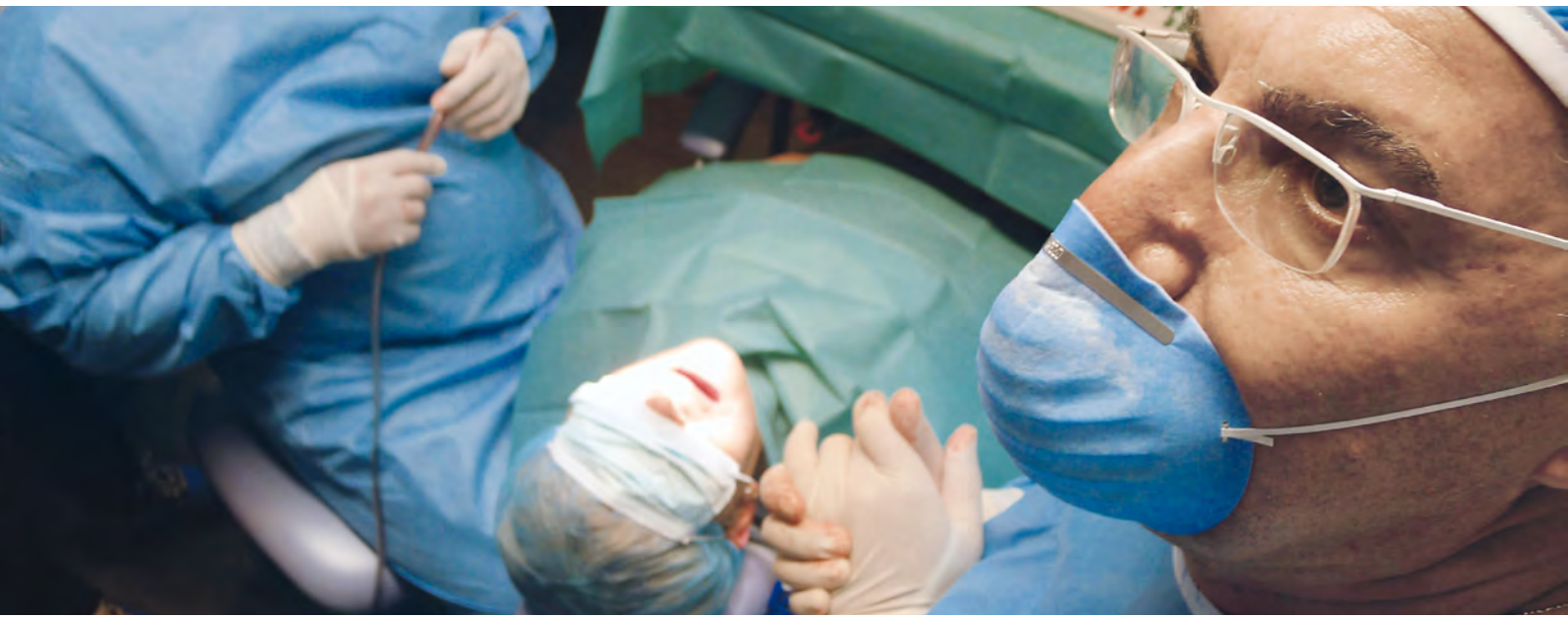
Also taking part: Katja Busse (Customer Solutions Manager), Dr Michel Dard (Head of Preclinical Research) and Izabel Arnoux.

Case discussion





Working continuously for 3 days: what the involved dentists do on a voluntary basis for "Un jour, un sourire" is extraordinary.

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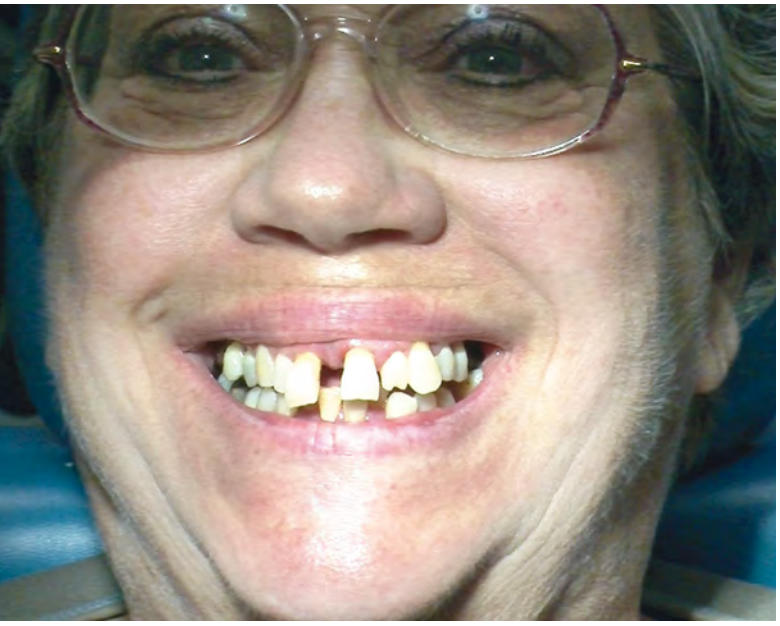
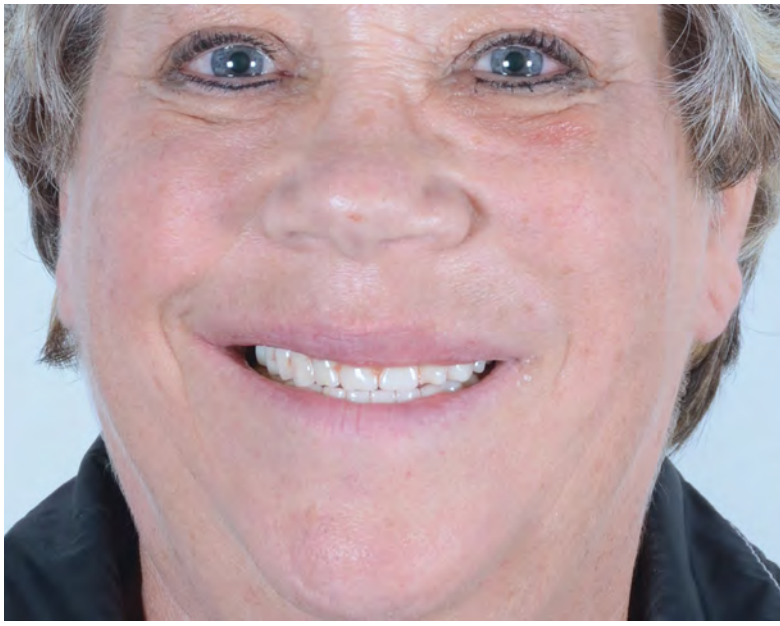




manufacturers like Straumann. I should like to take this opportunity to express my thanks to Straumann because without them we would never have had the necessary implants. Straumann not only supplies us with the implants free of charge – they also understood that in 14 patients 240 implants have to be placed in a short time. One can't say two months in advance: "I would like this size, that diameter" – with rigid planning and without flexibility. We therefore received more implants than necessary from Straumann so that we had a stock that we could choose from at the last minute, e.g. whether to use a length of 14 mm rather than 12 mm. We had every freedom for tailored treatments and the implants were selected as the case required. That was essential for us.

So system flexibility is important for you?
Yes, and what I am particularly happy about is that volume augmentation, that is, bone grafts, would have been necessary for our selected patients if they were having conventional treatment, given the waiting time necessary with a removable prosthesis prior to inserting the implants. Furthermore, we avoided our patients undergoing more invasive treatment and for the thickest distal implants we were able to use Straumann® Narrow CrossFit®, that is, narrow implants. The special feature of these implants made of Roxolid® is their superior mechanical strength. Because of this, we are able to place these implants confidently in the posterior areas and for this reason we do not have to undertake volume augmentation. We have made real progress and are now able to perform more complex and at the same time less invasive procedures. With these innovative techniques we can reduce both the number of procedures and the healing time. This is why we used SLActive® because with them healing time is one month, meaning that they become operational more quickly so they are functional sooner. In this operation, we really used the best material that exists today to treat our patients.

« In this operation, we really used the best material that can be imagined and treated our patients like VIPs. »

How were you able to recruit your colleagues for this action?
60 dentists from all over France helped and I cannot thank them enough. I should like to comment that these were dentists who attended our courses so they are familiar with these techniques. Of the 120 dentists who come to courses on the AFOPI Campus every year and who are members of our association, it was not difficult to mobilize 60. We simply sent out a letter and stopped recruitment very quickly after the first 60 replies.

Could you imagine this action taking place elsewhere?
Yes, that would be my dream, to extend this surgical method "one day, one smile" developed at the AFOPI to other technical platforms. There are other implantologists practicing in and outside France who use these techniques. And I should be very happy if we could some day carry out this action in different centers and on an international level – so perhaps several platforms performing these surgeries the same day.

« I should be very happy if we could some day carry out this action in different centers and on an international level. »

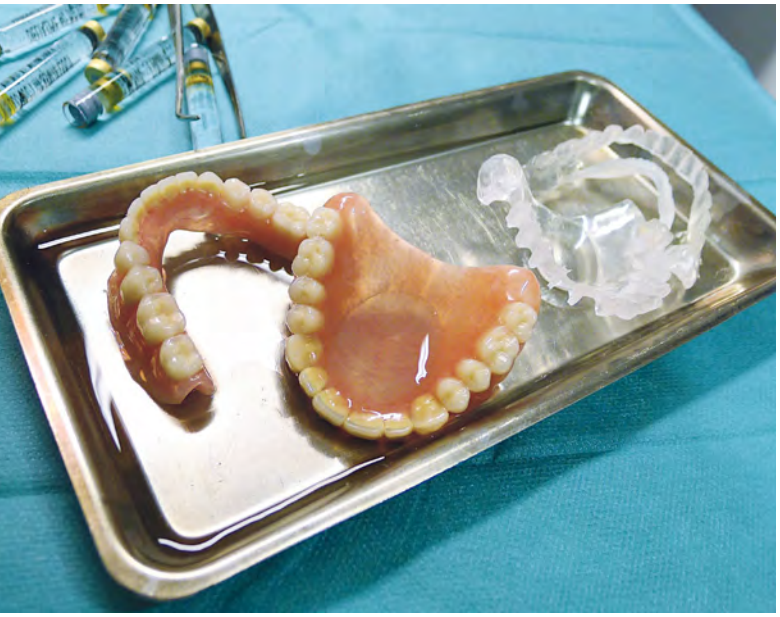
Could you describe the procedure and the technique that you use?
The patient comes to the clinic, we do a CT to examine the bone volume and perform the entire pre-implant examination. At the same time, we take impressions, make study models and then a wax-up. The data is used to enhance the aesthetics. A key stage to attaining immediate aesthetic success as teeth will not be extracted until the day of the operation so there will be no trial prior to that. We have planned the project like an architect building a house. For this purpose I have developed a special multifunctional guide: we can use this, for example, to make the incision lines, optimize the soft tissue, determine the direction of drilling and also to capture the positioning of the implants.

The purpose of this stage is to provide the prosthetic laboratory with as many elements as possible so the new teeth can be made in one to one and a half hours per maxilla. What makes the prosthetic laboratory original is that a maxilla and a mandible are treated separately by two people at the same time. It is then that the occlusal balancing is done. During the procedure we have available to us, on the one hand the guide that contains the information on the new teeth, and on the other the information provided by the CT with its plan, which is actually never rigid. Then when it is time to operate, the information has to be compared and a hierarchy is established to reach the final decision as regards the best positioning and implanting axis. In other words, this approach also makes it easier for the clinician as it gives him more freedom, so it is now longer a one shot procedure.

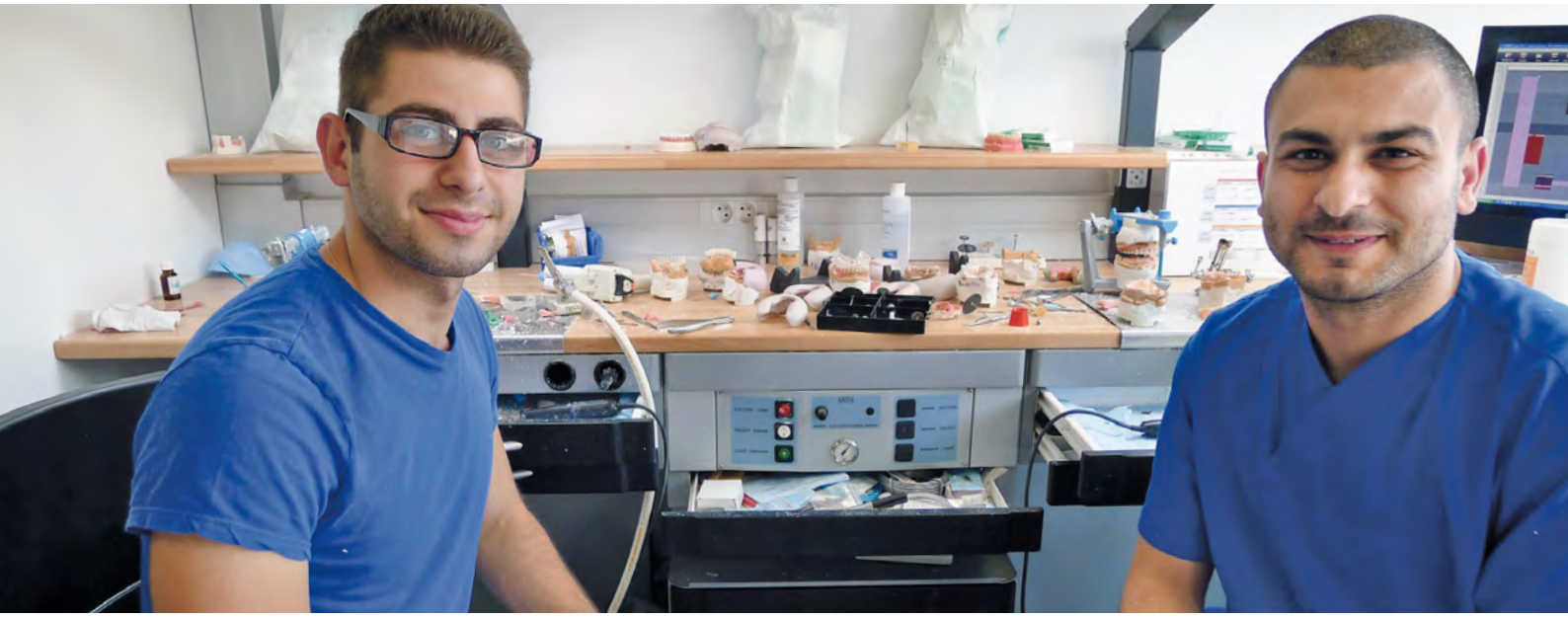
What has been your experience with the new Straumann® Bone Level Tapered Implant – BLT for short?
I am very happy to be able to use this implant as it is a conical implant. Quite apart from the SLActive® surface, which is a real bonanza. In effect, in one month osseointegration is already very far advanced. Implant stability and osseointegration are a dream. Under-preparation, or rather a preparation adapted to each type of bone, is possible with a conically-shaped implant, and precisely what was lacking with cylindrical implants was this primary stability obtained in such cases. Amazing primary stability is achieved, which is an important requirement for immediate loading and particularly for single rehabilitations. Moreover, a special aspect of these treatments is the ability to create bone with the aid of fillers around the stabilized implant in order to prevent autogenous grafts and it is easier to stabilize a conically shaped implant. With the new Straumann® Bone Level Tapered Implant, Straumann has succeeded in reconciling biology and mechanics. This is extremely significant for our patients for whom immediate loading is important and indicated.

« With this new Straumann® Bone Level Tapered Implant, Straumann has succeeded in reconciling biology and mechanics. This is extremely significant for our patients for whom immediate loading is important and indicated. »

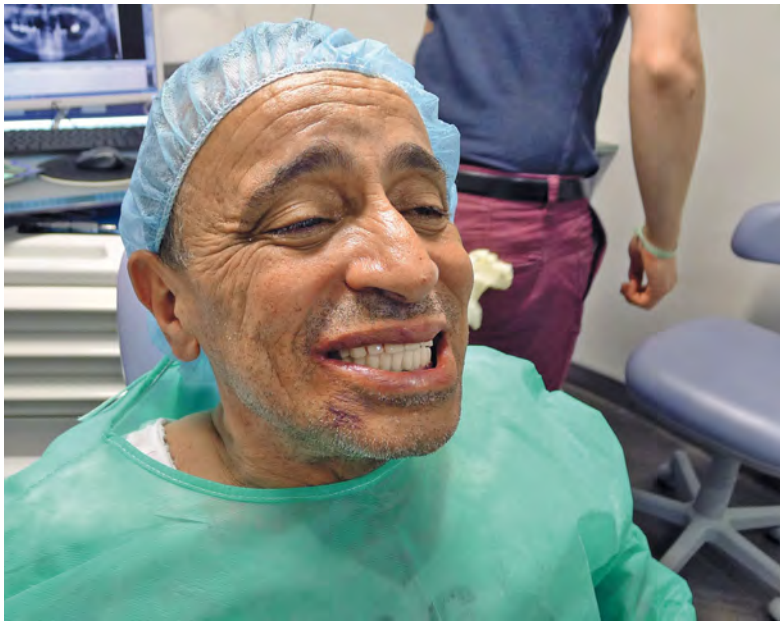
Some staff at Straumann regard the BLT more as a development than as a "revolution". There are other tapered implants with a similar technical design, even if not with the SLActive® surface. How do you see it?
To call the BLT a "development", that is a sign of Straumann's modesty. I personally would rather talk about a real revolution. Why? Because mechanics must not simply be considered separately from biology. Combining these two disciplines is what makes it a revolution. For a dentist, the revolution consists of being able to have full confidence in both the biology and the mechanics.



Material consumption is high and the team decides ad hoc which implant is the right one for the particular case.



The dental technicians David and Farès have a lot to do.



Patients are very happy with their regained teeth.

« Cette opération a changé

SOINS DENTAIRES. « Un jour un sourire » débute ce matin. Pour la deuxième an dentistes vont poser gratuitement des implants à ceux qui n'en ont pas les moyens.

UN LARGE SOURIRE, désormais volontiers souligné de rouge à lèvres, éclatant, sans complexe. A partir de 13 h 30 aujourd'hui, Sandrine le mettra au service des dentistes qui le lui ont rendu et qu'elle appelle ses Pères Noël. Pendant trois jours, elle le distribuera, pour les rassurer, aux patients qui franchiront le seuil de la clinique du docteur Jean-Louis Zadikian, à Sarcelles (Val-d'Oise).

Forcément un peu craintifs devant l'opération marathon qui les attend, mais pleins d'espoir à l'idée d'en repartir cinq ou six heures plus tard, comme elle il y a un an et demi, avec une bouche à nouveau pleine de dents toutes neuves. « Cinq heures d'opération, ce n'est pas rien, mais j'y suis allée en confiance. Et ma vie a changé ! »

Parce qu'il lui paraît important de rendre ainsi « un peu de ce qui lui a été donné », Sandrine, que son dentiste qualifie avec admiration de « sacré bout de femme », s'est bien volontiers vue promue, à 43 ans, marraine de l'opération Un jour un sourire. Pendant trois jours, les 00 m² de la clinique, où se forment aussi quelque 120 praticiens à l'implantologie chaque année, vont se muer en ruche où officieront dentistes et prothésistes bénévoles. Quinze patients, qui n'auraient que le dentier comme solution et les moyens de se payer mieux, ont s'y voir offrir le cadeau à 000 € d'une bouche complète

« Un sourire, ça fait partie de soi. Quand on ne l'a plus, on se sent amputé »

Sandrine, carer and herself a patient of "Un jour, un sourire" in 2012.

This new generation of implants is functional after one month and allows full utilization and stability despite minimal bone resources, enabling the execution of increasingly complex surgical procedures with less invasive steps. It is for these specific clinical challenges that Straumann has developed this new implant with its conical design, Roxolid® material and SLActive® surface.

Does the fact that immediate loading is possible with Roxolid® and osseointegration is further advanced with SLActive® therefore mean that you can place the final prosthesis sooner and prevent fractures of the temporary filler bridge?

Yes. Things actually go faster for the final prosthesis, even if the placement depends on the healing of the soft tissue and the maturing of the fillers whose purpose is to augment the volume in a horizontal direction. The problem during the waiting period is the consequences of the fracture of the resin bridge. Imagine that you have placed an angled implant at the level of tooth position 5 and another in front, in the position of the lateral teeth. The distance between the laterals and the last implant is relatively large. A patient who undergoes this type of treatment is generally careful for one month. After not being able to eat properly for a long time, he feels well again and that's when the problems start. He begins to chew harder and each time there is a problem fracture in the temporary bridge, it is at the level of the distal side of the laterals. I therefore rely on a study I conducted between June 2006 and September 2012 on 1042 implants used in this type of situation and inserted immediately; this study provides much information about the mechanical facts. In practice, when the patient attends the same day we repair it immediately and the implant is not affected. However, if he only comes three or four days later, the osseointegration is not yet complete. The extended effect of the fractured parts causes the distal implant to be uprooted, and I think this is the hardest to replace quickly. And that, precisely, is the problem: in our clinic, we treat patients from far afield. I personally know as an implantologist that I can feel completely secure with the BLT implant even if the patient receives his final prosthesis after two, three, four or six months.

« I feel perfectly confident with a BLT implant, even if the patient receives his final prosthesis two, three, four or five months later, because the SLActive® implant will have healed in one month. »

That's a good prospect. Have you also use the new angled abutments from Straumann?

Of course. The new Straumann® Screw-retained Abutment is really very simple to use and the platform switching of the Bone Level Implants is perfect. It simply has everything that can be expected of an abutment regardless of whether it is straight or angled. With straight abutments a lot can be corrected. The angle is 17° – we do not need any more. When the implant has a wide angle, this abutment is ideal. The prosthetic restoration must be as simple as possible and the surgery must be designed to make the prosthetics simple. The new products meet this criterion in full.

« The prosthetic restoration must be as simple as possible and the surgery must be designed to make the prosthetics simple. The new products meet this criterion in full. »

Dr Zadikian, thank you for all you have done here and we wish you every success for your next endeavors!

Straumann® Roxolid® SLActive® Customer Feedback

“A milestone in modern implantology”

Straumann caused a sensation among implantologists at the beginning of the year with a major reorientation of its product and pricing strategies, which was implemented worldwide: now, all soft tissue and bone level implants are sold in the innovative high-performance material Roxolid®, with no restrictions at no extra cost. The new Straumann® Roxolid® SLActive® implants are thus on offer for the same price as the existing titanium implants. What do experienced users in Germany think of this initiative?

Feedback from practitioners is consistently positive

“We're convinced” (**Dr Ulrich Konter**, Hamburg, Germany), “a significant advantage” (**Dr Stefan Kanehl**, Hamburg, Germany), “an exciting and logical addition” (**PD Dr Marcus Klein**, Dusseldorf, Germany), “a logical progression at a fair price” (**Dr Matthias Müller**, Hamburg, Germany) and “a signal sent at just the right time” (**Dr Andreas Hentschel**, Zwickau, Germany) – these are just a few examples of the many comments about the initiative received by Straumann from experienced implantologists.

Increased resilience thanks to tensile and fatigue strength

What makes the initiative so exciting? “Roxolid® combines high mechanical strength with the already familiar outstanding osseointegration properties of the hydrophilic Straumann® SLActive® surface. For me, therefore, the expansion of the Roxolid® range to include all implant lines and diameters means maximum safety in all applications,” says Dr Andreas Hentschel, a Zwickau-based oral and maxillofacial surgeon, with regard to the excellent features of Roxolid® – an alloy of approximately 85 percent titanium and 15 percent zirconium – in connection with SLActive®.

« We want to offer our patients implants made from the most stable and well-tolerated material, which is why we choose Roxolid®. *Dr Ulrich Konter* »

His practice, which was founded in 1998 and has grown to comprise six medical professionals, now offers exclusively Roxolid® SLActive® implants of the latest generation. “The excellent value for money in view of the outstanding quality of the product and its scientific basis enables us to offer highly successful premium products even in a medium-sized eastern German city. We are so convinced that we are even considering introducing a lifelong guarantee for all of our Roxolid® SLActive® implants.”

« I can happily recommend my colleagues in implantology to place their confidence in Roxolid®. It is the best implant on the market, and is available at a reasonable price from a technological perspective. We should be grateful and appreciate the opportunity to use such a product. *Dr Andreas Hentschel* »

40 % stronger than titanium and highly biocompatible

This confidence is well-founded, as “there is a significant amount of clinical data available to confirm the safety of the new alloy for all established indications,” emphasises Dr Marcus O. Klein (Dusseldorf).

The oral and maxillofacial surgeon, as well as plastic surgeon, worked for many years at the oral and maxillofacial surgeon clinic of the University Medical Center of the Johannes Gutenberg University Mainz, ultimately as a consultant. He actively participated in the Consensus Conference of the International Team for Implantology (ITI) concerning the use of reduced diameter dental implants, and supported the event as an author.

“In laboratory tests Roxolid® revealed itself to be approximately 40 percent stronger than conventional grade 4 titanium and highly biocompatible,” says Dr Klein. “What is more, animal models – histomorphometric studies and measurements of removal torque – have shown that it offers at least the same level of osseointegration as titanium.”

Extensive study data with 5-year results

With 17 publications within five years (eight clinical studies and nine preclinical studies of Roxolid®), according to Straumann it is "one of the biggest research programmes ever carried out by a provider of dental implants." It comprises double blind, randomised controlled studies and non-interventional observational studies aimed at assessing Roxolid® implants in daily practice. "I have complete trust in Straumann in its evaluation of the studies carried out," explains Dr Matthias Müller from Hamburg. The dentist, who runs a practice that is now in its fourth generation, is certain that "this trust is justified. The company has demonstrated this over the last 25 years with extremely well-founded studies of its products."

A shame to use it certain cases only

The study results match "our clinical experience over the last five years," explains Dr Ulrich Konter (Hamburg). "We have achieved outstanding treatment results that show that the titanium zirconium alloy is clearly an optimal combination for the bone, both from a biological and a biomechanical perspective. The material advantage is so clear that it would have really have been a shame for us, the users, only to have access to this high performance material for a part of the range."

« Roxolid® currently appears to combine all possible benefits. Even acceptance in material tests by GPs or alternative practitioners is excellent, reaching a similar level to ceramic implants. *Dr Stefan Kanehl* »

The oral and maxillofacial surgeon, who has been based in Hamburg since 1990, sees the clinical benefit of the Roxolid® implants in the "around 40 percent greater stability and fracture strength in comparison with titanium implants." This makes it possible, he says, to use "thinner implants with the same biomechanical properties as normal ones," and benefit from the same level of osseointegration.

Fewer augmentations, less invasive implants

The narrow Roxolid® implant, which was presented at the 2011 annual conference for the first time with an endosteal diameter of 3.3 mm – known as the Straumann® Narrow Neck CrossFit Implant (NNC) – combines the design of soft tissue level implants from Straumann with Roxolid® and the rough/hydrophilic SLActive surface and CrossFit®, the conical, internal implant abutment connection. Conventional small diameter implants made of pure titanium are known to

Stefan Kanehl
Hamburg / Germany
Dr med. Dr med. dent.

Studied medicine and dentistry in Aachen and Hamburg. Graduated as Dr med. dent specializing in laser dentistry. Graduated as Dr med. specializing in minimally invasive temporomandibular surgery. Trained as a specialist in Hamburg and Osnabrück. 1997-2003 employed in a Hamburg practice for oral and maxillofacial surgery. 2004 – 2006 Clinic for Oral and Maxillofacial Surgery, Center for Implantology, Esthetic Facial Surgery, Klinikum Osnabrück. Since 1998 engaged in implantology. Since 2007 group practice with Dr Ulrich Konter. Regular further training courses in Switzerland and the US. Acts as a referee at national level on the topics of navigated implantology, bone augmentation, soft tissues and esthetics in implantology. ITI Member. Director of the ITI Study Club Hamburg-Alster.

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Ulrich Konter
Hamburg / Germany
Dr med.

Studied medicine and dentistry in Kiel. Promotion to Dr med. in the field of inflammatory dermatoses (neurodermatitis). 1990 – 1993 trained as a specialist at the Department of Oral and Maxillofacial Surgery at the Bundeswehrkrankenhaus Hamburg. 1993 – 1995 trained as a specialist in the Clinic for Oral and Maxillofacial Surgery, Universitätskliniken Köln. Since 1995 specialist in oral and maxillofacial surgery in Hamburg. Since 1999 private practice in Hamburg city center. Since 1990 engaged in implantology. Since 1998 recognized BDIZ (European Association of Dental Implantologists) specialist in implantology. Regular further training courses in Switzerland and the US. Scientific research on stem cells in collaboration with the University of Freiburg. Speaker at national and international level. ITI Member.

offer lower fracture resistance. "We can significantly decrease the risk of implant factures by using narrow Roxolid® implants at locations where there is often too little space for normal sized implants – i.e. in narrow gaps between teeth, for example at the front of the lower jaw, around the upper lateral incisor and in the premolar region," says the oral and maxillofacial surgeon Konter, underlining a significant benefit of the narrow Roxolid® implants.

No planning restrictions for superstructure

Dr Müller, who has been using Roxolid® implants at his private practice in Hamburg ever since they were first launched, also uses the reduced diameter implants "as pillars for three to four unit bridges in the anterior region," while Roxolid® implants with regular diameters are used in the posterior region.

"Thanks to the increased strength, there are no restrictions on planning in relation to the superstructure," explains Dr Hentschel, who goes on to add that "as a result the user is not forced to use implants for support or splinting under certain circumstances. Furthermore, fears relating to an increase in perspective or the alternative use of implant abutments are unfounded."

A good choice for avoiding operation risks in risk groups

The "common indications for narrow 3.3 mm implants are already an integral part of the daily implantology routine," says Klein, the Dusseldorf implantologist, in summary, adding that "I believe that there is no reason why indications should not expand towards sections of the jaw that are under greater stress. Naturally, in this case surgical precautions are even more important in order to ensure that the best possible use is made of the bone available."

« The Roxolid® alloy is a milestone in modern implantology. Practitioners would be well advised to open up to this medical progress. We have converted fully to Roxolid®, and expect to see Roxolid® replace titanium as the material of choice over time. *Dr Ulrich Konter* »

The oral and maxillofacial surgeon is referring here to a group of patients for whom Roxolid® SLActive® implants can facilitate less invasive and more time saving implant rehabilitation: "For patients with pre-existing conditions such as diabetes or blood coagulation disorders, or those receiving bisphosphonate therapy and those with advanced alveolar ridge atrophy, for whom extensive pre-implant augmentative measures such as alveolar ridge augmentation – and the associated operation risks – should be avoided, Roxolid® is a very good

alternative. What is more, elderly patients in particular often have highly concrete fears of extensive operations and bone augmentations."

> Roxolid® combines the positive biological properties of titanium with increased mechanical strength. There is a significant amount of clinical data available to confirm the safety of the alloy for all established indications. *Dr Marcus Klein*

In many cases, single phase augmentations can be avoided

Dr Hentschel sees a significant advantage in avoiding augmentations "that would have been necessary for fitting an implant with a standard diameter at the same location." "Patients are extremely grateful to us when we make our procedures less invasive and at the same time more economical, while also cutting the overall treatment time." In a study carried out within his practice, Dr Hentschel was able to show that "in 57 percent of cases, the use of reduced diameter implants made it possible to avoid single phase augmentation, and in 14 percent of cases a two stage augmentation."

Added value for the surgeon and the patient

The oral and maxillofacial surgeons Dr Ulrich Konter and Dr Stefan Kanehl emphasise that it is highly beneficial and clinically relevant "that the SLActive® surface was applied to Roxolid®. This means that the Roxolid® implant has the same fast healing time and good bone implant contact (BIC) as the titanium implant." They have switched over completely to Roxolid®, as the "benefits apply across the board," says Konter. "The fact that Straumann is offering the Roxolid® implants for the same price as the existing titanium implants is a clear added value for us and the patient."

Hentschel comments that the "ultra-short healing times from six to eight weeks," had convinced to start using "exclusively SLActive® implants at our practice," back in 2008. Short healing times not only facilitate early implant loading, but they also increase safety by reducing the "critical healing period between the second and fourth weeks during the transition from primary to secondary stability," says Hentschel.

"The right step at the right time"

Hentschel points out that "Straumann's initiative has come at a time when the implant market is at risk of stagnating for some inexplicable reason, and budget providers are advancing aggressively into the market," stating criti-

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Dr med. dent.

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cally that: "Newcomers and less experienced users are being persuaded that it is all very straightforward, and that the implant success of a practice is based exclusively on low product prices. This is a dangerous policy that is simply wrong and in my view has the potential to damage an entire industry. As such I see the Straumann initiative as the right step by a responsible company at the right time."

> On the basis of the available evidence there is no reason why all implants should not be manufactured using Roxolid®. Outstanding strength and improved surface quality in comparison with titanium – two factors that speak for the product in all indications. *Dr Matthias Müller*

An affordable leading edge product

According to Dr Müller, "on the basis of the available evidence there is no reason why all implants should not be manufactured using Roxolid®." "Maximum safety, reliability and longevity – Roxolid® will become well established as an affordable leading edge product in the portfolio of a premium manufacturer," believes Dr Hentschel, who adds that "we should be grateful and appreciate the opportunity to use such a product."

The new material of choice for dental implants?

"Greater stability and fracture strength with the same healing process facilitate effective treatment results over the long term." The increased biocompatibility is an additional benefit, adds Dr Konter, who concludes that "The Roxolid® alloy is a milestone in modern implantology. Practitioners would be well advised to open up to this medical progress. We have converted fully to Roxolid®, and expect to see Roxolid® replace titanium as the material of choice over time."

Interviews by Dr Aneta Pecanov-Schröder of the agency DENTinform in Bonn/Germany. Article first published in "Die Zahnarzt Woche" 19/14, 7 May 2014.

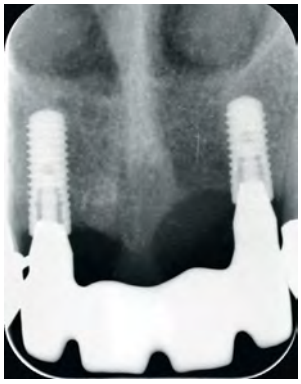

Fig. 1: *Follow-up radiograph of a screw retained bridge on two Roxolid® implants in the anterior upper jaw*

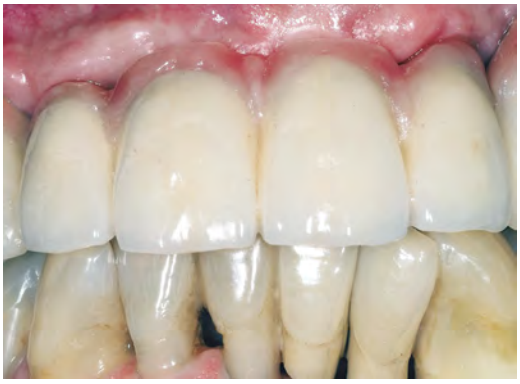

Fig. 2: *Clinical situation of the anterior bridge shown*

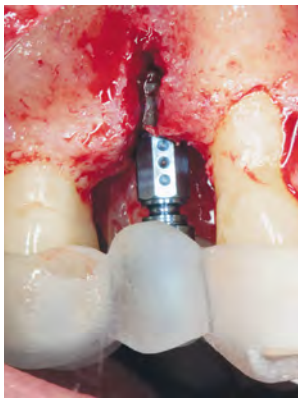

Fig. 3: *Replacement of a premolar in a narrow gap with a 3.3 mm Roxolid® implant (Source: Dr Matthias Müller, Hamburg)*

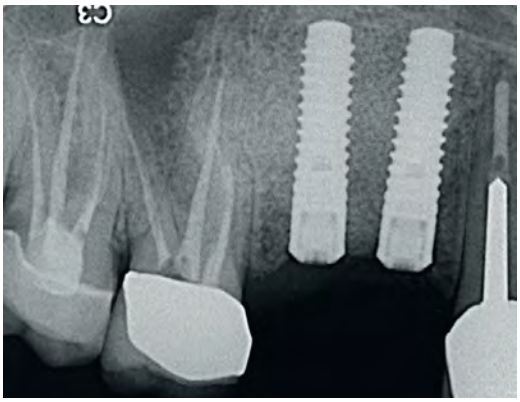

Fig. 4: *Straumann® NNC implants (3.3 x 12 mm) following insertion in narrow interdental space in the 14/15 region (Source: Dr Stefan Kanehl)*

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Dr med.

Studied Medicine in Jena. Studied Dentistry in Leipzig. Graduated as Dr med. in 1992. Since 1997 specialist in oral and maxillofacial surgery. Trained as a specialist at the Clinic for Oral and Maxillofacial Surgery/ Esthetic and Restorative Surgery at Klinikum Chemnitz under Prof. Dr med. K. Döring, becoming medical director of the outpatient clinic and lead assistant for the care of patients with cleft lip and palate problems. Set up his own practice in 1998, specializing in dental implantology. ITI Fellow, ITI Speaker, Director of the ITI Study Club Dresden. Author and speaker at national congresses.

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Ready to start

Impressions from the audience

ITI World Symposium 2014 Review

“Knowledge is key”

24 to 26 April 2014 in Geneva/Switzerland

The International Team for Implantology welcomed more than 4200 participants from 84 countries to its global flagship event, the ITI World Symposium which was held under the heading “Knowledge is key”. It was the biggest international implant dentistry meeting to date.

An excursion into outer space and the latest scientific findings

After a brief excursion into outer space, presented by keynote speaker Claude Nicollier, Switzerland’s first and only astronaut, the scientific program guided the audience back down to solid ground with a practically oriented offering of lectures, presentations and panel discussions. The latest scientific findings aligned to the ITI philosophy of evidence-based treatment served as the basis for all the presentations that came under the three main topics: “Digital implant dentistry”, “Prevention and management of biological and technical complications” and “New approaches, challenges and limitations in esthetics”.

Corporate Forum presented by industry leaders

The scientific program was supplemented by a half-day Pre-Symposium Corporate Forum presented by industry leaders Straumann, Morita and Geistlich as well as a research competition and an attractive social program that offered ample opportunity for networking and a chance to talk to key opinion leaders. An extensive industry exhibition with 50 exhibitors allowed participants the possibility to find out about the latest products related to their daily work.

The faculty of the ITI World Symposium 2014

About the ITI

The International Team for Implantology (ITI) unites professionals around the world from every field of implant dentistry and related tissue regeneration. As an independent academic association, it actively promotes networking and exchange among its membership. ITI Fellows and Members, who currently number more than 15 000, regularly share their knowledge and expertise from research and clinical practice at meetings, courses and congresses with the objective of continuously improving treatment methods and outcomes to the benefit of their patients.

In 34 years, the ITI has built a reputation for scientific rigor combined with concern for the welfare of patients. The organization focuses on the development of well-documented treatment guidelines backed by extensive clinical testing and the compilation of long-term results. The ITI funds research as well as Scholarships for young clinicians, organizes congresses and continuing education events and runs more than 600 Study Clubs around the globe. The organization also publishes reference books such as the ITI Treatment Guide series.

www.iti.org

The next ITI World Symposium takes place in 2017.

Coming soon: The ITI Online Academy

At the event, the soon-to-be-launched e-learning platform ITI Online Academy was introduced to the audience. "Our main theme 'Knowledge is key' underlines the importance the ITI assigns to evidence-based information for use in daily clinical practice," said Dr Stephen Chen, Chair of the Scientific Program Committee. "This applies not just to the ITI World Symposium, but also very particularly to our new e-learning platform, the ITI Online Academy, which we were able to showcase during the meeting for the first time." The platform is planned to be the most innovative and complete e-learning platform worldwide. With its user-oriented approach, the ITI Online Academy offers a broad and continuously expanding curriculum of learning modules designed for every level of expertise. It is supplemented by cases, videos and lectures as well as a wealth of free content, such as assessments geared to identifying individual strengths, weaknesses and gaps in knowledge.

« We are very proud of our new e-learning platform as we believe it goes further than any other offering currently available. Not only does the curriculum cover implant dentistry in its entirety, but the system is also designed to adapt dynamically to the user and propose further learning pathways based on the gaps and weaknesses identified. *Prof. Dr David Cochran, ITI President* »

ITI Online Academy workstations

Relaxing and discussing in the lounge area

Industry exhibitor Straumann

Stage show at Straumann's 60-Year Anniversary Party

André Schroeder Research Prize 2014

Dr Jia-Hui Fu and co-authors: on the efficacy of the sandwich bone augmentation technique

Jia-Hui Fu
BDS/MSc

Assistant Professor for Periodontics, Department of Preventive Dentistry, National University of Singapore. Registrar (Periodontics) at the Department of Dentistry, National University Hospital, Singapore. Bachelor of Dental Surgery from the Faculty of Dentistry at the National University of Singapore. Graduate of the Periodontics Program at the University of Michigan, School of Dentistry, USA. Master of Science and Certificate in Periodontics from the National University of Singapore, Faculty of Dentistry. Research activities in the fields of periodontal care and guided bone regeneration. Author of scientific articles and peer reviewer.

Dr Jia-Hui Fu from Singapore and co-authors submitted the winning paper on the following topic: **"A Randomized Clinical Trial Evaluating the Efficacy of the Sandwich Bone Augmentation Technique in Increasing Buccal Bone Thickness During Implant Placement Surgery. I. Clinical and Radiographic Parameters"**. Dr Fu, an Assistant Professor and researcher at the National University of Singapore, was presented with the award by ITI President Prof. Dr David Cochran during this year's ITI World Symposium in Geneva on April 26, 2014. The annual prize is endowed with 20 000 Swiss francs. "It is a great honor to win this highly respected prize and become part of such a distinguished research community," said Dr Fu. "This official recognition of our work will serve to fuel our motivation and enthusiasm to carry out further research in the field".

Collection of clinical and radiographic parameters

Dr Fu and co-authors T.-J. Oh, E. Benavides, I. Rudek and H.-L. Wang conducted a randomized clinical study to investigate the efficacy of the sandwich bone augmentation technique in increasing buccal bone thickness during implant placement surgery. The first part of the study, for which the prize was awarded, was dedicated to collecting clinical and radiographic parameters.

Priority Research Areas

Each year, the ITI Foundation dedicates 2.2 million Swiss francs to supporting research in the field of implant dentistry. The ITI Research Committee has announced that, as of this year, a sizeable portion of its annual research funds will be assigned to areas of particular interest to the field. In doing so, the ITI is supporting sustained development of selected research areas over a longer period of time. The current priority areas were defined for the period from 2014 to 2017:

- Effect of surface material and surface structure for improved soft-tissue attachment
- Minimally invasive implant therapy. How much osseointegration do we need? How short and narrow can implants be?
- Use and validation of digital data in planning, manufacture and treatment

The ITI emphasized that it will nevertheless continue to welcome research grant applications for all areas of interest in implant dentistry research.

André Schroeder Research Prize 2015

For the advancement of dental research

The 2015 André Schroeder Research Prize will be presented at the ITI Congress Germany, which will take place from April 17-18, 2015. If you have new findings in implant dentistry, oral tissue regeneration and related fields, we cordially invite you to apply for the 2015 André Schroeder Research Prize. Applications are accepted until October 15, 2014.

You can download the André Schroeder Research Prize Application Form (Word document) from the ITI website (Research Support/André Schroeder Research Prize). An objective evaluation of an application is only possible if precise and complete information is provided by the applicant(s). The application form must be filled out in English, as thoroughly as possible and in full compliance with the terms and conditions for participation.

The completed application form must be saved as a PDF file and sent to the ITI Headquarters to research@iti.org by email. Applications submitted by conventional mail will not be accepted.

Further information can be obtained from the ITI Headquarters:

Phone +41 (0)61 270 83 83
Email: research@iti.org

Previous winners of the André Schroeder Research Prize

2014 Jia-Hui Fu, Singapore – **2013** Jung-Chul Park, Republic of Korea **2012** Cornelius von Wilmowksy, Germany – **2011** Nikola Saulacic, Switzerland – **2010** Maria Retzepi, United Kingdom – **2007** Frank Schwarz, Germany – **2006** Karthikeyan Subramani, United Kingdom **2005** Xiaolong Zhu, Germany – **2004** Michael Hänggi, Switzerland **2003** Yuelian Liu, Switzerland – **2002** Lisa Mayfield, Switzerland **2001** Leif Persson, Sweden – **2000** Alexandra Behneke, Germany **1998** Siegfried Heckmann, Germany – **1997** Joachim Hermann, USA **1996** David Cochran, USA – **1995** Daniel Buser, Switzerland – **1993** Franz Sutter, Switzerland – **1992** Dieter Weingart, Germany

The André Schroeder Research Prize

Established more than 20 years ago, the André Schroeder Research Prize is an annual award presented by the ITI in honor of the late Professor André Schroeder (1918–2004), the founding ITI President, who pioneered implant dentistry and whose lifework contributed significantly to modern dentistry.

Worth 20 000 Swiss Francs in cash, the André Schroeder Research Prize is today one of the most highly sought-after awards in implant dentistry. It is awarded to independent researchers for the advancement of dental research and development. The aim is to promote new scientific findings in implant dentistry, oral tissue regeneration and related fields.

The André Schroeder Research Prize is adjudicated by the ITI Research Committee. The ITI Research Committee is made up of international specialists in implant dentistry and related fields.

ITI International Team for Implantology

ITI National Congresses 2014-2015

Network Knowledge Credit points

Catch up on the latest in implant dentistry at one of our national congresses

Congrès ITI Francophone	November 7 – 8, 2014	Marrakech, Morocco
ITI Congress UK & Ireland	March 6 – 7, 2015	London, UK
ITI Congress Brazil	March 19 – 21, 2015	Gramado, Brazil
ITI Congress Germany	April 17 – 18, 2015	Dresden, Germany
ITI Congress Iberia	April 17 – 18, 2015	Madrid, Spain
ITI Congress Japan	May 9 – 10, 2015	Tokyo, Japan
ITI Congress Switzerland	May 9, 2015	Bern, Switzerland
ITI Congress Finland	September 11 – 12, 2015	Helsinki, Finland
ITI Congress Greece	October 10 – 11, 2015	Athens, Greece
ITI Congress Russia	October 10 – 11, 2015	Moscow, Russia
ITI Congress Middle East	October 15 – 16, 2015	Dead Sea, Jordan

More details at www.iticongress.org

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ITI Education Weeks 2015

ITI International Team for Implantology

ITI Education Weeks are the ideal place to refresh and extend skills associated with implant dentistry. They offer:

- Up to the minute evidence-based teaching
- Top lecturers at state-of-the-art facilities
- Continuing education credits
- Participation in treatment planning
- Surgical and prosthetic sessions: live and hands-on

The courses are delivered by leading academic institutions around the world in partnership with the ITI – an independent academic organization dedicated to all aspects of implant dentistry.

FEBRUARY 23–27: **ITI Education Week Melbourne**
University of Melbourne, Melbourne Dental School, Australia

JUNE 8–12: **ITI Education Week Boston**
Harvard School of Dental Medicine & Tufts University School of Dental Medicine, USA

JULY 15–19: **ITI Education Week Pretoria**
Oral and Dental Hospital, University of Pretoria, South Africa

AUGUST 24–28: **ITI Education Week Bern**
University of Bern, School of Dental Medicine, Switzerland

SEPTEMBER 6–12: **ITI Education Week Hong Kong**
University of Hong Kong, Prince Philip Dental Hospital, PR China

OCTOBER 21–24: **ITI Education Week Toronto**
Holland Bloorview Kids Rehabilitation Hospital, Canada

NOVEMBER 16–20: **ITI Education Week Porto Alegre**
Hospital Moinhos de Vento, Brazil

For more information go to: www.iti.org/educationweek.

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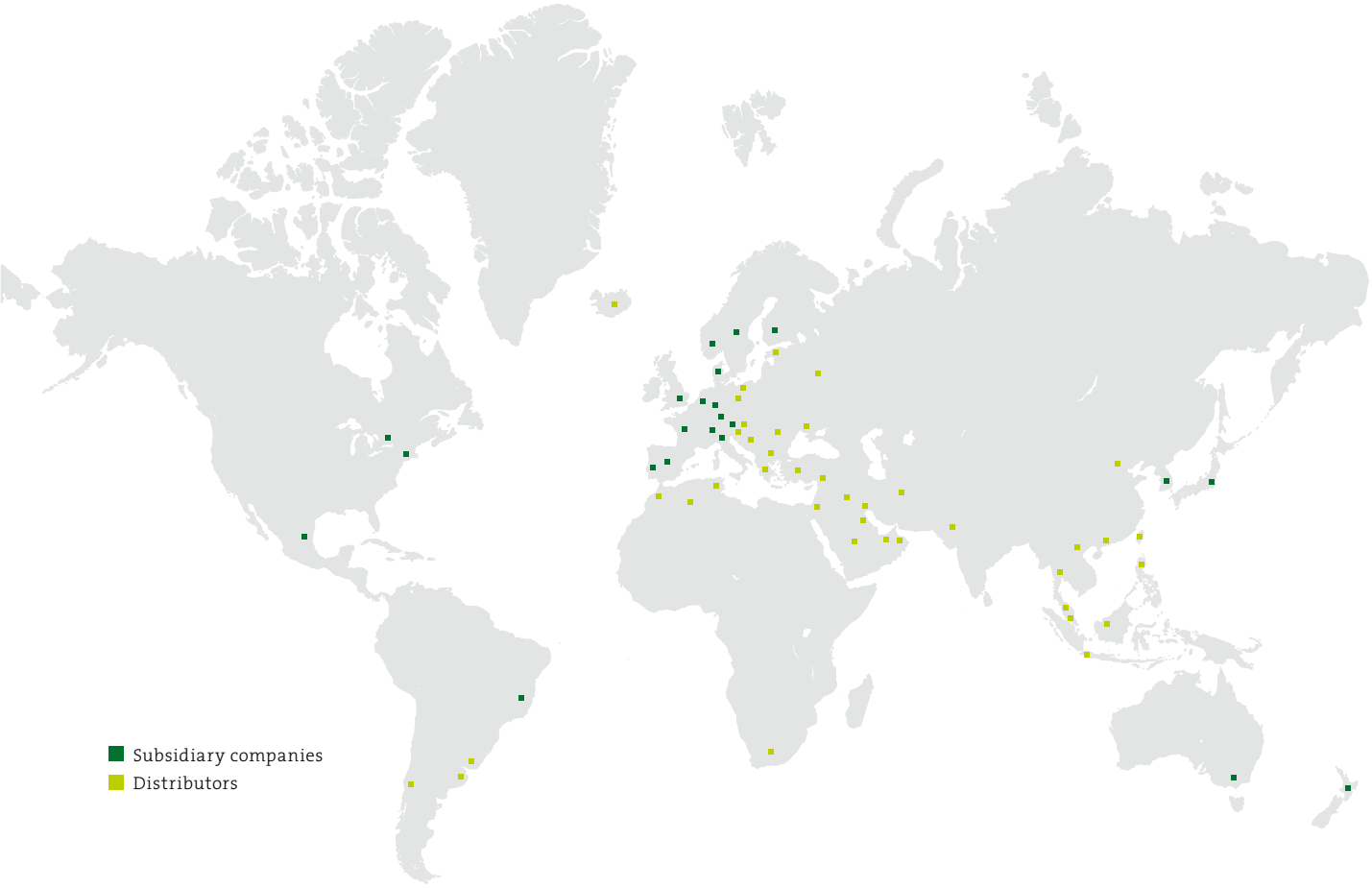

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