Dentistry and dental technology delivered with passion

By Ivoclar Vivadent AG

About a thousand dentists and dental technicians from 47 countries attended the 3rd International Expert Symposium hosted by Ivoclar Vivadent in Spain’s capital Madrid. Thirteen renowned opinion leaders from academic institutions, dental practices and laboratories provided insights into the latest advancements in the field of ‘Modern restorative dentistry: Technology and esthetics’.

Robert Ganley, CEO of Ivoclar Vivadent AG, underlined his desire to advance dentistry through intense dialogue. Sonia Gómara, Managing Director of the company’s subsidiary for the Iberian Peninsula, was delighted to provide the attendees with an opportunity to get to know the work of some of the world’s most renowned dental experts.

Trending high: minimally invasive procedures

Several speeches revolved around minimally invasive treatment options. Dentists talked about outcome-oriented approaches to preparation and impression-taking methods using trays and intraoral scanning devices. Dental technicians discussed the effects of limited oral space on their choice of materials and procedures. Adhesive cementation came to the fore...
Most sugar-free chewing gums in Middle East lack clear labelling on xylitol

By DTI

KUWAIT CITY, KUWAIT: The majority of sugar-free chewing gums containing xylitol that are sold in the Coop eration Council for the Arab States of the Gulf (GCC) countries do not have clear labelling regarding xylitol content, a new study has found. According to the researchers, the product labels mention neither the recommended daily dose of xylitol for caries prevention nor the actual amount of xylitol the chewing gum contains. They also found that the majority of gums do not provide the necessary amount of xylitol for caries prevention.

The aim of the study, conducted by Dr. Abirar Al-Ati, assistant professor at the Department of Developmental and Preventive Sciences of the Faculty of Dentistry at Kuwait University and her colleagues, was to identify sugar-free chewing gums available in the GCC region that provide the recommended daily dose of xylitol for the prevention of dental caries.

The daily dose recommended by various dental associations around the world ranges between 3 and 10 g of xylitol, available in the form of gums or lozenges, three to seven times a day. Taken regularly, xylitol can contribute to the prevention of caries by inhibiting the growth of Streptococcus mutans, one of the main bacteria associated with tooth decay. Moreover, the sugar substitute has been found to enhance remineralisation and reduce the quantity of dental plaque, as most plaque bacteria are not able to ferment xylitol into cariogenic end-products.

The researchers examined the concentration of xylitol in 21 brands of chewing gum (from Kuwait, Bahrain, Qatar, Saudi Arabia, the UAE and Oman), using a special enzymatic kit. They found a xylitol content of less than 0.3 g per piece of gum in nine products, of 0.3–0.5 g in seven and of more than 0.5 g in five products. According to the scientists, the majority of gums analysed did not provide the necessary amount of xylitol for caries prevention.

Moreover, most of the products tested lacked accurate labelling regarding their xylitol content. Of the 21 brands, only one clearly mentioned the amount of xylitol in grams on its label. Twelve products stated the percentage of xylitol (1.5–35 per cent). The rest did not specify the amount.

“Looking at the percentage, it is not easy for the consumer to calculate the actual amount of xylitol in grams. A consumer should be informed of the contents and the amount used in the product so that he can make an informed decision,” Al-Ati told the Middle Eastern newspaper Muscat Daily.

The researchers have therefore recommended clear, accurate labelling of all xylitol-containing gums sold in the GCC countries and advised dental associations in the Middle Eastern region to adopt the general recommendations for labelling of current xylitol products.

The study, titled “Xylitol chewing gums on the market: Do they prevent caries?”, was published online in the Oral Health and Preventive Dentistry journal on 12 May.

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Esthetic replacement of anterior class IV restorations

By Dr. Paulo Monteiro, Portugal

Initial Situation
Female patient 30 years old. Patient was not satisfied with current anterior restorations (maxillary central incisors). Patient also expressed dissatisfaction with shade and surface texture.

Challenge
Creating smooth and natural-looking restorations for patients who demand the highest level of esthetics can be challenging. Using materials that mimic shade and opacity of dentin and enamel is critical.

Fig. 1: Initial situation: patient was not satisfied with current restorations.

Fig. 2: Teeth were etched after preparation using Single Bond Universal Etchant.

Fig. 3: Single Bond Universal Adhesive is scrubbed into the surface, air dried and light cured with Elipar™ DeepCure-S LED Curing Light.

Fig. 4: A silicone matrix was used to create the palatal wall with Filtek™ Z350XT Universal Restorative, shade CT.

Fig. 5: The interproximal enamel layer was built with Filtek™ 350XT Universal Restorative, shade A3E and light cured with Elipar™ DeepCure-S LED Curing Light. For the incisal halo, Filtek™ Z350XT Flowable Restoration, shade W was used.

Fig. 6: Application of the dentin layer using Filtek™ Z350XT Universal Restorative, shade A1D. For volume control the Misura instrument (LM Arte by Style Italiano) was used to leave a 0.5mm space for the facial enamel.

Fig. 7: Creation of mamelons and application of a small portion of Filtek™ Z350XT Universal Restorative, shade CT between the dentin layer and incisal halo to enhance translucency at the incisal edge.

Fig. 8: The final enamel layer of Filtek™ Z350XT Universal Restorative, shade A3E was applied and light cured.

Fig. 9: Sof-Lex™ Discs are used to define the outline of the restoration and create secondary anatomy.

Fig. 10: Pre-polishing of restoration with Sof-Lex™ Pre-Polishing Spiral.

Fig. 11: Polishing with Sof-Lex™ Diamond Polishing Spiral to create a final smooth and high-gloss polish.

Fig. 12: Final restoration is very natural-looking.

Dr. Paulo Monteiro obtained his degree as a Doctor of Dental Medicine at the Instituto Superior de Ciências da Saúde-Sul and his Master’s Degree in Dental Medicine at the Instituto Superior de Ciências da Saúde Egas Moniz (ISCEM) in Caparica, Portugal. He completed his specialization in Esthetic and Restorative Dentistry at the ISCEM and obtained a Master’s degree in Dental Medicine. Presently he is an Assistant Professor at ISCEM for the Aesthetic and Restorative Dentistry post-graduation program and for the Oral Rehabilitation Department at ISCEM. He is also involved in research of new dental materials, including composite resins, dental adhesives, dental ceramics and new technologies.

Legacy of Innovation Continues for 3M Oral Care

The Anaheim Group acknowledges 3M’s contributions to the dental industry for an 11th consecutive year

By 3M ESPE

With 95 innovations launched in 2015, 3M’s designation as the Most Innovative Company in the Dental Industry was earned through a relentless commitment to science-based innovation. Honored with its 11th consecutive win, 3M’s rank on The Anaheim Group’s “Innovation Index” has once again placed the company in the top spot with 25 percent more innovations than any other dental company.

The Anaheim Group’s index combines the number of EC/WIPO patents, U.S. patents and U.S. 510(k) clearances, and is the dental industry’s best measure of overall technical strength and capability.

With its commitment to improving lives through science, 3M continues to improve on its own innovations. The maker of countless award-winning products under such brands as Filtek™, RelyX™ and Scotchbond™, 3M’s breakthrough innovations are often sourced from within its own walls. Interdisciplinary collaborations have inspired many of 3M’s greatest innovations in the dental industry, including pioneering the use of zirconia restorative materials and introducing nanotechnology for enhanced esthetics and strength in universal restorative material.

“Receiving the Most Innovative honor for more than a decade is a testament to what 3M excels at—applying science to help keep people healthy,” said James D. Ingebrand, vice president & general manager, Oral Care Solutions Division of 3M. “Every day, we explore new ways to impact lives, as we consistently pursue new product and process innovations with a focus on promoting lifelong oral health for all.

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Red & White Aesthetic Harmony

By Shofu

Beautifil II Enamel and GINGIVA from Shofu are developed as a complementary line extension of Beautifil II to create life-like direct resin restorations. A special one-push syringe ensures controlled dispensing of the smooth and creamy material that is easy to sculpt into fine details and recreate the surface textures seen in natural teeth & gums.

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Beautifil II Enamel is available in 4 naturally translucent and opalescent shades, effortless and superior pol-

TRIOS scans most accurate and consistent

By DTI

Baltimore, USA/Freiburg, Germany: A new study evaluating the accuracy of six leading intra-oral scanners in the dental market has found 3Shape’s TRIOS to be both the most accurate and consistent performer of the scanners tested.

The study, which was conducted jointly by the University of Maryland in Baltimore and the University of Freiburg in Germany, aimed to compare the ability of intra-oral scanning systems of different brands to accurately scan a single molar abutment tooth in vitro. The analyses included the following six scanners: iTero (Align Technology), 3M True Definition (3M ESPE), PlanScan (Planmeca), CS 3500 (Carestream Dental), TRIOS and CEREC AC Omnicam (Sirona Dental Systems).

In order to compare the accuracy of each system, the investigators used an industrial-grade, highly accurate reference scanner to create a digital reference dataset for an acrylic dental model. A single trained, experienced dentist then scanned the acrylic model on three separate occasions using each of the six intra-oral scanning systems.

Truearness (accuracy) was defined by superimposing the three digital datasets over the reference dataset, with 3D comparisons then performed. Precision (consistency) was defined by superimposing each dataset over the other two datasets obtained and then evaluating for 3D deviations.

Of the 18 datasets analysed, the smallest deviations for the truearness measurements (+ standard deviation) between the reference dataset and the various intra-oral scanner datasets were obtained from TRIOS (6.1 ± 0.9 µm), followed by CS 3500 (9.8 ± 2.5 µm), 3M True Definition (30.9 ± 10.8 µm), Scan (30.9 ± 10.8 µm) and CEREC AC Omnicam (30.9 ± 10.8 µm).

The TRIOS scanning technology, in combination with the wand design, seems to be beneficial for capturing high quality datasets with excellent truearness and precision values,” the investigators said.

However, the results obtained do not provide any information about the quality of a fabricated restoration based on these digital datasets, the researchers stressed. Moreover, in an in vivo design, the outcomes might be different owing to the presence of blood, saliva, and patient movements, they concluded.

The study, titled “Evaluation of the accuracy of six intra-oral scanning devices: An in-vitro investigation,” was published in Volume 10, Issue 4, of the ADA Professional Product Review.
SIDEXIS 4 update gives users many new functions and technical improvements

By Dentsply Sirona

At the end of last year, the SIDEXIS 4 imaging software received the internationally renowned Red Dot Award Best of the Best in the “Communication Design” category for its outstanding user friendliness. The new 4.1.3 software update from Dentsply Sirona Imaging now combines additional functions for users with technical modifications that further optimize the practice workflow. Especially in combination with the ORTHOPHOS SL, the SIDEXIS 4 software forms a highly functional and efficient unit. The update also offers advantages for networking with practice management systems and implantology planning or orthodontic analysis programs.

New functions make it easier to use

The software update now makes it possible to connect intraoral cameras from other manufacturers, as well as via Windows Driver Model. When imported images without an imaging date are provided, the user can enter the information manually to have the images displayed chronologically in the timeline. The user is provided with a complete patient history from all intraoral, panoramic, and 3D X-rays, digital camera images, and face scan data. The update also provides additional image information: The anatomical region and external image type are displayed for every image. To facilitate work for users, it will now be possible to use copy and paste to insert images into another application, such as image processing or patient management. The program also allows images to be moved retroactively to allocate them to another patient.

No more switching between SICAT Suite applications

The integration of the SICAT Suite software package with the SICAT Function and SICAT AIR applications into the SIDEXIS 4 interface represents a considerable added value for users. SICAT Function allows the three-dimensional visualization of jaw movements for the diagnosis and treatment of craniofacial dysfunction (CMD). Users can use SICAT Air to order protrusion appliances to treat obstructive sleep apnea. Planning data created by the two software applications are displayed in the timeline and from there can be opened again directly in the SICAT Suite. The package is integrated into the phase bar of SIDEXIS 4 with its own “Plan&Treat Phase.” The applications can therefore be selected directly and treatment planning can be started. The loading times for the required 3D image data were reduced by 50 percent.

SIDEXIS 4 – state-of-the-art technology

The technical aspects of the SIDEXIS 4.1.3 software version were expanded to Windows 10 and other operating systems. Instead of the previously used SQL Server 2008 R2 database managing system, the SQL Server 2014 is now installed both during initial installation of SIDEXIS 4 and in the case of an update.

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Esthetic replacement of maxillary premolar with immediate implant placement and metal ceramic crown over CAD/CAM abutment

By Dr. Larry R. Holt, USA

This article describes treatment to solve a common dental complication (loss of tooth due to vertical root fracture). Contemporary implant therapy and subsequent CAD/CAM laboratory procedures provide an elegant solution to this patient’s dental emergency. Treatment was accomplished during a period of approximately six months.

The patient is a healthy, 52-year-old female with an unremarkable medical history. Her dental history and general dental health are excellent. Unfortunately, she suffered a vertical fracture of tooth #5, which necessitated its extraction (Fig. 1).

The treatment plan was for extraction and immediate implant placement with concurrent bone grafting as required. A temporary partial was planned to provide esophageal protection and to support and shape tissue during the healing process. Final restoration was to be a cemented PFM crown supported by an Atlantis gold hue abutment.

Material selection was based on patient’s cross bite occlusion that transitions from normal to crossbite across this particular tooth’s occlusal table. Crown and abutment could potentially be subject to occlusal stress due to this transitional relationship.

A restoration that provides maximum strength was desirable for long-term stability of the restorations.

The patient has a thin biotype, and the gold hue abutment provides both strength and the gold color that provides a more natural tissue color.1 The gold color provides “warmth” of color in the critical transmucosal region. Titanium abutments provide strength but can telegraph a greying affect on thin tissues.

Treatment began with a preoperative appointment to take necessary records (impressions of both arches, facebow transfer, shade taking, bite registration and clinical photography). Prescription to lab was provided partnering with Atlantis (DENTSPLY Dental Laboratories, Charlotte, N.C.) (Figs. 2-3).

The abutment was fully seated and the gold hue custom abutment were prepared. Delivery appointment was uneventful. Healing abutment was removed and the Atlantis abutment was delivered uneventfully. These implantations were extremely retentive and not subject to disengagement or pressure over the implant site during function. Patient was seen at one week for postoperative check and adjustment of temporary appliance (Fig. 4).

Patient was instructed to return to surgical clinic in approximately four months for final evaluation prior to restorative procedures.

Four months after surgery, the patient was seen by surgeon to uncover the implant, remove the healing screw and place a temporary abutment. The temporary partial was adjusted to accommodate the added height of the healing abutment (Fig. 5). Patient was instructed to return to restorative office for definitive restoration of the implant in approximately three weeks.

Patient was appointed with restorative office for evaluation and to develop necessary records for laboratory fabrication of the definitive restoration. Implant site was evaluated and deemed adequately healed to proceed with restorative procedures (Fig. 6).

Healing abutment was removed and a closed tray impression coping was fitted onto the implant (Fig. 7). Radiograph was taken to confirm complete seating of the impression coping. A full-arch impression was taken with heavy body PVS impression material (Panasil Tray Soft, Heavy Body Regular Set, Kettenbach GmbH) (Fig. 8).

Healing abutment was replaced once impression was taken. A bite registration (Ever D Fast Set Kettenbach GmbH), new opposing impression (Siligrip plus Panasil Light Body Fast Set, Kettenbach GmbH) and shade map were taken. All clinical product was sent to laboratory along with shade photography and a complete written prescription. A PFM high noble crown and Atlantis gold hue custom abutment were prescribed. The abutment was ordered as tissue contouring with a mm deep margin placement circumferentially (Atlantis, Dentipsy Implants). The use of a custom abutment allows modification of transmucosal tissue profile and to ideally position margins. Tissues were previously shaped with the ovate pontic of the temporary partial. The final crown was planned to be chairside custom stained. Lab was cautioned that occlusion on this restoration was in the path of patient’s buccal cuspid transition from normal to crossbite.

The temporary (Drake Precision Dental Laboratories, Charlotte, N.C.) partnered with Atlantis (DENTISPLY Implants) for abutment design and milling and then fabricated the PFM crown (Figs. 9-10). The patient was appointed for definitive restoration delivery.

Delivery appointment was uneventful. Healing abutment was removed and the Atlantis abutment was placed (Fig. 11). Because of positive tissue pressure from tissue abutment, the abutment was slowly placed with incremental turns of the retention screw Tissue Blanching was carefully observed.

The abutment was fully seated and, within five minutes, tissue blanching had disappeared. The Atlantis abutment was torqued to manufacturer’s specifications (30 Ncm). A radiograph was taken to confirm final seating of the abutment. The PFM crown was tried on and interproximal contacts adjusted to allow complete seating of the crown.

Oclusion was marked with appropriate articulation ribbon and adjustments were accomplished, with particular attention to functional path and center contacts.

The final occlusion respected the cross bite while providing a light occlusal contact that became normal in intensity upon biting force.2 All functional contact was adjusted to be in minimal contact during excursions. Adjacent teeth provided partial group function.

Once all clinical appointments were made, a laboratory technician was consulted for final shade matching. The initial shade was very close to ideal.

The technician accomplished minor modifications (minimal characterization staining and reduction in final surface gloss). Proximal contacts and occlusal table were polished.

Retraction cord was used. The patient was seen by surgeon to expose the implant site and suture. Patient was seen by surgeon to uncover the implant, remove the healing screw and place a temporary abutment. The temporary partial was adjusted to accommodate the added height of the healing abutment (Fig. 5). Patient was instructed to return to restorative office for definitive restoration of the implant in approximately three weeks.

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ished after final glazing.

The crown was lined with silico
tape and then bite registration material was injected into the crown to fabricate a cementation jig (Fig. 12). This step is very important to avoid excess cement extrusion during final seating of the restoration. All pre-cementation procedures were completed, including approval by patient of both esthetics and bite comfort. Abutment screw access hole was sealed with silicone tape, respec
ting the external contours of the abutment to allow complete seating of the restoration. This is a critical step to maintain patency for future access to retentive screw.

The crown was steam cleaned and thoroughly dried. Intracranially, the abutment was thoroughly cleaned and dried in preparation for cementation procedures. Attending dental assistant maintained cheek retraction and dried field.

The walls of the crown were lined with implant cement (Dental Implant Cement, radiopaque, Premier). The crown was then seated on the previously fabricated cementation jig to extrude excess cement.

Cement adaptation to internal walls of crown was confirmed and the crown was seated over the cu
tom abutment. Excess cement was removed by combination of hand instru
tmentation and dental floss after initial cement setting.

The crown was left under biting pressure with cotton roll over oc
dental table for five more minutes to allow for cement to fully set. Me-
ticulous inspection of sulcus was ac
complished to remove any vestige of implant cement. Postoperative radiograph was taken to evaluate complete seating of crown and to confirm removal of any excess radi
apaque cement. Occlusion was con
cfirmed and patient was dismissed.

One-week recall was accomplished to confirm occlusion and to revalu
eat soft-tissue response to the resto-
ration.

This case study reveals the po
tential for implant supported tooth replacement. Esthetic result was ex
cellent, and final gingival contours were consistent with adjacent den-
tition. The tissue color was natural and did not reveal any hint of the under-
lying implant or abutment. Restora-
tion margins were concealed within the gingival sulcus. This treatment provided an elegant solution for this all-too-common dental emergency. The patient was extremely pleased with the result (Figs. 13-15).

Note: The author would like to ex
gress gratitude to Drake Precision Dental Laboratories (Charlotte, N.C.) for all services provided for this treatment. In addition, Dr. Todd En
gle, DDS, (Charlotte, N.C.) provided extraordinary care during extrac
tion and immediate placement of implant.

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Larry K. Holt, DDS, FICD has gradu
dated from the UNC School of Dentistry in 1978. He was in private practice from 1978-2008. Since 2008, he has been the director of clinical educa
tion and research at Drake Precision Dental Laboratories in Charlotte, N.C.
Fixed and Removable Implant Restorations: A Solution for Every Arch

By Dr. Paresh B. Patel, USA

When a patient presents with an edentulous arch or terminal dentition, implant treatment can be provided that improves not only form and function, but also quality of life for patients desiring better chewing capability, stability, esthetics and comfort than a traditional denture can offer. Both removable and fixed implant restorations are superior alternatives. While the appropriate implant solution can vary depending on the patient’s oral health, anatomy, quality and quantity of bone, and financial resources, full-arch prosthetics have progressed to the point where virtually every patient can be restored.

Although fixed, implant-supported restorations offer the highest levels of stability, function and patient satisfaction, removable overdentures are a dramatic improvement over conventional complete dentures as well. Both treatment options effectively mitigate the bone resorption that occurs following the loss of teeth, helping to preserve the oral and facial structures and, by extension, the self-confidence of the fully edentulous patient. Determining which solution is appropriate requires a careful evaluation of the individual patient’s circumstances and desires. Even when an implant overdenture is delivered, the prosthesis can eventually be converted to a fixed restoration.

As evidenced by the case that follows, in which one arch is restored with an implant overdenture and the other with a BruxZir® Full-Arch Implant Prosthesis, practitioners today have a great deal of clinical flexibility. Whatever prosthetic approach is adopted, immediate, life-changing relief can be provided to patients suffering from terminal dentition or an uncomfortable, poorly functioning traditional denture. Further, the dramatic overhanging of this patient’s oral health demonstrates the life-changing capabilities of implant therapy, which helped him overcome severe functional and esthetic challenges that were impacting practically every facet of his life prior to treatment.

Case Presentation
A 47-year-old male presented with terminal dentition in both arches resulting from periodontal disease and severe caries (Figs. 1a–1c). The patient had already lost many of his teeth, and the dentition that remained had been rendered unstable by his periodontal condition (Fig. 2). He had saved up enough money for a fixed implant restoration for his upper arch, for which he desired the most functional, lifetime prosthesis possible. While he couldn’t afford such a restoration for both arches, he wanted a retentive appliance for his mandible, with the option of later upgrading to a fixed prosthesis.

The patient accepted a treatment plan in which his maxilla would be restored with a BruxZir® Full-Arch Implant Prosthesis and his mandible with an Inclusive® Locator Implant Overdenture. Fabricating his mandibular overdenture from monolithic zirconia would ensure maximum long-term durability. This was important provided the relatively young age of the patient, who would not have to worry about his upper prosthesis succumbing to fractures, chips or stains.

His lower appliance would be held in place by connecting to the implants via Locator® attachments (Zest Anchors, Escondido, Calif.), which are an economical means of improving prosthetic retention and stability. The overdenture caps that connect to the Locator attachments would be incorporated in the prosthetics chairside, though it should be noted that many clinicians elect to have the laboratory handle this step. The surgical phase of treatment called for the extraction of the patient’s remaining teeth followed by volume augmentation of the surrounding periodontium, which had rendered the teeth mobile.

Figure 2: Preoperative panoramic X-ray exhibits periodontal disease, cervical caries, terminal state of the patient’s dentition, and the compromised state of the surrounding periodontium, which had rendered the teeth mobile.

Figures 3a–3c: Preoperative condition of the patient. Note the high lip line, severe cervical decay present on the patient’s remaining teeth, and lack of gingival support.

Figure 3: Maxillary implants with parallel pins in place exhibit the axial placement of the anterior implants and the tilted angulation of the posterior implants.

Figure 4a–4c: The inclusive Tapered Implants were threaded into place, achieving excellent initial stability.

Figure 5: Multi-unit abutment with cam-in place shape illustrates connection of the implant’s angulation to establish a uniform prosthetic platform around the arch.

Figure 6: Traditional dentures were fabricated in advance of the surgical appointment so they could be immediately converted to serve as temporary appliances during the healing phase.

Figure 7a, 7b: Same-day conversion of the maxillary denture to an immediate fixed prosthesis was achieved by adding multi-unit temporary cylinders using cold-cure acrylic and trimming the appliance into a horseshoe shape.

Figure 8a, 8b: Note the dramatic change in the appearance of the patient, who left with chairside-converted dentures in place on the same day as surgery, including a screw-retained, fixed provisional for his upper arch.

Figures 8a, 8b: Note the dramatic change in the appearance of the patient, who left with chairside-converted dentures in place on the same day as surgery, including a screw-retained, fixed provisional for his upper arch.
the immediate placement of eight dental implants. CBCT scans were taken to help determine the optimal placement of the implants within the available bone and away from the patient’s vital oral anatomy. Evaluation of the CBCT scan determined that there was sufficient height, width and quality of bone to place the implants in the appropriate locations and angulations via fremhard surgery. Four Zimmer Inclusive® Tapered Implants (Glidewell Direct, Irvine, Calif.) would be placed in each arch to support the fixed maxillary restoration and the removable mandibular prosthesis. At the surgical appointment, the patient’s remaining teeth were removed, and a flap was raised to visualize the socket sites and areas of implantation. Bone leveling was performed on the patient’s maxillary arch to elevate the patient’s smile transition line above the upper lip. The maxillary osteotomies were positioned to facilitate an All-on-4 configuration, with the posterior implants tilted to maximize the anterior-posterior (A-P) spread, avoid the sinus, and accommodate the patient’s bone limitations (Fig. 3). Osteotomies were created for the placement of four mandibular implants, as opposed to the minimum of two recommended for a overdenture. This would enhance retention of the overdenture while allowing for the possibility of upgrading to a fixed restoration at a later time. Following creation of the osteotomies, the implants were placed (Figs. 4a-4c). Inclusive® Multi-Unit Abutments (Glidewell Direct) were attached to the implants so a precise impression could be produced. The final lower overdenture from the approved provisional implant prosthesis was seated and checked for proper fit, function and support from the soft tissue. Then the provisional implant prosthesis was screwed into place, and its teeth positioned, function and esthetics were verified (Figs. 21a, 21b). With both appliances in place, the interocclusal For the recording of jaw relations, the lower wax rim was designed to seat over the Locator attachments as well as the gingival contours and vestibules.

Figures 12a, 12b: For the recording of jaw relations, the lower wax rim was designed to seat over the Locator attachments to the maxillary implants, (Figs. 8a, 8b). The final radiograph taken after seating the temporary appliances confirmed excellent positioning of the implants (Fig. 9). Note that when patients present for treatment with terminal dentition, they are commonly anxious about losing their teeth and the effect this will have on their speech and chewing capabilities. For this reason, it is important to make every effort to ensure that the patient leaves with functional appliances in place. Thus, traditional dentures were fabricated from preliminary impressions in advance of the surgical appointment for modification and delivery following placement of the implants (Fig. 6). Having achieved sufficient primary stability, the Inclusive Tapered Implants placed in the patient’s maxilla could be immediately loaded. Thus, the upper denture was trimmed and modified to allow for the connection of the Locator impression caps. The jaw relationship was recorded and a bite registration taken.

Figures 13a, 13b: The patient returned 14 weeks after implant surgery, and healing of the peri-implant tissue had progressed nicely.

Figures 14a, 14b: A VPS wash impression was made of the maxillary arch, capturing the positions of the maxillary overdenture and as well as the gingival contours and vestibules.

Figures 15a–15c. The lab produced wax setups for try-in. The upper included temporary cylinders so the setup could be attached to the implants during evaluation. The lower setup included reseats wells so it could be seated over the Locator attachments and onto the soft tissue.

Figures 16a–16c: The upper and lower wax setups were tried in to evaluate fit, esthetics, occlusion and function and were verified (Figs. 21a, 21b).
relationship was checked (Figs. 21a, 21b). Minor occlusal adjustments were made directly to the maxillary provisional implant prosthesis, as PMMA is easily modified. Slight alterations were also made to the lower implant overdenture. Then, blockout shims and the retentive overdenture caps were seated over the Locator attachments (Figs. 23a, 23b). Quick Up self-cure material (VOCO America; Indian Land, S.C.) was added to the recess wells of the overdenture before seating the appliance over the metal housings. After letting the material set for approximately three minutes, the overdenture was removed, picking up the denture caps in the process. The minor voids surrounding the denture and fill in the minor voids between the denture caps and recess wells of the prosthesis. NOTE: In many cases, the doctor elects to have the overdenture caps processed by the lab. Following patient approval, the provisional full-arch implant prosthesis was reseated, providing excellent retention, stability and function for the patient. With the final mandibular restoration in place, the patient wore the provisional full-arch implant prosthesis for a trial period of two weeks (Fig. 26). This opportunity to wear the appliance during actual day-to-day function instilled a high degree of confidence in the prosthetic design for the patient and doctor alike. Following patient approval, the provisional implant prosthesis was returned to the lab so it could serve as the blueprint for the final restoration and the minor adjustments made to the appliance could be included in the definitive prosthetic design. The final BruxZir Full-Arch Implant Prosthesis was digitally fabricated with precision (Fig. 27). As an exact reproduction of the test-driven prosthesis, the definitive restoration fits perfectly and offered the esthetics and function the patient had come to expect (Figs. 21a, 21b). The final restoration effectively addressed the unique circumstances of the case, providing the most durable, stable prosthesis possible for his upper, and a lower restoration that greatly improves prosthetic retention and can be upgraded to a fixed prosthesis should the patient’s situation change.

Conclusion

Practitioners now have the clinical flexibility to offer patients a wide range of treatment options, from entry-level, economical restorations like the Inclusive Locator Implant Overdenture, to the fixed, highly durable BruxZir Full-Arch Implant Prosthesis. There is a viable means of treating nearly all patients, whatever their oral health, needs and finances. Provided the life-changing benefits of implant therapy and the straightforward restorative protocols of today, this service should be offered to all patients confronting the challenges presented by complete edentulism.

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Designing real smiles with digital tools

By Drs Eduardo Mahn, Gustavo Mahn, Carlos Caceres, Luis Bustos, Chile & Christian Coachman, Brazil

Dental materials and clinical procedures have changed dramatically in the last decades. Probably the main advances that have occurred during the last two decades have been in the fields of implantology and adhesive dentistry, but the main revolution is the development of digital dentistry. Although these changes have certainly made diagnostics and certain procedures easier, the basics, such as function and the biological aspects, remain essential. At the same time, we have experienced major improvements in ceramics and composites, helping us to fulfill our patients’ aesthetic demands.

A basic prerequisite for these indications is an in-depth understanding of the facial and dental aesthetic parameters. The clinician needs to understand the challenges that each clinical case presents and has to be able to develop an appropriate treatment plan that approaches the case from a multidisciplinary perspective. Tooth proportions need to be considered in relation to gingival aesthetics and in relation to the facial appearance. It is pointless to make the most beautiful direct veneer if the contours or the texture do not match that of the adjacent teeth or the gingival zeniths are clearly not symmetric and visible. As an example, if we add a tilted occlusal plane or a maxillary tooth midline shift in relation to the facial midline, the results can be frustrating. Another important aspect is the proper analysis of the patient’s smile and display (Figs. 1 & 2). When photographs are taken, people tend to be dry, especially at the beginning and even more so if the person taking the photographs is not a professional photographer and the setting is a dental practice. Figure 3 shows the intraoral view, where besides the obvious diastema and the hypomineralized areas of both central incisors, the major discoloured areas of both mandibular lateral incisors, which were certainly in need of some sort of treatment, are apparent. It is important to try to make a video while conversing with the patient about normal daily issues to avoid overlooking aspects that need to be considered in the treatment plan. The conversation will relax the patient and evoke natural smiles and laughs in response to something humorous or silly that we might say. Figure 4 shows the differences between the social smile we achieved with our traditional photographs (Figs. 1 & 2) and the spontaneous smile, which was captured during dynamic recording. In this particular clinical case, had we based our treatment plan on the social smile photograph, we would have failed to visualize the display of the mandibular incisors, which showed unpleasant stains.

The next step was to analyse the patient from the facial perspective based on the details of her teeth. The digital smile design (DSD) concept diagnoses aesthetic problems from a facial perspective and, based on a simplified digital analysis of a few photographs, proposes treatment options and assists with communication between the various specialists in the team. The first step is to draw a horizontal and a vertical line. The photograph is centred, moved and rotated until the bi-pupillary line is horizontal. The facial midline is subsequently ascertained. Then the same lines are superimposed on to a similar photograph, which has also been centred, but this time taken with lip retractor in place (Figs. 5 & 6). The same photographs are then magnified and analysed (Figs. 6 & 7). The upper lip line is recreated and then superimposed on to the photograph taken with lip retractors in place as reference of its position (Figs. 8 & 9). Then the tooth proportions are measured and their ideal contours are drawn (Figs. 9 & 10a). The isolated situation can be seen in Figure 10b.

A photograph taken from the 12 o’clock position is used for the analysis of the labio-palatal position of the teeth and superimposed on to the analysis done previously (Fig. 11). Once the clinician is clear about the treatment possibilities and limitations, a digitally designed mock-up can be created.

This procedure reduces chair time dramatically and increases patient acceptance. Owing to easily accessible software such as Microsoft PowerPoint and Keynote, these effects are easily and quickly created by anyone with minimal training. Recently, new software has been released that simplifies the procedure even more: DSD software for iPads (www.digital-smiledesign.com). The procedure is based on overlapping certain areas of the teeth in the manner previously described. The result can be seen in detail in Figure 12 and the display in Figure 13. A comparison from the facial perspective between the preoperative situation, the traditional mock-up and the digital mock-up can be seen in Figure 14. Traditional indirect mock-ups are made from a previously created wax-up from the laboratory.

First, an impression is taken and a stone cast is then fabricated. Afterwards, the technician waxes the necessary teeth depending on the instructions given by the clinician. The next step is taking an impression from this wax-up. The excess is removed and a flowable self-curing composite material (usually bio-acrylic based) is applied to the acrylic guide and then placed in the patient’s mouth. After a few minutes, the excess is removed and the patient is able to see the changes and the clinician is able to evaluate the proposal directly in the mouth. Generally, photographs are taken of the new situation and analysed. The option of a digital mock-up is much simpler. Once the final forms have been created, a photograph is superimposed on to them, and the texture of the new teeth is created. As seen in Figure 14, the results of the traditional and the digital methods are similar.
and it is difficult to differentiate between them.

The protocol is based on photographs and videos that are taken during the first appointment. The analysis is performed, and eventually the case is discussed with the team if necessary. Once the presentation is ready, the treatment plan is presented in a visually attractive way to the patient (Fig. 15). Finally, whether to use ceramic or composite restorative materials is considered depending on different factors. Our philosophy is based on the minimally invasive concept. As long as we can provide the patient with the same aesthetics, durability and predictability of ceramics, we will select composites. In cases in which many teeth are involved, multiple diastemas are present or occlusal imbalances may jeopardise a successful outcome and major changes need to be made, our choice leans towards ceramics. Whatever approach is chosen, it is of paramount importance for the clinician to understand the ceramic and/or composite system he or she is using. In this particular clinical case, the ceramic system used was IPS e.max Press and the composite system was IPS Empress Direct (both Ivoclar Vivadent) because of its simple layering concept, its natural-look- ing shades and long-lasting gloss. The correspondences between the shades of both systems make them easier to combine.

Once the treatment plan has been accepted by the patient, the treatment begins with preparation and demarcation in order to be as conservative as possible (Fig. 16). Figure 17 shows the detail of the hypomineralised areas of the mandibular lateral incisors. The areas were excavated with a red-coloured bur (Komet Dental) and etched with phosphoric acid ExciTE F (Ivoclar Vivadent) was used as a bonding agent, and IPS Empress Direct Dentin A1 and Enamel A1 were placed using a novel instrument called OptraSculpt Pad (Ivoclar Vivadent).

The maxillary teeth were prepared and impressions taken. Figure 20 shows the six veneers fabricated by master dental technician Victor Romero (Santiago, Chile). Then they were tried-in with a specially designed glycerine-based paste components of the Variolink Esthetic cementation kit (Ivoclar Vivadent). Figure 21 shows how dramatic the change in value can be with this type of cement. This procedure is especially helpful when one or two veneers are seated, and the value needs to be slightly corrected in order to match them to the adjacent teeth. The veneers were then bonded and the final result can be seen in Figure 22, where the preoperative situation is shown against the similar results achieved with the digital mock-up compared with the final outcome. Figures 23 and 24 show the integration of the six maxillary ceramic veneers and the two direct composite restorations performed on the mandibular lateral incisors at the three-month follow-up. All this work was integrated from the facial perspective, as seen in Figure 25. The satisfied and spontaneous patient can be observed in Figure 26.

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Advanced Restorative Techniques and the Full / Partial Mouth Reconstruction. Articulator Selection and Clinical Stages. Part 4

By Prof. Paul Tipton, UK

A highly respected specialist in Prosthodontics, Paul has written many articles for the dental press and is an expert lecturer in his field with Tipton Training Academies in Manchester, Leeds, London and Dublin. After gaining his Masters Degree in Conservative Dentistry in 1999, he was awarded the Diploma in General Dental Practice by the Royal College of Surgeons four years later and received Specialist status in Prosthodontics in 1999 from the GDC. An ex-professional cricketer with Lancashire County Cricket Club, he is currently the President of the British Academy of Implant Dentistry. He is one of the UK’s most successful dental teachers in the fields of Restorative, Cosmetic and Implant Dentistry over the last 20 years with more than 2000 dentists completing a year long certificate courses from one of the Tipton Training Academies (www.tiptontraining.co.uk).

Introduction

The full mouth or partial reconstruction is one of the most challenging procedures in Restorative Dentistry. In order to successfully restore and maintain teeth, the dentist must find out why the teeth arrived at this state of destruction. Tooth wear can result from abrasion, attrition, and erosion as well as iatrogenic problems with previous restorations. Research has shown that these mechanisms rarely act alone and there is nearly always a combination of the processes. Evaluation and diagnosis should account for the patient’s diet, the present state of the occlusion and dental history. Emphasis must be placed on the evaluation of occlusal prematurities preventing condylar seating in RAP. Factors that may contribute to parafunctional habits or bruxism are important to understand and manage in order to successfully restore and maintain the newly restored dentition. When there is a complete understanding of the etiology of the definition’s present state a treatment plan can be established, taking into account the number of teeth to be restored, condylar position, space availability, the vertical dimension of occlusion (VDO), the choice of restorative material and the choice of articulator and ways of programming it.

Articulator Selection

There is a large choice when assessing what type of articulator is correct for the patient and restoration. In terms of classification, articulators range from hand held casts or simple hinge articulators to fixed condyle or average value articulators to semi-adjustable and to fully-adjustable.

When dealing with the complexity of the full mouth or partial reconstruction the choice narrows to average value or semi-adjustable v fully-adjustable. The accuracy of the articulator also depends upon how it is used and programmed. All of these articulators require the use of face-bow, arbitrary or kinematic (to record the true hinge axis) to mount the upper cast. Mounting the lower cast to upper cast is then done with an individual jaw registration taken at an open vertical or mounting around RAP and closed vertical if mounting around ICP.

Finally with the semi-adjustable and fully-adjustable programming of the posterior (condylar) determinants of occlusion can be done using lateral and protrusive check bites, cadiax recording or by using a pantograph.

The more adjustable the articulator the more accurate the restoration can be but all articulators have limitations and are only as accurate as the dentist/technician that is using it.

Restorative Stages

Following on from the third article in this series which dealt mainly with the diagnostic stages of a full mouth reconstruction we now look at the clinical stages which will be illustrated by the first case study. This gentleman Fig. 1 was referred for treatment of his severe anterior wear. The patient was over closed and due to the wear now in a pseudo-class III edge to edge occlusion (Fig. 2). After initial diagnostic stages which included cosmetic imaging (Fig. 3), diagnostic waxing (Fig. 4) etc., the patient was ready for initial tooth preparation.

Tooth Preparation

This will be dependent upon the type of restorative material to be used eg. PFM, scanned and milled porcelain, adhesive porcelain. Whilst the shift in recent years has been to all ceramic restorations, the PFM is often the restoration of choice as it allows a more conservative preparation on both anterior and posterior teeth with only part of the gingival margin area prepared for porcelain (labial) and the rest a conservative 0.5 mm chamfer for metal (Fig. 5). There is also the added longevity in both of these areas of the mouth.

The reader is referred to the work of Shillingburg for a full description of PFM crown preparation. In this instance the classic PFM crown was used to restore the upper 10 anterior teeth.

Tooth preparation should be done in stages so as to maintain control of the condylar position and vertical dimension. Providing the patient has adequate posterior stability (from amalgams, cores, prototype crown etc) then the initial tooth preparation should be the upper and lower anterior canine to canine teeth.

When completing a full-mouth reconstruction upper and lower preparations should be done together so as to be able to establish ideal anterior guidance in both protrusive and lateral movements. Once prepared the dentine is sealed and prototypes are relined, trimmed and fitted (Fig. 6). No impressions or jaw registrations are taken at this time.

The aim of the tooth preparation stage is, over three long visits,
restorative
to place prototypes on all the teeth and then to spend time reassessing occlusal planes, aesthetic concerns and of course occlusal scheme and comfort of the patient.

The long term success of the final restoration is directly proportional to the skill and time in preparing and planning prototypes and their adjustments. It is easy to lose vertical dimension, occlusal stability and ideal sealing of the condyle in the fossa if this stage is hurried.

If increasing vertical dimension then either the timing of the preparation and prototypes is changed to accommodate all initial procedures in one week or full occlusal contacts need to be re-established on posterior teeth during the interval between fitting of the anterior prototypes and the final segments of the posterior.

Impressions / Jaw Relationship
Once the patient has confirmed that they are happy with the aesthetic appearance, is symptom free, having an ideal occlusal scheme with multiple contacts on all teeth and the condyles in RAP with smooth shallow anterior guidance the next stage of treatment is to take impressions and jaw registrations. This can be done in several ways. A similar sequencing of events can occur as anterior prototypes are removed, retraction cords placed, teeth re-prepared, sealed and impressions, jaw registrations and facebow recordings made with the posterior prototypes maintaining occlusal contacts, vertical dimension and a stable RAP position. Alternately there are times when the full arch needs to be delivered to the patient at one go. This may be the case when anterior and posterior teeth are linked together in bridgework; there are limited number of appointments, patients are travelling long distances or vertical dimension is being increased on the fully adjustable articulator. This then requires the use of duralay bonnets or copings on all teeth and the use of

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a pickup impression, described later in the series.

Once anterior impressions, jaw registrations and facebow recordings are again taken the prototypes are relined, trimmed, cemented and are adjusted once more.

Try In Stage
The anterior restorations are now produced by the technician to the biscuit bake or “try in” stage and are tried in the mouth and the occlusion is adjusted using the mouth as the ultimate articulator.

Cementation
As described earlier all articulators have limitations as do the materials and techniques we use. Once upper and lower have been checked and adjusted they are sent back to the technician for glazing and then to the dentist for cementation (Fig. 7). This same sequence is then performed on one side of the mouth with upper and lower posterior and then finally the other side of the mouth.

Conclusions
Patients requiring full mouth or partial reconstruction are or have usually been bruxists. As such they may often brux again which is one of the limiting factors to the longevity of our restorations. Careful post restoration occlusal adjustment and refinement are essential, followed by the post restorative occlusal splint for night time wear (Fig. 8). The final smile is shown in Fig. 9,10.

Case Study 2
This lady was referred with a failing dentition, periodontal disease and TMJ dysfunction (Fig. 18). Her examination revealed several hopeless teeth and an almost edge to edge occlusion with limited anterior guidance on her anterior teeth.

In view of the limited guidance available the fully-adjustable articulator was chosen as the posterior determinants of occlusion and posterior guidance (condyles) have a greater bearing on mandibular movements and occlusal anatomy.

Following our standard diagnostic procedures, teeth prepared several teeth were removed (Fig. 12), prototypes fitted (Fig. 13), implants placed and the occlusion was adjusted so that RCP=ICP around RAP. A reorganized approach was used so as to reduce TMJ dysfunction and provide the patient with the ideal 5 principles of gnathology (occlusion) as discussed in earlier articles.

The fully-adjustable was programmed by using a facebow (Fig. 14) the cadiax (Denar) (Fig. 15,16) to record intercondylar distance, immediate and progressive side shifts and the shape of the superior and posterior walls of the fossa (Fig. 17,18).

The goal of the restoration was to move the maxillary teeth forwards and move the mandibular teeth posteriorly by occlusal adjustment, thereby establishing a deeper overbite and overjet and better anterior guidance (Fig. 19)

The final restoration and smile can be seen in Figs 20, 21.

Acknowledgements
I would like to thank the following for their help:

- Dr Ibrahim Hussain, BDS, M.Med. Sci. Implantology – Implant Surgeon
- Dr Andrew Watson, BDS, MSc, Specialist in Endodontics
- Dr Amit Patel, BDS, MSc, MClinDent, MFDS, RCSEd, MRD, RCSEng, Specialist in Periodontics
- Mr Bradley Moore – Dental Technician, ADS Laboratory, Harrogate

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User case study on the new composite bloc BRILLIANT Crios by COLTENE in the fabrication process of a CAD/CAM CEREC crown

By Dr. Med. Dent. Christoph G. Hässkins, Switzerland

The application fields of the new composite bloc include crowns, inlays, onlays and veneers as well as implant-supported crowns. BRILLIANT Crios is a reinforced composite bloc for the fabrication of permanent restorations using a CAD/CAM milling programme. This is available in Low Translucency (LT) and High Translucency (HT) shades in sizes 12 and 14. The material properties allow extended preparation of post space, tapered margins and polishing. In addition, the BRILLIANT Crios bloc can be processed with methacrylate-based composite materials. As part of material testing, a 54-year old patient in this case required a new fabricated restoration after losing a full ceramic crown due to fracture. The patient presented with a missing restoration on tooth 37. The X-ray of the untreated stump (Fig. 1) shows the tooth with a root filling and a composite abutment post (this restoration was performed by a different dentist).

Due to the loss of the full ceramic crown, the patient was willing to have a new restoration fabricated using a CEREC crown made of the new composite-based BRILLIANT Crios (COLTENE) CAD/CAM material. The examination of the stump required additional preparation to meet the following criteria:

- Minimum cervical thickness 1.5 mm
- Minimal buccal thickness 0.8 mm
- Minimal thickness under support of crown
- Minimal cervical thickness 0.8 mm

Occusal corrections and additional preparation of the transitions to the distal stage were required in this case. The existing deep distal stage on tooth 37 also proved problematic in this situation. We therefore decided on a squeeze bite impression with A-silicone (APFINS, COLTENE) as experience has shown direct optical impression taking to be difficult in such cases. With the aid of the subsequently fabricated plaster model (Fig. 2), it was quite easy to take the optical impres- sion for fabricating the CEREC crown. The BRILLIANT Crios bloc used for milling the full crown is shown on the photo (Fig. 3, shade A2 HT). At the time of preparing this report, there were only two milling programmes available from other manufacturers for processing composite blocs in the CEREC system. In future, there will be an own COLTENE BRILLIANT Crios milling programme by the Sirona company available for use in the CAD software.

In our case we chose the programme GC Ceramart 14. Presently, the Cries bloc can be milled with this Sirona programme (A further possible programme is the 3M ESPE Lava Ultimate). The blocs available to us was size 12 in future a bloc size 12 will also be available.

Construction and milling of the crown leads to the following result (Fig. 4). Compared with ceramic materials, for example IPS Empress (Ivo- clair Vivadent), the surface structure of the ground crown appears very smooth and the residual lug is small- er after milling. This facilitates its re- moval with a diamond and nothing remains visible after brief polishing. Polishing can be performed after milling using a conventional rotary polisher or milling paste. The crown in question also passed the check for cracks or material chipping. A check of the precision fit on the plaster model proved simple and quick. The BRILLIANT Crios crown is now ready for insertion. After binding our full crown with Duocem® (COLTENE), the edges were cleaned, excess was removed, and then every surface of the restoration was light-cured for 30 seconds (light output > 800mW/cm²) and then worked on with a rubber polisher. Milling of the occlusion proved simple and quick. The gloss of the entire composite crown already appeared after a short time. Furthermore, when readjusting the occlusal contact points, we were able to polish immediately, which is much more difficult to do with ceramic, in particular, and fired crowns.

Add/CAM restorations made from the new Crios blocs can be charac- terised, modified or also repaired at any time. Modifications can be made without prior treatment. In case of intraoral repairs, the restora- tion surface is cleaned with clearing paste, and then roughened using a diamond rotary instrument. In both cases, ONE COT 7 UNIVERSAL is applied to the surface to be treated and cleaned with compressed air for 5 seconds. This is followed by light-curing for 30 seconds (also see instructions for use ONE COT 7 UNIVERSAL). Colour shades or com- posite (i.e. BRILLIANT Ever-Glow, COLTENE) is then used afterwards according to the respective manu- facturer’s instructions. The mate- rial discussed for the fabrication of a CEREC crown is a composite with the following technical features. The flexural strength and the modulus of elasticity are represented in the following graph**.

For comparison purposes, the ce- ramic and composite materials of other manufacturers were used. The good flexural strength and the e- modus, which is similar to dentine, make the material more elastic than ceramic.

Conclusion

Handling is conveniently simple and the clinical result after placement and a weeks later is very good (Figs. 8 + 9). The following points result in time saving and “service benefits” versus ceramic restorations:

- No firing of the restoration required (i.e. as with IPS e.max CAD).
- Gasless of the composite is easy to achieve, also much easier with IPS Empress CAD.
- No etching with hydrofluoric acid or silanisation necessary.
- If required, repairs with composite are easy to realise, analogous to a fill- ing.
- Dentin like e.modulus, less bottle- ness than ceramic.

Long-term studies are necessary to compare the clinical results with ce- ramic materials. In terms of applica- tion, this material proved excellent. The patient was very satisfied with the result and praised the pleasant wear comfort of the composite res- toration versus his previous ceramic crown immediately after treatment. Next, we would like to attempt res- toration of an implant with a single crown.

** Source: www.scientific.coltene.com | 27.08.2015

*Comparison of filler morphology, mechanical strength and milling characteristics of different CAD/CAM blocs for Sirona inlab MC XL milling system - Cornelius Kauffmann, Ralph Böhme, Sirona/Zahndent AG, Switzerland. David Zweifel, Private Dental Laboratory, Switzerland.
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Treatment of the worn and spaced dentition – An ultraconservative, multidisciplinary approach

By Dr. Andrew Wakefield, UK

Tooth surface loss (TSL) can present in various clinical forms and has a wide range of aetiological factors. Dental erosion, attrition and abrasion are commonly observed by general practitioners, the first two often being seen in younger patients. The superimposition of TSL and malocclusion and/or tooth size and position discrepancies can compound the problem because of the coincident loss of form, function and aesthetics. It can also create difficulties in planning treatment options, with treatment strategies having to be drawn from multiple disciplines and integrated harmoniously to achieve long-term success. There are also other important issues to consider, treatment of tooth wear involves altering the vertical dimension of occlusion (VDO) and orthodontic treatment alters the position of the teeth, both often complex, lengthy and high cost procedures in their own right that need to be considered in combination. If the patient is young the cost of ideal treatment can be prohibitive and they will expect long-term longevity from the treatment provided and materials used. These are conflicts which probably will require some form of compromised treatment being embarked upon. It also needs to be borne in mind that the protection of valuable remaining natural tooth tissue is sacrosanct and this puts pressure on the ethical practitioner to be as conservative as possible. It is important to consider all these factors when planning treatment and to involve them in the decision making process itself. Fortunately with the advent of modern hybrid nano-composite materials and innovative orthodontic appliance technology, treatment can be designed to be progressive in nature, with patience a deciding factor. Treatment success can be achieved at the straightforward and predictable end of the treatment spectrum yet can evolve to encompass more complex restorative work involving multiple disciplines if required. All of these factors had to be considered in the case presented here.

Case Study

The case study illustrates a simple multidisciplinary approach through the use of occlusal therapy combining centric relation direct composite build-up of worn occlusal surfaces of upper and lower molars and premolars to re-establish the ideal vertical and comfortable VDO. The resulting increase in anterior space was utilised to re-establish an acceptable and comfortable VDO. This will also create space for the problem with soft tissue-sagittal treatment failure. The case would take approximately three-four months during which time the patient would be accommodating to the new VDO established in phase 1. This will create the need for invasive reduction of the incisors during the next phase.

Aims of treatment

1. To create a mutually protected occlusion where the anterior teeth incise the posterior teeth in all excursive movements of the mandible.
2. To avoid any preparation to the teeth whilst providing treatment according to sound biomechanical principles.
3. To prevent further pathologic wear of all teeth and to cover all exposed dentine.
4. To secure teeth into function at the end.
5. To improve the aesthetics and re-establish the patient’s confidence in the appearance of his smile.
6. To perform the treatment in a sensitive time frame and as cost effectively as possible.

Treatment plan

Four Phases

1. To establish a stable posterior and anterior position at an increased VDO using centric relation and simple direct composites bonded onto the occlusal surfaces as an occlusal deprogrammer to discourage the anterior slide and allow the mandible to go back.

This will also create space for the orthodontic phase.

1. To retract the upper anterior teeth with removable aligners by a sufficient amount to enable their subsequent restoration to aesthetically acceptable mesio-distal dimensions and to create interproximal contact, but not so much as to mirror a problem with soft tissue sagittal treatment failure. The case would take approximately three-four months during which time the patient would be accommodating to the new VDO established in phase 1. This will create the need for invasive reduction of the incisors during the next phase.

1. To re-etch the incisal anatomical form using direct nano-hybrid composite labial veneers. Precision in form will be assured by using a full clear silicone stent made over a diag-no-tic wax-up, with the wear of a pre-evaluative temporary to assess patient comfort and satisfaction.

1. To retain the teeth in their new positions for life using a palatal wire bonded retainer loaded into the composite post-restorations for added flexural strength.

Treatment Progression

The worn dentine and enamel on the occlusal surfaces of the upper and lower molars and premolars was covered and restored to original morphology with acid etch bonding and direct placement of nano-hybrid composite (Venus Pratt – Heraeus Kulzer). Even contacts were established in centric relation (not done definitively as the final adjustment of the occlusal scheme was performed after the establishment of the intercuspal position). The incise in the VDO anteriorly was approximately 2mm. A standard IAS Inman Aligner was fitted to the upper arch with the aim of retracting the incisors. This occurred over a four-month period with frequent 10 minute visits as the patient’s appliance was used for 10-12 hours per day. Once the incisors had been retracted to the pre-planned position, an accurate wax-up was made on a study cast and a full coverage clear silicone matrix, strengthened by 1mm Elosix.
case where there is no labial enamel erosion or thinning, ceramics are very much a second choice material since veneering or crowning necessitates enamel preparation to get good margins for the technician to work to in order to avoid over-contouring the restorations. In addition, crowning would have made reliable acid etch bonding of a retention wire impossible on the palatal side and macro-retention grooves in the palatal ceramic surface would necessitate more aggressive palatal-occlusal preparation to make sufficient space so as not to weaken the ceramic. Ceramic veneers would fare no better as their palatal margins would be right on the line of the bonded retainer and the bonding footprint for the wire to enamel would be much reduced, both increasing chances of failure.

Andrew Wakefield BDS LDS RCS is a general dental practitioner working at Apolline House Dental Practice in Northeast London.

Andrew Wakefield took “The New Concept of Alignment Bleaching and Bonding course” with IAS Academy in London 2014 and since then has completed over 40 Inman Aligner cases.
The impact of CAD/CAM on dental practices

Interview with Dr Jonathan L. Ferencz who shares his experiences with CAD/CAM technology in dental practice

By 3Shape

In what way has CAD/CAM made a major difference to your dental practice and patients?

The first time I really experienced the difference CAD/CAM has made for my patients was with one patient, a very successful partner at a well-known architectural firm. He came in on a Friday afternoon around 2 p.m. and said, “John, I’m very sorry to bother you but the crown on my front tooth just cracked. I’ve got a really important dinner tonight with clients and I’m going away on a 14-day ski trip with my family. If I don’t make the trip, I’m in trouble. If you made me a temporary, I would be most appreciative.”

His crown was in two pieces. I told him that I believed that we could do something broken, I think that we can do something.

By 3Shape

He took the broken piece and slipped it back into his mouth; it fitted perfectly. Ninety minutes later, the patient left with a final crown and not a temporary.

As a follow-up, he later told me that he must have really bored his clients at dinner that night, because the only thing he talked about was the crown we made in that one visit.

If you look at this case and compare it with what used to happen in the old days, that same procedure would have taken three visits.

Now, whenever I see an emergency in our schedule that involves something broken, I think that we can turn it into a definitive solution and not just a stopgap of placing a temporary and the patient returning the next week. Know that now we can fit a crown using a TRIOS digital impression and our laboratory. For patients like the one in this example, digital is a lifesaver.

Is there not a financial loss by not having the follow-up visits?

No, not at all. One charges the same fee regardless of the number of visits because the patient is charged for the procedure and not per visit. So for us, we actually save time and money. In addition, not having to wear a temporary crown is of great benefit for patients. They do not have to come back to our office.

Are there more advantages of this technology?

Another important advantage of digital technology is its potential for patient education. For example, I had a patient with a lateral incisor that was perfect from the facial aspect, but from the lingual, there was an amalgam restoration, a composite restoration and a vertical crack from the incisal edge to the gingiva. But how can you show that to the patient when it is on the lingual side?

In the old days, I would have tried with a mirror or taken a photograph and loaded it on the computer or an iPad. This would have taken 20 minutes. The patient would have been looking at his or her watch, thinking about getting out of the office. The key in situations like this is speed. So, now what I have started doing is taking a scan and obtaining a color digital impression in 3-D.

If I scan the patient, I can take the image of the lateral incisor, flip it and point out to the patient what I see that he or she cannot. The scan shows the crack. The patient would ask me to suggest treatment and I would recommend scheduling a crown. The patient would agree because it is such a convincing demonstration. We are helping patients to contemplate.

So the scan serves to educate and, in a way, empower the patient?

The best patient is an educated patient, but the communication or educational process has to be quick and intuitive. It cannot entail capturing an image, loading it on to the computer, locating the image, etc. So now, rather than taking out the camera and iPad, I reach for the TRIOS. The idea of having a scanner in every room and having a hygienist pick up the scanner is becoming a reality in our practice.

Do you envision scanning being a routine part of a patient visit?

There is so much information that I can now see from looking at the enlarged scan. It is like looking through my lenses that give four and a half times the magnification. With a scan, I can expand the image on my screen to be as large as I like. Basically, I can imagine us using a scanner for not just some patients, but EVERY patient.

Do you think that one day decisions on treatment could be made by just reviewing digital scans?

Do you mean do I imagine a day when I could be sitting in my beach house in the Bahamas leafing through scans on my laptop? It would be nice, but it will not happen because so much of our success is based on relationships and personal contact.

Dr Jonathan L. Ferencz is a diplomate of the American Board of Prosthodontics and Clinical Professor of Prosthodontics and Occlusion in the Department of Prosthodontics at the New York University College of Dentistry, where he has taught since 1972. He is also Adjunct Professor of Restorative Dentistry at the University of Pennsylvania School of Dental Medicine.
The right system for the demands and needs of dentists and patients

"Since the zirconia blocks are presintered, the material is circa 25 percent larger than in the final, full sintered state."

How does full contour zirconia behave in terms of accuracy of fit?
Very positively. Since the zirconia blocks are presintered, the material is circa 25 percent larger than in the final, full sintered state. Because the Finisher 10 milling instrument is relatively smaller than normal grinding burs, the margins, lumen and occlusal are all milled with the greatest detail. And, since there is no facing on a metal framework there are no overcontoured margins. Overall we see superb fit coming from full contour zirconia restorations and we’re excited to bring these benefits to the market.

References
2. Envisio GmbH German dentist patient survey, November 2015

Accredited hands-on courses in Aesthetic Dentistry in Dubai

By Dental Tribune MEA/CAPP Events

DUBAI, UAE: Centre for Advanced Professional Practices (CAPP Events) announce new courses in Aesthetic Dentistry in November 2016. The courses are aimed at dental professionals who wish to receive additional C.E. Credit Hours alongside bringing their knowledge to the next level.

All below mentioned hands-on courses are part of the annual Dubai Dental Week between 01-07 November 2016 at Jumeirah Beach Hotel.

The following hands-on courses will be available in Dubai between 05 November 2016 at Jumeirah Beach Hotel:

1. Digital Smile Design Part I & II
02-03 November 2016, 09:00 – 18:30 Dr. Eduardo Mahn, Chile
2. Smile Design & Aesthetic Restorative Options PART I & II
03-05 November 2016, 09:00 – 18:00 Prof. Brian Millar & Mr. Bill Sharpling, UK
3. Restorative & Aesthetic Certificate Module 2
02-03 November 2016 Dr. James Russell, UK & Prof. James Prichard, UK
4. The Style Italiano Approach to Veneers
03 November 2016, 09:00 – 18:00 Prof. Angelo Potiagunno, Italy
5. Non-Prep, Prepless and Modernized Non-Prep Veneers
03 November 2016, 09:00 – 18:00 Dr. Eduardo Mahn, Chile
6. Direct Veneers: How to Create the Right Shape and Texture and Achieve the Desire Shade
04 November 2016, 09:00 – 18:00 Dr. Eduardo Mahn, Chile
7. Tips and Tricks of Non-Surgical Powered Instrumentation and Polishing to Brighten Smiles
04 November 2016, 09:00 – 18:00 Dr. George Sanossian, USA
8. Modern Preparation and Cementation for Inlays, Onlays and Occlusal Veneers
05 November 2016, 09:00 – 18:00 Dr. Eduardo Mahn, Chile
9. Advance Composite Course (Closing, Diametors and Cor- rection of Pg Lateral)
06 November 2016, 09:00 – 18:00 Dr. Eduardo Mahn, Chile
10. The New Concept of Alignment, Bleaching and Bonding (Tinman Aligner Certification)
06 November 2016, 09:00 – 18:00 Dr. Tif Qureshi, IAA UK
11. Indirect Veneers
06 November 2016, 09:00 – 18:30 Dr. Munir Silwadi, UAE
12. Veneers Vs Crowns: the Challenge in Smile Design
07 November 2016, 09:00 – 18:00 Dr. Eduard Mahn, Chile
13. indirect, Onlays & Partial Crowns
07 November 2016, 09:00 – 18:30 Dr. Munir Silwadi, UAE
14. Practical Clinical Orthodontics Fellowship Module 1
07-12 November 2016, 08:00 – 16:00 Dr. Dubravko Peruja, USA

Upon completion of the hands-on courses delegates will receive accreditations from ADA C.E.R.P, Health Authority – Abu Dhabi (HAAD) and Dubai Health Authority (DHA).

Contact
The above mentioned courses have limited spaces available and all interested participants are requested to contact CAPP Events to reserve their places or visit www.cappmea.com/aesthetic2016
British Academy of Restorative Dentistry (BARD) Conference 2016 Review

By Dr Nisha Siosodia (BARD), UK

The British Academy of Restorative Dentistry (BARD) is an organisation whose core purpose is the education of dental clinicians, aiding in the improvement of Oral Health by offering them a flexible learning pathway.

These pathways can lead to MRD via PG certificate, Diploma, MSc and MCIndent. Members are encouraged and given the opportunity to improve their skills in all aspects of dentistry from the very basic principles to advanced treatments and concepts. Our members are not limited to just dentists, dental technicians are also part of the BARD Family.

The BARD Conference 2016 was held at the Forest of Arden Marriott Hotel & Country Club on 3rd and 4th June. The President, Professor Paul Tipton, core 3D and Swift dental talked about and showed the good quality work they produce, which gave the delegates a rare chance to discuss different approaches and treatments with lab technicians on a face to face basis. Brammer Finance provided their valuable knowledge in all things money/investment. There were dental experts from The Luke Barnett Centre for Cosmetic Dentistry, an opportunity to talk to Porsche and sit in a Tesla. All in All there were products and services to suit everyones dental and some non-dental needs.

Sponsors of the event made a fantastic contribution, the response and support exceeded expectations. There were an array of exhibitors offering the latest in materials, products and innovative technology designed in making the clinical practice more economical, effective and efficient. The exhibitors tied in with the lecture topics making their presence more valuable. The focal point was the BARD family growing year by year and the members are friendly and approachable creating a good network of clinicians meeting at events like this more enjoyable. The evening ended with new friends, laughter and some sore feet.

The conference ended with a drinks reception where everyone was amazed and baffled by an illusionist, there was a few “how did he guess that, just by looking at me?” comments. This reception was followed by a Charity dinner supporting The Vine trust. The British Academy of Restorative Dentistry (BARD) and Conference Chair, Dr Adam Toft, brought the conference to a close. The BARD family is growing year by year and the members are friendly and approachable creating a good network of clinicians meeting at events like this more enjoyable. The night ended with new friends, laughter and some sore feet.

The weekend catered for a broad spectrum and the feedback was positive. Delegates were inspired to go back to their own surgeries and incorporate what they had learnt, with a big buzz of interest in the next conference. Preparations and talks have already started and after the hugely positive remarks from this year’s conference, the goal being to keep the high standard and wide range of topics, exhibitors and speakers as well as another superb social event.

The next BARD Conference is looking to be held at The Belfry Hotel and Resort in the Spring/Summer of 2017. Go to www.bard-uk.com for further information/details.
Thirty-three users from 18 countries: International summit for Dentsply Sirona treatment center experts

By Dentsply Sirona

Dentsply Sirona treatment centers must meet the needs of different users all around the world. In order to achieve an in-depth understanding of these needs and use them as the basis for further development, the company invited 33 selected users from 18 countries to an exclusive event in Bensheim. It provided the experts for the first time, with a special platform to exchange experiences and opinions, both with Dentsply Sirona and each other.

Opening speech by Robert Ganley, CEO Ivoclar Vivadent AG

Bensheim/Salzburg: At Dentsply Sirona, the definition of quality comprises the designing of products according to users’ wishes and needs, which may differ from country to country. This is why international dentists are becoming increasingly involved in product development processes. “Listening” was therefore the motto of the first global Key User Summit, a three-day symposium for selected users of Dentsply Sirona treatment centers. From May 30 to June 1, the 33 dentists met at the German production site in Bensheim for an attractive program that included exchanging experiences, further development and training.

Ergonomic treatments

An important aspect of the symposium was working in ergonomic treatment positions. Thomas Senghaas, a dentist from Hamburg, clearly demonstrated how the new generation of treatment centers can support dentists while they work. “Up to now, I was not aware of these ergonomic training courses, so this was very valuable input for me,” said Dr. Michael Panahewsky from Calgary (Canada). The range of topics also included brief seminars on integration, economic training courses, so this was very valuable input for me,” said Dr. Michael Panahewsky from Calgary (Canada). The range of topics also included brief seminars on integration, the digital workflow and infection control as well as an entertaining coaching presentation on communicating with colleagues and patients given by prominent keynote speaker Georg Wawuschin from Vienna. “It is important for us to understand the details of the clinical challenges dentists face,” summarized Mariangela De Nata, product manager for Treatment Centers and organizer of the first summit. “This is why talking to dentists from different countries is so important because this is the only way we can develop products that make dental treatments better, faster and safer.”

Important exchange of experiences among users

The participants were equally enthusiastic. Dr. Sam Rui Hong from China said, “The dental world was so small for us and now it has become much bigger. It is vital to exchange experiences with colleagues as this results in a far better understanding of how we can make the best use of our Dentsply Sirona equipment.” All of the participants praised the sense of community. Rui Hong called it a “new family.”

Dentsply Sirona provided the high-quality and extensive transfer of knowledge. The participants gained practical insights into the treatment center creation process during a tour of the Dentsply Sirona production halls. The guests from around the world also enjoyed a tour of the historical city of Heidelberg, including a visit to the castle.

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