Therapy of craniofacial defects successful

Daniel Zimmermann

HONG KONG/LEPZIG, Germany: At a meeting on regenerative medicine and stem cell research in China, clinicians from Spain presented what could be a breakthrough in the treatment of craniofacial defects. With the help of Bone Repair Cells (BRCs) developed by the US company Aastrom Biosciences Inc., patients experienced new bone formation and nerve recovery in cases of severe mandibular osteoradionecrosis and osteomyelitis. Bone Repair Cells are derived from a small sample of the patient’s bone marrow, which is processed using Aastrom’s proprietary Tissue Repair Cell (TRC) technology to generate larger numbers of stem and early progenitor cells with enhanced therapeutic potential.

“The outcome of these treatments with BRCs has been very satisfactory,” observed early bone formation in the afflicted areas that eventually resulted in complete healing,” said Dr Jose Mendonca, Director of the Head and Neck Surgery Unit of Hospital POLUSA in Lugo in Spain and previously a Clinical and Research Fellow in Oral and Maxillofacial Surgery at the UCLA School of Dentistry. “Unexpected therapeutic results from treatment with BRCs include peripheral nerve regeneration or repair, new skin formation and proliferation in blood vessels in ischemic areas. The results open a promising pathway for the treatment of some patients where conventional therapies fail or do not exist.”

Ethical approval for compassionate use of TRC-based products was granted by the Spanish Ministry of Health.

In May 2008, Aastrom announced the re-prioritisation of its clinical development programmes to focus primarily on cardiovascular applications, thus discontinuing further patient enrollment in the US Phase III ON-CORE bone regeneration clinical trial. The company does not anticipate new clinical bone activity or reactivating the Phase III ON-CORE trial at the present time but will continue to treat patients on a compassionate-use basis in Spain. “Our bone programme remains open for participating. Encouraging compassionate-use treatments such as those noted by Dr Mendonca strengthen our bone programme portfolio, especially in EU,” said Dr Sheldon A. Schaffer, Aastrom’s Vice-President of Corporate Development and Intellectual Property.

Philippines to hold world record medical day

The Philippine Charity Sweepstakes Office has announced that it will run the world’s largest single-day medical mission in early September. The mission, which is part of the organisation’s 75th anniversary celebrations, aims to provide simultaneous medical and dental treatment to a record number of beneficiaries in the country’s 62,000 districts, also called barangays.

According to the organisation’s director Jose R. Tanu V, the agency will attempt to gain world prominence by gaining entry into the Guinness World Records, while reaching out to marginalised members of society who need quality medical assistance.

He said they intend to achieve this world record by clustering barangays and mobilising their 25 district offices nationwide, as well as enlisting the support of local government units (including the police and the military), church groups and other non-governmental organisations.

Millions of new HIV infections

A new report by the organisation UNAIDS has called on countries in Asia and the Pacific region to scale up HIV prevention programmes and structural interventions for men with high-risk sexual behaviour. The report released at the 9th International Congress on AIDS in Asia and the Pacific in Bali, Indonesia, notes that men who buy sex constitute the largest infected population group and most of them are either married or will get married.

This puts a number of 50 million women, often perceived as ‘low risk’ because they only have sex with their husbands, at risk of HIV infection.

Despite being in a relationship, at least 75 million men regularly buy sex from sex workers in Asia, and a further 20 million men have sex with other men or are injecting drug users, according to UNAIDS figures.

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Asia News

Malaysia takes on shortage of dentists

Malaysian National News Agency

PENANG, Malaysia: As a first step to establishing a National Oral Health Center, the Health Ministry of Malaysia has announced the formation of a Center of Excellence for dentistry in several hospitals nationwide. The center will be opened in stages later this year and cover various disciplines, such as mouth-cancer screenings and dental surgery, Health Minister Datuk Seri Luow Tong Lai told reporters at the Malaysian Dental Association’s AGM held in George Town last week.

The Health Ministry added that the center will be crucial for dental experts in his country to enhance their specialties in-line with current technological advancements. As oral health is becoming more complex, there is need for expertise and specialisation, he said. This year, the government has already given out 56 scholarships to students in selected fields of dentistry compared to 29 last year.

Malaysia is facing a shortage of dentists and needs to increase their numbers in order to cope with the increased demand for dental care. According to ministry figures, only 60 per cent of posts for dental officers in the Health Ministry were filled in 2008 and only 56 per cent of all dental specialist posts. The Health Minister said that his ministry aims to triple the number of dentists and increase the ratio of dentists to the population from slightly over 1:8,000 to 1:4,000 by the year 2017.

On 51 December 2008, there were 5,410 dentists in Malaysia, of which 241 were specialists. (Edited by Daniel Zimmermann)

Ancient teeth question origin of men

HONG KONG/LEIPZIG, Germany: Humans may have been evolved from primates in Asia, fossils found in Myanmar suggest. The jawbones and teeth of the primates related to a family of Asian anthropoids are ten times larger than Lucy, the famous African hominid, and challenge common theories that the ancestors of humans came from Africa.

The jawbones found in 2005 featured greatly enlarged canine teeth that distinguish the animal, also called Ganlea megastomata, from prosimians, a family of earlier and primitive primates that did not evolve into monkeys or apes. Heavy dental abrasion also indicated that Ganlea used its canine teeth to open tough tropical fruits and extract the nutritious seeds contained inside, a type of feeding adaptation that has never been documented among prosimian primates.

“These findings show that early Asian anthropoids had already assumed the modern ecological role of modern monkeys 58 million years ago,” Dr Beard said. Recent paleoanthropological research has been focusing on evidence that anthropoids originated from prosimian primates and some scientists also argued that primates such as Ganlea megastomata were not anthropoids at all.

(Edited by Daniel Zimmermann)
Micronesia study confirms oral health benefits of xylitol

Claudia Salwiczek
DTI

Recently, the use of a xylitol syrup rinse was confirmed to be effective protection against tooth decay. Researchers, who conducted a study in the Republic of the Marshall Islands where the caries rate is two to three times that of the typical American or European community, found that 16 ml of xylitol syrup could prevent up to 70 per cent of decayed teeth. The findings were presented in the July issue of the Archives of Pediatrics & Adolescent Medicine, and demonstrate the first evidence (to the authors' knowledge) that xylitol is “effective for the prevention of decay in primary teeth for toddlers.”

Scientists in Finland first discovered the beneficial uses of xylitol in dentistry in the early 1970s. Studies led by Profs. Kauko K. Mäkinen and Arje Schein at the Institute of Dentistry at the University of Turku proved that xylitol, which occurs as a sugar in the fibres of many fruits and vegetables, inhibits the adhesion of the caries-causing oral bacteria Streptococcus mutans.

Xylitol is widely used in a number of dental care products, including chewing gum, toothpaste and mouth rinses.

Beijing targets health

The government of Beijing has announced a ten-year plan for raising the average life span of its citizens through increasing health awareness and the improvement of health care services. Further objectives are to reduce obesity rates in primary and middle schools, as well as to lower mortality rates amongst pregnant women and babies, city officials told reporters at a press conference in August. Improved dental hygiene will also be a point of focus, they said.

Living conditions and lifestyles have changed rapidly in major Chinese cities like Beijing and Shanghai. An unhealthy diet rich in sugars, low exposure to fluoride in general and a lack of tradition in personal care and oral hygiene are major factors in increasing dental caries incidence rates. Growing tobacco consumption and excessive use of alcohol have also increased the risk of periodontal disease and oral cancer. Beijing has invested US$2 million in recent years on caries prevention programmes but needs to do more to improve oral health status amongst its citizens. According to the third national oral epidemiological survey in 2008, over 90 per cent of people in the city suffer from some form of oral disease.

Fang Laiying, director of the Beijing Municipal Health Bureau, said that the municipal government hopes to improve the health of locals comprehensively through the plan’s implementation. He said that the municipal government will work intensively to achieve the plan’s objectives, through popularising health information, such as correct toothbrushing, and advocating healthy food, tobacco control and more exercise. Efforts will also be made to further dental health care, eye care, personal health awareness, and safeguard the health of mothers and infants.

Laiying added that a committee for health promotion with personnel from 18 governmental departments had been set up by the municipal government to oversee the efforts of urban districts, suburban counties and relevant government departments in implementing the plan. The funds necessary for implementing the plan will be provided for in the city’s monetary budget, he said.

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Dental Tribune Asia Pacific Edition
Asia News 3

New
It's NEW. It's NANO. Get it NOW.
Dear reader,

Daniel Zimmermann

A friend of mine recently had a bacterial infection. In telling me about his problems, the first thing he mentioned was that he had experienced symptoms of dry mouth and matured biofilm. He had also suffered from hypersensitive teeth.

My friend’s example, though trivial in nature, is a good example by which to demonstrate the way the oral cavity functions as a window to our inside world. The latest research has shown that it can be a very reliable indicator of our inner state of health. Every day, the salivary glands secrete over 1.5 litres of saliva into the oral cavity, carrying with it valuable information. These biomarkers can be from sites of disease, or the salivary glands themselves can produce surrogate biomarkers of disease. The good news is that the information provided by these can be obtained non-invasively, painlessly and with no embarrassment to the patient—without needles or cringing.

Owing to these salivary properties, a dental examination today is no longer only about teeth and gums. Dentists should be aware that they are probably the first to detect signs of systemic diseases in their patients. Take HIV/AIDS for example: despite new, effective medication, the latest infection rates still demonstrate a continued increase in poor and developing countries alike. According to a recent report by UNAIDS, for example, an estimated 50 million women in Asia alone are at risk of becoming infected with HIV/AIDS by their intimate partners in the next decade. Early detection could significantly reduce morbidity here.

Oral fluid testing technologies are under development and already in use in several dental offices in Europe and the US. It will be years, perhaps even decades, before these tests are a regular part of every visit to the dentist, but there is no doubt that they will play a valuable part in the management and control of worldwide epidemics, such as HIV/AIDS or cancer.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

Dental Tribune welcomes comments, suggestions and contains all feedback at dental-tribune.com

**Opinion**

**“This species is getting more eccentric, don’t you think?”**

Daniel Zimmermann

The ASEAN member countries’ decision on foreign reciprocity or the Mutual Recognition Agreement comes at the backdrop of the economic global recession. The need for economic survival for everyone amidst these stressful times has become a primary concern; hence, is likely that many view this agreement as addressing a most important issue.

However, as a member of the academe, a part of me views the agreement as a noble programme; yet, the other part disagrees because not all member countries are on an equal footing. The accumulation of Continuing Professional Education (CPE) units is an obligation of the professional in his or her desire to further his or her skills. This ensures patients of a high level of quality of treatment. Unfortunately, not all participating countries in the ASEAN region have established guidelines set by the professional regulating bodies of their particular governments on this matter. I like countries such as Singapore, Taiwan, Japan and Korea, to name a few, who had these guidelines long before this agreement took place, the system in the Philippines was stopped for almost ten years, owing to a bill filed by a senator who argued that earning CPE units is optional rather than mandatory. Recently, owing to the passage of the new dental law in the Philippines, the acquisition of CPE credit units became mandatory again, for which we are so thankful, but unfortunately, the almost ten-year trial has not yet paid off.

**ASEAN agreement penalises Filipino dentists**

On a broader aspect, I see cooperation at work amongst the member countries because we come to the assistance of professionals in need of employment and patients with professional health care needs wherever they may be. The Philippines boasts of quite a number of dental professionals every year and we see this as an opportunity for us to alleviate the growing need for health workers in the ASEAN region. This reciprocal act of employing health workers internationally signals the need to apply a standardised guideline procedure to the delivery of health services, thus raising the level of care to a level consistent with that in the rest of the world. This minimises errors and maltreatment.

As a certain amount of CPE units is required of an applicant, it is possible that dentists from countries with no clear set of rules on their acquisition and recording may be denied employment, simply because their governments have not taken steps to ensure that all credit units earned by attending seminars, symposiums, conventions and the like have been properly recorded in the educational programme of their professional regulating bodies.

If that in-depth consultation with the various heads of professions involved in this agreement should have taken place prior to forging ties with our ASEAN neighbours, this could have led to further ironing out of kinks in the programme, thereby making it a better-accepted foreign reciprocity programme, which is fairly beneficial to all the health care providers in our region.

Christopher H. Fox

**Contact Info**

Christopher H. Fox is the Executive Director of the International Dental Research. He can be contacted at fox@iad.org.
FDA says mercury dental fillings not harmful

WASHINGTON, DC, USA: The US Food and Drug Administration said recently silver-coloured dental fillings that contain mercury are safe for patients, reversing an earlier caution against their use in certain patients, including pregnant women and children.

While elemental mercury has been associated with adverse health effects at high exposures, the levels released by dental amalgam fillings are not high enough to cause harm in patients, the FDA said, citing an agency review of roughly 200 scientific studies.

In 2006, Moms Against Mercury and three other groups sued the FDA to have mercury fillings removed from the US market. Later that year, an FDA panel of outside experts said most people would not be harmed but that more information was needed.

But Susan Runner, acting director for the FDA division that oversees dental devices, said there was no “causal link” between amalgam fillings and health problems. “The best available scientific evidence supports the conclusion that patients with dental amalgam fillings are not at risk,” she told reporters on a conference call. Over the past 20 years, the agency has received just 141 reports of problems in patients with the fillings, she added.

That conclusion counters a statement the agency made last June that the fillings may cause health problems in pregnant women, children and fetuses.

The FDA's decision could impact makers of metal fillings, which include Dentsply International Inc and Danaher Corp's unit Kerr, as well as distributors such as Henry Schein Inc and Patterson Cos Inc.

According to the American Dental Association (ADA), about 50 per cent of fillings given to patients are mercury-filled, with a growing number of patients instead opting for lighter, tooth-coloured options such as resin composites. The ADA, which represents the dental industry, backed the FDA’s decision not to restrict mercury fillings, saying alternatives are also considered “moderate risk” by the FDA. “The FDA has left the decision about dental treatment right where it needs to be—between the dentist and the patient,” ADA President Dr John Findley said in a statement.

But Charlie Brown, a lawyer for Consumers for Dental Choice, said poorer people or those who receive their health care through large institutions such as the US military are more likely to receive the cheaper, silver-coloured fillings and are at greater risk for harm. “Most consumers, and most dentists, have already switched to the main alternative, resin composite,” said Brown, whose group was part of the lawsuit settlement last June that called on the agency to issue more specific rules. His group is now weighing its legal options, he said.

Moms Against Mercury President Amy Carson said she was disappointed in the FDA’s reversal. Her group, along with several others, filed a new petition with the FDA on Tuesday, again calling for a ban on mercury fillings, she added.

(Edited by Daniel Zimmermann)

To the Editor

Re: “Americans support dental coverage in health-care reforms” (Dental Tribune Asia Pacific No. 6, Vol. 7, page 9)

Here’s the problem with Medicaid as it now stands. It is based on formularies of the late 1960s. In the late ’60s, my monthly S.S.D. [Social Security Disability] payments would have been a tidy sum. Medicaid’s “spend down” or “surplus” rules are based on these old formularies. With my S.S.D. payments being what they are, the so-called monthly “spend-down” I have to pay is currently US$265.00. Ergo, I have to pay US$265.00 before Medicaid pays for anything—like dental work. As a result, I have had no routine care for several years and now need six extractions, a full upper plate and partial lower plate. I recently had a dental emergency that took me to a hospital emergency room and their clinic performed the extraction. When I asked about the bill (100% of what I would need to restore my teeth, the estimate was US$1,720. (This is one of the best estimates I’ve received.) I would have to go into my rent budget for three months to do this—and then face exction. I would have been better off if I never worked a day in my life and came to this country as an illegal immigrant; they are covered. That’s what one gets for working twenty-five years and becoming disabled, I guess. Seems fair to you?”

Carol Dedman, 17 Jul., 2009

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“ I FEEL GOOD”

Findley said in a statement. The FDA's decision could impact makers of metal fillings, which include Dentsply International Inc and Danaher Corp's unit Kerr, as well as distributors such as Henry Schein Inc and Patterson Cos Inc. According to the American Dental Association (ADA), about 50 per cent of fillings given to patients are mercury-filled, with a growing number of patients instead opting for lighter, tooth-coloured options such as resin composites. The ADA, which represents the dental industry, backed the FDA’s decision not to restrict mercury fillings, saying alternatives are also considered “moderate risk” by the FDA. “The FDA has left the decision about dental treatment right where it needs to be—between the dentist and the patient,” ADA President Dr John Findley said in a statement.
Universities in the UK are reported to exploit a government policy that keeps British applicants out, while leaving no restrictions in terms of international applicants. According to newest figures released by the Higher Education Statistics Agency in London, the number of domestic higher education (HE) students enrolling at UK universities has stalled lately, while that of students coming to study from overseas has continued to rise.

After the US, Britain is currently the second most popular choice of destination for HE students. More than one university student in seven is from outside Britain, and those from outside the EU bring in 8 to 10 per cent of the total income of British universities, paying almost £1.9 billion in tuition fees last year.

The government has refused to fund enough places in order to accept extra applicants from the UK, even though the statistics are dampening hopes of the current administration of reaching the target of 50 per cent of 18- to 30-year-olds with a university education by 2010. Even after clearance, some 20,000 to 40,000 are expected to be left with no place at all this autumn.

Currently, there are 8,500 students enrolled in UK dental schools, of which 750 are from outside the EU.
“These are exciting times in which we live”
An interview with Prof. Thimios Mitsiadis, Head of the Institute for Oral Biology at the University of Zurich, on stem cell research in dentistry

These are exciting times in which we live. It is evident that in the near future—in about 20 to 30 years—we will be able to create new tissue with the aid of microbiology and genetics. Clinical studies that examine the use of dental stem cells for the regeneration of jaw bone are already underway. This is proof that progress in this regard is being made. We just need more information on how to achieve natural protection.

What progress has been made in stem cell research for the formation of enamel?

We recently formed a European consortium with researchers working with stem cells in Germany, Finland, Switzerland, Italy and France. The consortium’s objective is to isolate stem cells from teeth, the face and the head, and to use them to generate products. With stem cells, for example, natural implants could be produced. There are also tests being conducted in Italy to recreate teeth, but in my opinion this is far too complex to be realised at the moment. At this stage, we should only concentrate on creating tissue as a replacement for damaged or destroyed material, such as dentine and dental tissue.

Thank you very much for the interview.

This interview originally appeared in DT Germany No. 4, Vol. 7, 2009. Translation was provided by Annemarie Fischer, Germany.

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Dental CAD/CAM technology offers productivity, increases worldwide

Constantine Gart
De Kamperman Consultant
USA

NEW YORK, NY, USA and VANCOUVER, BC, Canada: Dental CAD/CAM technology has met one of the most important developments in dentistry today. Especially on the lab side, CAD/CAM technology is expected to increase productivity, enabling labs to meet the growing demand for dental prosthetics and other restorations.

This growth is a result of the aging population and the increasing demand for improved dental aesthetics. CAD/CAM technology has met challenges in satisfying dental laboratories’ expectations of what this technology will bring to their businesses. However, the technology is evolving at a rapid pace, as new trends and technological capabilities are emerging, representing the potential to surpass what it had initially offered dental laboratories.

Zirconia is the primary driver of CAD/CAM adoption, as the material can be milled into a crown or bridge only on a very low labor-intensive system, most often a CAD/CAM system. Zirconia’s biocompatibility and high aesthetic qualities have led to a rapid increase in its use for dental prosthetics.

For example, the number of all-ceramic prosthetic units projected to grow at a CAGR of 10.5 per cent in the United States and Europe, respectively, over the next five years. This is well above the growth rate of other materials, such as porcelain fused to metal (PFM), which will see relatively flat growth.

While a large and growing portion of dental technicians prefer to use all-ceramic over traditional materials, all-ceramic acceptance has been met with resistance from dentists. All-ceramic materials have had above-average failure rates, with limited long-term clinical data to validate their durability and reliability. As a result, conservatively-minded dentists have continued to rely on more traditional materials, such as non-precious alloys, titanium, acrylic, resin, and even gold.

According to implantologist and owner Dr Stefan Ihde, the company’s implants can be safely used for all indications with some limitations. The company, for example, allows this advantageous treatment modality to be employed in such a way that it is particularly appreciated by patients. The implant is inserted via conventional methods; the definitive restoration can be delivered within only five days.

In addition, Dr Ihde has been specializing in developing and improving the concept of fixed dental implants, resulting in several integrated implants that can be used in the minimum vertical bone supply, eliminating the need of harvesting bone grafts from the iliac crest, thereby performing comprehensive bone augmentation surgery.

All implant lines are continuously expanded, improved, and updated to incorporate and accommodate the most current scientific findings in oral implantology. Dental CAD/CAM technology offers manufacturers the potential to meet all the requirements of everyday clinical practice.

All implants are produced in Europe, meeting the most stringent German and Swiss quality standards. Ihde Dental is present in more than 20 countries through its network of qualified resellers, who, according to Dr Ihde, are committed to excellent service for their customers.

“We will continue to follow the consistent path of international expansion with a focus on key regions,” explains export consultant Gert Wieners. “This is why we have decided to present our implant product range at the FDI World Dental Congress in Singapore this year.”

Visitors of this year’s FDI Congress will be able to find Dr Ihde Dental at the World Dental Exhibitions booth L17. More information about the company’s implant lines and other product offers are available at www.ihde-dental.de and www.implant.com.

Dental CAD/CAM technology offers productivity, increases worldwide

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Zirconia is the primary driver of CAD/CAM adoption, as the material can be milled into a crown or bridge only on a very low labor-intensive system, most often a CAD/CAM system. Zirconia’s biocompatibility and high aesthetic qualities have led to a rapid increase in its use for dental prosthetics.

For example, the number of all-ceramic prosthetic units projected to grow at a CAGR of 10.8 per cent and 10.5 per cent in Europe are also under strain due to competition from other materials, such as China, Morocco, Turkey and Costa Rica.

The vast majority of dental laboratories around the world employ less than five dentists. Many of these laboratories have had enough volume to warrant the purchase of an expensive CAD/CAM system with in-house milling capabilities. To reach the smaller players in the market, CAD/CAM manufacturers such as 3M ESPE, DENSTPFL and Nobel Biocare have offered scanning units to dental laboratories, enabling the labs to scan and outsource the digital restoration to be milled at other locations (either a centralized milling facility or dental laboratories with in-house milling capability).

This purchasing option allows large dental laboratories that generate sufficient volume and revenue to invest in a full CAD/CAM system with in-house milling capability, whereas small to medium dentists can improve the option of investing in a lower cost scanning unit, simultaneously eliminating the continuing production costs of dental copings and frameworks.

Full CAD/CAM systems typically involve one scanner unit and one milling unit-in-house. A stand-alone scanner/CAD/CAM system consists of only a scanner unit, which sends the digital impression to either a centralized milling facility, or a dental lab with milling capability. The growing popularity of the two purchasing options is evident in the US and European markets, as there is an approximate ratio of one full CAD/CAM system to two stand-alone scanners in the two installed bases.

CAD/CAM systems are becoming increasingly more affordable to dental laboratories as their prices continue to drop. For example, in the U.S. market, the average selling prices (ASPs) of full systems and scanners are expected to drop at CADs of 4.8 per cent and 4.5 per cent, respectively.

Manufacturers and distributors are offering financing programs to help laboratories acquire the systems and, in some cases, are giving the system away for free on the condition that the labs manufacture a certain number of proprietary prosthetics. Likewise, the cost of the network the labs built by selling CAD/CAM systems is rapidly dropping; this, coupled with rising gold prices, has reduced the price of a zirconia crown almost to par with a gold crown. This has made zirconia milled frameworks a strong alternative to the traditional gold crown.

There are many dentists that only use PFM restorations and abstain from zirconia. To address this issue, CAD/CAM technology is expanding beyond its initial capability of milling only zirconia material and dental devices, to include other materials, such as non-precious alloys, titanium, acrylic, resin, and even gold.

This technological capability gives labs greater versatility in meeting customer needs by offering a greater breadth of materials and dental restorations.

The acceptance and integration of CAD/CAM technology into dental laboratories appears to be inevitable. Despite the many challenges that this technology has faced, ranging from uncertainty regarding the viability of zirconia material for dental prosthetics, to the use of technology’s economic feasibility, CAD/CAM technology has progressed and continues to adapt in order to offer greater versatility in services to both small and large dental laboratories.

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“We are very pleased with the market launch of NobelProcera.”

An interview with Domenico Scala, CEO of Nobel Biocare

LEIPZIG, Germany/ZURICH, Switzerland: Nobel Biocare, a world leader in restorative and aesthetic dental solutions, provides dental professionals with root-to-tooth solutions, including dental implants, all-ceramic crowns, bridges and laminates, guided surgery planning, scanners, and biomaterials. Dental Tribune Group editor Daniel Zimmermann spoke to Domenico Scala, Nobel Biocare CEO, about current developments within the company and the dental market.

Domenico Scala: Dr Soiron announced some time ago already that he would like to withdraw from one of his industry positions. His retirement as Chairman of Nobel Biocare will thus come as no surprise at the upcoming shareholders’ meeting in March 2010. Every business appreciates having a leader with Dr Soiron’s vision and personality at the reins. His decision, however, will have no influence on Nobel Biocare’s current strategy. The board will duly announce a successor.

The last quarterly results were assessed rather negatively. To what extent were these results due to economic factors and to what extent were they due to company management?

Even the dental market cannot remain entirely unharmed by the current economic crisis. This fact has been demonstrated by the economic results of various market participants for several quarters. However, we have worked intensively during the last 18 months to prepare Nobel Biocare for the future. We constantly work at advancing the company, and we steadily invest in research and product development, in order to continue supplying our customers with attractive innovations and treatment solutions.

What have these results given rise to?

We are orienting ourselves towards long-term goals. Our strategic tasks and the needs of our customers have become our focus. Of course, we are also working on our cost structure.

Will the growing markets in Asia or South America be able to absorb the losses of the North American and European markets in the long run, or do you believe the economic situation will show a relatively quick recovery?

I'm hesitant to speculate about the future. Currently, prospects are simply too uncertain. However, we can ascertain that the dental market remains an attractive market with much opportunity in the long-term. We would like to take advantage of this opportunity and are working towards this.

You have just signed an IT services contract with Computer Sciences Corporation (CSC). Are you planning for additional cost cutting?

There is nothing unusual about our collaboration with CSC as our new IT partner, as we have different requirements and demands for our global IT infrastructure to those we had some years ago. Optimising our costs is only one of the advantages.

As a market leader, what is your response to the circulating acquisition rumours?

These rumours have circulated for some years and, therefore, no longer bother us. Rather, these rumours confirm that we all move in an interesting and attractive market. As a matter of principle, we do not comment on speculations and rumours.

You have identified the transformed communication culture as one of the most significant achievement in your work at Nobel Biocare. What insights did you gain during this transformation process, and how was this knowledge implemented?

Customers, researchers and opinion leaders readily collaborate with Nobel Biocare and participate actively and willingly because we listen and have much to offer. Customers return and new clients join us because they are satisfied with our products and solutions and Nobel Biocare’s new direction. Thus development encourages me to further pursue this innovative direction resolutely. However, we are self-critical and know that we have to improve in terms of customer orientation, which is something that we continue working on.

In the present situation, it is difficult to discuss investment. What are your focal points in the current and following business year?

Even in these times, we invest in the development of new products and solutions. Last year we invested about €400 million. Our product offensive at Nobel Procera is an example. We are active in the implant segment, in which we are developing innovations. We also invest in the education and training of our personnel and customers.

With the acquisition of Optinet and AlphaBiotech, you have already responded to changing market conditions. Are you considering further takeovers?

Of course, we constantly investigate interesting opportunities. However, we have decided not to discuss concrete plans and projects.

How has the market launch of NobelProcera progressed, and what are the most significant advantages of this system in comparison to conventional systems?

We are very pleased with the market launch of NobelProcera. The new optical scanner and the accompanying innovative prosthetics software have been received with significant interest by dental laboratories. The same applies to our considerably expanded product range in the area of prosthetic dentistry, both dental and laboratory technicians are enthusiastic about the future product range and its quality, which sets new standards.

Which benefits are on offer for the dental therapist and the patient?

From this year on, dentists can choose from an extensive range of treatment procedures, products and materials, in order to provide his or her patient with the optimum solution. Therefore, patients will now receive a custom-made solution with the best possible fit, functionality, and aesthetics.

What is your evaluation of your position in the growing digital dentistry market?

We are well prepared for increasing digitalisation in dentistry, and we intend further improving our position.

Thank you very much for the interview.
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Fixed prosthodontic management of a mutilated dentition: A team approach

Introduction

Prudent clinical judgement and careful balancing of the risks and benefits of various treatment options are essential for a predictable long-term treatment outcome for prosthodontic treatment. It is known that loss of the vertical dimension of occlusion (VDO) may pose significant clinical difficulties in prosthodontic treatment. The clinical procedures for the re-establishment of a new therapeutic vertical dimension of occlusion is seldom taught in undergraduate dental curricula. VDO is defined as the superior-inferior measurement between two points when the occluding elements are in contact. Various methods have been proposed for the clinical assessment of the VDO. Loss of the tooth structure does not necessarily equate to loss of the VDO, as the VDO may be maintained as a result of compensatory dental eruption. When the clinical loss of the VDO is small, accurate diagnosis can be difficult. In this case study, the management objective was to determine whether there was any need for the re-establishment of the VDO in the case of small loss and whether the proposed change in the VDO was clinically acceptable. When the loss of the VDO is small, any change in the VDO should be based on the amount of inter-occlusal space required to restore the dentition to proper form and function. A significant alteration of the VDO should be approached with care, and unnecessary, excessive changes of the VDO should be avoided. In general, a significant change of the VDO should be monitored over an extended period.

Improvements in macroscopic implant morphology and surface treatments have led to the reduction of healing time and the concept of immediate loading of implants. Early implant loading is a successful protocol in selected cases. Providing that sufficient bone volume is available, flagless surgical implant placement is predictable and patients experience minimal post-surgical discomfort.

The posterior maxilla presents a unique challenge to implant placement when minimal bone height remains inferior to the sinus floor. Pneumatisation of the maxillary sinus occurs after extraction of molars. In addition, the posterior maxilla has poorer bone quality, mainly Type IV bone.

Placement of implants in grafted bone sites has a high success rate of osseointegration. Several authors have reported an approximate 92 per cent success rate of implants after sinus augmentation. However, immediate implant loading under such conditions is generally avoided. The low failure rate may be attributed to the placement of implants of greater lengths in grafted bone sites.

This case study describes the team approach management of a mutilated dentition, using different types of con-

Fig. 1: Pre-treatment intra-oral frontal view, presenting with attrition, loss of posterior support, reduced VDO and compromised aesthetics.

Fig. 2: Pre-treatment intra-oral occlusal view of the maxilla, showing dental attrition and inadequately restored molars. The orthodontic arch wire was broken.

Fig. 3: Pre-treatment intra-oral occlusal view of the mandible, showing dental attrition and inadequately restored teeth. A few of the orthodontic brackets were debonded from the mandibular incisors.

Fig. 4: Pre-treatment orthopantomogram X-ray, showing adequate endodontic fillings, over-eruption of maxillary molars, inadequate occlusal support and inadequately restored teeth. Posterior mandible bone bed was diagnosed as Type II.
Conventional and implant-supported fixed restorations with immediate-loading and delayed-loading protocol.

Clinical report

A 58-year-old patient presented with multiple missing teeth. The patient desired the restoration of function and aesthetics. He was undergoing orthodontic treatment. He presented clinically with moderate dental attrition, defective restorations, loss of posterior support, discoloration, mild loss of the VDO and compromised aesthetics (Figs. 1–5). The pre-treatment radiograph showed adequate endodontic obturation, missing mandibular posterior teeth, over-eruption of maxillary posterior teeth and attrition of the incisors. The dentition was free from active dental caries and periodontal probing was within normal limits. The maxillary left molar region bone was determined to be inadequate for the placement of dental implants. The mandibular posterior bone bed was diagnosed as Type 2B with sufficient bone density for early implant-loading prosthodontic treatment (Fig. 4).

The overall fixed prosthodontic treatment plan included placement of endosseous implants in the mandibular posterior area for prosthodontic rehabilitation, using the early implant-loading protocol; placement of fixed restorations in the maxilla and mandible; sinus lift with bone augmentation on the patient’s left side; and simultaneous bilateral placement of implants in the maxillary posterior area, using the conventional two-stage protocol. This was followed by the placement of implant-supported prostheses in the maxilla after a healing period of six months.

Maxillary and mandibular diagnostic casts were made of Type IV dental stone (Silky-Rock, Whip Mix). The casts were mounted on a semi-adjustable articulator (Hanau, Wide-view, Teledyne Water-pik). Diagnostic wax-up was carried out to restore the anterior teeth to proper form. The resulting diagnostic wax-up indicated that an increase of 1.0 mm in vertical dimension at the incisal pin level was required to restore the patient’s anterior teeth to proper form. Such level of change of the VDO had no practical need for prolonged provisionalisation before definitive prosthodontic treatment. The patient’s maxillary right second and third molars required a reduction of 2.5 mm gingivo-inciatal height, in order to re-establish a proper occlusal plane. All the natural teeth in the maxillary and mandibular arches required full coverage restorations. The maxillary right second and third molars were restored with an amalgam post-and-core foundation prior to full coverage restoration preparation. An adequate pre-existing composite resin core retained by a prefabricated post with sufficient ferrule was noted in the mandibular left second premolar.

On the day of teeth preparation, all teeth were prepared to receive full crown restorations. In order to establish anterior guidance, the treatment indicated that the restoration of the anterior teeth should be completed before or at the same time as the implant-supported restorations. The anterior teeth were then restored using the conventional way for complete coverage crown restorations.

The first objective of the present study was to compare shear strengths at the bone-implant interface between the SLActive implants and the TiUnite implants. The second objective was to compare the bone-to-implant contact between the two different surfaces. The hypothesis of the study was that the SLActive implants would promote a superior osseointegration to the TiUnite implants, as evaluated by biomechanical and histological means.

Thirty rabbits with a minimum age of 3 months were chosen for the study. Two test implants (Standard Plus, Ø 4.1 mm, RN, SLActive, 8 mm) and two control implants (Re-Place Select Taper, Ø 4.3 mm, TiUnite, 10 mm, corresponding to 8.5 mm Ti-Units) were inserted in the tibia, and one test and one control implant were inserted in the femur. The left and right side were randomised for test and control implants. Ten rabbits per time point were evaluated after ten days, three weeks six weeks of healing. Ten test and control implants per time point placed in the tibia were subjected to shear-strength testing. Thereby, the removal torque values were measured and the shear-strength values subsequently calculated. Histomorphometrical investigation was performed on all implants.

At ten days of healing, the SLActive implants yielded higher mean shear-strength values than the TiUnite implants without statistical significance. At three weeks and six weeks of healing, the SLActive implants yielded higher mean shear-strength values than the TiUnite implants (Fig. 1) with statistical significance.

The histomorphometrical investigation for the second objective of the study is still in progress. Thus far, this study strongly suggests that the interface shear strength of titanium implants is significantly influenced by their surface characteristics. The SLActive surface demonstrated higher shear strength with statistical significance in the tibia of rabbits compared with the TiUnite surface at three and six weeks after implant placement.

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Light-curing temporary filling material
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- no risk of damaging the preparation

Influence of surface properties on osseointegration

A biomechanical and histological study in the rabbit

Jan Gottlow, Sargun Bakkerno & Lars Svanberg Sweden

Fig. 1. Shear strength (Nm/11) after ten days, three weeks and six weeks after implant placement.

*p < 0.001 after three weeks, p < 0.001 after six weeks
Margins of the tooth preparations were kept supra-gingival, and no gingival displacement procedures on the prepared teeth were necessary.

Upon completion of the crown preparations, six endosseous implants (Nobel-Replace, Nobel Biocare) were placed by the periodontist in the posterior mandible using a flapless surgical protocol. All implants were placed with 15N·cm insertion torque (Fig. 5). No surgical template was used during the surgical phase; the prosthodontist was present during the implant surgery to ensure implant placement was prosthodontically acceptable.

Pick-up type implant impression copings (NobelReplace, Nobel Biocare) were attached to the newly placed mandibular implants. High-viscosity vinyl polysiloxane material (Aquasil Ultra Heavy, DENTSPLY DeTrey) was carefully injected onto all tooth preparations and the implant impression copings. A stock polytetrafluoroethylene tray loaded with putty material (Aquasil Putty, DENTSPLY DeTrey) was seated over the entire dental arch to make the definitive mandibular impression. The maxillary definitive impression was made in the usual manner, a centric relation record was made with a vinyl polysiloxane material (Regisil PR, DENTSPLY DeTrey).

The development of the definitive crown restorations was carried out as usual on the definitive casts. Except for the maxillary right molars, all maxillary and mandibular crowns supported by natural teeth were restored with Cercon (Degudent) full-ceramic crowns. Prefabricated abutments (NobelReplace, Nobel Biocare) were custom milled with a six-degree taper in the dental laboratory to facilitate the development of the restorations. Splinted, cement-retained, implant-supported mandibular restorations with porcelain occlusal surfaces were made of porcelain fused to metal material.

On the day of restoration delivery, the mandibular implant abutments were torqued down to 32 N·cm. The abutment screw holes were sealed with gutta-percha (Mynol, Block Drug Company). All the definitive crowns were cemented in resin-modified glass-ionomer luting agent (RelyX Unicem, ESPE, Figs. 8 & 9).

In the presence of the prosthodontist, three endosseous implants (NobelReplace, Nobel Biocare) were placed by the periodontist in the right maxillary posterior area. The treatment required a small increase in the VDO. It was therefore necessary to make impressions that registered all tooth preparations simultaneously.

The patient desired a high level of aesthetics; full-ceramic restorations were chosen for the anterior teeth. As the minimum core thickness for this full-ceramic system is 4.0 mm, this enabled conservation of tooth structure while achieving excellent aesthetics.

Traditional porcelain-fused-to-metal anterior crown restorations require the placement of labial crown margins within the gingival sulcus, in order to mask the transition between the root surface and the porcelain-fused-to-metal restoration. By prescribing full-ceramic restorations, intra-sulcular placement of crown margins on the labial surface becomes less important from an aesthetic standpoint.

In this report, the cervical tooth structure of the anterior teeth was free of caries, teeth preparation margins were made at the gingival level and gingival retraction procedures were eliminated. As gingival retraction cord packing was not required, mechanical trauma to the gingival tissues was reduced and significantly less clinical time was required. This is particularly beneficial for individuals with thin gingival biotypes.

Porcelain-fused-to-metal restorations were used in the posterior teeth because of the posterior teeth because of the complex functional prosthetic rehabilitation is a clinical challenge. Various restorative materials were used for this treatment. A combination of full-ceramic restorations and porcelain-fused-to-metal restorations with porcelain occlusal surfaces enhances the overall aesthetic outcome, as well as functional predictability. Various surgical and implant-loading protocols were used to ensure optimal results.

Conclusion

The clinical management of an aesthetically demanding, complex functional prosthodontic rehabilitation is a clinical challenge. Various restorative materials were used for this treatment. A combination of full-ceramic restorations and porcelain-fused-to-metal restorations with porcelain occlusal surfaces enhances the overall aesthetic outcome, as well as functional predictability. Various surgical and implant-loading protocols were used, to ensure optimal results.

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Managing oral health for good quality of life

An interview with Dr Stuart Smith, GSK

Dr Stuart Smith has worked as a dentist and teacher in several dental hospitals and schools in the UK. In recent years, he became Vice President of Global Dental Scientific and Professional Communications for GlaxoSmithKline (GSK), a large multi-national pharmaceutical company with an extensive consumer healthcare division. DT Asia Pacific editor Claudia Salwiczek spoke with Dr Smith about GSK’s approach to oral care management.

Claudia Salwiczek: Dr Smith, GSK is developing solutions for the oral health management of customers throughout the world. In your opinion, what impact do oral diseases have on people’s lives?

Dr Stuart Smith: Oral diseases can have a massive and varied impact on the lives of individuals, families and communities. Dental caries has been declining in many markets but remains a significant problem around the world not only causing pain for the individual but also days of schooling for children and work days for adults. Gum diseases remain a common reason for tooth loss which in turn can have a dramatic impact on someone’s self esteem. There is also an increasing focus in the links between oral health and its role in systemic health and the role that hygiene may have in the process. Other oral diseases, such as dentine hypersensitivity and xerostomia, can also impact an individual’s quality of life with patients having to modify the way they live their lives to cope with the condition. Hence improvements in prevention and treatment of dental diseases must remain a high priority.

You have been with GSK for 15 years. How does your work routine in a corporate environment compare to your university experience?

Much of the work is very similar; the objectives of dental academic researchers and industry are very closely aligned. Both are looking for ways to improve preventive and treatment outcomes for patients. Our task is to provide products that enable these improvements and this research and development is inevitably undertaken in collaboration with academic partners. What does the development process for new products look like?

Oral healthcare fits perfectly within the GSK company mission, which is to help people to do more, feel better and live longer. Within consumer healthcare all products that are developed must be expert recommended and consumer preferred so this means we need to work extensively with external experts and also consumer groups to ensure that the products that we develop will deliver against the needs of the dental profession.

To be successful as a company we need to develop products that patients find acceptable and want to use. It is therefore critical that we understand the needs and wishes of consumers to ensure that we provide products that meet their requirements and that they want to use. It doesn’t matter how effective a product is, it will only work if it is used.

We typically work with independent global teams to identify a new therapeutic area throughout new product development. This collaboration is ongoing right from the beginning of the project when professional insights and advice are sought right through to the research phase to publication of the work in scientific journals and scientific and educational symposia. This provides the evidence that dental healthcare professionals (HCP) around the world expect and demand.

So R&D has become globalised as well?

It certainly seems that the world is becoming a smaller place. Whilst historically most R&D has been conducted in Europe and USA it is now becoming much more evenly spread throughout the world. GSK consumer healthcare has now established R&D facilities and capabilities in India and China and are constantly seeking ways of building collaborative relationships in Asia to ensure we capitalise on the scientific expertise and capabilities in this region.

What are the benefits of these relationships?

Through such collaborations we access an extensive knowledge base and gain insights into the specific health needs of the individual countries. We also recognise that most important new therapeutic breakthroughs will be discovered by researchers in universities spread throughout the world. We embrace this through a system of open innovation where we partner with the inventors and collaboratively develop products and bring them to market. (Editorial note: For more information, please visit www.innovation.gsk.com.)

It seems that you are always working closely with HCPs... Absolutely! GSK and HCPs strive towards the same goal: understanding and serving the needs of the patients. In order to do so successfully, good communication and a close working relationship with HCPs are essential.

Where does the consumer factor in this process?

Consumers increasingly not only want to be healthy but to be happy with their smile and be confident in social settings without having to undertake time consuming habits such as consumers with dentine hypersensitivity avoiding ice cream or denture-wearers having to avoid hard foods. We spend much time and money talking with consumers both in groups and individually to really understand how they feel and what they want. The consumer insights that this generates enable us to develop products or educational materials that directly target the needs of our customers.

Can you give us an example?

A simple example is that whilst approximately one in three people report suffering from dentine hypersensitivity only half of these patients will actually mention it to their dentist and so the pain may go untreated.

With your Sensodyne toothpaste brand you say you have developed a solution for this problem.

Indeed. Sensodyne is the most widely used toothpaste brand in the world. It is the brand that dentists recommend and over time we have come to understand that the protection delivered by HCPs for the treatment of sensitised teeth. This success has been achieved through a close partnership between GSK and the dental profession and it is something we are extremely proud of.

We have been able to provide scientific support and educational materials on dentine hypersensitivity to both healthcare professionals and to our own staff who have been able to increase patient attendance at the dentist and encourage dialogue about the condition between patient and dentist. Through a thorough understanding of the aetiology of dentine hypersensitivity, we are able to provide products that patients and healthcare professionals want to recommend and use.

You suggested earlier, that people need to be educated in order to achieve a change in oral care behaviour. What are some of the measures GSK takes to facilitate this change?

Positive health behaviour change to prevent disease is generally very difficult to implement. Dental disease is no different in this regard. Other conditions such as obesity, type 2 diabetes and reducing tobacco usage. GSK works with dental health-care professionals to improve education amongst the profession and also in its communication with consumers. We undertake programmes to raise awareness of dental health, dental disease and measures that can be taken to control it. This can also serve to increase regular visits to the dentist and open dialogue between patients and dentists, which all help to facilitate positive health behaviour change. Attitudes to dental health and personal responsibility for our own health are also changing but take time as children’s attitudes will be heavily influenced by their parents’ experiences and beliefs. It is hugely advantageous if positive health behaviours can be established at a young age.

You suggested earlier, that patient compliance to oral care instructions is still an issue... Unfortunately yes. Dental professionals around the world are working hard to modify patient behaviour on a daily basis. We are aware that it is critical that the flavour and mouthfeel of our products are acceptable to drive compliance. It is no good having a really effective product if the patient won’t use it.

For some products such as Aquafresh, the flavour and mouthfeel are a real bonus during usage since most people want the therapeutic benefits delivered by fluoride but also like the sensorial experience of brushing and the resulting feeling of a freshly cleaned mouth and the confidence that fresh breath brings. It can be a similar situation with denture wearers who may be embarrassed that they wear dentures but find that keeping a denture clean with Polident is a fast and effective way of removing bacterial deposits. The resulting reassurance that denture odour is controlled leads to greater confidence in social settings and improved quality of life. This beneficial outcome provides positive feedback and encouragement to many patients. For other products it is a tougher challenge to deliver the efficacy with quite the same level of patients acceptability because the active ingredients that are required for the product to work can have a negative impact on flavour. The task is then to deliver the optimal sensory characteristics without impacting the efficiency. When a new product hits the shelf extensive testing will have been undertaken with large groups of consumers who have used the products at home in real life conditions for prolonged periods to ensure patient acceptability.

In summary, dental healthcare professionals and consumers are at the heart of everything we do. It is our goal to develop products that experts want to recommend and patients want to use.

Claudia Salwiczek: Thank you for this interview!

Dr Stuart Smith can be contacted at stuart.r.smith@gsk.com.
“Most people are worried it is often something worse.”

Dr Nick Rote. East Finchley, UK

1 in 3 people suffer from dentine hypersensitivity and over 50% of sufferers don’t mention it to their dental professional.¹ Research shows that this may be because they fear it requires major dental work, the pain may be variable so they don’t report it or because they may be using techniques to try and avoid the pain.²

These findings highlight the important role that dental professionals play in actively diagnosing dentine hypersensitivity.

Recommending daily brushing with Sensodyne is a simple, effective solution which is clinically proven to reduce the symptoms of dentine hypersensitivity.

“When they come back to see me next time, they’re very pleased that the solution was given to them so easily.”

² Canadian Advisory Board on Dentin Hypersensitivity. Consensus-Based Recommendations for the Diagnosis and Management of Dentin Hypersensitivity. J Can Dent Assoc 2003; 69(4) 221 - 228

*Sensodyne is a registered trade mark of the GlaxoSmithKline group of companies. Further information is available on request.*
The primary goal of periodontal-therapeutic methods is to introduce need-orientated individual oral hygiene and to enable and maintain perfect supra-gingival plaque control. After systematic sub-gingival instrumentation of the diseased periodontium, regular mechanical removal of the sub-gingival biofilm by a dentist or a dental hygienist is required. This combination is considered the ‘gold standard’ in periodontal treatment and with consistent application can maintain periodontal health over several decades.

A basic condition for the formation and progression of periodontal disease is an opportunistic infection that is mostly poly-microbial with pathogenic micro-organisms of the oral biofilm. Biofilm is an organised microbial accumulation on a humid surface (Fig. 1). This multi-layered structure protects bacteria from the immune system of their host and from anti-microbial agents, such as local and systemic antibiotics.

No scientifically proven alternatives to the mechanical removal of oral biofilm have been found to date. The organised bacteria do not only operate directly. Damage to the periodontium is inflicted, without bacterial invasion, in the corresponding compartments of the periodontal apparatus through the host’s immune reaction to the bacterial stimulus.

The progression of the disease, which varies from individual to individual, is determined by genetic, acquired and partly-modifiable risk factors.

Dr Clemens Walter & Dr Beate Mohr
Switzerland

Invasiveness of the instrumentation

Currently, several established and new, innovative instruments are available for the removal of the sub-gingival biofilm, as well as the scaling and root planning of the diseased periodontium. In addition to the removal of biofilm, the establishment of a bio-compatible root surface (even, hard and decontaminated) is a priority during initial instrumentation. For this, hand instruments, such as Gracey curettes (Fig. 2) and ultrasonic scalers with diamond tips, are indicated.

However, there can be several undesirable side effects with such a course of treatment. Patients often find the instrumentation of the diseased periodontium an unpleasant experience. Moreover, gingival recession may occur as a result of the treatment, which can lead to aesthetic impairment and dentine hypersensitivity. Long-term treatment of the root surface contributes substantially to the erosion of enamel, which can result in long brittle teeth.

During initial sub-gingival instrumentation, all concretions and calculi should be removed as far as possible. Supportive periodontal therapy (SPT) of the periodontium entails removal of the biofilm. Accordingly, minimally invasive and patient-friendly procedures like biofilm management are favoured in SPT (Fig. 5).

Air-abrasive polishers in periodontal therapy

In recent years, scientific interest has centred around the development of air-abrasive polishers for supra- and sub-gingival application. These systems use a mixture of an abrasive powder and water blasted onto the surface of the tooth. The application angle varies depending on the type of unit.

Initial variants using sodium bicarbonate or aluminium oxide powder were not approved for sub-gingival instrumentation. The application of sodium bicarbonate with a grain size of 250 µm resulted in massive dentine and cementum damage. In addition, trauma of the gingiva was observed.

The high degree of abrasiveness of these materials required the development of...
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new air-powder polishers, especially for sub-gingival application in periodontal therapy. The development of new air polishers focused on the reduction of the grain size and sub-gingival application through a special attachment.

The new generation of air-abrasive polishers

The recently launched glycerine-based powder Air-Flow Powder Perio (EMS, Switzerland) with a grain size of approximately 25 µm (d 50) allows sub-gingival instrumentation without damage to the cementum or gingiva. The powder-air mixture and rinse water are introduced sub-gingivally with a fine, flexible attachment. The triple-injector system causes spinning at the application site, which extends the effective range (Fig. 4). A follow-up polishing of the instrumented surfaces with rubber cups is often unnecessary, owing to this powder's reduced abrasiveness. The nozzle is for single use only.

Options for supra-gingival and sub-gingival application have been combined into one single device (Air-Flow Master, EMS, Fig. 5). Based on indication and the required abrasion, users can select various powder grain sizes:

• A Sodium bicarbonate-based powder (Air-Flow Powder Classic) with a grain size of approximately 65 µm (d 50) and rounded particles with a smooth surface is recommended for the supragingival removal of stains as well as before bleaching fissure sealing.

• A glycine-based powder (Air-Flow Powder Soft) with a grain size of approximately 65 µm (d 50) is recommended by the manufacturer for supra-gingival cleaning and in cases of difficult access due to an orthodontic appliance.

Evidence and first personal experiences

A recently published clinical study has shown promising results regarding the efficiency of Air-Flow applications containing glycine in SPT. According to the results, gentle and quick removal of the sub-gingival biofilm is possible up to a pocket depth of 4 mm. Significant irritation of the marginal gingiva was not observed. Surprisingly, patients found the instrumentation using air abrasion a more pleasant experience than instrumentation using traditional methods.

The first clinical experiences in Basel confirmed a high acceptance rate amongst patients. The procedure with minimally abrasive glycine powder is especially recommended for patients diagnosed with periodontitis with minor dental calculus formation. Closed or open peri-implantitis therapy is a further indication for treatment (Fig. 6).

Before treatment, the patient should be protected with safety glasses, protective attire and a sufficient layer of Vaseline on the lips. A prudent suction of the aerosols by the dental assistant further protects the patient and facilitates treatment. Access to higher pocket depths is critical and could be improved with the introduction of a more gracile and rigid nozzle.

To summarise, it can be concluded that at present minimally abrasive powder-air mixtures are a good alternative for SPT, owing to their low damage potential for periodontal tissue and high patient acceptance rate.

This article first appeared in Dental Tribune Switzerland No.11, Vol. 6, 2008. Translation was provided by Annemarie Fischer, Germany.
Matthias Kaiser was an English and French language teacher before becoming CEO of Kaiser Dental Laboratory in Germany. Today, he leads a team of four dental technicians in Singapore that produces and delivers dental prostheses for dentists in Asia and Europe. Dental Tribune Group Editor Daniel Zimmermann spoke with him about the working conditions in Singapore and his opinion of the dental laboratory market in Asia.

Daniel Zimmermann: Mr. Kaiser, where did the idea of establishing a dental laboratory in Singapore originate?

Matthias Kaiser: The idea came from my brother Christoph, who was hired by a French dental laboratory in the mid-1980s but was dissatisfied with quality standards. With his wife Farida, he founded the Kaiser Dental Laboratory in Singapore in 1987. We later followed with proDentum in Berlin for sales in Germany.

Quality standards in technology and service were more important to us than being the cheapest supplier in the market. Throughout the years, this concept has brought us a very stable business. We have seen many competitors copying our concept and constantly looking for favourable locations throughout the region; however, they still buy work that is more sophisticated from us.

Since the 1990s, a number of Asian countries, such as Singapore, have experienced considerable economic growth rates. What impact have these developments had on the dental market?

Dentistry is and will remain primarily a handicraft. Large entities like in other manufacturing areas, such as the textile industry, are not imitable. Even though there are quite a number of large laboratories in China, individual training and technical routine remain a problem. In the last couple of years, all other international laboratories have left Singapore and are now producing in China or Vietnam. However, conditions and quality standards in these countries vary to a high degree.

In a recent interview with DT Asia Pacific, the president of STD Lab Management in Beijing estimated that there are 5,000 dental laboratories in China. What is your opinion of this potential?

It is a question of quality and demand. In China, everything is mass-produced, but everyone who purchases dental prostheses in that country will soon realise the importance of quality and how difficult it is to retain quality in mass production. I think that Chinese laboratories will be producing for the expanding middle class in the country itself.

Have you thought of entering the Chinese market?

We would be on the same technological level again but more advanced in terms of organisation and marketing. The current trend shows that our view on this is on the right track.

Of course, when you receive an offer to buy an all-ceramic restoration for only €8, you start thinking about this option. However, when you see the product itself, you know that the purchasing of dentures cannot be approached in the same manner as the purchasing of fabrics.

We are patiently waiting for costs to explode in China. Then, we will be on the same technological level again but more advanced in terms of organisation and marketing. The current trend shows that our view on this is on the right track.

How do the working conditions in Singapore compare to those in Germany or Europe?

A well-trained dental technician in Singapore can earn as much as a technician in Berlin or any other part of Europe. Although we have experienced an increased cost of living in recent years, efficient labour organisation, the optimal utilisation of resources, and very low ancillary labour costs make production here still attractive, so patients in Germany and other countries can save a lot. As our laboratory in Singapore is certified by the German Technical Supervisory Association (TÜV), the basic conditions for production are more or less the same as those in Germany.

Which markets do you primarily serve?

Approximately 70 per cent of our prosthetic work goes to Germany and Austria, and 10 per cent to Norway and the Netherlands. The 20 per cent remainder goes to the fastest growing markets of Singapore and its neighbouring countries, where high-quality dental laboratory work is in demand.

Do you offer your services via established distribution structures or via the Internet?

We usually take the established routes because our efforts to install an IT-based processing system have failed in the past owing to the lack of a standard interface to the dentist.

At the International Dental Show in Cologne it was evident than automated production of dental prostheses is the future. What do you think of this development and will Asia soon follow the trend?

In Asia, where people customarily love new technology, these trends are likely to be followed much more quickly than in Europe. However, it seems that there is a long way ahead before all these technologies are able to replace the entire production process. If some day the price for a CAD/CAM-produced all-ceramic restoration is the same as that for a crown produced by hand by a dental technician in China or Singapore, things will probably change. Then we would no longer need to import laboratory work from abroad. I do not see this happening for a long time.

You recently opened a dental clinic. What services do you offer there?

At the clinic, we are working with patients from Singapore who are in particular need of high-quality implantology. There are many expatriates from Germany here and so we would like to hire German dentists. Unfortunately, the Singapore Dental Association is refusing to give us permission to hire them, even though we have already received applications from highly-qualified applicants. But we will continue to work on this matter.

Singapore has recently become a strong player in the medical and dental tourism market. Do you intend to participate in this market as well?

We believe that this could be a good investment, although only a few people would be willing to travel from Europe to Singapore. What we cannot predict at the moment is whether patients from more developed countries in the region will come to Singapore to seek dental treatment. The number of enquiries from Indonesia or Malaysia is noticeably growing. Meanwhile, we are looking for investors who would like to participate in the clinic’s expansion and support our marketing campaigns. And we are looking for Singaporean dentists who speak German well!

Are you planning any special activities for the FDI Congress?

Instead of distributing pictures and brochures, we invite all dentists to see our laboratory facilities ‘in action’ and to speak with our dental technicians and management about possible collaboration. Whoever is interested can just contact us, we’ll pick him or her up at the hotel and bring her or him back to the hotel again. Our staff speak Mandarin, Malay, English and German.

Thank you very much for the interview.

A well-trained dental technician in Singapore can earn as much as a technician in Berlin.
Miniscrews—a focal point in practice

Six-part series by Dr Björn Ludwig, Dr Bettina Glasl, Dr Thomas Lietz & Prof. Jörg A. Lisson—Part VI

Complications and risks

Preliminary remarks

The use of miniscrews facilitates many aspects of orthodontic treatment and in some cases actually makes such treatments possible. But miniscrew-based treatments, in common with all medical procedures, are not without their problems, complications and risks. It should be borne in mind that medical progress is only possible thanks to the pioneers and patients who are willing to enter uncharted regions. The major phase of miniscrew trials began in 2000. Today, the use of miniscrews is becoming increasingly established and consolidated, which means that the potential and limitations of miniscrews are also ever more apparent.

Miniscrews: Complications and risks

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Fig. 1: There are many possible causes of the premature loss of miniscrews. The most common of these are presentation-related.

A single problem or mistake during the planning and implementation of a miniscrew procedure can have various consequences and result in a number of complications. Often, a whole sequence of adverse events is triggered. At first glance, there is frequently no direct connection between the origin and outcome of a problem and/or a complication and its cause. Obviously, there are still several areas that have not been sufficiently researched. But we are becoming increasingly aware of what works well, what lies in the grey area between success and failure and what is bound to fail (Table 1). Because of this, it is responsible for the patient to be informed of the potential risks and the availability of alternative treatments. The most common complication is the loss of a miniscrew.

Success rate/failure rate

How low is the failure rate— or, to put it better, how high is the success rate—of miniscrew procedures? It would be easy to reproduce the figures from published studies, but these are not of interest; for example: the success rate is in the range of 0 to 100 per cent. The published results of clinical observation and ‘studies’ are all within this range. So, do we now know whether miniscrew XYZ is any good or not? And is this a suitable criterion on which to base the evaluation of a system or therapeutic approach?

A study by Behrens and Wirschmann reported failure rates of miniscrews inserted in the maxilla, for example, 100 per cent for Dual-Top and 70 per cent for AbsoAnchor. What does this actually mean? Is the AbsoAnchor better than Dual-Top? Here, cause and effect can be easily confused. One single region and a high rate of loss of two screws—surely this means that the insertion site was problematic or unsuitable. It seems probable that the outcome would be the same for all other mini-screws inserted at this location. It should be borne in mind that it is unwise to draw premature conclusions from figures alone. There are many possible causes for the loss or partial failure of mini-screws. As a rule, it is not the system itself that is at fault! The comparability of clinical situations and experimental designs is a problematic area. Patients’ reactions and their habits differ, the biomechanical concept can very greatly and so on. What is frequently not mentioned in published studies is the level of experience of the operating practitioner at the start of the study. This is an important factor in determining outcome. In view of the numerous influencing factors, a direct comparison of different studies is simply not possible.

Statistics themselves are of little value because ultimately it is individual experience that counts. There must be a willingness to learn, not only from one’s own mistakes, but also from those of others. The success rate should be well above 90 per cent, although a practitioner is unlikely to achieve this result by starting using miniscrews. There is a clearly demonstrable learning curve in connection with this form of treatment, particularly with regard to the insertion procedure. The cause of most complications lies within the surgical procedure itself.

Intragenic problems

As Figure 1 and Table 1 show, there is a whole range of possible causes of the loss of a miniscrew. In view of their diversity, it is only possible to consider a few aspects in the following discussion.

Planning and organisation

Careful planning is undoubtedly one of the key means to success. The same documentation and information required for other orthodontic procedures are perfectly adequate when planning a miniscrew treatment. The choice of biomechanical concept for the approach should be based on medical history, assessment findings (including possible concomitant procedures, see Overview 1), diagnosis, and treatment objective. The general conclusions and indications have been adopted from those that apply to implant procedures. The actual effect of these disorders and conditions on the use/outcome of miniscrew procedures has not yet been determined.

Screw location

The best site for the screw should be selected on the basis of the biomechanical concept. The following should be considered:

• There should be at least 0.5 mm bone around the screw on all sides.
• The screw head should be positioned on inflammation-free, attached gingiva.

It is most important to determine the quantity and quality of the bone at the selected site of insertion. This will provide initial indications of the quality of the bone to be expected (Fig. 2). However, an X-ray will only provide limited information in this respect, although it will make it possible to assess the spatial situation in two dimensions. This prevents or re-

Fig. 2: The desired mesialisation of the molars is not possible because of the screw location and because the springs are too short.
Overview 1
Local contraindications:

- Quantitative and qualitative deficiency of bone at the insertion site
- Insufficient bone or space
- Site in retromolar maxilla
- Insufficient bone or space
- Full thickness of gingiva
- Insufficient bone or space
- Screw head near mobile mucosa or extraction wound
- Screw head near mobile mucosa or extraction wound
- Dental follicle or not yet ossified
- Insufficient bone or space
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any stability commences shortly after insertion (Fig. 9). If this process is persistently inhibited (e.g., by micro-movements of the screw), the screw may be lost.

**Force application**

It is probable that using a miniscrew immediately or later to apply force has no influence on the failure rate. Forces applied should be such that no damage is caused to the teeth to be moved. When a miniscrew is coupled to elastic chains or springs, micro-movements of the screw can result. The distance between miniscrew and site of application of force of any springs directly attached to it should be kept to a minimum. Otherwise, these will be ineffective (Fig. 7).

**Post-operative complications**

**Inflammation**

There is a high probability that a miniscrew will fail if peri-mucosal or peri-implantitis develop. Metastasis or infradentbe (which includes instructs on oral hygiene) and that follow up is possible. During follow-up, examination of the screw (status of the surrounding tissue, stability of the screw) should be carried out. The positioning of attached elements (springs, extension arms) may cause the development of pressure sores or even ulceration of the mucosa. This is something that should also be monitored and treated as necessary.

**Oral hygiene**

The patient must ensure that adequate hygiene is maintained in the area around the miniscrew. A normal toothbrush should be used for this purpose. There is evidence that electric toothbrushes, particularly those with rotating heads, can loosen miniscrews, which can cause failure. In addition to the cleaning technique itself, the frequency and intensity of cleaning are undoubtedly also important. Very frequent cleaning that results in persistent micro-movement of the screw could well be disadvantageous.

**Liability insurance**

Orthodontists who wish to insert miniscrews themselves in their practices are frequently unsure about aspects of indemnity insurance. Policies available cover claims ranging from €1.5 to €5 million. When deciding on the extent of cover required (and thus the premiums that will need to be paid), the particular circumstances of the practice need to be considered. An indemnity insurance policy will also cover the practice’s personnel but may exclude temporary employees. Furthermore, there are any changes to the activities profile in the practice, the owner should verify that this is covered by the policy. The insurer will be happy to clarify this. There are insurance companies that do not differentiate between dental practices and orthodontic practices as far as their policies are concerned.

In cases in which an orthodontist is planning to personally insert miniscrews in an (aspects that has many advantages), this is usually automatically covered by the policy. This is what the policy refers to when specifying ‘with implants’ or ‘with surgery’. In any case of doubt, however, policyholders should always contact their insurers and inform them of the extent, the range of treatments provided, particularly if the policy does not specifically cover surgical or implant procedures. In this case, the annual premium is likely to be increased by €20 to €50 (applicable at time of writing, June 2007). In order to protect themselves should a claim of negligence be made, orthodontists should ensure that they follow certain basic rules.

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“Children are the best messengers for introducing behaviour change into family life”

An interview with Bella Monse about the ‘Fit for School’ initiative in the Philippines

The ‘Fit for School’ initiative in the Philippines began in 1998 as a small-scale project in Mindanao, one of the southern Philippine islands, incorporating 20 schools and focusing on oral-health education and dental treatment. Since then, it has developed into a registered NGO committed to supporting government and non-government agencies in conceptualising, implementing, monitoring and evaluating school health programmes. Dental Tribune International Group Editor Daniel Zimmermann spoke with Dr Bella Monse, a former dentist and now consultant of the German Development Corporation (GTZ) in the Health and Nutrition Section of the Department of Education in the Philippines, about the programme and how it could be helping to improve the oral health status of children throughout the Asia Pacific region.

Daniel Zimmermann: Ms Monse, you are going to introduce your country’s ‘Fit for School’ Health Programme at the World Congress on Preventive Dentistry in Thailand. Could you please explain what the programme does?

Bella Monse: The NGO ‘Fit for School’ supports the health and education sector in the Philippines in institutionalising an Essential Health Care Package for Filipino Children. This package implements daily hand-washing with soap and tooth-brushing with fluoride toothpaste, both as well as biannual deworming, as an integrated part of the public school system.

“Children are the main actors as they carry out the activities in the same organised manner, like the daily flag ceremony, under the leadership of classmates as group leaders. This daily routine in schools is familiarising children with healthy habits and may induce long-term behaviour change in family life.

What are the main advantages of an integrated school health programme?

In countries where diarrhoea and respiratory tract infections are still the major cause of death amongst children, two-thirds of the children are infected with soil-transmitted parasites (common worms), and virtually all children suffer from untreated dental caries, improvement in personal hygiene, focusing on hand-washing and tooth-brushing is the base for any health-care programme. Integration of oral health care into general health care will mainstream advocacy, pool resources, avoid overlap and simplify health programmes.

The latest National Oral Health Survey has revealed that 97 per cent of first-graders in public schools in the Philippines suffer from tooth decay.

The oral-health status of children in the Philippines is in an alarming state, and this is true for other countries in Asia as well. In the Philippines, caries amongst public school children remains completely untreated, leading to unnecessary pain and intra-oral infections. The National Oral Health Survey revealed that six-year-old children had an average nine decayed teeth in their mouth with 40 per cent of these teeth presenting caries with pulp involvement.

Twenty per cent of six-year-old children also reported toothache during the time of the survey and the condition is the main reason for school absenteeism in the Philippines. We have developed an index to measure the consequences of untreated caries—the PUFA index—which will be presented during the World Congress on Preventive Dentistry in Thailand.

What are the reasons for the neglect of oral health care and are there regional differences?

The main reasons are an unhealthy diet and lack of access to appropriate levels of fluoride. Daily tooth-brushing with fluoride toothpaste is not yet a habit for the majority of Filipino children in their family life. The National Oral Health Survey found the highest caries levels in highly urbanised areas and easily accessible areas (near high-street locations), where money for soft drinks and junk food is available, while caries levels in remote areas are lower, most probably owing to traditional nutritional habits.

The programme implements daily tooth-brushing with fluoride toothpaste and giving advice to visit the dentist twice a year. However, despite these efforts, children are eating junk food, not brushing their teeth and not visiting dentists. And how can children do so, if regular tooth-brushing is not a habit in family life, if toothbrushes and toothpaste are not available, and if there is no money to go to the dentist, even if children have toothache? Schools are the most effective places to introduce change, as children spend the majority of their day with their classmates and the teacher. Children are the best messengers for introducing behaviour change into family life.

The programmes are aimed primarily at school children. Yet, figures from watchdog organisations for children’s rights estimate that 16 per cent of young children in the Philippines work and thus do not attend school.

This is a sad fact and the real figures are even higher. Only about 60 per cent of children finish elementary school. All efforts have to be increased to achieve universal primary education, helping and encouraging parents to send their children to school.

You recently completed the first pilot programmes. What was their outcome?

These pilot programmes have already been scaled up to national policy and currently more than 650,000 children are enrolled in the programme. We expect that at the end of the school year 2009/10 more than a million school children will participate in the programme. With regard to the institutionalisation process, one of the most important outcomes of the pilot phase was the need for clear policies, mandating teachers to supervise the daily routine of hand-washing and tooth-brushing and integrate these into daily school activities. We also learned a lot concerning partnership with the parents and children’s homes.

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teachers’ association and community involvement, which is essential for the construction of hand-washing and tooth-brushing facilities.

With regard to the health outcomes of the interventions, hand-washing with soap has proven around the globe to be the most effective health care intervention in halving the occurrence of infectious diseases (specifically diarrhoea and respiratory infections). Our research has shown that daily fluoride tooth-brushing reduces the caries increment by 60 per cent and progression into the pulp by 40 per cent, while international published data on mass deworming of children provides the evidence for improved nutritional status and academic performance.

Education Secretary Jesli A. Lapus has announced plans to extend the programme to six million children by the end of 2010. Is this a realistic target?

The Philippines Education Secretary is actively promoting this programme, and he is accorded much attention within the Philippines and in the Asian region, especially in light of the H1N1 pandemic, for which hand-washing is important as well. The compelling concept of the ‘Fit for School’ programme, addressing high-impact childhood diseases in a comprehensive, yet simple, and cost-effective package, provides the backdrop for high expectations for a fascinating public health success story.

We aim to reach six million children, which is nearly 50 per cent of public school children, by the end of 2012. Backed by national and international health policies, ample evidence on effectiveness, clear implementation strategies and support from influential partners, this is a realistic target.

Dental hygiene has to be maintained throughout life. Do you expect the programme to have any long-term effects or is there need for further oral-health promotion programmes later in life?

Children are performing daily tooth-brushing in school and we expect that this will lead to lifelong behaviour change. It is known that children are the best messengers and agents of change for promoting and introducing behaviour change in family life. Limited data is available to answer this question, but promising results from research conducted in Scotland amongst high-risk children showed long-lasting effects, evidenced by a reduction in caries increment of 50 per cent compared with control children four years after the termination of a school-based fluoride tooth-brushing programme. We are just starting a comprehensive research project to evaluate the programme in terms of health outcomes, academic performance and behaviour change.

You said before that many countries in Asia demonstrate similar oral-health patterns amongst their youth. What lessons can your programme provide for countries that aim to implement similar programmes in their schools?

Countries that want to implement similar programmes have to focus on prevention and behaviour change. Only a few evidence-based interventions, which governments can afford for all children, are necessary for an essential school health package that answers to the demand and the local conditions of the public school system in their respective countries.

Thank you very much for the interview.

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