



Science.
Applied to Life.™

Feria de Madrid

3MSM Health Care Academy

Simplifying success in adhesive dentistry.

Christiane Stein, 3M Oral Care, Seefeld, Germany

Helping practitioners to work in a simpler way – without compromising aesthetic appearance, outcome success and longevity – is crucial to adhesive dentistry, according to speakers from 3M's Lunch Symposium, held in Spain last year as part of the FDI World Dental Congress.

Experts from around the world spoke to over 150 dental professionals about how smart chemistry – such as the development of products that can bond to different substrates with less complex pre-treatment required -- is leading to simpler protocols, less work steps and safer procedures. This is evident in applications such as cementation, direct restorative procedures, and adhesive techniques like selective enamel etching.



The congress venue: IFEMA – Feria de Madrid.



Participants during the 3M Lunch Symposium in Madrid.

Adhesive dentistry is a highly complex discipline by nature: A strong and long-lasting bond needs to be established to various restorative materials on one side and tooth substrates on the other. For example, there is not only a difference between enamel and dentine, but also between coronal and root dentin, and ceramics with a glass matrix have a completely different structure and composition than polycrystalline ceramics, composite or metal. So it comes to no surprise that the materials do not have identical pre-treatment and cementation requirements. Nevertheless, it is possible today to simplify the protocols, more than 150 dental professionals attending the 3M Lunch Symposium at the FDI World Congress 2017 learned on Thursday, August 31 in Madrid, Spain.

Material development

In the beginning, Dr. Sigrid Hader, MD, PhD (3M, Germany) focused on the challenges a manufacturer has to overcome to provide materials that allow for simplified workflows. She picked out two products from the company's portfolio – 3M™ Scotchbond™ Universal Adhesive and 3M™ RelyX™ Unicem Self-Adhesive Resin Cement – to illustrate how much effort is involved in the development of innovative materials. For both products, smart chemistry had to be invented to create the ability of bonding to different substrates with either no or less complex pre-treatment involved. This leads to a reduction of cases: Scientific and clinical evidence confirms that very good clinical results can be obtained – provided that the user follows the manufacturer's instructions.



Sigrid Hader, MD, PhD, Scientific Affairs Manager 3M Oral Care.

Simplifying cementation

Dr. Ana Sezinando, DDS, MS, PhD (Private Practice, Portugal) presented clinical protocols for the cementation of indirect ceramic restorations. She explained the necessity of treating ceramics with a glass matrix (e.g. feldspathic porcelain, lithium disilicate) differently than polycrystalline ceramics (e.g. zirconia). Glass-matrix ceramics always require etching with hydrofluoric acid and adhesive cementation. Through the combined use of an adhesive with an adhesive resin cement, a strong bond is ensured and the stability of the ceramics increased.



Ana Sezinando, DMD, MS, PhD, private practice in Porto and Lisbon, Portugal.

For maximum simplification, the use of a universal adhesive containing silane (Scotchbond Universal Adhesive) is recommended by the speaker, as this eliminates the need for a separate primer. Regarding the tooth substrate, the preferred adhesive technique is selective enamel etching: The dentine should not be etched because the etchant would remove calcium from the tooth surface, which is needed to ensure proper interaction with the adhesive. By contrast, the enamel should be etched as a certain amount of demineralisation is required to establish a strong bond. Universal adhesives are only mildly acidic so that their demineralising effect is limited. HF etching has no effect on polycrystalline ceramics. Instead, the bond strength is increased by sandblasting (alumina particle size 30 – 50 µm, pressure < 2 bar). After thorough cleaning, restorations with a retentive design may be placed using conventional or self-adhesive resin cement. The former is indicated with infragingival preparation margins as it is easier to remove the excess.

The self-adhesive material – e.g. RelyX Unicem 2 cement – is preferred in all other situations. It is also the material of choice for cementation of posts in the root canal due to its ease of use and high sealing ability.

Simplifying direct procedures

Finally, Prof. Paulo Monteiro, DMD, MSc (ISCEM, Portugal) shared his ideas of how to simplify direct restorative procedures. The goal should be to work in a less complicated way without compromising the aesthetic appearance and longevity of the outcome.



Paulo Monteiro, DMD, MSc, Professor in Endodontic, Esthetic and Restorative Dentistry, ISCEM, Portugal.

Both in the posterior and anterior regions, the speaker uses Scotchbond Universal Adhesive in the selective enamel etch technique to lay the foundation for a safe and efficient procedure. For restorations in the posterior area, he likes to employ a high-viscosity bulk fill material. They offer strong mechanical properties and do not need a capping layer of universal composite. As they may be applied in layers of up to 4 mm, fewer steps are required than for the incremental approach. The bulk fill composite launched most recently – 3M™ Filtek™ One Bulk Fill Restorative – even offers a body-shade opacity so that the aesthetic appearance of the restorations is no longer compromised. What is highly important for a reliable outcome is the use of a high-performance curing light for curing of each side of the restoration.

In the anterior region, Prof. Monteiro opts for a layering concept that follows the structure of natural teeth, using one dentine and one enamel shade of 3M™ Filtek™ Supreme XTE Universal Restorative. Colour recipes are available from StyleItalliano™, so that the practitioner may concentrate on the shape and texture of the restoration, which is even more important for an aesthetic outcome. For the build-up of the palatal wall, a silicone key is useful. In order to simplify the procedure, however, it should be produced intraorally with putty material that is trimmed as required.

Alternatively, an acetate matrix strip may be used as a basis. For the creation of the interproximal wall, a vertically placed posterior matrix band is used and after placement of the dentine core, the Misura instrument (LM Arte) is employed to create the required 0.5 mm space for the final enamel layer. Finishing is done with fine-grained diamond burs and the surface is finally polished with the 3M™ Sof-Lex™ Diamond Polishing System under water cooling.



The three speakers after the symposium.

Keep it simple

All three speakers agreed that “simplicity is the ultimate sophistication” (Leonardo da Vinci). On top of that, Prof. Monteiro pointed out that, while keeping procedures simple, the participants should always put some passion into their work and opt for evidence-based protocols only.

Contact 3M

Australia

3M.com.au/dental

New Zealand

3M.co.nz/dental

Scientific Affairs

Stephen Langdon

Email: sdlangdon@mmm.com

Janice Pitt

Email: jpitt3@mmm.com

Christiane Stein

Email: christiane.stein@mmm.com

3M Health Care Academy



3M Oral Care

3M Australia Pty Limited
Building A, 1 Rivett Rd
North Ryde NSW 2113
Ph: 1300 363 454
3M.com.au

3M New Zealand Limited
94 Apollo Drive
Rosedale Auckland 0632
Ph: 0800 80 81 82
3M.co.nz



Find us on Facebook

Disclaimer: 3M brand names mentioned in this clinical case may have been amended from the originally published version to reflect branding variances in Australia and New Zealand. Please always refer to the 3M Product Instructions For Use.

Published by 3M Oral Care. 3M, "3M Science. Applied to Life." and Expertise are trademarks of 3M. 3M Health Care Academy is a service mark of 3M. Please recycle. © 3M 2018. All rights reserved.