

## Universal adhesives – to etch or not to etch?

The trend in dentistry to simplify clinical procedures and make them less technique sensitive has led to the development of universal adhesives – the latest generation of adhesive systems was introduced on the market approximately a decade ago. They are referred to as “universal,” since they contain functional monomers that provide bonding opportunities to both dental tissues and ceramic/composite/metal restorative materials. Furthermore, they provide dentists with the opportunity to decide whether to use them in etch-and-rinse (E&R), full self-etch (SE) or selective-enamel etch (SEE; SE on dentin) mode. Lastly, when used in E&R mode, the control of dentin moisture is not as crucial as with previous generations of adhesive systems.<sup>1,5</sup>

However, one can wonder how “versatile” universal adhesives really are and how far we can follow our personal preferences when using these adhesives. Should we use a particular adhesive strategy in order to achieve optimal clinical performance when resin composite restorations are placed with universal adhesives? Should we preferentially apply them in E&R mode on sclerotic dentin? Should we preferentially apply them in SEE mode on young, permeable dentin?

The evidence from research suggests that enamel bond strength is superior when an additional etching step is introduced. Furthermore, the data from in vitro studies suggest that the bonding performance of (ultra)mild universal adhesives is not influenced by the bonding mode.<sup>2</sup>

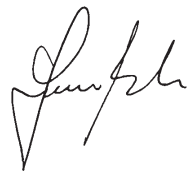
At the moment, when it comes to clinical evidence, a 5-year follow-up period is most likely the longest randomized clinical trial available on the clinical performance of universal adhesives in non-cariou cervical lesions,<sup>4</sup> commonly used as a model to investigate clinical effectiveness of adhesives.

It was observed that restorations were 2.6 times more likely to debond/fracture within the first five years of clinical service when using universal adhesives in full SE compared to E&R (both dry and moist dentin) mode.<sup>4</sup> Similar findings were also observed for marginal adaptation and discoloration. Interestingly, there was no significant difference in debonding and marginal discoloration/adaptation between E&R and SEE bonding mode. Therefore, it seems

that a promising approach in optimizing clinical behavior of composite restorations would be to use universal adhesives in SEE mode.

Nevertheless, we wait and watch with great interest for other clinical studies with similar or even longer follow-up periods, as it can take up to 10 years of clinical service to observe differences in clinical effectiveness between various adhesive strategies.<sup>3</sup>

Finally, it is clear that long-term clinical follow-up of this newest generations of universal adhesives remains crucial, as the failure rate recorded in the abovementioned study already exceeds the failure rate of the so-called gold-standard E&R and SE adhesives when having clinically served for more than 10 years.<sup>5</sup> Hence, we may justifiably ask whether universal adhesives should be regarded as adhesives that trade bond durability for ease of use.



Lorenzo Breschi



Bart Van Meerbeek

### REFERENCES

1. Ahmed MH, Yao C, Van Landuyt K, Peumans M, Van Meerbeek B. Extra bonding layer compensates universal adhesive's thin film thickness. *J Adhes Dent* 2020;22:483–501.
2. Cuevas-Suarez CE, da Rosa WLO, Lund RG, da Silva AF, Piva E. Bonding performance of universal adhesives: an updated systematic review and meta-analysis. *J Adhes Dent* 2019;21:7–26.
3. Josic U, Maravic T, Mazzitelli C, Del Bianco F, Mazzoni A, Breschi L. The effect of chlorhexidine primer application on the clinical performance of composite restorations: a literature review. *J Esthet Restor Dent* 2021;33:69–77.
4. Matos T, Perdigao J, De Paula E, Coppla F, Hass V, Scheffer R, et al. Five-year clinical evaluation of a universal adhesive: A randomized double-blind trial. *Dent Mater* 2020;36:1474–1485.
5. Van Meerbeek B, Yoshihara K, Van Landuyt K, Yoshida Y, Peumans M. From Buonocore's pioneering acid-etch technique to self-adhering restoratives. a status perspective of rapidly advancing dental adhesive technology. *J Adhes Dent* 2020;22:7–34.