How to Avoid Resin Voids at Class II Margins?

A discussion among dental professionals on the message boards of Dentaltown.com. This is a frustrating issue with many methods for prevention. Read this discussion and improve your technique in 10 minutes or less. Log on today to participate in this discussion and thousands more.

Kent Bower
Post: 1 of 33
Posted: 5/22/2003
Total Posts: 83

I had two cases in a row this morning where I placed my Class II resin and found a void afterwards at the margin! I am sick of it!

1. Do you guys (who don't get voids) use a flowable resin first?
2. Do you guide the flowable along the margin of the tooth/matrix with an explorer?
3. Do you light-cure the flowable, then place the composite? Or do you mush it together?

I've heard so many techniques, one must work! Before you cure the composite, if you have a small air void in there, is it even physically possibly to get rid of it by compressing the resin? I mean, if there is a small air bubble and you are shoving it around with a condenser, but it is air-tight, the void won’t leave, you’re just screwed? Do you always redo these? Sometimes your schedule is really hacked up afterward. Do you re-do by cutting another Class II and placing a matrix or do you “patch” it in with an instrument, and if you do patch it, how on earth do you avoid getting adhesive resin on the neighboring prep, if that one hasn't been filled yet, or how do you get it off? I refresh the unfilled prep, with a diamond, but could have easily left some poorly bonded adhesive to the other prep and not known it, it is invisible after all. Would that matter if I re-etch everything real well? Sorry for the barrage of questions, I’m just really frustrated about this and have been for quite some time. I need an idiot-proof technique to avoid these bubbles/voids and a handbook on how, or if, to fix them when they occur.

Molar Roller
Post: 2 of 33
Posted: 5/22/2003
Total Posts: 5,971

It is easier to take a minute and fix it right away (patient is numb and in the chair, etc.). If it is at the corner of a box and you can get to it directly, clean it up with a small round, re-etch/bond and use some flowable to repair the void. If not, prep into the “old” resin and do a Class I within a Class II, using a matrix like before. Yes, I use flowable first. I do one increment along the floor of the box and cure, then line the two box walls and the floor of the rest of the prep and cure again. Then, fill incrementally, and end by pulse-curing. Some people say two layers of the flowable is overkill, but I like it. If you use flowable, have an explorer ready to “stir” the flowable at the margin to make sure the layer is thin and holds no bubbles. The tip will pop any bubbles and leave with a smooth coating of the margins. Just one way to do it.

Mark

richman
Post: 3 of 33
Posted: 5/22/2003
Total Posts: 562

Kent, if dentists who do interproximal restorations of any material say they “never” get a void, they may need to take a class in integrity. It happens very rarely anymore, none in the last group of six-month recalls (of course, that’s all I can remember). I will attempt to explain how we avoid this:

1. Isolate the interproximal with a sectional matrix system (I like Garrison’s).
2. Dentin bonding agent (Simplicity).
3. Flowable composite on dentin only (Renamel Flow Hybrid) and move around with a mini Microbrush less than 0.5mm thick.
4. Incrementally add composite (Vit-l-escence). I flatten it on a pad to insure no air bubbles (Ladimore #3 condenser).
5. Build to contour.
6. USP Glycerin.
7. Cure, obviously curing with each new increment added.

I don’t care what materials you use, but just included what I use for examples. Careful not to agitate the composite too much. Use the largest tip of the condenser that will fit and sort of tap slowly like you should do with a spherical alloy like Tytin. Hope this helps. ■ Rich

Kent, always flowable on the dentin surfaces and against the cavosurface-matrix interface. I cure the flowable. If you insert the paste and press, the flowable flows out over the walls and onto the cavosurface margins. I don’t want flowable on the occlusal! Use very small diameter needle tips to place the flowable, and if necessary, guide in place to prevent voids, as Mark suggested. I very rarely get a void and then in extremely wide restorations where I failed to adequately place the paste in undercuts. If I do, I correct immediately. As Mark said, the patient is numb and there for treatment. You can repair the void if you have an adhesive that will cure to previously set composite. ■ Gerry

FWIW [for what it’s worth], I use P-60 in my boxes. After applying Touch&Bond and Flow-It and curing them both, I place P-60 in the box with an amalgam condenser. This stuff is so thick, it can’t come out of a compule. It is available syringe only. I express a little on a paper pad, cut a piece off with the amalgam condenser, then carry it to the mouth that way. P-60 needs to be condensed darn near like amalgam because it is so viscous. I pack it in with a layer or two, then top off with Filtek Supreme. Very rarely do I ever trap an air void. Like Mike, I highly believe in loupes/headlight usage. 3.0 SurgiTel flip-ups for me with the plug-in headlight. ■ Dan

Hi Kent, I sure have had it happen. When it does, if I can access it, I will fill it with a dab of composite spread into the defect with a Woodson blade or similar instrument, pulse-cure, as with an occlusal final increment, finish it. If it hasn’t been contaminated by blood or spit after removal of the matrix, I generally will not re-etch or reapply bonding agent, but occasionally do brush on some Simplicity. If it has been contaminated, I roughen it. If very narrow, I’ll use flowable. If I can access it adequately, to apply the patch and finish it, I don’t see a need to replace the restoration. But, if it is contiguous with the gingival margin, I’ll do some serious drilling out or even replace it. In terms of prevention, I use two techniques:
1. The “Marshall Technique.” This entails using Absolute Dentin delivered to the box in a Centrix needle – tube and plug. The stuff is pretty thixotropic and will go where injected, is wettable, but doesn’t truly flow or slump. Fill the entire box up to the pulpal floor, or even the entire prep up to about 2mm below the cavosurface margin. Zap it only 10-20 seconds to gel-set the coronal portion (it’s dual-cure, so it’ll complete its conversion apically on its own), then place your occlusal “enamel” layer with a high, wear-resistance VLC [vis-
ible light-cured] composite and pulse-cure. Absolute Dentin has excellent physical properties with one exception - wear resistance. It doesn't wear as badly as a flowable, but really shouldn't be used at the posterior chewing surfaces unless as a compromise or shorter-term stop-gap measure.

2. Use the technique refined by Kanca and adhere to several rules:
   • Keep all flowable syringes vertical when stored, with the tip up. This minimizes bubble formation.
   • Have at least one syringe with a small-diameter 30-gauge tip.
   • Place the flowable initially with a 30-gauge tip and first at all the line angles formed by margins with the matrix, both gingivally and axially. Then, cover the floor of the box, internal line angles and floors of the rest of the prep; all this to a thickness of roughly .5 mm. This small tip allows greater control. Cure this fully (10 seconds if the light puts out \( \geq 700\text{mW/cm}^2 \), 20 seconds if under that).
   • Do not fill boxes with flowable; it has lower compressive strength, lower tensile strength, and slightly more polymerization shrinkage than conventional composites. Research shows it has an uncanny ability to improve adaptation of the overall restoration to the walls, floors and any internal line angles of preps, as well as gingival and axial margins of boxes; but that it is a poor restorative choice alone or in bulk for posterior use. Bulk placement also increases the chance of undiscovered bubbles.
   • Place the restorative in horizontal increments of about 2mm thickness. Never even attempt placing so-called “oblique increments,” especially in a box. It serves absolutely no purpose other than in the mind of a dentist, and increases the probability of void formation. Do not over cure these increments: if light is \( \geq 700\text{ mW/cm}^2 \), five seconds is plenty, 10 seconds if light puts out less.

In essence we are “pulse-curing” these increments and their complete conversion will be facilitated at final cure.

• Pulse-cure the final occlusal increment that will bond to occlusal enamel margin with a three-to-four second pulse from 2-3cm away; then remove matrices, trim, cut anatomy, adjust occlusion and polish. Finally, place sealer as directed and final cure 10 seconds each from occlusal, buccal and lingual if light puts out \( \geq 700\), 20 seconds each if less. Done.

• Never use flowable on an occlusal margin.

FWIW [for what it’s worth], I do believe in beveling all margins; I do believe we should almost always break contact with the adjacent tooth in Class II preps, even if only with our bevel; I do believe we should choose a bonding agent that gives as thin a film thickness as possible, combined with high bond strength to both enamel and dentin. Fillers in bonding agents are of no use whatever while also tending to make the adhesive layer unnecessarily thicker. Hang in there Kent, you can do this too.