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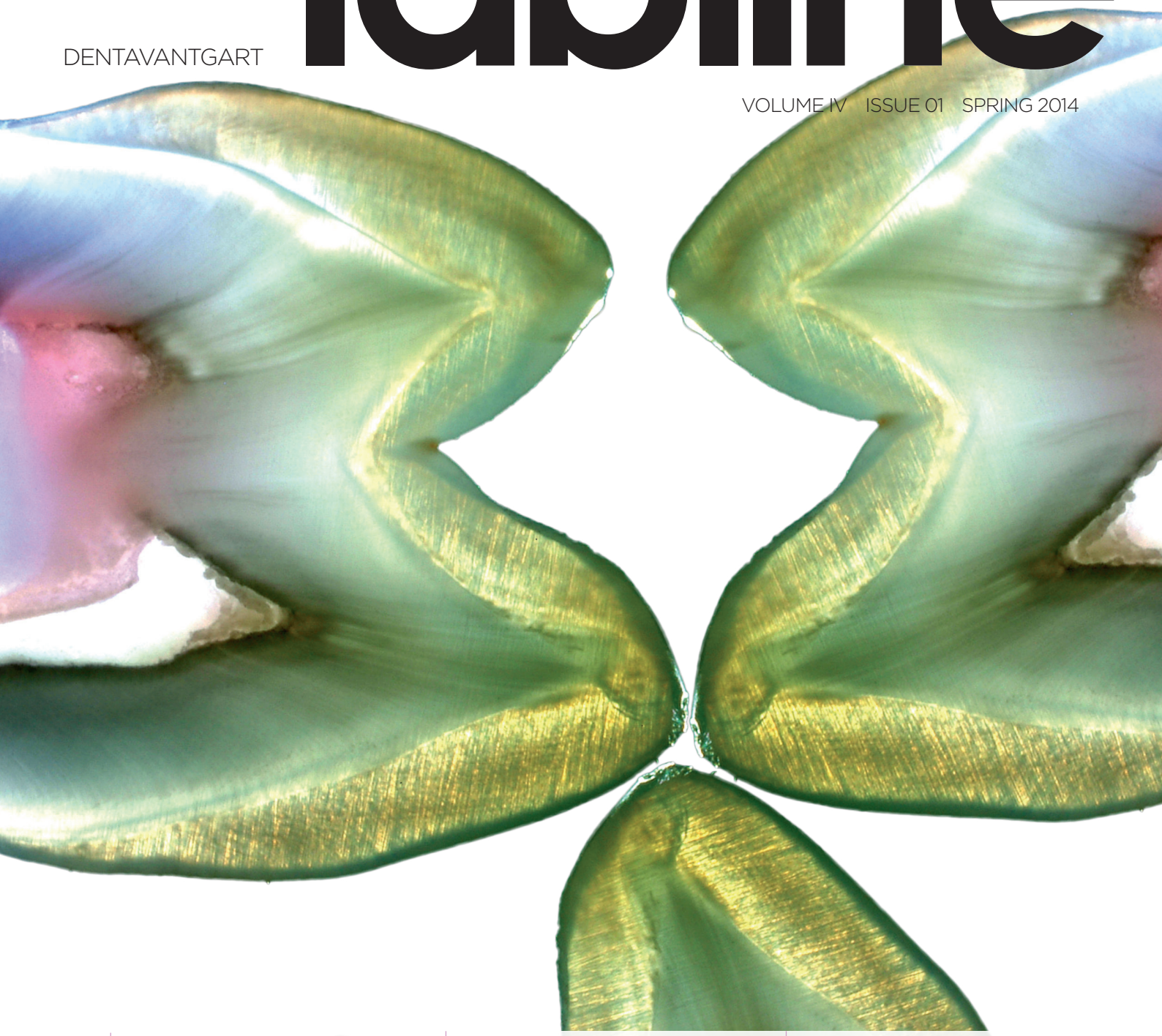


INTERVIEW

AUGUST BRUGUERA
HIS LIFE IS ADVANCEMENT

MDT
IÑIGO CASARES GURMENDI

WHITE & PINK

CDT, DDS, FESCD
SIMONE VACCARI &
DMD, CAGS
GIACOMO ORI

THE PREVISUALIZATION TECHNIQUE AS A KEY TO SUCCESS IN ESTHETIC CASES

Different AESTHETIC OPTIONS OF LITHIUM DISILICATE

CDT **Ferran Puigrefagut**
AV/ Generalitat 2, 4D,
Mollerussa (Lérida), Spain
Phone: +0034-699314024 | +0034-973097008
E-mail: fpc_86@hotmail.com
Web: www.ferranpuig.es

DDS **Albert Verd**
AV/ Generalitat 2, 3º,
Mollerussa,
Spain

DDS **Lidia Martorell**
Agusti Ros 5, 1º,
Agramunt,
Spain

Serafí Miret Cuenca
AV/ Generalitat 2, 3º,
Mollerussa,
Spain

Nowadays, we have seen different applications and heard different evaluations on lithium disilicate. Most of them are positive, but there are also negative, which basically relates to aesthetic limitations.
In this article we will discuss the different aesthetic solutions offered by this material and the versatility that it allows us if we know how to manipulate it delicately when it is in our hands.

The main points are:

1. Abutments over Implants. Lithium disilicate injection on Tilite base abutments with angulation rectification (Talladium), to obtain a fully aesthetic ceramic abutment of disilicate. Anterior groups alternative with or without angulation problems.
2. Disilicate-based veneers of 0.1 mm with ceramic coat. In cases with favorable colors.
3. Micro layered disilicate veneers.
4. Major color changes. Opacity options that this material offers in case of teeth with unfavorable color. Selecting the most suitable tablet.

It is important to draw a number of conclusions when we have had a material in our hands and handled it, about whether the conclusions are good or not. What we try to do is open our mind, try new things and check if the material allows us do it.

Our work, which fortunately is mechanical and repeated daily, offers us the possibility of performing the "trial and error" test very often, this way we can really know how far we can go with it.

We must choose between what most people do, being advised by dental brands taking precautions and not going further with the material to not have any problem, or to use our own knowledge and daily practice to be able to give another utility or application to the material and make sure that it works.

Also it is convenient to exchange opinions with those colleagues who like to work with this material and know their evaluations about it according to their experience.

In this respect, we would like to take this opportunity to thank for the help, a great technician and person, **Mr. August Bruguera**, who has vast knowledge on this material and helped us to open our eyes finding solutions to everyday clinical cases, sometimes challenging the limits.

INTRODUCTION OF CASES

ABUTMENTS OVER IMPLANTS

Many times, when working with interfaces and finishing a restoration of this material in the laboratory, we are not sure about the color that will be achieved.

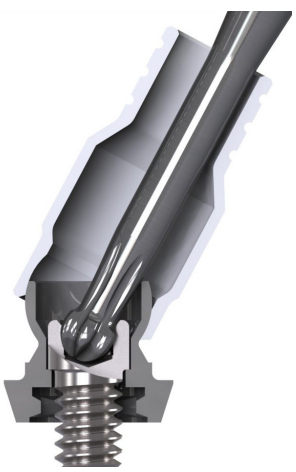
The interaction between the interface, the core we have chosen (with opacity level) and the cement can alter the desired color. To resolve this problem and to control the final color, we used a Dynamic Abutment interface (Talladium) and injected lithium disilicate (prior opaque application) which we have subsequently covered with Ivoclar e-max Vivadent ceramic.

The versatility of this interface allows us to carry out a full ceramic screwed prosthesis in cases with problems of implants inclination, as well as in combination with lithium disilicate and its ability to be injected, after applying an opaque layer we can safely control the final color of the restoration.

Dynamic Abutment System is a prosthetic abutment that allows us to rectify angulations from 0° to 28° and can be screwed directly into implants or intermediate abutments **(Figure 1)**.

The special design of its base allows us to inject lithium disilicate directly on the pre-treated interface, obtaining a mechanical retention for the restoration and full control of the final color of our prosthesis without further modifications and being able to correct the entry of the screw if necessary **(Figure 2)**.

1 Dynamic Abutment System **2**



CONSIDER AN EXAMPLE

Male patient, 67 years old, who attended our clinic with a broken crown at the 2.2 and advanced periodontal problem.
After completing the clinical records (without finding pathologies of interest) and complementary tests (orthopantomography and visiography), we decided to carry out a periodontal treatment (by scraping per quadrants and maintenance stages every 4 months), the removal of root fragments of 2.2. and then placement of a Straumann Tissue Level (RN) implant of 4'1 x 12mm. Due to problems of bone lack, the implant had to be placed with a non-ideal inclination that impeded us from using a conventional screwed restoration. In these situations we can choose cemented, or if we want it to be screwed in, we can use an angled abutment or Talladium Dynamic Abutment. In this case we chose the Dynamic Abutment but with a novel solution, in order to make a totally ceramic screwed prosthesis of lithium disilicate.

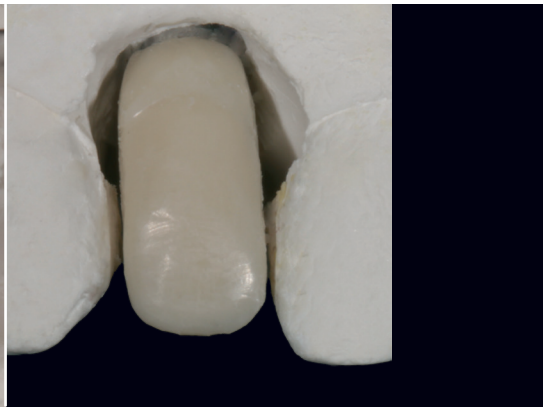
What steps we followed:
The plastic chimney was dismantled to work directly with the Dynamic Abutment Tilite base as a metal structure.
The base was blasted with aluminum oxide of 110 microns, taking care not to encumber the connection base with the implant and after that we oxidized the metal. In this case, for Tilite, at an initial temperature of 540°C under vacuum and increasing 55°C per minute up to 982°C. Once the temperature was reached, we released the vacuum and removed the piece.
It was painted with an opaque base, in this case we used the opaque mass of Noritake EX3, A3 color (base color of the tooth) and then we carried out the appropriate firings. The opaque brand is not important, as long as having a temperature of 920°C or higher and the material is metal-ceramic **(Figures 1 and 2)**.

1 Tilite base blasted.

2 Tilite base painted with opaque.

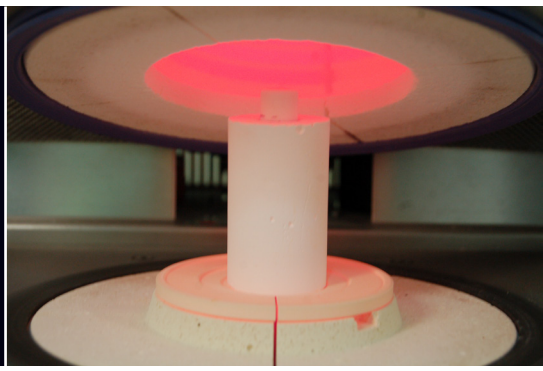
3 Start modeling the abutment.

4 Occlusal view of the angled abutment.



5 Frontal view of the angled abutment.

6 Abutments prepared to inject disilicate.



7 Oven opening after injection.

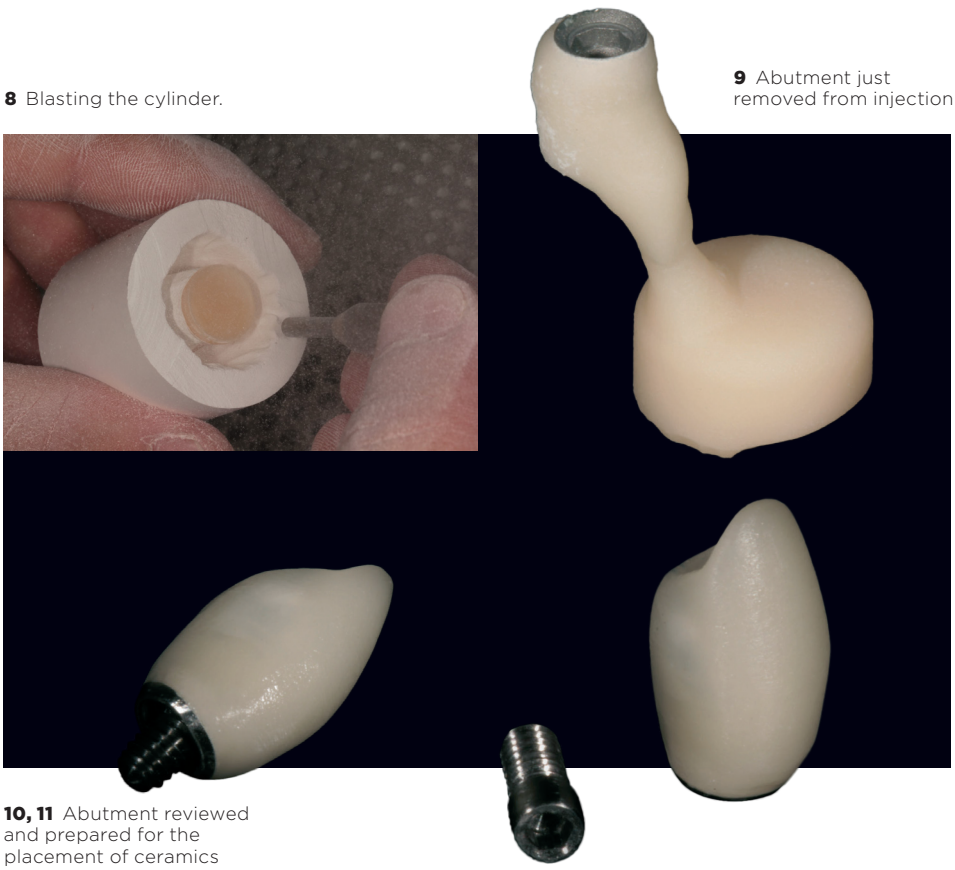
8 Blasting the cylinder.

9 Abutment just removed from injection.

Once the structure was prepared, we directly modeled the core of the tooth, to make the injection of lithium disilicate on Tilite base later. **(Figures 3, 4 and 5)**

The cylinder was prepared and injected, in this case a tablet of MO1 disilicate. This tablet has the characteristic of being quite opaque (second opacity level), sufficient to hide the opaque metal base.
(Figures 6 and 7)

Once injected we, retouched it, letting the disilicate prepared to stratify the ceramics.
(Figures 8, 9, 10 and 11)



10, 11 Abutment reviewed and prepared for the placement of ceramics

12, 13 Angled abutment with its load of ceramics finished.

We used e-max ceramic from Ivoclar Vivadent. We stratified and characterized the color according to the indications and reference photographs. **(Figures 12 and 13)**

The finished tooth was screwed into the mouth and the final aesthetic result was checked. **(Figures 14,15,16, 17 and 18)**

14 Central view with the absence of the tooth 22.

15 Central view with tooth 22 already installed in mouth

16 Central view with tooth 22 already installed in mouth with black background

17 Palatinal view in mouth.

18 Detail of the tooth aesthetics in mouth.

19 Initial case.

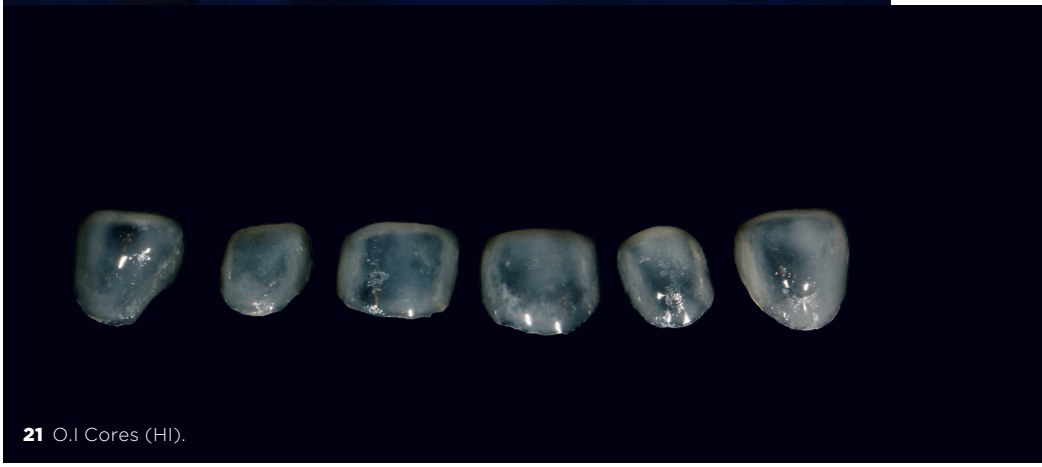
VENEERS WITH CORE OF 0.1 mm

Female patient, 39 years old, who attended our clinic for an aesthetic problem in the anterior superior area. She wanted to close the diastema and harmonize her smile **(Figure 19)**. After completing the clinical records (without finding pathologies of interest) and complementary tests (orthopantomography and visiography), we offered her the possibility of closing the diastema of 1.3. to 2.3. by placing veneers.

Since she had a positive tooth color (A2-A3) and the desired color was A1, we made a minimal cut in the teeth eliminating retentive areas (for horizontal insertion), marking a 0.3 mm margin in the cervical and a 0.5 mm incisal flat carving, as the aesthetic goal established with the waxing and verified by mock-up, was to increase the length of the anterior teeth by 1 mm. **(Figure 20)**

When we face such cases, personally we like making the disilicate veneers HT with a core of 0.1 mm in thickness and feldspathic ceramic coating (E-max). **(Figures 21 and 22)**

20 Veneers cut.



21 O.I Cores (HI).

In our opinion, they have many advantages compared to conventional feldspathic veneers, made in refractory model. The preparation is faster and gives greater accuracy in terms of contact points when manufacturing them. Having a small core of lithium disilicate below our feldspathic ceramic does not allow much contraction of the ceramic coating in the different firing we carry out. Otherwise, in the veneers made in the refractory model, after its removal from the investment, we have to adjust the contact points in a master model and very often we must spend time making corrections with low melt masses to add material to those areas. At the same time, we expect it not to be deformed because it does not have the correct support as we have already removed them from the investment.

Final appearance within two weeks after cementation.
(Figures 23, 24, 25 and 26)

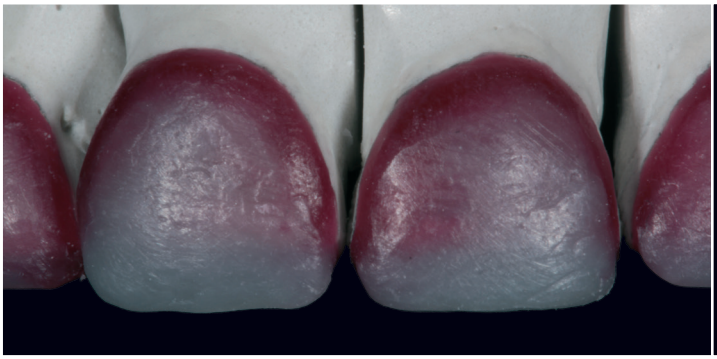
22 Detail of finished veneer.

23 Front view of the veneers in the mouth.

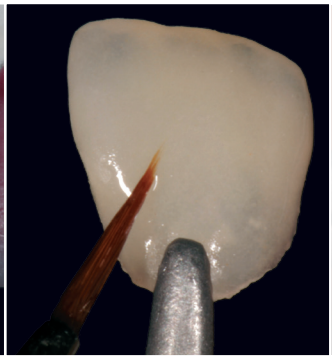
24 Lateral view of the veneers in mouth.

25, 26 Lateral view of the veneers in mouth.

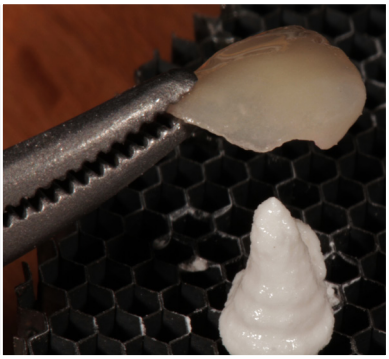
Extrém diaszthemás esetek: Extreme diastema cases: in these cases we can shape the lithium disilicate core making it the right way to properly close the gingival pockets without leaving "black triangles". We know that it is going to be tightly closed because the lithium disilicate does not contract, unlike the ceramic veneers on the refractory model which contract in each firing. These are much more difficult to make and adjust to the correct size in the interdental areas, we must make mini-wings doing several firings, with the consequent wasting of time. Also lithium disilicate allows us to make the "cake" test if deemed appropriate. This is impossible with feldspathic veneers on the refractory model because we cannot remove it from the investment without finishing them, so we cannot verify if everything is correct before completing them.



27 Cores modeled with wax.



28 Glazing the veneer.



29 Positioning of the veneer in the oven tray.

30 Front view of a completed case.

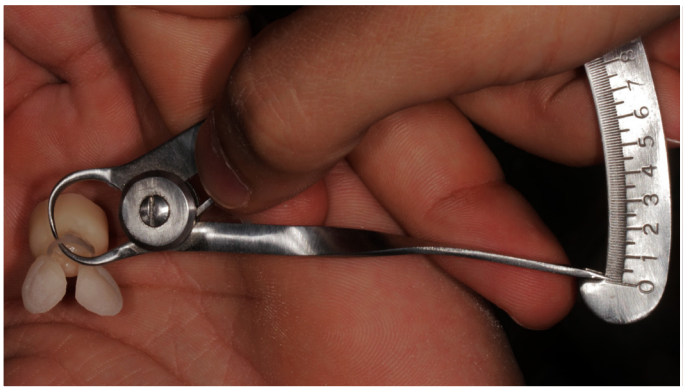
Another advantage of this material is that we can have control of our veneer color, since at any moment of the process we can remove the model and see if we are getting the desired color **(Figures 28 and 29)**. A similar case to the previous one, placed in the mouth as an example **(Figure 30)**.

When we started making HT 1 veneers (case of example), we had to prepare a conventional sectioned model with its corresponding pins, which is where we will model the core of these veneers **(Figure 27)**. Furthermore, we must have a non-manipulated master model in order to check the fit of the cores once injected. Case placed on mouth **(Figure 30)**. The minimum thickness for injection of the lithium disilicate that Ivoclar Vivadent advised in order to avoid problems is 0.5 mm.

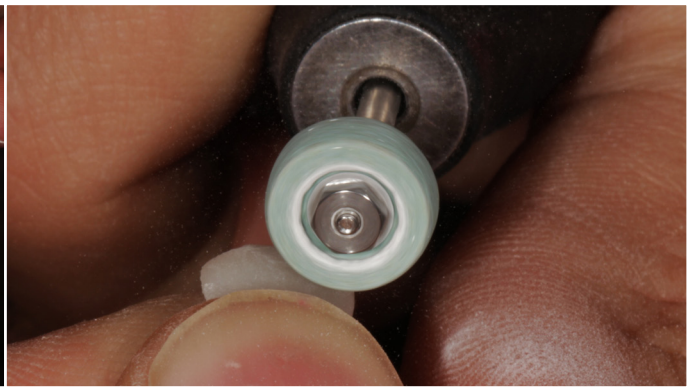
At first we injected like this and after that we would rough the material with stones until we got the desired thickness, but currently we use the technique proposed by Scopin, Romanini and Hirata in the QDT 2012 that allows the correct injection of material with thicknesses of 0.2–0.3 mm. This consists of: once we have waxed the veneer core, we add a strip of wax that goes from the incisal to the cervical, crossing the core all over the vestibular face **(Figures 31 and 32)**. With the increase of the volume of the material to be injected we make sure that no air bubbles are trapped and that it flows properly, achieving the finest cores, well adjusted and that allows us to save a lot of time when roughing with stones to reach the desired thickness of 0.1 mm **(Figures 33 and 34)**.

This is very interesting in cases where the color is favorable since we want to have the minimum thickness of the core to keep the advantages of lithium disilicate in terms of non-contraction and to not include the disadvantages of having a big thickness of a material that is very transparent in the base, which would make our restoration go grayer, losing value. We must understand that when we put a transparent layer according to its thickness under our ceramic stratification and as it would let more light pass through it without optical interaction, it may make the restoration look gray. For this reason, it is so important for the core to be thin, since it does not affect the value of our feldspathic ceramic coating or the general aesthetics either.

31 Veneers taken out of injection.



32 Veneers taken out of injection with thickness of 0.2–0.3.



33 Core review.

34 Core of 0.1.

If we are unable to reduce the disilicate core to the thickness of 0.1 mm, it is preferable to make the veneers with refractory model in order not to sacrifice the optical properties of our feldspathic ceramic coating and to avoid compromising our aesthetic result.

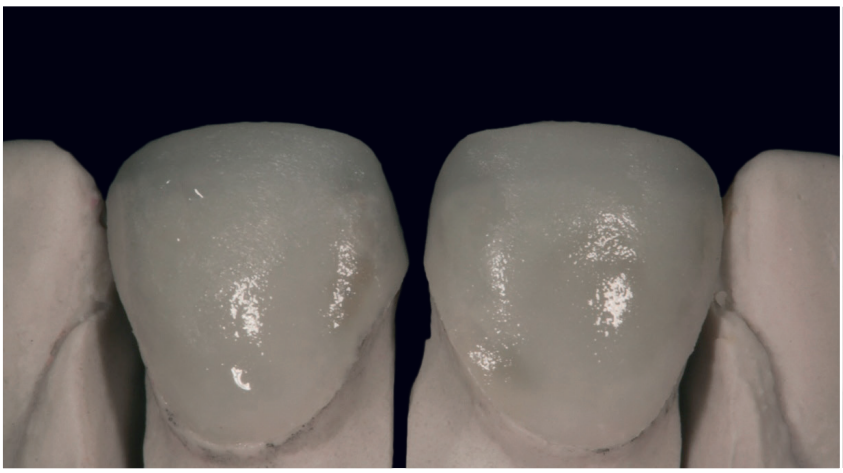
Now, we are making our veneer cases with favorable colors with this technique, since we have confirmed for three years that if the core is properly thin, the aesthetic result is the same as we can achieve with feldspathic veneers **(Figures 35 and 36)**.

35 Initial case.

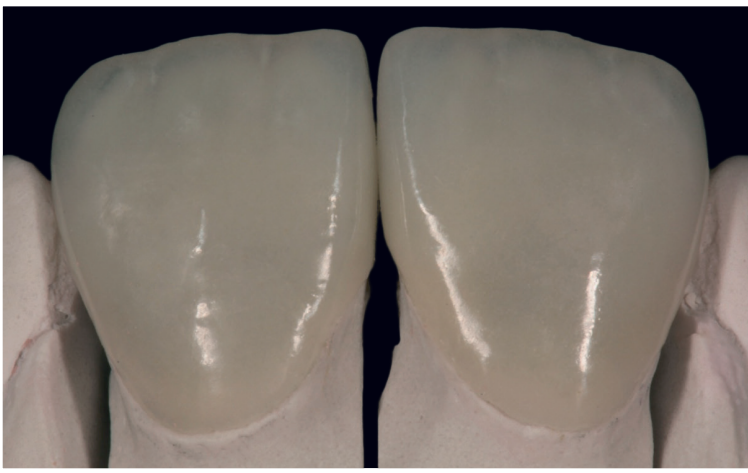
36 Veneers cut.

There are many cases in which we put the pure disilicate in the cervical area of our prosthetic termination and the mimicry of the tooth is incredible **(Figures 37, 38 and 39)**. Additionally, we have the advantage of having an unchanged core which facilitates the production of it.

What we should be aware of is the fact that the fragility of such veneers is very similar to that of the feldspathic veneers. After reducing that much of the core, the mechanical properties of lithium disilicate are very affected.



37 Veneers core.



38 Finished veneers in the model.

39 Veneers finished in mouth.

DISILICATE STRATIFIED MICRO-VENEERS

Male patient, 35 years old, who attended our clinic with avulsion and loss of the 1.1 space and the intrusion of the 1.2. after he suffered a bicycle accident with facial trauma, in which he also broke the two condyles and the right elbow.

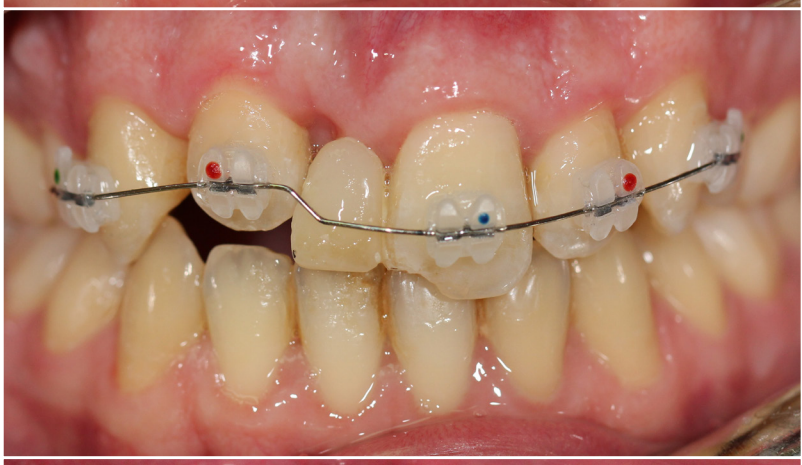
He was seen at the hospital in the emergency department and priority was given to the fractured elbow. In terms of his oral problem, the jaws were splinted and he could not operate the condyles. Due to the time that the elbow took to recover, the condyles were welded without intervention and the 1.1 space started to close **(Figure 40)**.

When we saw him for the first time at the clinic, the endodontics of 1.1, 1.2. and 2.2. had to be done and after that braces were placed for 6 months to recover space **(Figure 41)**. Afterwards, the implant was placed with bio-os regeneration and a membrane, four months later a keratinized gingival graft was conducted **(Figure 42)**.

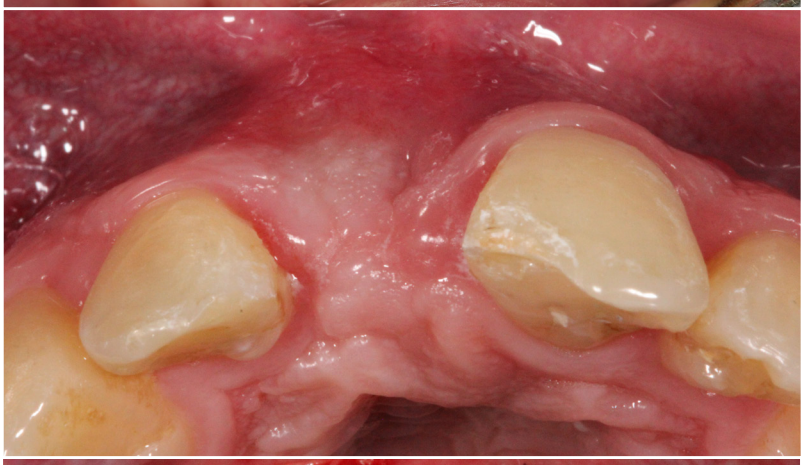
After four months, a provisional was placed and the gums were adapting to get the emergency shaping **(Figures 43 and 44)**.

Finally, a micro-veneer at mesial angle of the 21 was carried out and an implant supported tooth of metal-ceramic was placed in the 11.

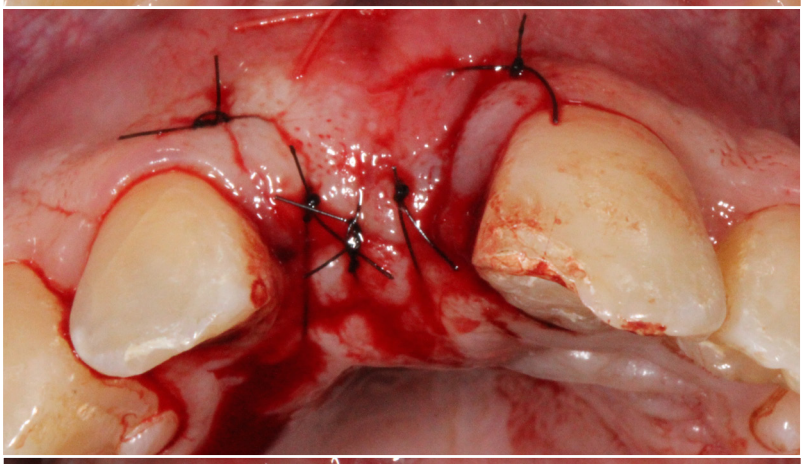
40 Initial situation of the case.



41 Orthodontics.



42 Initial situation of the tissue



43 Situation of the gum after surgery.

44 Initial situation with the first provisional.

45
Preparation for definitive impression taking.

46
Base of the Micro-veneer.

47
Stratified micro-veneer.

48
Final situation in mouth.

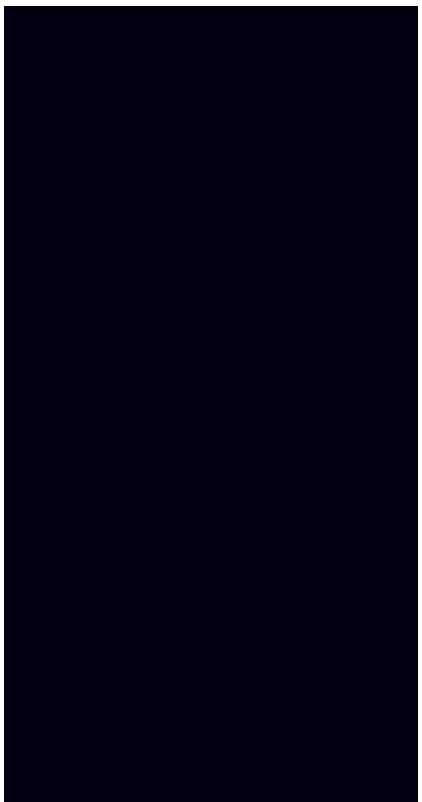
49
Final situation in mouth.

This is the first point where we have to stop, observe and seek a solution to restore this small portion of tooth absence. It is observed that this is a type of tooth with many chromatic characteristics in the incisal area. It makes it difficult to work because for such cases, Ivoclar already has some tablets called "Impulse" designed to small fragments and thin veneers, but it is a very opalescent mass that for certain cases is fine but if we have to copy a fragment of incisal edge with its "halo" and "mamelons", we will have to laminate a micro-veneer.

To carry out this type of micro-veneers, we have to make a tiny base with HT tablets (high transparency), which will be in contact with the tooth. This is the part where we are interested that our restoration closely simulates the tooth.
After that we will fire the ceramic mass over this small wedge of disilicate **(Figures 45 and 46)**.

Different views of the finished case **(Figures 47 and 48)**.

Making this type of restoration requires being careful and working with the material very delicately.
In my point of view, this type of solution is comfortable, but I consider it more practical to do it on top of a refractory material and that the restoration should be totally feldspathic.



CASES WITH SEVERE DISCOLORATIONS AND STAINS: MO “0” – MO “1” – “HO”

In this section we will refer to MO "0" tablets in the layering technique with high fluorescence and vitality and MO "1" for colors with a lower value. Such tablets are ideal for cases which have different color dyschromias. According to the color and value that we need to obtain in our final restorations, we will use the tablets MO "0" for colors with more value, and MO "1" for colors with a lower value.

It is important to control the thickness of the disilicate core because if it has a thickness of 0.1–0.2, it transmits much vitality, however, if the core has a thickness of (0.5–0.8), we will get some opaque restorations without vitality.

It is also very important to control the thickness of the core, because it will determine the amount of ceramic coating that we put on top of it. These two thicknesses (disilicate core) and (ceramic coating) are the factors that will give us the aesthetic success, or on the contrary, failure.

We will have to risk making it opaque and at the same time to achieve a proper transparency and vitality in our restorations for natural results.

Female patient, 45 years old, who attended our clinic because of the color of her teeth, it presented severe staining in most of her teeth so she wanted to make a color change and aesthetics in general. We evaluated quickly the color in the first appointment with the Vita guide (classic) to get an idea of the intensity of staining and to know a little about where we would start and what our goal was. At the very moment we could see that the color was very saturated and very stained, since it was darker than our color C4 on the Vita guide (classic). **(Figures 50 and 51)**.

A total of 20 veneers were going to be made, ten on superior and ten on inferior, on 15 to 25 and on 35 to 45.

In this case we made cores with MO 1 for our veneers with 0.2-0.3 thickness and then we applied a ceramic coating of approximately 0.3 of thickness so our restorations would sufficiently hide the different stains that are shown in this case, especially on tooth 21. **(Figures 52 and 53)**

Moreover, the advantage of working with these cores with respect to some feldspathic veneers, is that we do not have to make different stratifications placing different masses according to the discoloration beneath the stump, but the same material gives all teeth a uniform color and you just have to start layering the ceramics, without having to do mass combinations, trying randomly to get the possibility that it overshadows or not and that all restorations will have the same color, value and brightness. **(Figures 54, 55, 56 and 57)**

50 Initial shade determination (Vita C4).

51 Veneers cut.

52 Finished veneers in the model.

53 Colour trials with the try-in.

54 Intraoral view with veneers.

55 Detail of the incisal edges.

56 Lateral view of the veneers.

57 Front view of the cemented veneers.

We will use these types of tablets in cases where we have very severe stains in which it is necessary to hide some titanium abutments or structures with gold bolts.

This tablet will be used as a last resort because its opacity is very high (similar to zirconium), so we are talking about a 0.4 core that will help us to hide the black color. Unlike the other cores, and in order to give more life to the restoration, we must apply a thicker ceramic coating than the other disilicate cores, due to its opacity.

In my experience, this type of tablet is not recommended for veneers, because they are too opaque, and in case you have to use them because the requested color requires it, the best way to use them with aesthetic success is when you have restorations sets, such as the example we show in the pictures **(Figures 58, 59 and 60)**, in restorations that include from the anterior group up to premolars, from 15 to 25 or 35 to 45. Since if we insert this type of core, with natural teeth, the difference of value, light and vitality will not be integrated with the patient's remaining teeth. We can see in the final picture, the high value of these restorations after we have cemented it on the mouth **(Figure 61)**.

58 Stumps shade taking.

59 Finished veneers in the model.

60 Verification of color with the guidance.

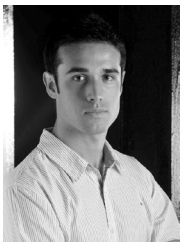
61 Veneers cemented in the mouth.

62 0.1 Core before and after placing the ceramics.


4D
540
B1

DISCUSSION

In this article we have seen the possibilities offered by disilicate and we could see that it is a great and practical aesthetic solution for the great majority of daily cases that we have in our dental practices and laboratories. According to the technique already acquired, some professionals like to work more with the layered disilicate and others prefer the refractory when making veneers and restorations. However, what I want to transmit in this article is the importance of the way we work each material and the technical knowledge we have about it, to get where we want, our goal.



FERRAN PUIGREFAGUT COS

Dental Technician at the Valle de Tena institute (Zaragoza) in 2006.

Continuous courses and journeys with prestigious dental technicians worldwide.

Author of a chapter in the book Layers.

National Demonstrator of the Noritake dental ceramics.

Private practice at the Dental Laboratory Mollerussa.

LIDIA MARTORELL SOLDEVILLA

2001. Graduated in Dentistry from the Universidad de Barcelona

2002. Postgraduate in Prosthetic Dentistry from the Universidad de Barcelona

2004. Postgraduate in Esthetic Dentistry from the Universidad de Barcelona

2005. Postgraduate in Orthodontia from the Universidad de Barcelona

Private Practice of Prostheses and Aesthetics in Agramunt.

SERAFI MIRET CUENCA

1985. Graduated in Dentistry from the Universidad de Barcelona.

1987. Postgraduate in Prosthetic Dentistry from the Universidad de Barcelona

1989. Postgraduate in Orthodontia from the Universidad de Barcelona

1990. Postgraduate in implantology from the Universidad de Barcelona

Private Practice of Surgery and Prostheses in Mollerussa, Cervera, Agramunt and La Seu d'Urgell.

ALBERT VERD BERTRAN

2001. Graduated in Dentistry from the Universidad de Barcelona

2002. Postgraduate in Prosthetic Dentistry from the Universidad de Barcelona

2004. Master degree in Occlusion and Oral Rehabilitation from the Universidad de Barcelona.

Private Practice of Prostheses and Aesthetics in Cervera and Mollerussa.

PHOTO: DR. ÁRPÁD MENTES