

DENTAL TRIBUNE

— The World's Dental Newspaper · ASEAN Edition —



COVID-19 pandemic:

Young dentists concerned, doubtful about their future in dentistry

3D printing: Study examines dentists' user experiences and spending

Dentists providing cosmetic injectables to require licence



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EDITOR'S MESSAGE

We have come to the second issue of *Dental Tribune ASEAN* in 2022! Throughout the period, we have received so much love and feedback from our readers that we are truly grateful and appreciate. As we're coming into April, we have witnessed a few key events around the world. From the number of COVID-19 cases exceeding 300 million worldwide, the 2022 Winter Olympics, to the increase in global food prices.

Unilever's family of oral care brands has launched the "Don't Wait Until It's Too Late #TalkToADentist" campaign which aimed to tackle the inequality of access in conjunction with the World Oral Health Day on March 20. This campaign also premiered a film that centered on the importance of taking precautions early to prevent tooth loss. Unilever also provided free dental check-ups and consultations to tackle barriers to access such as distance and dentist availability.

In the local scene, Malaysia has upregulated dental services effective January 1, 2022. This regulation was made by the Minister of Health to ensure the quality of dental services and patient safety are guaranteed. This




Susan Tricia
Editor

is also because dental treatment is popular with medical tourists to Malaysia, but the quality has always been an issue. The new Act also requires only qualified and registered practitioners to provide dental services.

Dental Tribune ASEAN will be circulated in dental exhibitions, seminars, and even webinars across ASEAN providing additional mileage for advertisers of the magazine and reaching out to new subscribers. Visit our website at asean.dental-tribune.com for more updates. Let's do our part and get vaccinated.

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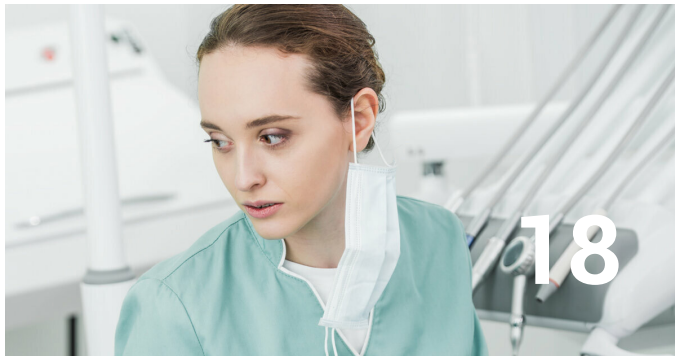
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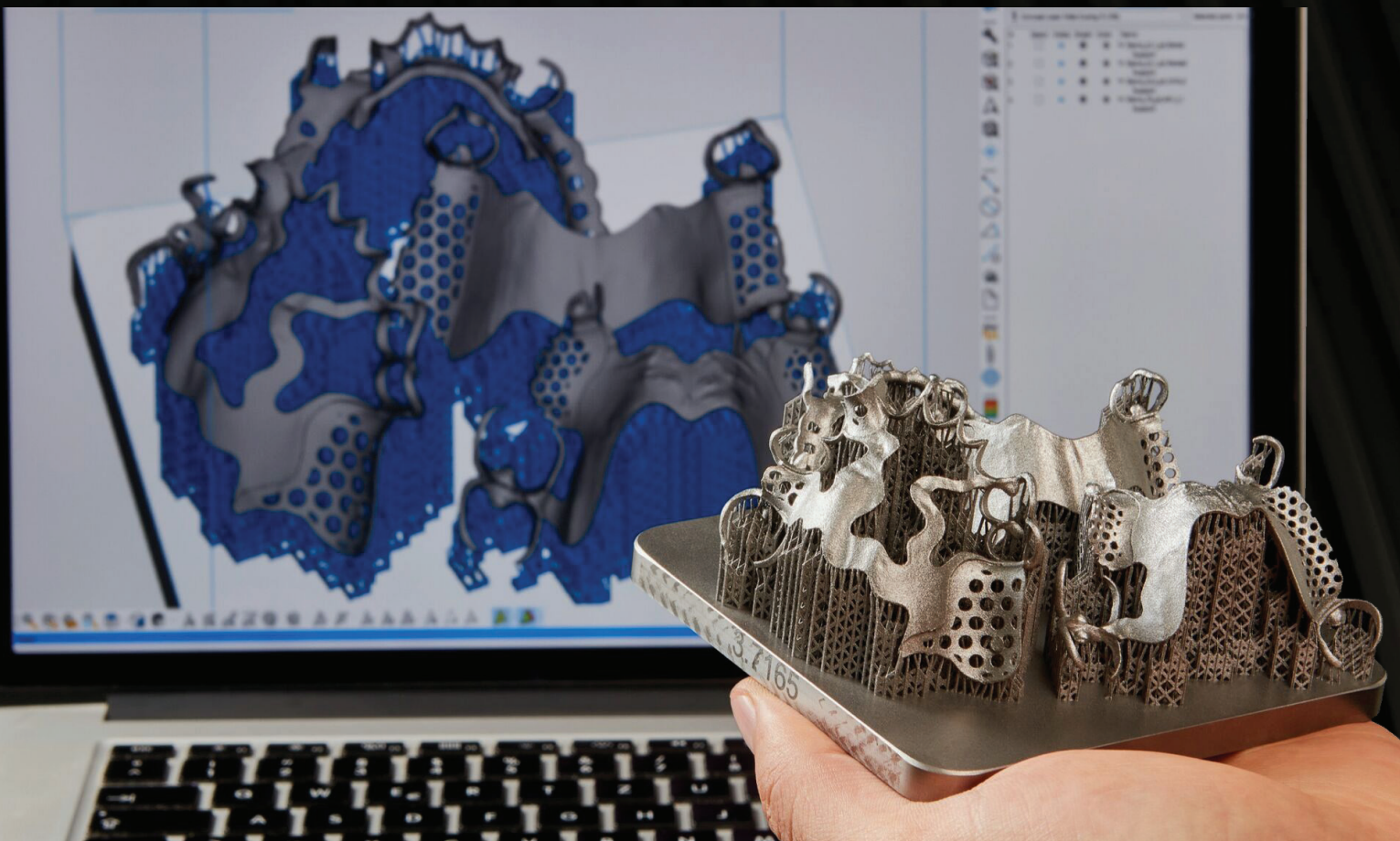
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3D printing: Study examines dentists' user experiences and spending

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Mussel-inspired compound enhances adhesion of dental filling material

By Franziska Beier, Dental Tribune International

A mussel-inspired compound has been found to improve the durability of the resin–dentine bond and the longevity of dental fillings.
(Image: C E Newman/Shutterstock)

Moisture is one of the greatest challenges for dental fillings, as it reduces adhesive performance. To overcome this obstacle, researchers from the Faculty of Dentistry of the University of Hong Kong (HKU), Wuhan University and Peking University Shenzhen Hospital turned to nature and found an answer in a mussel-derived compound. After studying its performance in various tests, they found that the compound can improve the durability of the resin–dentine bond and thus the longevity of dental fillings.

Dental fillings are clinically challenging, since the restoration's success is affected by factors such as the moist environment of the oral cavity and mechanical stress caused by chewing. Failure of the resin–dentine bond results in increased visits and costs for the patient.

Lead researcher Dr Cynthia Kar Yung Yiu, clinical professor of paediatric dentistry at HKU, explained in a press release that mussels need to maintain their adhesive properties under harsh conditions, such as humidity, extreme temperature changes and pH values, and mechanical shocks—circumstances similar to the conditions in the oral cavity.

The wet adhesion property of mussels has long been of interest to scientists, and several studies have focused on how this quality could be used in clinical practice. Such applications have included surgical protein glues for wound closure, microneedle bandages for cardiac tissue regeneration and materials for drug delivery.

The properties of mussels have also been widely used in dental applications. As reported by Dental Tribune International, mussel-derived solutions have enhanced dental implant coatings, helped create more biocompatible implants, advanced the treatment of dentine hypersensitivity and inspired the development of tougher products for restorative dentistry.

Evaluation of clinical performance

The wet adhesion property of mussels is attributed to a

derivative of the amino acid tyrosine, called dopa, in the mussel adhesive protein which the marine organisms secrete to stick to surfaces in moist environments. The research team evaluated the performance of a mussel-derived compound based on this (DMA) as a functional monomer in dental adhesives regarding the durability of the resin–dentine bond.

The team compared the durability of the control group with three solutions containing different concentrations of DMA in various tests. The results showed that DMA successfully linked with dentine collagen, polymerised with the adhesive without affecting the degree of conversion or elastic modulus, strengthened the integrity of the resin–dentine interface, prolonged the durability of the bond and inhibited the activity of endogenous metalloproteinases, which are involved in the degradation of collagen and of the resin–dentine interface. The findings indicate that DMA can polymerise with resin monomers without hampering the adhesive's mechanical strength and may prevent bond failure caused by a sudden change in stress.

Co-author Dr James Kit Hon Tsoi, associate professor of dental material science at HKU, summarised the research findings and gave an outlook for the future: “This research discovered that DMA is effective in strengthening the resin–dentine bond and improves its durability. The cytotoxicity is also similar to the resin monomers in traditional dental adhesives. It is believed that this compound may be commercialised in the future.”

Remaining challenges

Despite the performance of DMA, the researchers raised concerns about its limited shelf life. During testing, the DMA solution turned a faintly yellow colour after two months, a characteristic that would prove unpractical for clinical usage. Thus, future studies may consider adding antioxidants to the DMA solution in order to avoid this effect.

The study, titled “Enhancing resin-dentin bond durability using a novel mussel-inspired monomer”, was published in the September 2021 issue of Materials Today Bio.



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Air embolism during dental surgery or treatment can cause danger such as face swelling, cardiac and respiratory failure.

New research outlines vaping's unique connection to periodontal disease

By Anisha Hall Hoppe, Dental Tribune International

The first longitudinal study on vaping has shown that e-cigarettes have deleterious effects on periodontal health. (Image: Rommel Canlas/Shutterstock)

Smoking tobacco has long been known to be detrimental to oral health, but the risks of newer simulations of smoking such as vaping are less well-known though they are often believed to be healthier alternatives. Now, researchers from the New York University (NYU) College of Dentistry have completed the first study on the oral health of users of e-cigarettes. They found that vaping created a unique periodontal microbiome, compared with that of non-smokers and conventional cigarette smokers, and that participants who vaped experienced a worsened state of periodontal disease at the end of the study.

The study compared the bacterial composition and cytokine concentrations of the subgingival plaque in conventional cigarette smokers, e-cigarette users and non-smokers over the course of six months. The participants in all groups exhibited some evidence of periodontal disease at baseline.

In the e-cigarette users, the detected cytokine levels indicated inflammation, but some cytokines were at lower levels than expected. The researchers believe this was possibly due to the

strains of bacteria present in those who vaped but not present in those who smoked or who had never smoked. The researchers hypothesised that it was possible that these bacteria were actively suppressing the immune reactions that would normally have been expected.

Co-author of the study Fangxi Xu, a junior research scientist at NYU, said in a press release: "Vaping appears to be driving unique patterns in bacteria and influencing the growth of some bacteria in a manner akin to cigarette smoking, but with its own profile and risks to oral health."

Even worse was the finding that clinical in the e-cigarette smokers. This was measured in the same groups of participants but in a separate, earlier study.

Lead author of the most recent study Dr Scott Thomas, an assistant research scientist at NYU, said of the findings: "E-cigarette use is a relatively new human habit. Unlike smoking, which has been studied extensively for decades, we know little



about the health consequences of e-cigarette use and are just starting to understand how the unique microbiome promoted by vaping impacts oral health and disease.”

More long-term research is needed for dentists to feel comfortable offering counsel to their patients regarding e-cigarette use. E-cigarettes and alternative tobacco products fall under the umbrella of what some call tobacco harm reduction.

Dental Tribune International reported that a survey of German dentists by the German subsidiary of Philip Morris International (PMG), a cigarette company moving towards smoke-free products, found that 58% of the respondents did not feel informed on the subject of tobacco harm reduction and that 69% were not aware of the concept.

Dr Charilaos Avrabos, then PMG’s manager of scientific and medical affairs, claimed in a 2018 press briefing regarding the survey that “it is clear that e-cigarettes are not risk-free products; neither are tobacco heating devices. For non-smokers, these are

not products that offer any benefits. For smokers, who use the most damaging form of nicotine delivery continually over a period of years, switching to these products can make a huge difference by reducing the amount of harmful substance.”

However, PMG’s claims seem to be contradicted by the findings of the NYU research and the results of a 2020 study on vaping’s effect on periodontal health. Senior author of that study Dr Purnima Kumar, professor of periodontics at Ohio State University, said: “If you stop smoking and start vaping instead, you don’t move back toward a healthy bacterial profile but shift up to the vaping profile. Knowing the vaping profile is pathogen-rich, you’re not doing yourself any favours by using vaping to quit smoking.”

The recent study, titled “Electronic cigarette use promotes a unique periodontal microbiome”, was published in the February 2022 issue of mBio.