Minimally invasive inlay restoration from the hybrid ceramic VITA ENAMIC

By VITA

Inlay restorations using CEREC procedures have been an established process in digital dentistry for decades. However, due to the required minimum wall thickness, a lot of tooth substance frequently had to be dissected in reconstructions of traditional ceramics. Due to reduced minimum wall thicknesses, VITA ENAMIC (VITA Zahnfabrik, Bad Säckingen, Germany) allows minimally invasive restorations and can be precisely ground in thinly tapering edge areas. In the report, Dr. Gerhard Werling (Bellheim, Germany) explains the clinical procedures for an inlay-restoration of hybrid ceramic in region 24-26.

Initial situation

Figures 1 and 2 show the initial situation. On the basis of the patient’s history and according to the patient’s request (male, 38 years), he was not treated with alternative methods (filtration technique, fluoridation, regular controls, etc.). Instead, a filling cavity was carefully dissected on the tooth in which the cavity had already penetrated the approximal enamel in the X-ray image. Surprisingly, in the clinical image, the caries had penetrated deep into the dentin, so that after extensive excavation, a considerable defect in the substance was present.

Material selection

Since the patient wanted a permanent enamel-like and tooth-like restoration, composite could not be used as a restoration material. It was decided to proceed according to the “extension for prevention” rule – but as minimally invasive as possible. The hybrid ceramic VITA ENAMIC is very advantageous in this case. The unique network structure in which ceramic and acrylic polymers interpenetrate, provides for enormous resilience and offers more freedom than traditional restoration materials.

CAD/CAM workflow

Three VITA ENAMIC inlays were fabricated using the CEREC System (Sirona Dental, Bensheim, Germany). The intraoral scan was done using the CEREC Omnicam. With the biogenetic software, the reconstruction was done analogously to the missing chewing surfaces. In the grinding preview, the inlays were placed in the material blanks. The geometry EM-10 (8 x 10 x 15 mm) was chosen according to the shade determination with VITA Easyshade (VITA Zahnfabrik) in the color SmA1-H1. The hybrid ceramic can be processed very simply and quickly by machine as well as manually. Thanks to the high load-bearing capacity and edge stability, constructions with comparably small wall thicknesses and thin running edges are also feasible. Edge chipping, which can occur in traditional ceramics, are rare with this material.

Processing and integration

It is advantageous that there is no firing process, and a shade characterization is possible if desired. The available shade selection (EM1 - EM6) in two translucent steps, plus the good light transmission of the material allow for esthetically pleasing results. The inlays have been polished to a high gloss with the VITA ENAMIC Polishing set in the clinic. The hybrid ceramic can also be easily polished intraorally. With VITA polishing instruments, the restoration edges can be polished in a unique, fine manner so that virtually no transition between the tooth and the restoration remains visible. Bonding is performed adhesively.

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By King’s College London

King’s College London ranked top university in Europe for dentistry

The 2017 QS World University Rankings by subject have scored Dentistry at King’s College London first in Europe, and number 4 in the world for the second year running.

The QS rankings highlight the world’s top universities across 42 popular subject areas. Institutions are assessed on academic reputation, citations to publications and employer reputation to give an overall score. Executive Dean Professor Mark Woolford said: “Rising to first in Europe in the global rankings reaffirms our position as a world-class institution and reflects the dedication, commitment and innovation of our academic and professional staff, our students, and our alumni.”

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By King’s College London
Ivoclar Vivadent launches comprehensive CAD/CAM product portfolio under new brand

By DTI

COLOGNE, Germany: Increasing digitalisation of the dental treatment workflow requires all the different components used in a process to be optimally coordinated. To meet this demand, Ivoclar Vivadent has extended its long-standing materials and processing expertise to the entire digital process chain with a comprehensive portfolio of CAD/CAM products for both dental laboratories and practices. The new range, under the brand Ivoclar Digital, is being presented for the first time at IDS 2017; the company announced during a press conference in Cologne in Germany today.

This is a consistent further development, since we have accumulated significant know-how in the field of digitally processed materials with products such as IPS e.max,” said CEO Robert Ganley, explaining the expansion. “This knowledge has gone into the development of milling units and support services that will allow dental professionals to improve their efficiency and performance. They are designed to deliver predictable and aesthetic results.”

For Ivoclar Digital, new products have been added to the company’s range of aesthetic, state-of-the-art CAD/CAM materials for fixed, removable and implant-supported prosthetic restorations, including versatile ZirCAD blocks and a range of discs for the IPS e.max system.

Dentists and laboratories will be able to digitally produce dental restorations quickly and easily with four new PrograMill digital milling units that are suited for laboratories of all sizes. The range of high-end scanners from 3Shape has also been extended to include the new 3Shape E series, which, together with the Dental Designer software and exclusively developed Ivoclar Digital software addresses, is aimed at increasing the reliability and efficiency of fully digitised processes. “This knowledge has Ivoclar Digital offering includes services, a dental outsourcing partner, that, according to Ivoclar, will assist laboratories entering CAD/CAM fabrication by taking on design and production orders and providing them with access to an extended range of materials and indications.

“We plan to enhance our customer-focused market strength significantly with the introduction of Ivoclar Digital. This is a unique new digital product portfolio based on our core competencies in digital materials and processes,” commented Ganley.

Visitors to the 12th CAD/CAM & Digital Dentistry Exhibition can experience the new portfolio and other innovations from Ivoclar Vivadent, such as the new cordless Bluephase Style 20i curing light, boasting the latest LED generation, over two days.

Who’s who of the dental industry gather at DTI Media Lounge

By DTI

COLOGNE, Germany: The 2017 International Dental Show (IDS), which took place from 21 to 25 March, was a show of superlatives in many respects. One of the numerous highlights on the exhibition floor this year was the Media Lounge, the booth of Dental Tribune International (DTI) and its German publishing partner OENUS MEDIA. It gave representatives of the global dental business a 230 m² space in which to relax and network.

With a unique design that changes every two years, the Media Lounge provides an oasis during the busy IDS week. Accessible via a personalised invitation card, which members of the dental industry receive ahead of the show, the Media Lounge offers delicious à la carte dishes, as well as coffee and other drinks, prepared by a high-end culinary crew.

As an IDS tradition, DTI hosts an event every evening under a new theme. Throughout the dental industry, these invitation-only nights are known as an exclusive opportunity to receive business updates on international markets and connect with leaders from the dental industry.

On 21 March, Russian Night was organised in collaboration with DTI’s media partner DENTALEXPO. The second evening was Brazilian Night and on the third CHANNEL 3 Night was followed by an Iranian reception, which was organised in close collaboration with DTI’s local partner in Iran. On the evening of 25 March, dental company Kulzer hosted an information session for dental students about dentXperts, Kulzer’s career club for dental students, young assistant dentists and dentists aiming to open their first dental practice. Every evening, traditional cuisine and beverages relevant to the respective theme were served.

The Media Lounge featured a fully equipped editorial office, where editors, graphic designers and video specialists produced up-to-the-minute content during the show. The result was six daily issues of the today trade show newspaper, which published product news, interviews and other highlights of the previous day. More than 30 hostesses distributed 10,000 issues daily to the around 135,000 visitors to the show.

In addition, the online editorial team informed e-mail subscribers about the latest at IDS through newsletters sent throughout the day.

For the first time in the history of its participation at IDS, DTI hosted a lecture space. From 22 to 24 March, visitors had the opportunity to attend 30-minute presentations by dentists, product developers, dental experts and other representatives of the global dental industry. The interactive lectures took place every hour and were broadcast live online.

Go to Topics to read more news from IDS.
BANGKOK, Thailand/TOKYO, Japan: With the development of new materials and technology in dentistry, expectations for durable and aesthetically pleasing restorations are ever increasing. In a recent study, researchers from Thailand and Japan investigated how sensitive various restorative materials were to discoloration from coffee.

Leaving a lasting impression may be desirable in a job interview, but is certainly not what one wants from one’s morning coffee. Just like natural teeth, restorative materials are susceptible to discoloration from certain foods and beverages with high staining properties, including coffee, tea and red wine. In order to avoid discoloration over time, surface quality is thus essential for the success of restorative treatments.

New CAD/CAM composite resin blocks are industrially polymerised under standardised parameters at high temperature and pressure to achieve optimum properties at the macrostructural level and a high degree of conversion. As a result, material characteristics have improved compared with direct restorative composite resin.

In the study, researchers from the Tokyo Medical and Dental University in Japan and the Chulalongkorn University in Bangkok aimed to evaluate how modern composite resin block materials developed for CAD/CAM systems react to coffee exposure compared with conventional resin materials. The researchers measured the change in colour in eight CAD/CAM blocks, including five composite resin blocks (Block HC, Shofu; CER-AMART, GC; GRADIA Block, GC; K2R CAD Hybrid Resin Black, Yamamoto Precision Metal; Laiva Ultimate, 3M ESPE), one hybrid ceramic block (VITAENAMIC VITA,Zahnfabrik), one PMMA block (Tello CAD, Ivoclar Vivadent) and one feldspathic ceramic block (VITABLOCS Mark II, VITA Zahnfabrik), and four conventional composite resin blocks. The latter included one hybrid composite (CLEARFIL AP X, Kuraray), one macro-filled composite (Durafill and Filtek Supreme Ultra, 3M ESPE), and endodontic and two nano-hybrid composites (ESTELITE SIGMA, Ivoclar Vivadent; KVR-CAD Hybrid Resin Block, Yamamoto Precision Metal).

They created 10 mm discs from each of the restorative materials and then calculated the discs’ initial colour measurements before placing them in an instant coffee solution, which was changed daily. Colour changes were measured after one day, one week and one month.

The results showed that the coffee solution significantly discouloured all of the discs over time; however, CAD/CAM materials were generally less affected than the conventional resin materials. After one month, the change in colour of CAD/CAM composite resin blocks and restorative composites ranged from 1.6 to 3.7 and from 21 to 75, respectively. According to the researchers, only one material, Durafill VS, was restored after polishing with prophylaxis paste for 20 seconds. Of the conventional composite resins, Durafill and Filtek Supreme Ultra still showed some noticeable discoloration after polishing.

The authors noted that, owing to the study’s in vitro design, it is unknown how external factors, including regular toothbrushing, might affect the long-term discoloration of the materials when used in patients. They further pointed out that one month of immersion might have exaggerated the results beyond what would be seen in vivo, as immersing materials in coffee for one week is the equivalent of about seven months of coffee drinking.

The study, titled “Discoloration of various CAD/CAM blocks after immersion in coffee,” was published in the February issue of the Restorative Dentistry and Endodontics journal.

Coffee is one of the world’s most popular beverages; however, it is known for its tooth staining properties. A study has now tested how various CAD/CAM materials reacted to immersion in coffee. (Photograph: Pexels/Pixabay)
IDS 2017 sets new record

By DTI

COLOGNE, Germany: More than 155,000 people from 157 countries visited the International Dental Show (IDS) this year, according to the latest figures released by organiser Koelnmesse. This is an increase of 12 per cent compared with IDS 2015. Furthermore, the number of international attendees rose by almost 20 per cent to around 60 per cent. There was also a slight increase in national visitors.

There was a significant increase in visitor numbers from almost all regions: the Americas (+12.6 per cent), North America (+15.7 per cent) and eastern Europe (+43.0 per cent), Asia (+28.0 per cent) and Africa (+18.7 per cent) and Asia (+18.0 per cent). The number of attendees from North America (+43.0 per cent) and Asia (+18.0 per cent) also rose significantly.

In a visitor survey, about three-quarters of respondents were very satisfied or satisfied with IDS 2017, as well as with achieving their targets for the exhibition. The majority of those surveyed (90 per cent) would recommend IDS to business partners, and 70 per cent said they plan to visit IDS in 2019.

At the fair, 2,305 companies from 59 countries (compared with 2,185 companies from 56 countries in 2015) exhibited in an overall area of 169,000 m² (158,200 m² in 2015). These included 614 exhibitors and 20 additionally represented companies from Germany (616 and 19, respectively, in 2015), as well as 1,671 exhibitors and 44 additionally represented companies from abroad (1,480 and 44, respectively, in 2015). The proportion of foreign companies was 72 per cent (70 per cent in 2015). Of the more than 150,000 visitors from 157 countries (188,500 visitors from 152 countries in 2015) around 60 per cent (compared with 51 per cent in 2015) came from abroad.

IDS 2017 focused on digital production and diagnostics, intelligent networking solutions for practices and laboratories, smart services for dentists and dental technicians, as well as the further improvement of patient care and thus oral health worldwide.

The next IDS will take place from 12 to 16 March 2019.

Interview: “Our new products are game-changing”

By Yvonne Bachmann, DTI

On Monday night, global leader in dental manufacturing Planmeca welcomed around 700 international distributors to its Dealer Event at the Musical Dome in Cologne in Germany. In a groundbreaking and visually impressive show, participants were introduced to the company’s latest inventions: including a new CBCT unit, a lightweight oral scanner, a milling unit, state-of-the-art software and an operating light. At the event, Dental Tribune Online had the opportunity to speak to Planmeca Group Senior Vice President Tuomas Lokki about the game-changing products and the Dream Clinic Show, which the company is presenting at its booth during the International Dental Show (IDS) this week.

Dental Tribune Online: Mr Lokki, Planmeca has developed a large number of new products that are all being launched during IDS. Which of them are especially noteworthy?

Tuomas Lokki: That is difficult, but if I had to pick three, it would be Planmeca Viso, the next generation CBCT unit, which is capable of capturing outstanding images at a low radiation dose even during longer working days and introduces a renewed imaging workflow, Planmeca Emerald, a new 183 g intra-oral scanner that is small, lightweight and exceedingly fast with superior accuracy; and the entire Planmeca Romexis software suite. What makes these products special is that we can now provide a full clinical digital workflow, and that is important. There are many modules and there have been different software programs, but now this has all been combined into one program and a comprehensive workflow. We think that our new products are game-changing because the ultimate goal is efficiency in the dental clinic, and if we can help clinicians improve their workflow, I think they will trust us.

Planmeca is inviting IDS visitors to its 800 m² booth to see the Dream Clinic Show. What can visitors expect?

The Dream Clinic Show is a world premiere, but we will probably take it around the globe. At IDS, it is being shown every hour in English and in German. The show includes all of the latest Planmeca equipment and takes users through a case in which it is all applied. It features everything the clinician needs to have and know. The show is being presented in a closed environment, so it can be enjoyed without interruption. In between those sessions, we are introducing Planmeca Viso and informing visitors about this 3D imaging platform of the future.

The Planmeca Group employs 2,800 people worldwide. How many of them were involved in the development of the new products being showcased this week in Cologne?

We work with dentists and we have 200 engineers involved in the development, but naturally, this is a team effort. Everybody in the company contributed. We start preparing for IDS when the last one has ended —after IDS is before IDS. However, the last six months have been particularly busy. About 250 people from various divisions are now here at the trade show to present the company and its portfolio.

Thank you very much for the interview.
Study finds Zendium toothpaste to promote healthy balance of mouth bacteria

By DTI

SAN FRANCISCO, USA: Good oral health depends to a large extent on the balance between health-associated and disease-associated bacteria in the mouth. New research, presented at the General Session and Exhibition of the International Association for Dental Research in San Francisco in March, has proven that Zendium, a Unilever toothpaste brand available in most of Europe and the Middle East, promotes such a balanced oral microbiome as the first of its kind.

According to the study, which was published in the Scientific Reports journal earlier this year, the enzyme-and protein-containing toothpaste significantly increased health-associated bacteria and reduced disease-associated bacteria in the oral plaque microbiome in subjects brushing with Zendium over a period of 14 weeks. As a result, a microbial community with a stronger association with health was formed, compared with baseline, the researchers said in their report.

It is the first time that a toothpaste has been shown to significantly shift the oral microbiome at species level, according to Unilever. For their study, the researchers used the Human Oral Microbiome Database and next-generation DNA sequencing techniques in order to characterise the oral plaque microbiome.

The research was also conducted in cooperation with internationally leading genomic research centres.

"The mouth houses the second-most diverse microbiome in the body, and now advanced molecular techniques have enabled us to better understand how it is possible to promote a balanced microbiome," commented Dr Alison Green, Director of Oral Care Research at Unilever, on the results.

Available on the market since the 1970s, Zendium has a formulation that boasts a number of natural enzymes and proteins that are similar to those found in saliva, where they are known to promote a healthy microbiome.

The study, titled “A randomised clinical study to determine the effect of a toothpaste containing enzymes and proteins on plaque oral microbiome ecology”, was published online on 27 February in Scientific Reports.