COMMENTARY

Effect of Polishing Direction on the Marginal Adaptation of Composite Resin Restorations¹

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This article addresses a topic often discussed, that is, what is the best and least destructive manner in which to shape, finish, and polish direct composite restorations to ensure maximum longevity, function, and esthetics while minimizing marginal breakdown, staining, and recurrent caries.¹ Anecdotally, most clinicians would agree that marginal discrepancies would decrease with polishing direction going from composite to tooth, and with the variables encountered clinically in vivo, measurements are difficult to ascertain. However, the overall results for this well-designed study agree that, in general, when using the materials used in this paper, polishing composite from the restoration toward the tooth margin yield superior results. This study used excellent materials—composites, adhesive, etchant, curing light, and polishing systems, and great detail was placed on measurement and documentation of results. The discussion section is very good, bringing up subjects such as white line, C-factor, and the difficulty of intraoral access to polish margins in the preferred direction. This is especially true for gingival margins, where it is impossible to employ rotary instruments in a composite to tooth direction without traumatizing gingival tissue.

This evaluator believes that, through clinical trial and error, white lines are due to marginal unsupported enamel rods that move with polymerization shrinkage and subsequent incorporation into the cured composite—this doesn't contribute to marginal breakdown or opening, their presence just alters the optical qualities of the marginal composite. White line can be solved with a quick pass on prepped enamel margins with a sharp Hollenback. One or two swipes and the margin is very smooth and white lines will not appear. This study also mentioned that adhesive breakdown may have occurred during the polishing procedure, but OptiBond FL (Kerr, Orange, CA, USA) is one of the strongest adhesives available, is 48% filled, and is probably the least likely to breakdown—all other adhesives would potentially have worse results. In addition, most clinicians don't take the time to bevel all enamel margins on Class I or V preparations. Does polishing in this manner maintain the same quality of marginal seal? The study mentions hygroscopic expansion and coefficient of expansion/contraction, and hints at the dark cure phase that increases the degree of conversion for hours to days after placement, but this in vitro study doesn't consider the significant effect of occlusal function over time. It is important to consider proper case selection, particularly in posterior occlusal composites, proper isolation, a tested curing light, and the C-factor:

When considering the readers' view of this study, what would the results be with self-etch adhesives, the new "universal" adhesives, lights that are inadequately tested, and "bulk-fill" composites? Would results be the same, or would they vary significantly? More research would have to be done to answer this. In this study, multiple steps are used to finish and polish, under dry conditions, probably generating more heat than found clinically, and naturally the result of moving heated resin matrix would seal margins better if polishing is from composite to tooth, so there is a possibility that the same experiment performed in vivo would be invalid. In vitro results do not always directly translate into in vivo solutions. Clinically, composite should be shaped and sculpted as closely to final form as possible with

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instruments before light curing—then a simple finishing of margins would be quick and simple with one step followed by final polishing. When possible, marginal polishing should go from composite to tooth with intermittent pressure and cooling when needed. Following this, to ensure marginal seal as well as repair cracks in the composite from stress or polishing technique, the entire surface of the material and marginal areas should be etched, washed, and completely dried, followed by a thin layer of composite sealant, light cured, and the remaining air inhibited layer wiped off with a wet cotton roll. If this is done, postoperative sensitivity, marginal breakdown/staining, and recurrent caries will be minimized, and restoration longevity and esthetics will be maximized. Finally, this paper was well written, the method was well done, the materials used were all high quality, and the measurements and results were thoroughly done. The limitations of the paper are the differences that would be encountered clinically, but the principles of polishing direction/orientation should be considered whenever possible.

REFERENCE

 St-Pierre L, Bergeron C, Qian F, et al. Effect of polishing direction on the marginal adaptation of composite resin restorations. J Esthet Restor DOI 10.1111/jerd.12020. Copyright of Journal of Esthetic & Restorative Dentistry is the property of Wiley-Blackwell and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.