The challenge of combining TFZ to e.max in one case

By Alham Farah, Syria

The challenge of this case.

The way to think about combination cases, where you have glass ceramic veneers next to zirconium oxide bridges, is different than having only one kind of restorative material in a case. Lot of factors have to be taken into account; most important is the optical properties of both materials and the fact that they need to match (Not just from a dental technician point of view, but also from a dental point of view and the way he adjusts his/her preparation accordingly).

It was difficult to find an equivalent to our chosen SiO2 material for the veneers (IPS e.max Press, in this case), with its outstanding esthetic and life-like appearance, but going to Zirconium oxide option to restore the posterior bridges was necessary since the IPS e.max is indicated for a maximum of 3 units bridges up to the second premolar region, and in our situation here our bridges go further to the molar area.

Material Selection Judgment

Before you choose where to outsource your Zirconia work, you have to make sure that the brand of Zirconia to be used will fulfill your requirements of translucency-opacity level, and the shade concept will easily match your IPS e.max veneers work in the front esthetic region.

No method would enable you to make sure, better than milling different kind of Zirconia, and trying them all in, together with the IPS e.max veneers, to check the matching level yourself.

In my case scenario here, to narrow down my options I based on a study for 3M ESPE showing a comparison between several kind of high translucent zirconia. (Fig. 11)

Showing that; Lava Plus (from 3M ESPE) & Zenostar Zr Translucent Pure (from Wieland) are the top in their range when it comes to translucency levels. The advantage of Zenostar in our case situation over the Lava, was the important factor of the shading concept of Zenostar and how its coordinated with the IPS e.max press Ingot shade and coloring concept.

In terms of MO (Medium Opacity) Ingot from IPS e.max Press has a match in the Zenostar Zirconia, which is also called MO (Medium Opacity). LT (Law Translucency) Ingot from IPS e.max Press have equivalent in the Zenostar Zirconia which is also called T=(Translucent).

Nothing left to do but to try the material on a dummy case and make sure of the match myself. (Fig. 12)

Zenostar Pure & Light

From the (T=Translucent) Zirconia and according to the final shade chosen by our patient for her veneers & bridges restorations which is BL4 (according to Ivoclar Vivadent shade guide A-D), we had to choose between two Zr blanks from the bright colors (light & pure). Since the intensity and brightness of a color would change relatively with changing the thickness of the material, I decided to go for both colors, then we choose which matches our veneers better on the day of the try in. (Fig. 14)

For professionals by professionals – SR Nexco goes one step further

By Ivoclar Vivadent

A new flask has been developed in collaboration with expert users of the press technique.

SR Nexco Flask is a new type of flask with the help of which light-curing veneering composites can be pressed on dental frameworks. In order to effectively address the practical challenges of functionality, ergonomics and design, the flask has been developed in close cooperation with industry professionals.

The new flask offers the following important benefits: It allows composite materials to be efficiently and quickly pressed to dental restorations, including long-span bridges. The results are highly accurate, showing hardly any difference between
5-D virtual planning concepts for implant-retained full-arch mandibular prostheses: The bone reduction guide

By Dr. Scott D. Ganz, USA

The process of accumulating patient information to determine which course of dental implant treatment should be considered can be described under the category of pre-surgical prosthetic planning. The first step in patient evaluation involves conventional peri-apical radiographs, panoramic radiographs, oral examination, and mounted, articulated study casts. These conventional tools allow the clinician to assess several important aspects of the patient’s anatomical presentation, including vertical dimension of occlusion, lip support, phonetics, smile line, overjet, overbite, and ridge contours, and to obtain a basic understanding of the underlying bone structures.

The accumulation of preliminary data afforded by conventional diagnostics provides the foundation for preparing a course of treatment for the patient. However, the review of findings is based upon a 2-D assessment of the patient’s bone anatomy and may not be accurate in the appreciation of the spatial positioning of other vital structures, such as the incisive canal, the inferior alveolar nerve, or the maxillary sinus. In order to understand each individual patient’s presentation fully, it is essential that clinicians adopt an innovative set of virtual 5-D tools. Through the use of advanced imaging modalities, new paradigms have been established that, in the author’s opinion, will continue to redefine the process of diagnosis and treatment planning for dental implant procedures for years to come. Without the application of computed tomography (CT) or lower radiation dosage cone beam computed tomography (CBCT), an understanding of the 3-D anatomical reality cannot be accurately determined, potentially increasing surgical and restorative complications.

The utilisation of 5-D imaging modalities as part of pre-surgical prosthetic planning can take several paths as demonstrated in the flow chart. The first involves acquiring a 5-D scan directly, without any prior planning or ancillary appliances. The scan process can be accomplished at a local radiology centre or via an in-office CBCT machine, now widely available. The scan itself can be completed within several minutes. Once the data has been processed, it can be viewed via the native software of the CBCT machine used and evaluated for potential implant recipient sites, followed by the surgical intervention. A second path requires the fabrication of a radiopaque scanographic appliance that incorporates vital restorative information and will be worn by the patient during the acquisition of the scan. In this manner, the tooth position can be evaluated in relation to the underlying bone and other important anatomical structures, such as the maxillary sinus or the inferior alveolar nerve. The scan data can again be visualised via the CBCT machine’s native software and a plan can be determined based directly upon the restorative needs of the patient.

The scan data is formatted into a nonproprietary data interchange protocol referred to as DICOM (Digital Imaging and Communications in Medicine). The DICOM data can be exported for use in third-party software applications that incorporate additional tool sets to aid clinicians in the diagnosis and treatment planning functions.

The use of interactive treatment planning has expanded dramatically in the past ten years as computing power has increased exponentially. There are at least two paths that can be taken once a virtual plan has been established. The first allows the data to be assessed, providing important information to the clinician who will perform the surgical intervention free-hand based upon the software plan. This has been termed CT-assisted intervention by the author. The second path involves the fabrication of a surgical guide or template that is remotely constructed from the digital plan usually through rapid prototyping or stereolithography. This method has been described as CT-derived template-assisted intervention and is considered to be more predictable than any previous methods. The use of advanced imaging modalities for presurgical prosthetic planning is essential for any type of implant surgical and restorative intervention, including single-tooth and multiple-tooth restoration, full-arch fixed and removable overdenture reconstruction.

5-D planning concepts for the mandible
Regardless of the image acquisition process, there are four standard views that need to be fully appreciated in the diagnosis phase. These include the cross-sectional (A), the axial (B), the panoramic (C), and the 3-D reconstructed volume (D) (Image: Dr Scott D. Ganz).
individual patient anatomy. The cross-sectional slice is important for the assessment of the facial and lingual cortical bone plates, the intramandibular bone, and the positioning of teeth within the alveolus. The axial view allows inspection of the entire upper or lower jaw, the maxillary sinus volume, the position of the incisive canal in the maxil-

lary, and the mental foraminas in the mandible. The panoramic view is an overall scout image, and can be helpful in tracing the mandibular nerve, and assessment of the maxillary sinus floor near the nose region. The 5-D reconstructed volumes are easily available in the planning process and in communicating information to the members of the implant team, including the patient and the dental laboratory technician who will fabricate the final prosthesis. These images are especially useful, as they are most readily understood and ap-

preciated.

As represented in the flow chart, a patient may be referred to a radi-

cology centre for a CRCT scan of the mandibular arch without a selection. The 5-D reconstructed volumes are easily understood and interpreted for the clinician. Within the case described, there were several hopeless anterior teeth that were planned for extraction. The extent of the bone loss can be appreciated by the clinician and communicated to the patient as an excellent educational and communication tool. The virt-

ual mandible can be rotated to view all views of the patient’s individual anatomical presenta-


tion (Figs. 5a & b). With innovative software tools, the teeth can be virtually extracted in the 5-D reconstructed volume, aiding the planning process and assessment of the local anatomy to identify potential implant recipient sites (Figs. 4a & b). In this example, the alveolar ridge narrowed considerably at the anterior region, and in order to facilitate implant place-

ment, the ridge required an al-

veolectomy, reducing the ridge by approximately 10 mm. Advanced software applications allow for the bone to be sec-

tioned based upon the desired plan. A bone reduction template pioneered by the manufacturer can be simulated by the software and then fabricated to assist in the bone removal (Figs. 5e & f). The reduction template fits over the ridge, allowing complete visual-

ization of the residual bone to be sectioned from the alveolar ridge. The flattened ridge can also assist in advancing the clinician’s appre-

ciation of the remaining bone topos- 

graphy. By removing the amount of bone to be removed can be visualized as shown in Figure 7a and then assessed with realistic manufacturer-specific implant placement in the bone (Fig. 7b). The occlusal and facial planes were viewed to assess the new bone volume, width of available crestal bone for implant placement (Figs. 8a & b). The visualization of the bone crest can aid in the deter-

mination of ideal implant recipi-

ent sites. However, it must be noted that all other views must be considered to appreciate ad-


dajcent vital anatomical struc-

tures and the remaining topog-

raphy of the anterior mandible before any plan can be finalised.

Several different options can be quickly simulated and then dis-

cussed with the patient and all members of the implant team. The use of a bone reduction template can facilitate the accu-

rate removal of bone and the im-

mediate placement of implants, eliminating the need for two separate surgical interventions and thus minimizing patient morbidity.

The initial plan in the case dem-

onstrated was for the patient to receive an implant-retained overdenture. Therefore, recipi-

ent sites were determined based upon the available bone in the mandibular symphysis between the right and left mental foramina, which were identified in the axial and cross-sectional views. While it is possible to fabricate an overdenture design with implants in the posterior region of the mandible, the usual position of implants is with the sym-

physis region. The choices were to place two implants, three im-

plants, or four implants between the two mental foramina (Figs. 9a-d). The symphysis area is not free from risk. A cross-sectional view is necessary for an appre-

ciation of the thickness of the facial and lingual cortical bone structures. In addition, there are important vessels in the region that have been shown to cause some degree of imaging if perforated. These vessels differ from patient to patient and underscore the importance of a 3-D diagnosis. In this case, two such vessels were found in the midline area of the symphysis (red arrows) as seen in the cross-sectional view, which also revealed the excessive bone loss surrounding the hopeless teeth (yellow areas; Fig. 10).

Virtual realistic implants were simulated in the residual al-

veolar bone (Figs. 11a- d). A clinical surgical template was fabricated for the desired implant positions and rested on the reduced bone both facially and lingually. At the midline, where the vital vessels resided, it was elected not to place an implant to avoid potential surgical complica-

tions (Fig. 12). The simulated bone-borne surgical template was visualised in vari-

ous planes (Figures 13a-c). The first two were a midline horizontal sta-

bilisation site (Figs. 15a & b) and the last showed a standard bone-borne template without (Fig. 15c). The virtual implants were required for improved stability or had a fixed denture. The hybrid restoration was indicated, supplementary recipient sites could have been located based upon the available anatomy.

In order to demonstrate the ca-

pabilities of the new digital para-

digm, five virtual implants were placed into the initial anterior al-

veolar ridge after the teeth had been extracted virtually (Fig. 14a). The positions of implants can be further enhanced by plac-

ing yellow abutment projections that extend above the occlusal plane. Using selective transpar-

tency, the various structures can be adjusted in opacity and trans-


lucency. Using advanced soft-

ware simulation, horizontal os-

seotomies to allow the implants to be placed in the same vertical position in the newly reduced ridge were illustrated (Fig. 14b). Implant-to-implant relation-

ships can be evaluated in all dimensions (Figs. 15a & b). In addition, it is important to pro-

vide ample clearance between the most posterior implants and the inferior alveolar nerve and mental foramen. Once the posi-

tions of the implants have been finalised, a surgical guide can be simulated (Figs. 16a & b). Note that the implants were all parallel, several different fabrication techniques for overdentures and in achieving passive fit for fixed restorations were considered (Fig. 15c) and finally evaluated in Figure 16d. If a fixed detach-

able hybrid, full-arch CAD/CAM zirconia restoration, or an im-

mediate restorative protocol is desired, the ability to simulate implant position with an accu-

rate consideration of the desired tooth position will enhance the surgical, restorative and labora-

tory phases of treatment.

Conclusion

The advent of complete den-

ture fabrication has evolved into the adoption of overdenture concepts for both natural and implant-retained restorations. Conventional prossthetic protocols have been developed to aid in the diagnosis, treatment planning and laboratory phases of the reconstruction. These include conventional periapical radiographs, panoramic ra-

diographs, oral examination, and mounted, articulated study cast. Using these, the clinician can assess several important as-

pects of the patient’s anatomical presentation, including vertical dimension of occlusion, lip sup-
port, phonetics, smile line, over-

jet, overbite, and ridge contours, and can obtain a basic under-

standing of the underlying bone structures. The accumulation of preliminary data afforded by conventional diagno-

stics provides the foundation for prepar-

ing a course of treatment for the patient. However, the review of findings is based upon a 2-D as-

essment of the patient’s bone anatomy.

In order to understand each patient’s presentation fully, ad-

vanced 3-D imaging modalities are essential. This article has illustrated the use of various in-

novative 3-D tools.

The application of CT or lower resolution scans will enhance the ability of the dentists with an accurate un-

derstanding of the 3-D anatomical reality of our patients as an aid in providing state-of-the-art treatment. Implants will be better positioned, with fewer surgical and restorative com-

plications, and reduced labora-

tory remakes based upon these diagnostic tools. The benefits will enable clinicians to better understand the relationship be-

between patient anatomy and the desired restorative outcomes in the process of achieving true restoratively driven implant reconstruction. The ability to utilise digital imaging and treat-

ment planning technology is now within the reach of many clinicians through the various software products on the mar-

ket. In addition, there are many thirdparty outlets online that en-

able clinicians to upload their DICOM data for evaluation, processing, treatment planning, and even surgical template fab-

rication.

In many case presentations, a reduction of the alveolar crest is an essential part of the surgical phase to achieve adequate width of the bone for implant place-

ment. It is now possible to plan for accurate bone reduction with the full knowledge of the impact on the inter-arch space and oc-

clusal requirements. The advent of the bone reduction template provides one additional digital solution that can also result in reduced patient morbidity, espe-

cially when the process can be completed in one surgical pro-

cedure. New paradigms have been established that, in the author’s opinion, will continue to redefine the process of diag-

nosis and treatment planning for dental implant procedures, both removable and fixed implant-

retained overdentures and restorations, for years to come.

Editorial Note

More information is available from the publisher.
Global success – Sirona Connect portal now available in eight languages

By Sirona

B

essenheim, germany: Take digital impressions and order the restoration online, quickly and easily via the global Sirona Connect portal. Sirona Connect is the first innovative system for digital cooperation between dentists and dental labs. The rapidly growing number of users is creating a true boom in orders -this year Sirona anticipates a 60-percent increase in orders around the world.

Sirona Connect allows dentists and dental technicians to connect in a very modern way - they can exchange data conveniently and securely via the portal. The portal interface is integrated into the dentist’s and technician’s software, regardless of which software version is being used by either party, thus greatly facilitating workflow.

More and more dentists and dental technicians are using this service. “This year, we anticipate 60 percent more orders than last year via the portal all around the world,” says Ronny Kucharczyk, Product Manager Digital Impressions. “This corresponds to around 100,000 restorations.” He partly attributes this growth to CEREC users who use laboratory services for certain indications or materials. “These are dentists who cannot or do not want to make certain restorations themselves for various reasons.” And there is also a growing number of users of purely digital impression systems such as APOLLO DI or CEREC AC Connect with Omnicam who order their restorations via the portal. “The high demand reflects practice routine,” explains Kucharczyk.

Sirona Connect users come mainly from Europe and the US. But the number of orders from countries such as China, Korea, and Brazil is increasing as well. The main reason for this is that taking digital impressions is becoming more common in practices, especially in these countries. Thus the Sirona Connect portal is now available in the language of each respective country. Dentists and dental technicians can now communicate via the portal provided by Sirona, the global market and technology leader in the dental industry, in a total of eight languages. In addition to German and English, the available languages include French, Italian, Spanish, Chinese, Korean, and Portuguese.

inLab MC X5: DENTAL LAB FREEDOM OF CHOICE.

Experience new freedom in your lab processes breaking the chains of former dependencies with inLab and the new 5 axis milling and grinding unit inLab MC X5. Open for all restoration data, combining the largest material range and the possibility to machine both wet and dry disks and blocks – for no limitations to your production. Enjoy every day.

With Sirona.

INLABMCX5.COM

The Dental Company