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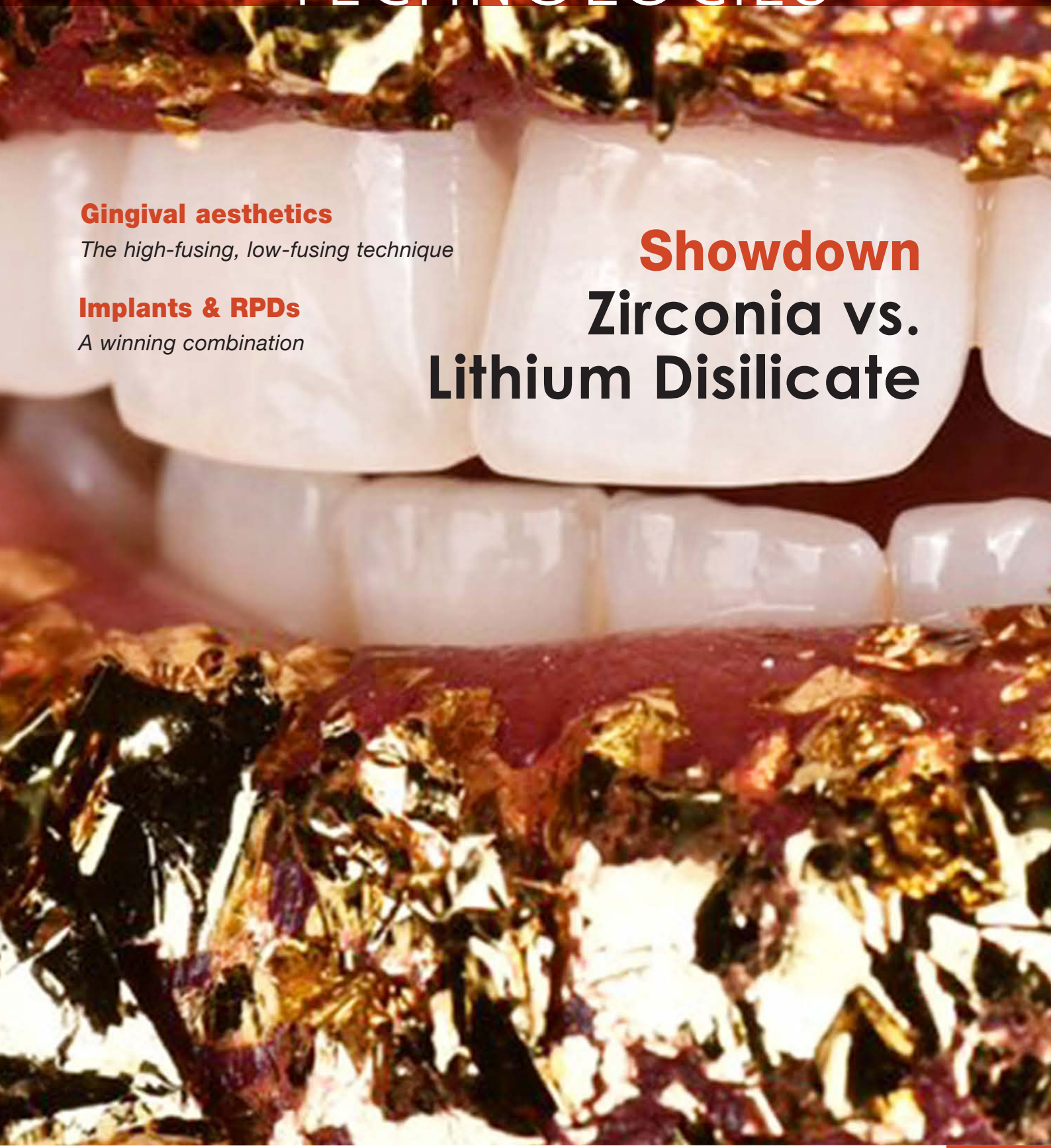

Gingival aesthetics
The high-fusing, low-fusing technique

Implants & RPDs
A winning combination

Showdown
Zirconia vs. Lithium Disilicate

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Spring 2025 No. 156


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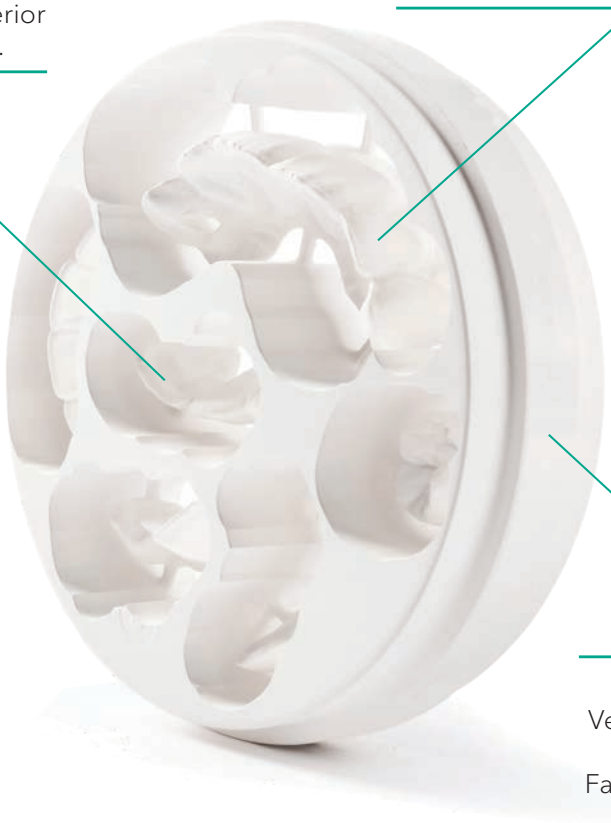

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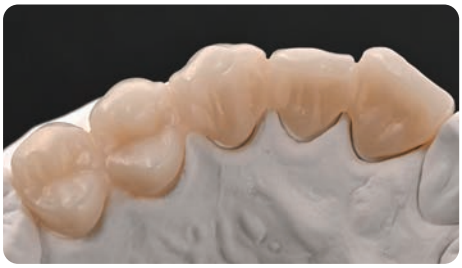

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EDITORIAL
ISSUE 156

By **Wilky Bunyan**, *Scientific Director*
And **Poppy Stoddart**, *Editor*

Hello Readers,

The Dental Technologies team enjoyed attending the International Dental Show in Cologne last month. We had a great few days seeing what is new in dentistry and catching up with old friends.

We are currently compiling an article about some of the best products and latest innovations that we saw: we had hoped to have the article ready for this issue, but have taken the decision to publish it in our Summer issue, so keep an eye out for our full product roundup and in-depth insights in the next issue.

It was great to see how the materials for digital dentistry are improving and how the software is evolving. From our point of view, there are still many ways in which analog will give us technicians a more predictable and precise result, but digital is definitely improving year on year. From printable dentures material now EU certified, to AI-driven workflows and the latest in CAD/CAM, there was a plethora of time-saving techniques and next-generation materials to look at. It all seems very exciting, but we also need to look at the quality of the results obtained. As we have said on many occasions, digital is a tool, not the answer.
The same goes for AI: it can currently perform well if the person directing it understands and masters the complexities of the task in hand.

It would be good to hear from you, readers, what your experiences are using digital, experimenting with AI, and find out what your suggestions are on how to get the most out of these technologies that we have at our fingertips.

We're excited to continue the conversation and connect with you at the Dental Technology Showcase (DTS) in the UK this May. See you there!

Wilk and Poppy

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Printing: Dupliprint
Mailing: STP Print

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ISSN 1466-0083 ● Disclaimer: All articles are published under the responsibility of their authors ●
 Periodicals postage is paid at Champlain, NY, USPS n°018-344 ● Société canadienne des postes. Envois de publications canadiennes. Numéro de convention: 155802 ● Spring 2025 Issue ●

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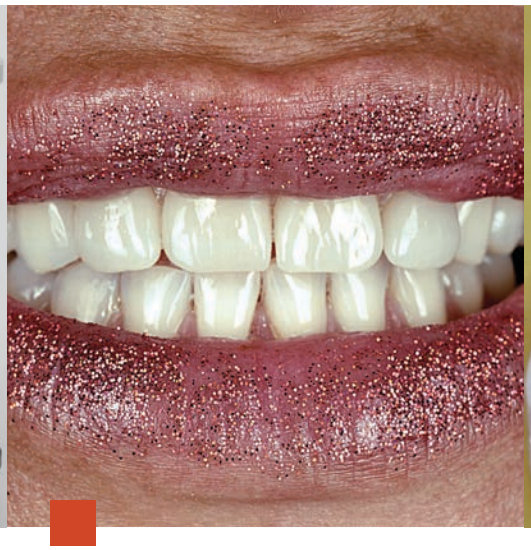

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Gingival aesthetics:

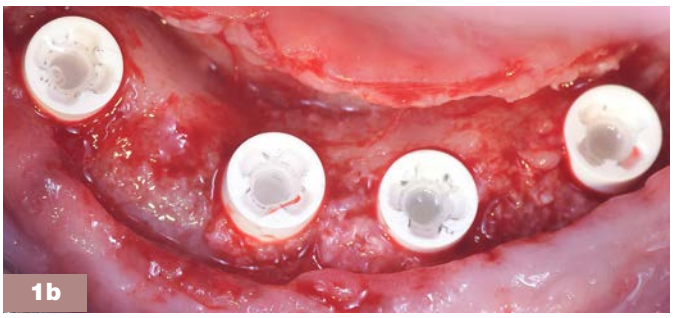
The high-fusing, low-fusing technique

Initial situation

By **Denis Rizzo**
Dental Technician

And By **Stéphane Perrin**
Dental Surgeon

The number of cases of patients with a severe intolerance to metals has grown in recent years. In this case, the patient presented with a severe allergy to all metals, which was discovered during cardiac stenting.
This patient would require zirconia implants (Nobel Pearl) for his full mouth rehabilitation.
Despite bone grafting, there was considerable gingival resorption, and we needed to include a gingival area in the maxillary restoration in order to avoid overly-long maxillaries. This indication can create various problems if done in a single bake, including the mixing of dental and gingival powders etc. To resolve this, it was decided that we would use a low-fusing porcelain for the gingiva after the teeth had been built-up and baked with a high-fusing porcelain. I call this 'the high-fusing, low-fusing technique'.



Figs. 1a & 1b: Nobel Pearl RP zirconia implants in the maxilla and mandible

Figs. 2a & 2b: Full arch zirconia framework in the maxilla (Katana) and Peek framework in the mandible (Bredent)

Checking the proportional reduction of the framework in relation to the approved aesthetic project

Fabricating the frameworks, Zr in the maxillary and Peek in the mandible

Once the Nobel Pearl implants had been placed in the patient's jaw **(figs. 1a & b)**, it was decided to use a zirconia framework in the maxilla **(fig. 2a)** and a Peek framework (Bredent) in the mandible **(fig. 2b)**, as this type of solution is highly recommended to avoid the inevitable shock of hard zirconia teeth knocking together, due to the patient's lack of proprioception.

We first checked that the shape of the maxillary framework with cut-back matched the silicone key made according to the aesthetic project, which had been approved by the patient and the dentist **(fig. 3)**.

We ensured that there was enough space available for the porcleain build-up.

Internal effects using Dentine porcelain (Noritake): bluish effects added in the transition line areas, pink at the necks and connectors

The teeth were first built-up using Dentine A2

Luster LT1 porcelain was then added in the incisal third

Dental mamelons were carved in the incisal area to create internal effects in the incisal third of the teeth

The spaces between the carved mamelons were then filled using Luster LT1 powder

After the first bake, CCV3 powder was applied to create an orange effect in the cervical area

A bluish powder, Aqua blue 1, was used in transition line areas

After the second bake

High-fusing porcelain build-up of the maxillary teeth

Although it is possible to build-up teeth and gingiva in a single bake, we know from experience that this is complicated because there is a risk that the red powders will 'run' and mix with the white, which will require tedious and time-consuming corrections and other adjustments. In the end, it is quicker to start by layering the teeth with a high-fusing ceramic (here with Noritake CZR ceramic).

Noritake CZR is fired at 925°C, so there is no risk of the porcelain melting and becoming misshapen when the low-fusing gingival porcelain is fired at 730°C. With a firing temperature difference of almost 200°C, there is no risk of any unpleasant surprises.

I carried our my build-up according to my usual method, which I have described in detail in my previous articles **(figs. 4 to 11)**.


12
A layer was added for surface morphology using ELT2


13
After the final porcelain bake


14
Transition lines were traced onto the restoration in order to help shape them by grinding


15
The green pencil show areas to work on to adjust the surface state


16
Gold powder allows us to visualise the surface state

Adjusting the morphology and the surface state

As you can see, we left the top of the framework bare during the tooth build-up to leave space for the gingival build-up.
After build up and two bakes, we proceeded to work on the surface morphology and surface aspect.
To do this, I use a transparent powder, in this case ELT2, to build-up the volume **(figs. 12 and 13)**.

I then outline the transition lines **(fig. 14)** and grind these areas for a more three-dimensional effect **(fig. 15)**.
I create surface texture and I check the results using gold powder, which allows me to visualise and highlight the results obtained **(fig. 16)**.

17

I created internal effects for the gingival areas by first extending the tooth emergence profiles in order to represent the underlying tooth roots and add depth in the interdental spaces

18

Internal effects of the ginigva after the first bake

19

First ginigval layer

Internal effects and first layer of low-fusing gingival porcelain

To create internal effects for the gingival tissue, I first recreated the underlying situation for the gingiva.
To do this, I extended the emergence profiles of the porcelain teeth using emax Ceram Power Dentin to create underlying tooth roots and add depth in the interdental spaces. Next I added emax Ceram Gingiva IG4 powder to add depth and gingival effects in the interdental spaces **(fig. 17)**. Here are the results after a first bake, which create a realistic underlying situation onto which to build up our aesthetic layer **(fig. 18)**.
I then created my first gingival layer using Gingiva emax Ceram BG34 **(figs. 19 and 20)**.

20

After the first bake

21

Final layer of gingiva, built-up using emax Ceram BG34.
The median frenulum was created using a 1:1 ratio of Power Dentin and BG34

22

After the bake

Final gingival layer

The second layer of gingiva was built-up in emax Ceram BG34.
The upper frenulum was simulated using Power Dentin mixed with BG34 in equal proportions, to create a lighter appearance: this reproduces what biological frenulum would look like when under pressure in the mouth **(fig. 21)**.

Tip

To create a natural, granular effect on the surface of the gingiva, I use a toothbrush. I tap the bristles onto the built-up porcelain prior to the bake.

23

Finished full arch zirconia bridge

24

Finished mandibular Peek bar with integrated teeth and gingiva in acrylic

The result can be seen after the final bake, with the slightly lighter medial frenulum standing out even more clearly. This reproduces an impression of living tissue and creates a natural appearance **(figs. 22 and 23)**.

Mandibular restoration

The mandibular restoration was made using Ivoclar Phonares teeth embedded in Ivocap resin, injected onto the Peek framework (Bredent) and the gingiva was finished off with Ivoclar Nexo Gingiva composite **(fig. 24)**. Before sending the resoration to the surgery, I removed the zirconia T-base wings to facilitate insertion, but not on the canines, to provide an anchor for the dentist during tightening.

Figs. 25 & 26: observe the patient's smile line with the integrated restoration

Full mouth rehabilitation in-situ

Conclusion

Integrating gingival areas into a porcelain build-up is often a fairly stressful process due to concern that the different powders could mix and the pink aesthetics could seep into the white...

The technique I have shared in this article means that you do the build-up in two separate stages, ensuring the teeth are already finished using a high-fusing porcleain before starting the ginigval build-up using a low-fusing porcelain.

This technique not only ensures peace of mind, it also makes the build-up less painstaking and meticulous, due to the reduced risk of leakage.

This means that it actually saves labour time, offering a guaraneed and perfectly aesthetic result.

By Denis Rizzo
Dental Technician

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CANDULOR Announces KZW Award Winners

The 14th KunstZahnWerk (KZW) Award Ceremony was a wonderful event, held in Cologne on March 28, 2025

The KZW Competition has become something of an institution within the dental world, the jury had a tough choice narrowing down the competition entries. In the end, cases by dental technicians and prosthodontists from 10 countries made it to the judges' final round for the 2025 competition. The participants once again demonstrated creativity, know-how and excellent technical precision in the work they submitted.

The Challenge

62 participants took on the challenge of making an age-appropriate, characterful, aesthetic, mucosa-supported maxillary and mandibular full denture based on a detailed model analysis.
The particular challenge this time involved pronounced atrophy in the lower jaw.
As in previous competitions, the procedure for implementing the work had to be documented by the participants in both text and images or a video, for which an extra prize was awarded this year.

The following criteria also had to be met by the solutions:

- The work had to be prepared using the GERBER set-up method (tooth-to-tooth relationship).
- The finished dentures had to be submitted in a Candulor articulator or a partially or fully adjustable articulator aligned according to the Camper's plane.

First Place – Jade Connors (front view)

First Place – Jade Connors (lateral view)

The jury of experts

Three renowned experts in prosthetics judged this year's submissions:

- Dr. med. dent. Daniel Weber, Senior Physician University Marburg, Marburg (Germany)
- Steven De Maesschalck, owner of the dental technology laboratory dtb Steven De Maesschalck, Ingelmunster (Belgium)
- Oliver Benz (MDT), Head of the SSOP (Swiss School of Prosthetics), Zurich (Switzerland)

The jury met in Heidelberg for two days in a closed session to evaluate the submitted cases according to a predefined set of criteria.
They carefully examined the cases with meticulous attention to detail. The focus was on a comprehensible model analysis, the set-up of the teeth as well as the characterization of the denture. Great emphasis was also placed on the stipulation as to whether the work corresponded to the specific patient requirements.

Jury (f.l.t.r) Steven De Maesschalck, Dr. med. dent. Daniel Weber, Oliver Benz

Oliver Benz commented: *"It was impressive to see how some of the prizewinners had thoroughly addressed the issues at hand and arrived at different and creative solutions."*

Winners of the case award

The winner of the 2025 KZW Award is Canadian Jade Connors from the Pearl Denture & Implant Centre. She was delighted to receive the Candulor Gold Award and a one-year subscription to the International Journal of Prosthodontics (Quintessence).
The honor of second place went to Denise Habermeyer of Zahntechnik

2nd Place – Denise Habermeyer (front view)

2nd Place – Denise Habermeyer (lateral view)

Third Place – Michael Riedl (front view)

Third Place – Michael Riedl (lateral view)

Ranking of the top 15 KZW submissions:

Place	First name	Surname	Company	Country
1	Jade	Connors	Pearl Denture & Implant Centre	Canada
2	Denise	Habermeyer	Zahntechnik Thomas Backscheider	Germany
3	Michael	Riedl	BVAEB	Austria
4	Aspen	Morrow	Edmonds Dental Prosthetics, Inc.	United States
5	Marco	Rolleri	Lab. Odont. Rolleri Marco	Italy
6	Rudy	Concina	Evan Street Denture Clinic	Australia
7	Tim	Janssen	Tim Janssen Dentures	Belgium
8	Stela	Hristova	SMTL DS MUT 7	Bulgaria
9	Jérôme	Miot	Odontech Dental Lab	France
10	Alana	Haferkorn	Zahnwerk Rastede GmbH	Germany
11	Theresa	Rupp	Wolf's Art Dentalstudio GmbH	Germany
12	William	Disantis	Ivory Denture Care, Inc.	United States
13	Kevin	Forster	Dentaltechnik Hartwich GmbH	Germany
14	Nela	Zielonka	GreenLab Protetyka Nela Zielonka	Poland
15	Salvatore	Marono	Lab. Odont. Salvatore Marono	Italy

Thomas Backscheider in Germany. She received the Candulor Silver Award as well as the QDT Yearbook: Complex restorations and digital technologies (Quintessence).
Michael Riedl from Austria, who works as a dental technician at BVAEB, won the Candulor Award in bronze and the QDT Yearbook.

Documentation winners

First place in the documentation category went to Adrian Kolk from UMG Pro Dental. He was the happy recipient of a year's subscription to the magazine Das Dental Labor, sponsored by the publishing house Verlag Neuer Merkur, as well as a voucher from Quintessenz Publishing.
Marco Menzel from the Polyclinic for Restorative Dentistry at the University Clinic Marburg (UKGM) took second place. He also received a year's subscription from the publishing house Verlag Neuer Merkur as a prize.

Third place went to Theresa Rupp from Wolf's Art Dentalstudio. She was presented with the book "Symbiosis 2" from the publishing house Verlag Neuer Merkur.

All participants who made it into the top 15 received annual subscriptions, shopping vouchers and books, generously donated by the trade publishers Quintessenz Publishing, Verlag Neuer Merkur, Spitta, mgo dental and teamwork media Italy, as well as DentAvantgArt, at the Award Ceremony.

All cases will be published on the Candulor website, where they can be viewed at:
https://www.candulor.com/de/kzw-gewinner-2025

In addition, the KZW works are also disseminated via the Candulor social media channels.

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Photo courtesy of Dr.Tofan Gratiela

Zirconia vs. Lithium Disilicate:

Choosing the best material

A practical guide for dental labs and surgeries

Ceramic materials such as zirconia and lithium disilicate have become the solutions of choice for both aesthetic and functional dental restorations. This is due to the natural-looking results that can be obtained whilst ensuring remarkable strength and durability, allowing the dental team to provide increasingly personalised and sophisticated solutions for patients.

All-ceramic materials are widely used for a variety of treatments, from crowns and veneers to implant-supported restorations. Each material has its specifications: when selecting the best material for a case, numerous parameters need to be considered. In this article, I am going to share information that we have put together in-house to communicate with our dentist partners.

By **Malo Le Guen**
3DDI Dental Lab

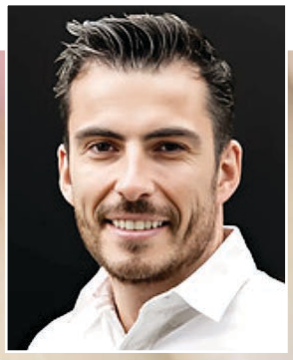

Photo courtesy of Dr.Tofan Gratiela

- **Lithium disilicate** is particularly appreciated for its superior aesthetics and translucency, enabling restorations to blend perfectly into the natural oral environment.

- **Zirconia**, is renowned for its unrivalled strength and ability to withstand powerful chewing forces. It is the preferred choice for posterior crowns and restorations in areas of high stress. Thanks to the new generation of micro-layering materials and techniques, full-contour zirconia is also becoming more common in the anterior section.

Both materials have their own strengths and limitations, making them more or less suitable for specific clinical cases.

The aim of this article is to provide a comparison of these two restorative materials to help you make informed decisions for each case, in partnership with your practitioner.

Lithium disilicate

PRESENTATION:

Lithium disilicate is a dental ceramic reputed for its high resistance and aesthetic qualities, as it mimics the natural translucency of teeth, meaning we can obtain aesthetic, true-to-nature results, which closely imitate the appearance of tooth enamel. It can be stained or layered to blend with the shade of the surrounding teeth.

Technical specifications [1, 2]

- Flexural strength : 300-500 MPa.
- Fracture toughness 2.65-3.5 MPa$\sqrt{m}$.
- Vicker's hardness: 600HV
- % of allergies recorded: 0%
- Translucency index: 65%
- 10-year survival rate (crowns): 90%

Chemical Composition

Lithium disilicate is a glass ceramic, made up of lithium (Li), silicon (Si), and oxygen (O), forming the chemical formula $Li_2Si_2O_5$. Thanks to its unique structure made of many small, interlocking needle-like crystals, the material stop cracks from spreading by deflecting or weakening them.

What is a Glass-Ceramic?

A glass-ceramic consists of a crystalline phase embedded in a glassy matrix. The crystals occur during controlled heating. This combines the benefits of glass (amorphous, transparent, and easy to shape) with ceramics (crystalline, strong, and heat-resistant). Lithium disilicate is a glass-ceramic because it undergoes this transformation when heated, meaning that restorations made from this material can be both translucent and tough with excellent resistance to cracking.

In terms of fabrication, lithium disilicate offers great flexibility when it comes to adjusting restorations, allowing for precise finishing and an excellent fit. It is mainly used for single crowns, veneers, onlays and overlays.

Full emax case:

ADVANTAGES:

Strength

Lithium disilicate is strong enough to withstand moderate chewing load (in general up to the first premolar) while remaining less susceptible to fracture than traditional ceramics.
Although zirconia and some metallic materials offer superior strength, this material stands out for its ability to combine aesthetics with robustness.

Aesthetics

Lithium Disilicate offers excellent translucency, and this allows for the near-perfect reproduction of natural teeth. It's also possible to characterise the shade and translucency to match the surrounding teeth.
Its ability to reproduce nuances and natural brightness makes it an excellent choice for the aesthetic zone.

Biocompatibility

Lithium disilicate is well tolerated in an intra-oral environment, causing no inflammatory or allergic reactions, which is crucial for patients with sensitivities to other materials.
This ensures harmonious integration with the gingiva, reducing any risks, and also meaning the gingiva is more likely to grow around the restoration in healthy festoons.

Numerous applications

Lithium disilicate can be used for a range of restorations, including single crowns, veneers, onlays and overlays. It is suitable for use in three-unit bridges, where the bridges are not subject to strong masticatory forces, i.e. up to the first premolar.
This versatility means that the dental team can choose Lithium Disilicate for various clinical applications.

Milling precision

Lithium disilicate restorations are designed using CAD software, then milled in a milling machine. The glass matrix means that the material is easy to shape and adjust if necessary, ensuring an optimal fit. This in turn improves patient comfort, ensuring that chairside adjustments are extremely rare.

Durability

Most clinical studies show that lithium disilicate crowns have a high-survival rate, exceeding 90% after 10 years.[3] This durability is enhanced by the high-temperature crystallisation process, which increases the density and strength of the material.
However, concerning lithium disilicate bridges, one study revealed a survival rate of 49% after 15 years.[4]
Another concluded that these restorations tended to crack in connector areas.[3] However, there is a lack of conclusive data on this, because there aren't enough long-term clinical trials to confirm these figures.

Full-contour lithium disilicate with micro-layering

Zirconia

PRESENTATION:

Dental zirconia is a high-strength ceramic material used for crowns, bridges, and implants due to its excellent durability, biocompatibility, and aesthetics. It provides high-quality results that meet the demands of modern dental treatment in terms of comfort, durability and appearance.
The dental zirconia market has grown in proportion with the development and democratisation of CAD/CAM systems in labs, and the utilization of transformation-toughened zirconia. It has traditionally been veneered with porcelain, but new generation materials are often stained.

Technical specifications [5, 6]

- Flexural strength: 900–1200 MPa
- Fracture toughness : 4 - 8 MPa√m
- Vicker's hardness: 1200 HV
- % of allergies recorded: 0%
- Translucency index: 40%
- 10-year survival rate: 95%

Chemical Composition

The chemical composition of dental zirconia mainly involves zirconium dioxide (ZrO_2). This material naturally exists in different crystalline forms depending on temperature:

- Monoclinic (room temp)
- Tetragonal (mid temp)
- Cubic (high temp)

To make zirconia suitable for use in the mouth, manufacturers stabilize it (usually with yttrium oxide) to retain the tetragonal phase at room temperature. This stabilized version is known as yttria-stabilized tetragonal zirconia polycrystal (Y-TZP).

When properly mastered, this material offers precise customisation, optimal fit and low restoration maintenance in the long run.

Zirconia restorations must be certified and comply with ISO standards (worldwide standards for safe products and services).

A full-contour zirconia case:

ADVANTAGES

Strength

Dental zirconia is extremely resistant, offering great strength and durability. Its robustness means that restorations are long-lasting and resistant to wear, reducing the need for repairs.

It is capable of withstanding the significant forces associated with chewing, making it suitable for posterior restorations and long-span bridges.

Aesthetics

The aesthetic qualities of this material are also remarkable. It can be stained or layered to perfectly reproduce the appearance of natural teeth, providing translucency and sparkle that enhance smile aesthetics. Zirconia has been the flagship product of my dental lab, 3DDI, for many years now.

Biocompatibility

Zirconia is a material that is well tolerated by oral tissues, and does not cause allergic or inflammatory reactions. This makes it particularly suitable for patients with metal allergies or sensitivity. It also facilitates restoration integration in the mouth, and can help with encouraging gingival festoons at the cervical margin.

Versatile applications

Zirconia is suitable for a wide range of dental treatments, and is commonly used for crowns, bridges and veneers. It is the material of choice for implantology cases.
Zirconia is also a durable option for complete arches.

Evolving technology

Over the past ten years, dental zirconia has undergone significant advancements, particularly with the development of monolithic zirconia restorations with internal shading. These are often micro-layered in the aesthetic zone for additional characterisation.
To enhance translucency, manufacturers have increased the yttria content, leading to the creation of partially stabilized zirconia with a higher cubic phase content. This modification has improved translucency and therefore aesthetics, but resulted in a trade-off with reduced flexural strength and fracture toughness. For example, the flexural strength of 5Y-PSZ typically ranges between 500 MPa and 800 MPa. [7, 8]
The more recent generation of Zr discs offer varying gradients of translucency within the same disc. Another advancement is the ability to combine zirconia with removable dentures. This has also expanded treatment options for complex cases, offering tailor-made solutions to patients.
Zirconia combines strength, aesthetics and biocompatibility. This is the material of choice in our laboratory!

Micro-layering on full ZR multi

Zirconia / Lithium Disilicate
Our recommendations after 10 years' experience:

Indication	Lithium Disilicate	Zirconia
Veneers	Thinner, lighter, more translucent	Best when prepared tooth shade is darker
Inlays	Good fit, suitable protocol for cementing	Best fit and more durable
Onlays/ Overlays	Good fit, suitable protocol for cementing	Zirconia onlays provide more strength for bruxism cases
Anterior crowns	Natural aesthetics and translucency	Best when prepared tooth shade is darker Miyo microlayering
Posterior crowns	Possible if the chewing load is moderate	High flexural strength
Bridges	For Maryland bridges (with wings) only (upto 2 units)	Strength and durability
Dental Implants	Too translucant, requires ceramic abutments	Ideal material, combining aesthetics, strength and biocompatibility
Full arch on implants	Not strong enough	Recommended due to strength and structural stability
Combined restoration (Crown + removable)	Not strong enough	Recommended due to high flexural strength and fracture toughness

Photo courtesy of Dr.Tofan Gratiela

Zirconia VS Lithium disilicate

In conclusion, lithium disilicate and zirconia offer complementary solutions that allow the dental team to adapt to the requirements of each case. Their growing popularity is testament to their effectiveness and their ability to meet patients' expectations for restorations that are both aesthetically pleasing and durable.
As technologies evolve and new versions of these materials emerge, their role in today's dental practices will continue to grow, contributing to ever more personalised, high-performance care.
For over 10 years, zirconia has been our laboratory's flagship product, renowned for its reliability and aesthetics, with an almost non-existent failure rate.

For aesthetic or specifically characterised cases, we use monolithic multilayer zirconia which we microlayer using CZR Noritake. For more delicate cases we use MIYO, which guarantees a good result for us.

Malo Le Guen
3DDI Dental Lab

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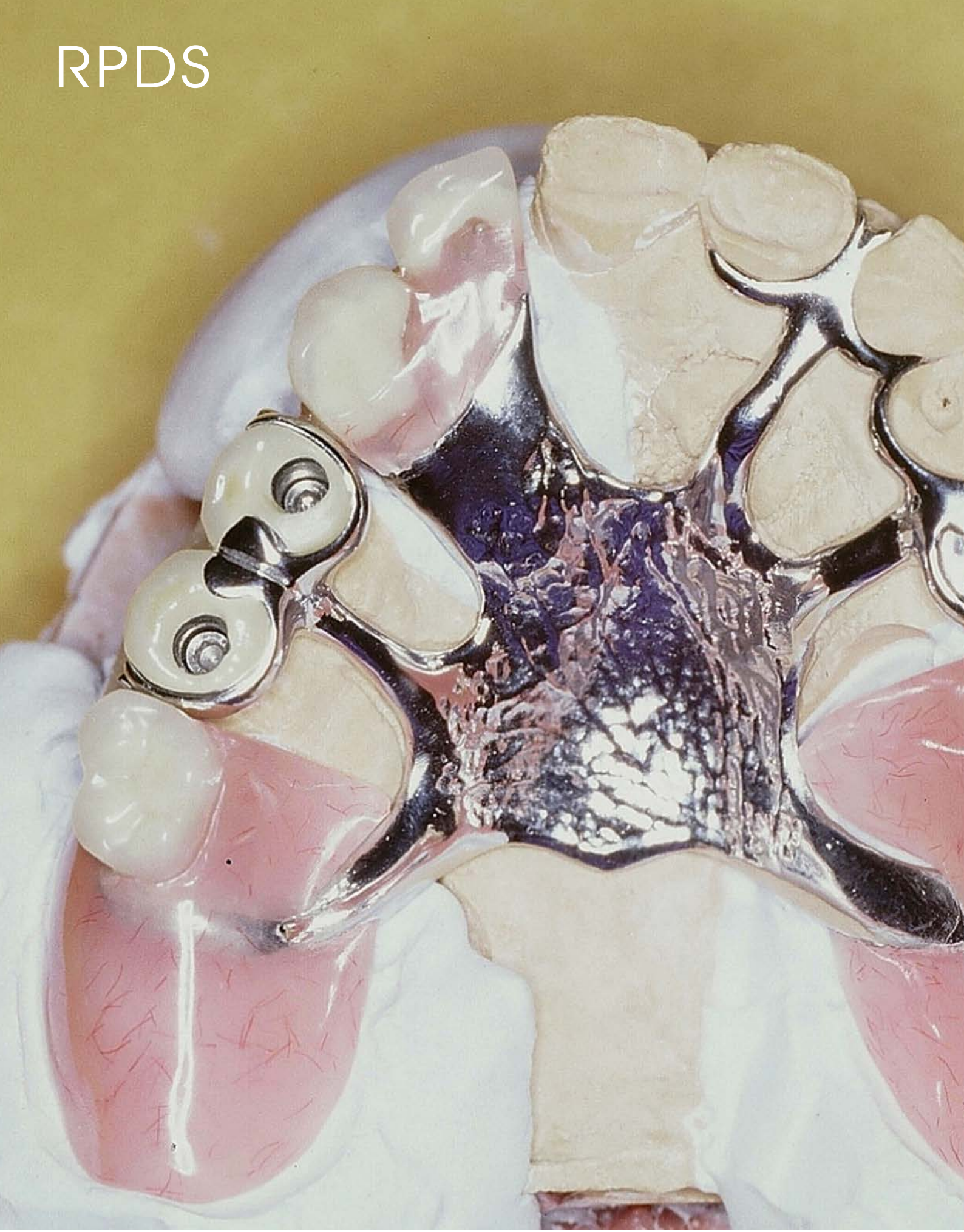
With thanks Léa Deliaire and Margaux Lamy for their help in preparing this article.

RPDS



By **Gérard JOURDA**
Dental Surgeon

Implants and removable partial dentures

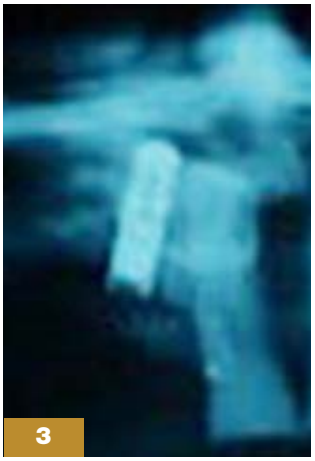
A winning combination

When treating partial edentulism, it is common to consider two separate treatment options: implants or removable partial dentures. In certain cases, extensive implant treatment may be contraindicated, undesirable or too expensive. RPD design may be complicated if there is insufficient support. However, it may be possible to integrate one or more implant borne crowns with integrated rests to support an RPD.

Whilst this solution is rarely considered, the clinical case presented in this article will demonstrate that combining dental implants with RPDs can provide an excellent restorative solution.

The clinical case

The initial RPD did not integrate rest areas on the abutments



Implant fracture at tooth position 12

View of the fit surface of the RPD, with an attachment on the implant

Housing of the initial attachment

Case history and clinical examination

Mrs B., aged 75, consulted with the aim of renewing her maxillary partial denture, which was totally unbalanced and prone to tipping.

The clinical examination revealed partial edentulism **(fig. 1)** that was treated with a rigid removable partial denture that was not supported on the abutment teeth and was therefore without appropriate rests **(fig. 2)**.
The x-ray assessment revealed the presence of a fractured implant cylinder at position 12 **(fig. 3)**.
Examination of the fit surface of the RPD showed the presence of a snap-type attachment at position 12 **(figs. 4 and 5)**.

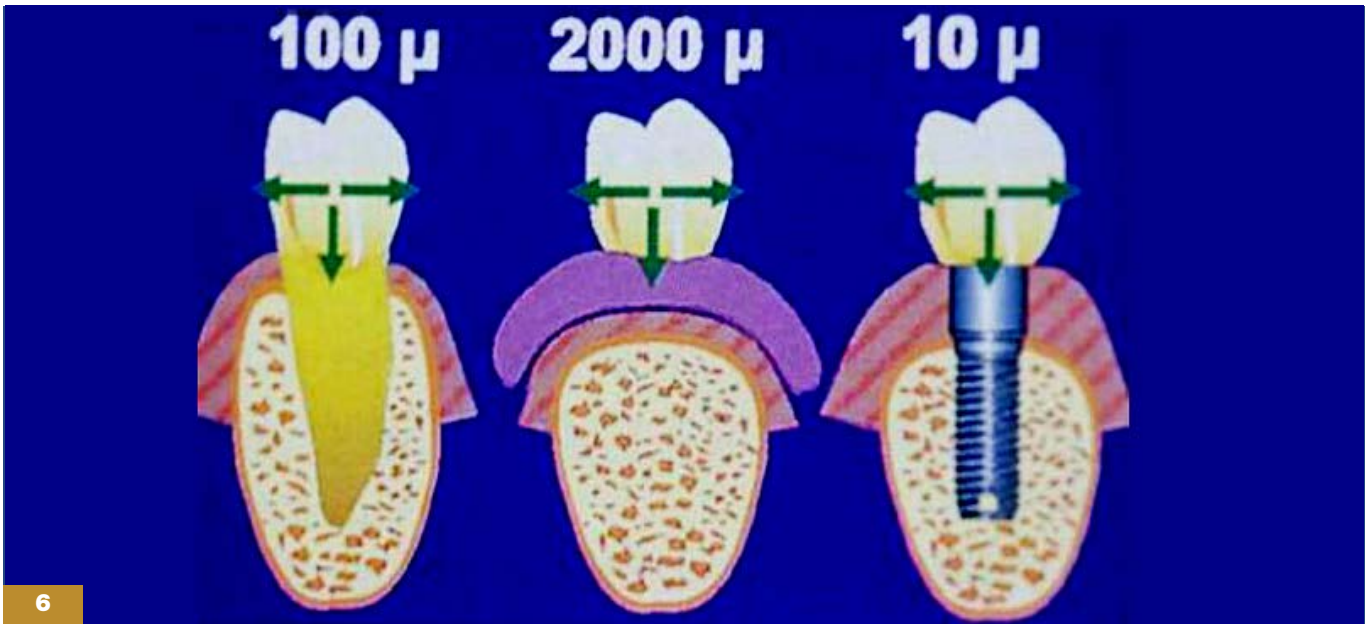
Mechanical analysis of the RPD revealed that the implant abutment had been subjected to traction during mastication, leading to implant fracture [1].
It was also noted that the crown placed on 25 needed to be replaced.

Treatment plan

The patient expressed a desire to attain satisfactory function as well as improve the aesthetics of her previous restoration. She wanted efficient treatment, but did not desire full implant treatment as she found this too intensive. It was feared that removing the implant would create bone resorption. Because the implant was only slightly fractured at the subgingival level, it was decided that it was not necessary to remove it.

The following treatment plan was therefore developed:

- The fractured implant at postion 12 was left in place and buried using a gingival graft.
- New implants were placed in positions 14 and 15.
- Two PFM crowns were designed to fit over these implants, with manually added metallic rest areas to support the RPD.
- A similar PFM crown with integrated rests for the RPD was designed for tooth 25.



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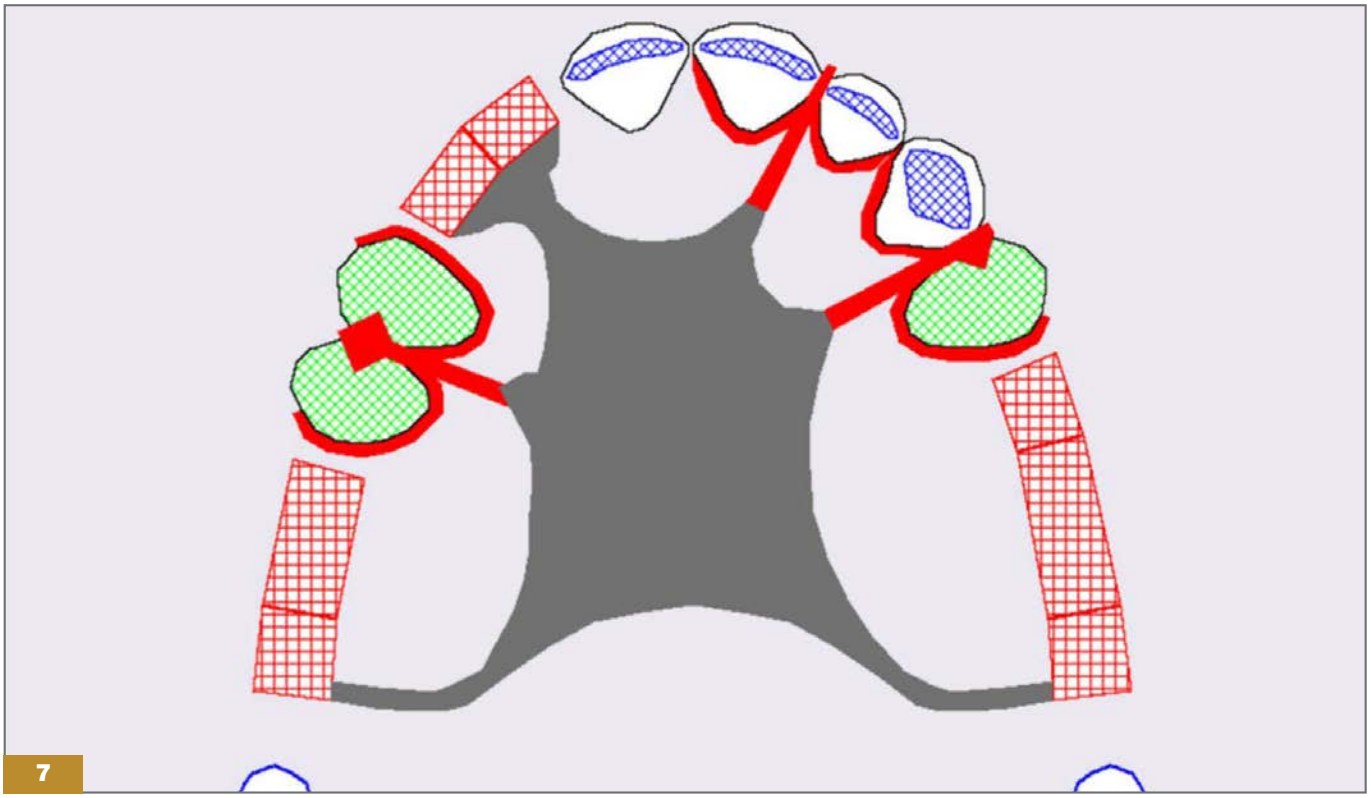
Branemark diagram showing the lateral displacement of RPD support areas under the effect of chewing forces. Left: tooth; centre: soft tissue; right: implants



7

Diagram of the treatment plan creating using the Stelligraphe software

The removable partial denture would be made in consequence, taking into account the various supporting rest areas, which were respectively: dental, implant and mucosal. Each of these supporting elements reacts differently under stress.

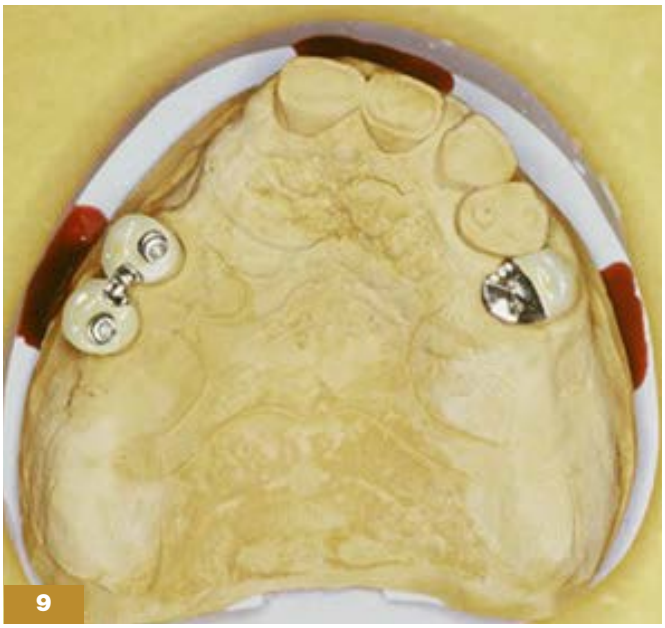
When subjected to chewing loads, the axial displacement for soft tissue is 2,000µ (or 2mm) for teeth it is 100µ (or 1/10 mm), whilst for implants it is just 10µ (or 1/100mm) as summarised in the Branemak diagram **(fig. 6)**.

This heterogeneity has always posed problems, and has been highlighted by numerous publications[2], which confirm the impact of this disparity[3].

These biomechanical considerations require a differentiated (and separate) impression for the saddle areas, known as an 'altered-cast impression' (and described by Applegate as an anatomo-functional impression). The cast will be altered using this additional mucosal impression to achieve disjointed saddles[4] (for a full discussion of the altered-cast technique, please refer to my article in Dental Technologies Issue 142).

The treatment plan is then laid out on-screen using the Stelligraphe RPD design software **(fig. 7)**[5].

Implants on the model



PFM crowns with integrated metal rest areas, note the extent of support on tooth 25

Treatment stages

The protocol for the fabrication of any removable partial denture requires successive stages of clinical and laboratory work.
If the practitioner-technician team is to work well together, the protocol must be planned in such a way as to ensure the efficiency, time-savings and quality required for this type of rehabilitation[6].

After relining the fractured implant and placing the crown on 25, the two implants were placed at sites 14 and 15 **(fig. 8)**.

After osseointegration, the milled, veneered PFM crowns were screwed onto the implants 14 and 15 and cemented onto tooth stump 25 **(fig. 9)**.

The RPD framework was then fabricated **(fig. 10)** using the initial Stelligraphe design as a basis **(fig. 7)**. Next, an impression was taken of the saddle areas in the mouth.
This is known as a 'altered-cast impression' or 'Applegate's anatomo-functional impression' a 'dissociated impression' or sometimes simply as 'the tertiary impression' (see box for further discussion).

This additional impression of the uncompressed mucosa is used to replace the compressed saddle areas of the secondary impression by sectioning the model. The RPD is then designed on the altered cast **(fig. 11)**.

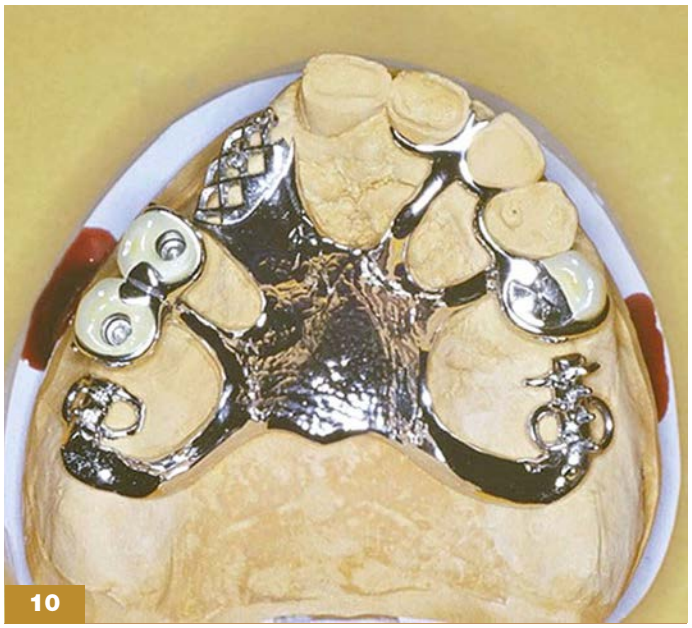
Advantages of the altered-cast technique:

- It allows dynamic recording of mucosal tissues,
- It enables the limits of the saddle to be perfectly defined (something that optical digital impressions are currently unable to do),
- the saddle can use the maximum mucosal support available, by eliminating under-extensions,
- risk of injury in the saddle areas is eliminated by avoiding over extention of the saddles,
- as a result, this eliminates the need for (often repetitive) correction of saddle boundaries, which creates discomfort for patients,
- It frees the practitioner from the tedious, random and time-consuming procedures of post-fitting adjustments

An RPD designed in this way meets the following requirements:

- Aesthetic: milling that enables effective, aesthetic retention without fragile attachments;
- Mechanical, due to triple support from teeth / implants / mucosa due to the integration of disjointed saddles;
- Functional, by re-establishing alternate chewing in the saddle areas, without tipping, thanks to the independence of the saddle areas

By integrating these methods, the technician and dentist can be proud to deliver a truly 'custom-made medical device'.



10

The framework on the model during fabrication: note how the crowns are used for support

11

The finished RPD on the model

Conclusion

By using a limited number of implants as rests, placed at strategic positions, the combination of implants and removable partial dentures provides a comfortable and effective therapeutic rehabilitation.

It is essential to bear in mind two key factors:

1. The fundamental design principles of removable partial dentures must be respected, particularly the design and layout of the RPD, as well as the preparation of the mouth for suitable rests and support.

2. The conditions dictated by double support (implants/mucosal tissues) and triple support (teeth/implants/mucosal tissues) must be managed using concepts that respond to these mechanical constraints[8].

Non-respect of these requirements can result in various problems, from bone resorption to implant fracture, as we saw with this patient during the initial consultation. However, if the appropriate conditions are respected, we can see how the placement of dental implants can facilitate or even allow for the use of removable partial dentures as a restorative solution.
We can also see that the use of an RPD can be positive for implants, thus extending their respective therapeutic possibilities.

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Vita & Panthera

Panthera and Vita announced their partnership at the IDS

Vita Zahnfabrik and Panthera Dental Announce Distribution Partnership to Enhance Prosthetic Solutions

Vita Zahnfabrik, a leading global manufacturer of high-quality dental materials, and Panthera Dental, a pioneer in CAD/CAM design and manufacture of custom-made dental prosthetic restorations, have entered a commercial partnership.

This collaboration aims to provide dental technicians, laboratories, and milling centers in Western Europe with easier access to Panthera Dental's high-quality solutions, further advancing digital dental technology. Through this agreement, Vita becomes the exclusive distributor for Panthera Dental's prosthetic products in Austria, France, Germany, Italy, Spain, and Switzerland.

By leveraging the strengths of both companies, the partnership expands treatment options for complex implant cases, offering dental technicians greater flexibility and precision in their workflows.
Panthera Dental benefits from Vita's established sales network and therefore offers an additional option for high-precision denture solutions.
This collaboration enhances the availability of advanced implant-supported restorations and ensures seamless integration into existing workflows.

Dr. Emanuel Rauter, Managing Director of Vita Zahnfabrik, emphasizes: *"Our collaboration with Panthera Dental allows us to offer dental technicians, laboratories, and milling centers an additional specialized solution, complementing our well-established network of partners."*

Gabriel Robichaud, Co-Founder and CEO of Panthera Dental, adds: *"Partnering with Vita strengthens our presence in Europe and ensures that our industry-leading, custom-made prosthetic solutions reach more professionals relying on cutting-edge technology."*

This distribution partnership reinforces both companies' commitment to innovation, efficiency, and quality in digital dental technology. By combining their expertise, Vita Zahnfabrik and Panthera Dental lay the foundation for future innovations that will shape the next generation of digital dental restorations.

Dr Brian Schottlander. Eda Dzinovic & Dr Shiyana Eliyas.

BSSPD / Schottlander Oral Presentation Prize

Schottlander awards an annual prize for the advancement of knowledge in Prosthetic Dentistry, in collabotation with The British Society of Prosthodontists (BSSPD).

The winner of this year's prestigious prize was Eda Dzinovic from King's College, London. Her presentation was entitled "Advancing Dental Materials with High-Fidelity Octopus-Inspired Suction Cups".

Complete dentures frequently exhibit poor adhesion to oral tissues. However, nature provides many examples of organisms that overcome such challenges through highly ordered topographies. A method of reproducing the topography of fresh octopus suction cups, reducing them in size, incorporating them onto the fitting surface of a denture and testing them for adhesion was presented. Against dry mucosa adhesion was reduced, but in a wet environment, adhesion was increased.
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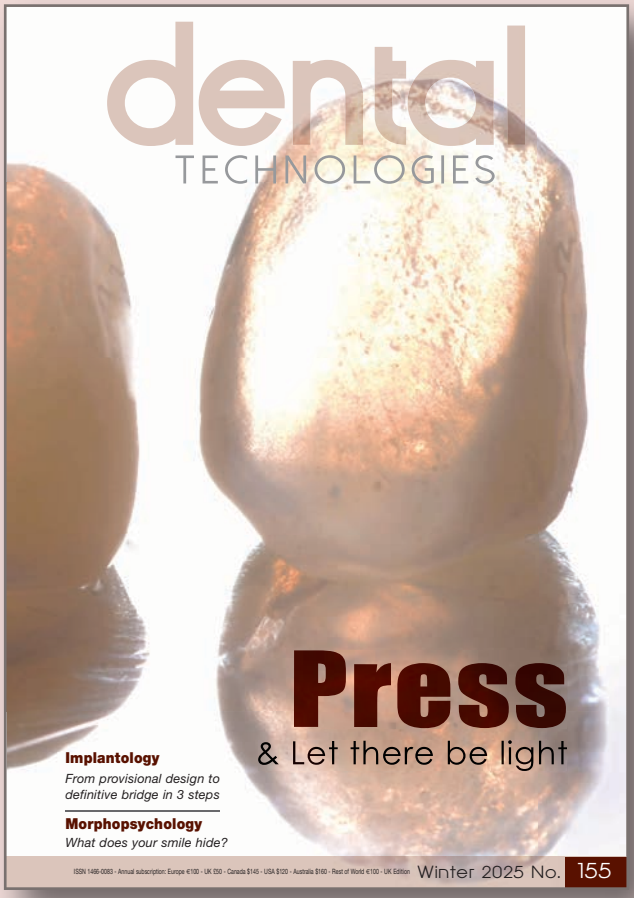

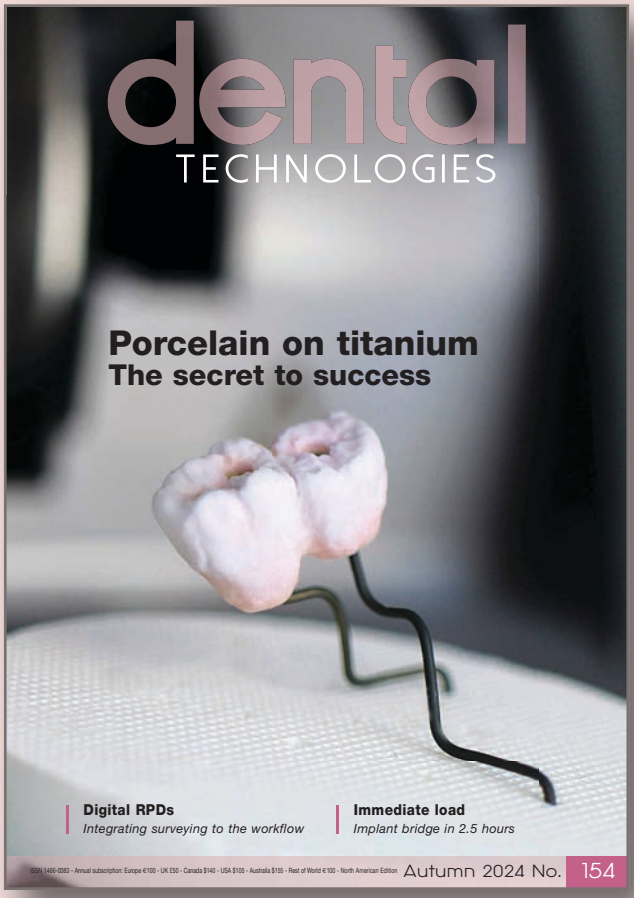

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With increasing efforts being made to train dentists to screen, refer and treat patients with snoring conditions, there is a corresponding need for appropriately trained and accredited technicians and clinical dental technicians to construct these devices.

Price: £150 + VAT p/p
CPD: 6 hours enhanced CPD
Venue: Schottlander Training Centre, Letchworth, Hertfordshire SG6 2WD

Gingival Composite Characterisation
Presented by Chris Wibberley
Friday 11th July @SG6 2WD
Friday 6th June @OL3 5BY

This fast paced one day, hands-on course will focus on teaching Chris' advanced techniques for improving denture aesthetics.

This course will help dental technicians and CDTs to enhance their skills and learn new techniques for creating truly aesthetic dentures with natural looking teeth and soft tissue. Delegates will learn how to characterise denture teeth and gingival tissue to meet the expectation of patients for extremely lifelike removable prosthesis.

Chris will teach easy and practical techniques which can be immediately adapted and integrated into daily lab work.
Delegates will learn a greater understanding of how composites and light-cured stains can be used to make removable prosthesis look more natural.
They will also gain confidence in their improved ability to produce better dentures aesthetics, for which they can charge discerning customers appropriately.

Presented in a friendly, informal, and practical way, this course will demystify the work of denture 'gurus' with step-by-step, easy to understand, hands-on training.

Price: £250 + VAT p/p
CPD:5.5 hours enhanced
Location: CW Dentures. Oldham OL3 5BY
OR
Schottlander Training Centre. Letchworth SG6 2WD
Depending on the date

For all courses contact:
Tel: 01462 704 633
courses@schottlander.co.uk

Valplast

Two-day Valplast Flexible Partial Denture Course
Dates arranged upon request

This comprehensive class will cover all aspects of how to fabricate Valplast Flexible Partial Dentures. Includes both theory and hands-on training.

Learn to fabricate a functional Valplast flexible partial denture, including master model preparation, surveying, wax block-out & duplication, tooth set-up & waxing,processing and finishing & polishing of the appliance.
16 hours of CPD

Contact:
Tel: 01903 700037
Bookings: lucy@valplast.info

ZFX

Open Day: Digital Lab
The Zfx digital lab workshop will overview the Zfx management software, functions & options, scanning process and information on the Zfx network. Hands-On: Trial scan and modelling of your own work up to 3 units or 1 individual abutment.
Up to 2 hours CPD available.

Basic course Fee:
Price: £100 /person
Groups (upto 3) £75 /person
Advanced course Fee:
Individual: £650 /person
Groups (upto 3)
£350 /person
Basic and advanced courses can be tailored to your needs, at Zfx Birmingham or your lab.

CAD Software Course
Basic Crown & bridge design, inlay, onlay & veneer, overpress function, waxup functions.
Course objectives: Starting up the scanner, Zfx scan III, Zfx Evolution, Zfx management software (Dental DB).
Hands-On: Simulation of a patient case using the Zfx management software through to upload of the finished data.
6 hours CPD available.
Individual booking (£499)
Group booking (£199)

CAD Software: Advanced Individual abutments
For bonding on a titanium base or milled from a single piece, occlusally screw-retained abutments (for direct veneering), Screw-on bridges, different types of bar constructions (Dolder, Hader), attachments and thread setting for Locator.
Course objectives: abutment designer, bar designer, virtual articulator, use of various help tools, special functions for complex restorations, bite-splint. Hands-On: Simulation of a patient case with highend construction.

6 hours CPD available
Course situated at Zfx, Birmingham, UK
Flexible dates, course locations & group bookings available.

Please visit:
zfx-dental.co.uk

USA

LMT

LMT Lab Day West
MAY 16-17, 2025
Hyatt Regency
GARDEN GROVE, CA

Second only to Lab Day Chicago, Lab day West is the largest laboratory trade show on the West Coast. Crowded with busy shoppers and buzzing with industry news and education, Lab day West embodies the good vibrations for which Southern California is famous.
Join LMT for our 34th annual Lab Day West.
Entrance into both exhibit halls is free!

Friday, May 16th 2025
Exhibition: 10am - 5pm
Seminars: 8am - 6pm
Saturday, May 17th 2025
Exhibition: 10am - 3.30pm
Seminars: 8am - 6pm

LMT Lab Day East
Saturday, September 27th
Westchester Marriott
Tarrytown, NY

Join LMT for our 25th Annual LAB DAY East, the Largest Dental Laboratory Technology Show in the Northeast!

Since its debut in 2000, LAB DAY EAST has become the must-attend event on the East Coast. Our annual show has captured the attention of eager audiences who appreciate the central location, educational clinics and busy exhibit hall.

Saturday, September 27
Exhibit Hall: 9am - 4pm
Seminars: 9:30am - 4:30pm

For more information on any Lab Day event, visit:
www.lmtmag.com

FDLA

The Southern States Symposium & Expo Meeting
Jun 13-14
Signia by Hilton Orlando, Florida

The Southern States Symposium & Expo meeting is the largest dental laboratory industry meeting in the country run by a nonprofit association. The educational sessions and expo will all provide you with beneficial information on the latest trends and technology updates. FDLA offers CDT/RG, AGD and State of Florida approved credits, so you will earn continuing education credits for attending the courses held during the Symposium.

To register or for more information, please visit:
fdla.net/symposium

GNYDM

101st Greater New York Dental Meeting
Jacob K. Javits Convention Center, NY, NY

Nov 28th - Dec 3rd
Exhibition: Nov 30th-Dec 3rd

We invite you to participate in one of the largest Dental Congresses in the US. At our 2024 Meeting, we hosted over 30,000 healthcare professionals, featuring over 1,600 Technical Exhibits demonstrating the newest dental technology. NO PRE-REGISTRATION FEE!
We have again planned an unparalleled educational program for 2025, featuring some of the most highly regarded educators in the field of Dentistry. There is a choice of full-day seminars, half-day seminars, and hands-on workshops that are sure to fascinate even the most discriminating dentist and staff.
We urge you to partake in the many educational programs and visit our Exhibitors on our expansive exhibit floor. It is an integral part of the Dental Meeting experience for attendees to interact with the over 600 Exhibitors who enhance our Meeting in countless ways. They are there to demonstrate and teach you about new products and technology from around the world. You can touch, use and compare the newest materials and technology in Dentistry today. The conference will feature Dental Laboratory Education.

To register or for more information, please visit:
gnydm.com

How it works

Verifiable CPD is for subscribers only.
Each questionnaire relates to one article.

In the UK and Australia:
Each questionnaire is worth one hour of verifiable CPD, at the editor's discretion. It is possible to complete one or both questionnaires, for upto two hours of CPD per issue.

In the USA:
According to NBC guidelines, and since we check your answers and return a stamped certificate, each article questionnaire submitted with 60% correct answers will earn:
½ Scientific CE credit
½ Professional development credit

This means you can obtain one hour of Scientific CE credit and one hour of professional development credit per issue.

Complete the questions and return the questionnaire to us.
- By email: **contact@dental-technologies.net**
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Don't forget to sign the declaration and fill out your name and address clearly overleaf!

We will return your certificate in due course, with the stamped original or scanned page. There is no additional charge for CPD certificates, this is a free service for subscribers. We advise you to keep a photocopy for your records.

Development outcome: maintenance and development of knowledge or skills within the field of restorative dentistry.

Gingival aesthetics: the high-fusing, low-fusing technique *(pg. 6)*

1. Why was a gingival section in the maxillary bridge required?

2. Why is it complicated to build-up teeth and gingiva in a single bake?

3. What is Denis' proposed solution to this problem?

4.a What does Denis first do when building up the gingiva?

.b What does he do next, and why?

5. How does Denis create a natural granular effect on the surface of the gingiva?

Comments:

Name: .....
Laboratory Name: .....
Address: .....
.....
.....
Telephone: .....
GDC / Reg N°: .....

I certify that the answers submitted herein are entirely my own work, and that no part has been copied from the work of others.

Signed:

Date: .....

Development outcome: maintenance and development of knowledge or skills within the field of restorative dentistry.

Zirconia vs. Lithium disilicate: choosing the best material (pg.22)

1. What is the chemical composition of lithium disilicate?

2a. Describe the unique structure of lithium disilicate.

b. Why is this structure useful?

3. What is a glass ceramic?

4. What is Y-TZP?

5. Why is stabilizing zirconia useful?

6a. How have manufacturers improved the translucency of zirconia in recent years?

b. What is the trade-off for improving translucency?

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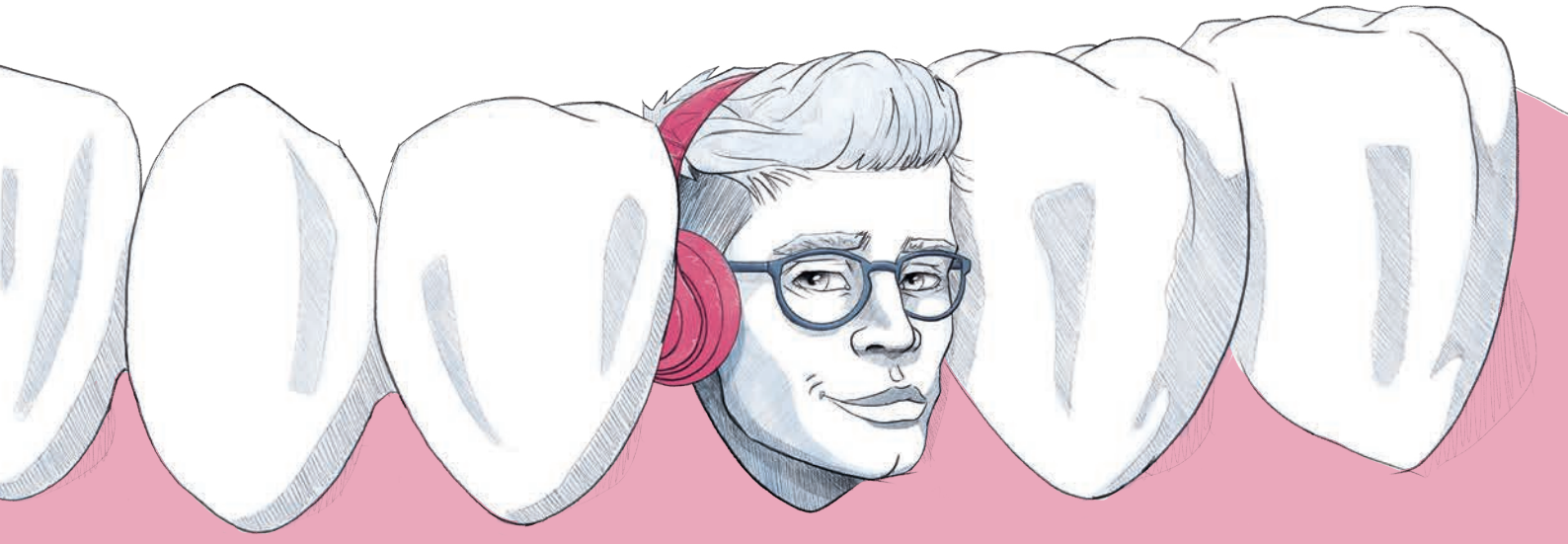

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