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—   The World's Dental Newspaper · Nordic Edition   —

PUBLISHED IN SCANDINAVIA

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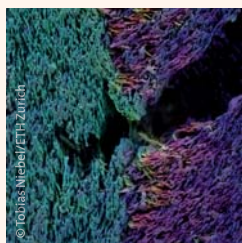
VOL. 1, No. 4



## A GATEWAY TO SMOKING?

A study from the University of Oulu has investigated how adolescents' smokeless tobacco use is linked to cigarette smoking and alcohol consumption.

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## BIOMETRIC TOOTH

Materials researchers from ETH Zurich have created an artificial tooth that mimics the complex structure of natural teeth almost perfectly.

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## CASE REPORT

Dr Irfêo Saraiva de Camargo on how to achieve natural aesthetics using modern crown and bridge materials for temporary restorations.

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# Xylitol: No benefits with braces

By DTI

**IOWA CITY, USA:** As xylitol has been shown to have decay-preventive qualities, especially for people at moderate to high risk of decay, orthodontic patients are sometimes advised to chew xylitol-containing gums or mints. A recent study, however, has found that xylitol has no clinical or bacterial benefit in these patients.

The study sought to investigate the long-term effects of xylitol on plaque and *saliva mutans streptococci*, which play a major role in the development of dental caries. The participants were divided into three groups. Those in the first group consumed six pieces of xylitol chewing gum per day for three months after each meal, resulting in a total daily intake of 6 g of xylitol. The second group ate 12 xylitol chewable mints per day for the same period, also resulting in a total daily intake of 6 g of xylitol. Participants in the third group served as controls and did not receive any xylitol application.



In the study, xylitol did not provide any additional measurable benefit as a caries prevention measure.

Clinical examination at three, six and 12 months after baseline showed that all three groups had a reduction in plaque scores. However, there was no significant difference between the groups. Based on their findings, the researchers

were unable to advocate its use as a caries prevention measure, since it did not provide any additional measurable benefit. They concluded that oral hygiene instructions and fluoride application were effective in study participants

whether or not xylitol was consumed. The study, titled "Long-term clinical and bacterial effects of xylitol on patients with fixed orthodontic appliances," was published in the October issue of the *Progress in Orthodontics* journal.

# Natural antibiotic

By DTI

**QUEBEC, Canada:** Researchers at Université Laval in Quebec may have found a promising agent for new periodontal therapy. In a laboratory test series, they tested the effectiveness of *Vaccinium angustifolium* Ait., an extract from the wild lowbush blueberry, against *Fusobacterium nucleatum*, one of the main species of bacteria associated with periodontitis.

They found that the polyphenol-rich extract successfully inhibited the growth of *F. nucleatum*, as well as its ability to form biofilms. This property may result from the ability of blueberry polyphenols to chelate iron, the researchers said. In addition, the extract blocked a molecular pathway involved in inflammation.

The researchers further stated that they are developing an oral device that could slowly release the extract after tooth scaling to help treat periodontitis.

# Preventing dangerous biofilms

By DTI

**BASEL, Switzerland:** The European Society of Clinical Microbiology and Infectious Disease (ESCMID) has published the first clinical guidelines aimed at preventing build-up of dangerous biofilm. The ESCMID's Study Group for Biofilms

(ESGB) further called for stronger collaboration between anti-bacterial researchers and the pharmaceutical and medical device industry in order to address increasing health risks posed by biofilms.

"Biofilms are becoming an increasing problem both for medical

device manufacturers and more crucially within clinical settings themselves. We are hoping that by publishing the guidelines and encouraging collaboration between research groups across Europe, there will be earlier diagnosis and more efficient treatments of biofilms in the future," ESGB Chairperson Prof. Thomas Bjarnsholt from the University of Copenhagen said in a press announcement.

The study group's guidelines include recommendations for the collection of samples and the use of the most reliable detection methods for biofilms. The guidelines also include evaluation of antibody responses to biofilms and guidance on susceptibility testing of antibiotics.

The guidelines were first published in the May issue of the ESCMID's journal *Clinical Microbiology and Infection*. More information can be found at [www.escmid.org](http://www.escmid.org).



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# Association between snus use, smoking and alcohol investigated

By DTI

**OULU, Finland:** Although the relationship between the use of snus and lifestyle-related habits has

the association between snus use and habits and attitudes regarding cigarette smoking and alcohol consumption among Finnish adolescents.

Data about snus use, habits and attitudes concerning smoking and alcohol consumption, as well as age, sex, school type and parents' educational and smoking back-

ing proved to be consistent across all school types and for both sexes.

Other factors that were significantly associated with adolescents' current snus use in the study were male sex, weekly consumption of alcohol and higher parental education, whereas parental smoking did not. According to the researchers, the results suggest that snus use among adolescents may signal an accumulation of other lifestyle-related risk behaviours, such as current or past smoking and alcohol consumption, as well as a positive attitude towards smoking. Thus, co-existing health-related risk factors, as well as sex and educational background, should be taken into account in order to target preventive messages more effectively through health promotion activities, they concluded.

The use of a diversity of non-conventional tobacco products has become commonplace and even increased in many countries, such as Sweden, Norway and Finland, in recent decades. In Finland, snus use among the youth is increasing despite an EU ban on the sale of snus since Finland joined the EU in 1995. As recently reported by *Helsinki Times*, personal imports of snus have increased by 65 per cent since 2008. According to statistics released by the Finnish tobacco industry and the National Supervisory Authority for Welfare and Health, Finnish residents brought a total of 600 million cigarettes and 10 million tins of snus into the country over the past 12 months.



Some studies have suggested that smokeless tobacco use could be a gateway to cigarette smoking.

not been widely investigated yet, some studies have suggested that smokeless tobacco use could be a gateway to cigarette smoking. Aiming to shed light on the issue, researchers from the University of Oulu have now investigated

The study was conducted as part the country's National School Health Promotion Study, a research programme that was established in 2000 in order to monitor the health and well-being of Finnish adolescents.

ground, was collected via a questionnaire. Altogether, 183,226 Finns between the ages of 13 and 19 participated in the survey.

More than two-thirds of the adolescents held positive attitudes towards smoking and alcohol, at 71 per cent and 67 per cent, respectively. Of the young Finns surveyed, 18 per cent had used snus in the past. Overall, snus use was more common among boys

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## In the study, current snus use was strongly related to smoking habits and attitudes towards smoking.

than girls. As for smoking, the study showed that 19 per cent of the participants smoked daily and 15 per cent were occasional smokers. Regarding alcohol, 11 per cent reported consumption of alcohol weekly and 57 per cent monthly or less frequently.

The analyses showed that adolescents' current snus use was strongly related to their smoking habits and attitudes towards smoking. Moreover, current snus users tended to be current smokers and reported positive attitudes towards smoking. The latter find-

Although smokeless tobacco such as snus has been found to be less harmful than cigarettes, it can cause mouth sores and dental cavities and generally raises the risk of several diseases, including oral cancer, pancreatic cancer and oesophageal cancer.

The study, titled "Use of snus, its association with smoking and alcohol consumption, and related attitudes among adolescents: The Finnish National School Health Promotion Study", was published on 24 October in the *Tobacco Induced Diseases* journal.

### IMPRINT

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The World's Dental Newspaper - United Kingdom Edition

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# Artificial tooth mimics nature

By DTI

**ZURICH, Switzerland:** Materials researchers from ETH Zurich (the Swiss federal institute of technology) have developed a new procedure that allows them to mimic the structure of biological composite materials, such as teeth and seashells.

Using the new technique, they produced an artificial tooth whose surface is as hard and structurally complex as a real tooth, while the layer beneath is softer, just like natural dentine.

Although the MASC results are promising, the appearance of the material has to be significantly improved before the technique can be used for dental prostheses, Studart remarked. For the time being, the results offer proof that the natural fine structure of a tooth can be reproduced in the laboratory.

Although other methods exist to imitate nacre or tooth enamel, up to now it was a challenge to create a material that mimics the complex structure of the entire seashell or tooth.

As reported on the EHT website, the magnetisation and orientation

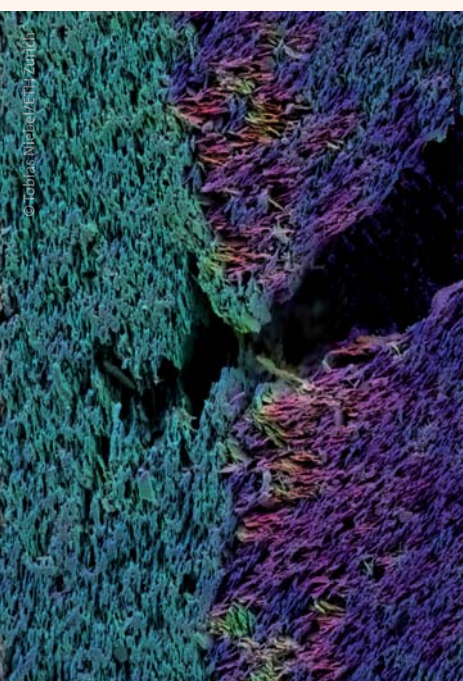
of the ceramic platelets in the MASC process has already been patented.

The study, titled "Magnetically assisted slip casting of bioinspired heterogeneous composites", was published online on 21 September in the *Nature Materials* journal.



Natural tooth in its gypsum mold, artificial tooth (sintered but not yet polymer infiltrated), finished artificial tooth embedded in a "puck" to enable polishing.

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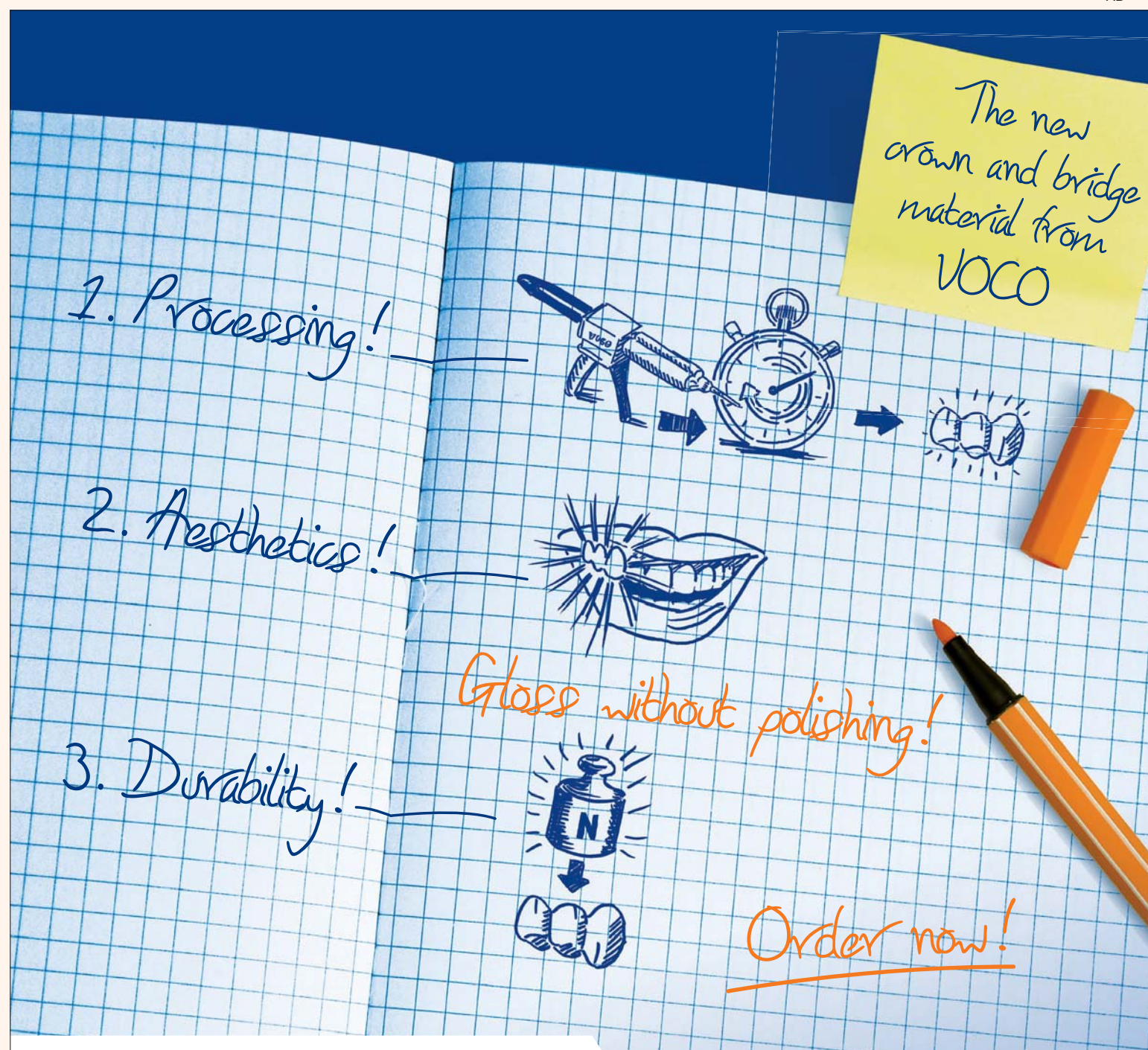


Layer structure of the artificial tooth under the electron microscope.

"Our technique is similar to 3-D printing, but ten times faster and much more cost-effective," said Dr Florian Bouville, a postdoctoral researcher from the ETH study group. The new method, called magnetically assisted slip casting (MASC), allows for the creation of complex composite materials that are almost perfect imitations of their natural models.

In order to demonstrate the technique's potential for future applications in dentistry, the researchers produced an artificial tooth. "The profile of hardness and toughness obtained from the artificial tooth corresponds exactly with that of a natural tooth," said lead researcher Dr André Studart, Professor of Complex Materials at ETH, pleased with the results.

In the MASC process, a plaster cast is filled with a suspension containing magnetised ceramic platelets. In order to achieve the unique structure of the natural models, in which numerous micro-platelets are joined together in different layers, a magnetic field is applied during the hardening process and its orientation changed at regular intervals. The ceramic platelets align to the magnetic field, resulting in layers with differing material properties in a single object.



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## Structur 3



# Choose black, get white— The gentle approach to whitening

Swiss brand CURAPROX is now offering a whitening toothpaste. Activated carbon gives the toothpaste both its colour and its name:

Black Is White. To maintain good oral health, stains are removed by activated carbon instead of abrasion or chemical bleaching.

In pursuing its goal of effective and atraumatic products, CURAPROX chose activated carbon as the active ingredient for its gentle whitening

toothpaste. This ingredient removes stains without abrading the enamel or using a chemical bleaching agent. Instead, it absorbs stain

particles and gently eliminates them. Moreover, the whitening effect of activated carbon is enhanced by optical means: a blue filter reduces yellow discolouration. This helps to make teeth appear whiter without the use of chemical agents.

As the toothpaste is gentle and contains 1,450 ppm sodium fluoride, it can be used as regular toothpaste without any limitations. Sodium fluoride acts quickly and creates a more neutral environment. Black Is White also contains enzymes that occur naturally in the saliva. These enzymes enhance the saliva's antibacterial and antiviral functions. In addition, they protect against tooth decay and help to combat dry mouth. Another component, nano-hydroxyapatite, aims to protect the teeth. Owing to the close similarity of its structure to tooth enamel, it serves as a protective layer on the tooth. Additionally, it has been found to have a remedial effect on damaged tooth enamel and can even reverse incipient caries.

Black Is White does not contain triclosan or sodium lauryl sulphate. This surfactant, which is present in almost all toothpastes, dries the mouth and causes damage to the mucous membranes, leaving the mouth susceptible to aphthous ulcers. Black Is White has a refreshing lemon taste and is available in an extra mild flavour under the name White Is Black.

Swiss-owned company Curaden is a pioneering expert in oral health and individual dental prophylaxis, based in Kriens near Lucerne. Its unique range of oral health products have been created and developed in Switzerland under the brand name CURAPROX since 1972.

Together with dental professionals in teaching, research and practice, the company introduces products that serve one purpose only: to keep teeth healthy for a lifetime. The company's collaboration with Swiss dentists, dental hygienists and university specialists has produced a wealth of knowledge about cleaning techniques and dental care—and about products that combine true benefits with real comfort: atraumatic, effective and accepted.

CURAPROX's wide range of products for dental prophylaxis include its flagship product, the ultra-soft CS 5460 toothbrush with 5460 CUREN bristles, which are very effective against plaque and gentle on the gingiva. Other unique products are the long-life Prime interdental brush line with a non-breakable CURAL wire, and the non-staining chlorhexidine rinse CURASEPT ADS. Today, CURAPROX is represented in more than 60 countries worldwide.

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# Perfect provisional restorations

## A case report

By Dr Irfêo Saraiva de Camargo, Brazil

In this article, I present a case that demonstrates that using modern temporary crown and bridge materials facilitates the fabrication of temporary restorations that achieve natural aesthetics and meet the highest standards of reliability.

Patients have high expectations, particularly when it comes to the aesthetic results of dental restorations. This is because, on the one hand, sub-optimal results are mostly visible straight away and, on the other hand,



Fig. 1: Full-face portrait of the patient.—Fig. 2: Inharmonious maxillary anterior region; tooth #22 is missing.

over the wax-up on the model and the resulting impression was then trimmed carefully. The course of the vestibular gingiva can only be checked when the impression is in place; incised markings enable precise intra-oral positioning of the impression. This was followed by the careful selection of shades for the patient.

The method presented describes the fabrication of a restoration and simultaneous adhesion to the conditioned teeth in one step. Alternatively, the temporary restoration can be produced and finished in the conventional manner, that is without simultaneous adhesion. Temporary adhesion is then carried out in a separate step.

cone impression was filled with Structur 2 SC (VOCO; Fig. 13) and re-inserted on the dental arch (Fig. 14). During the plastic phase, the excess material can simply be removed owing to prior careful adaptation of the impression, and the correct amount of time for which the impression must remain in the mouth can be reliably determined based on the degree of polymerisation of the material in the mouth. Owing to the prior adhesive stage, the restoration remains in the mouth during this time.

After complete polymerisation, after four minutes, the temporary restoration can be carefully finished intra-orally. Suitable instruments for this are a sharp scalpel and different-sized carbide rotary instruments. Should minor corrections be necessary, these are done using the material itself or the light-curing (flow) composite. The finished result is achieved



Figs. 3 & 4: Close-ups of the clinical situation.—Fig. 5: Lateral view from the right.—Fig. 6: Lateral view from the left; tooth #22 is missing.—Fig. 7: Inharmonious dental arches.—Fig. 8: Dysgnathic tooth position.—Fig. 9: Frontal view of wax-up.—Fig. 10: Detailed view of wax-up.—Fig. 11: Right side of wax-up.—Fig. 12: Left side of wax-up.—Fig. 13: Filling of the silicone impression.—Fig. 14: Reinsertion of the filled impression.

“beautiful teeth” are all-important to achieve that radiant smile.

Modern methods assist dentists in many ways, allowing them to achieve predictable results, especially in terms of aesthetics. In addition to the use of radiographs, photography and special software that can simulate various results on screen, the diagnostic mock-up is important, as is consultation with the patient, which also deals with the limits of dental restorations. The mock-up enables the result of the planned treatment to be assessed in advance and requires comparatively little time and effort. Moreover, the result can be realised on a temporary basis using the relevant materials without having to perform irreversible invasive measures straight away.

The temporary materials used in this process are of particular importance. They must be available in the respective tooth shades and be able to withstand the high loads in the oral

cavity for the time required by the patient to accept or, as the case may be, reject the changes effected with the temporary restoration.

This clinical case is an impressive example of the possibilities that the combination of a wax-up and mock-up offer. A 27-year-old female patient presented to the practice wishing to improve the situation in her maxillary anterior region, which she felt was unsatisfactory (Figs. 1 & 2). The date for her wedding had already been set. The findings showed agenesis of tooth #22, marked palatal dislocation of tooth #12, the inhomogeneous course of the maxillary anterior arch, clearly separated central incisors, as well as further malpositions in the maxillary anterior region (Figs. 3–8). The analysis of the posterior region showed a clear Class II malocclusion.

To begin with, impressions of both jaws were taken and models were produced. After careful analysis of

the models, a diagnostic wax-up was prepared of the maxillary anterior region with the aim of correcting the malpositioned teeth, replacing the missing tooth and visually shaping the dental arch (Figs. 9–12). In the next step, a silicone impression was taken

Next, teeth #13–23 were selectively conditioned for 5–10 seconds using phosphoric acid, the acid was rinsed off and an adhesive compatible with self-curing composites was applied to the etched areas. After light polymerisation of the adhesive, the sili-

using appropriate silicone polishers for composite materials.

Oral hygiene is of great importance. Interdental brushes, dental floss and, as a further aid, a chlorhexidine-containing oral rinse were used on a regular basis. As far as the patient was concerned, the outcome was worth the substantial time and effort required. When her reluctant smile prior to the treatment is compared with her smile after finishing the temporary crowns, the difference is striking (Figs. 15–21).

Dental experience, the targeted use of diagnostic measures, manual dexterity and the use of high-quality materials led to the impressive result, which won over the patient even as a temporary version. From a dental perspective, this first stage of treatment to visualise the end-result proved to be a complete success. The patient and dentist were able to test the final result without the need for any invasive measures. In this case, the patient was



Figs. 15 & 16: Temporary restoration of the maxillary anterior region.



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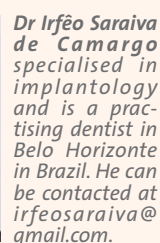




The patient is currently undergoing orthodontic treatment. The goal is alignment of the maxillary anterior teeth and closure of the gap between the existing teeth. Furthermore, the dental arches are to be harmonised and stable occlusion is to be produced. After conclusion of the orthodontic measures, the missing tooth will be replaced—the final course of treatment for this has yet to be decided. Restoration with a mini-implant or with an adhesive bridge is conceivable.



Model and photographic analysis, diagnostic wax-up, mock-up and temporary restorations are important tools for communicating with patients and demonstrating the envisioned results. Using the method presented here by way of example, this can be accomplished without the need for irreversible treatment steps and only requires comparatively little time and effort. The prerequisites are careful diagnosis and the use of high-quality products for the temporary restoration.

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■ From 19 to 21 November, the Finnish Dental Congress and Exhibition will once again convene Finland's dental community at Messukeskus Helsinki, the city's expo and convention centre. The event, being held for the 77<sup>th</sup> time and organised by Messukeskus together with the Finnish Dental Society Apollonia, will highlight the latest developments in industry, science and research.

Over 100 dental manufacturers and suppliers have already registered for the fair, which attracts decision makers and dental professionals from Finland and abroad. In 2014, about 8,400 dentists, dental nurses, dental hygienists and other dental professionals, as well as students, visited the event, making it the largest annual dental conference and exhibition in Finland.

At this year's event, scientific lectures will address topics such as treating the elderly, special needs in orthodontic therapy, heart disease and angiopathy, as

well as innovations in dental equipment, treatment and workflow optimisation. Parallel to the lectures and training sessions organised by Apollonia, Messukeskus will be hosting an educational event for dental hygienists and dental nurses on oral health.

The exhibition will take place in Halls 1 and 2, directly alongside the lecture hall. Attendees are also invited to visit the Information Clinic, where exhibitors will be giving presentations. The Information Clinic is located in the exhibition area and is free of admittance for all visitors.

On Friday, attendees are invited to the Happy Hour event in the exhibition area. From 16:30 to 17:30, guests can connect with friends and colleagues in a relaxed atmosphere with entertainment from a surprise musical act.

More information about the congress, evening programme and exhibition is available at [www.hammaslaakaripaivat.fi](http://www.hammaslaakaripaivat.fi). ◀



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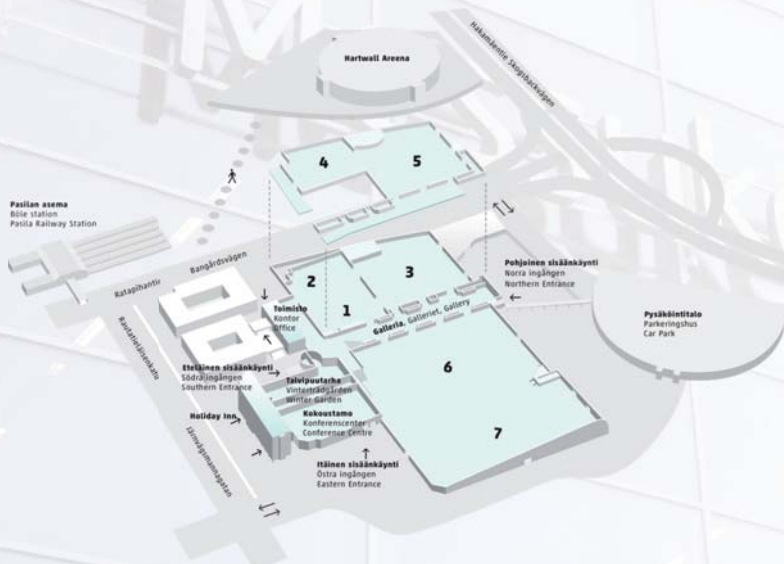
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- Saturday, 21 November: 10:00–14:45



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