A Tale of Two Pulp Caps...

...I just wanted to show a couple of recent cases. I saw John Kanca my second year out of school when I was working in a VERY rural and high caries area. I was trying my best to do what I could for my patients and had heard about pulp capping. I had a so-so success rate...that being Vegas odds of 50/50. Then after seeing John, I saw that skyrocket to 95% plus at three years. Then, the next practice better, and now almost six years into our current practice, I would say that my DPCs [direct pulp caps] are darn close to 99% plus. Hat’s off to you John. It was all about technique. I have changed it a bit, but still I am strongly influenced by the original premise, so I thought that I would share some recent ones. A success so far, and a question mark...

Case one involves a retreat of a recent PFM. After I removed it, there was extensive decay. The crown was less than one year old.

There is always discussion about DPCs of mechanical vs. carious exposure. When you are close, who is to say which happens first? I use 4.5-6x loupes and this was very close...either way...there was a lot of red.

This is just with a quick blast of air.

Etch 20 seconds, OptiBond Solo 20, light air for 15 seconds, cure, flowable cap, 20 second cure, and restore build-up. No RD [rubber dam] or Isolite—just 4x4s, cotton rolls and suction.

Completed prep.
Pt was informed of risks, benefits, etc. 60 days out the tooth is testing vital and ready for crown delivery. …


Aren’t you worried that you will just have to cut into the new crown to perform the endo? That exposure is pretty large. Have you been that successful with other exposures that are of this size? Where do you see this tooth in five years?


Thanks for sharing your success. I have had a similar experience using Superoxol to clean the exposure, but I lay calcium hydroxide down over the exposure, and then proceed with bonding. An old habit I cannot get away from because it seems to work long-term for me.


Miguel, first, thanks for the kind words. Second, what were the symptoms of that tooth prior to removal of the old crown?


First of all, I want to say that I am not going to bash anyone for doing an endo here. I have in similar situations, and probably will in the future. My current tx comfort zone is a culmination of my short 11 years, but a heck of a lot of pulp caps. My first three years out, we were the only dentists for close to 90 miles, and I saw a lot of welfare and cash strapped pts where it was fill or yank it, so I committed to caps pretty early on.

BK (before Kanca) I was getting those 50/50 results, but I was not really going through much of a protocol—no bleach, using Dycal...and saw loads of failures. The ones that did last got calcified before they failed.

AK (after Kanca) I was amazed by the results. I do vary as I etch over the pulp and use a different bonding agent, but the results that I have speak for themselves.

So to the questions...

Matt—I did hedge my bets with a metal lingual window on the crown, but I am really not too concerned. While the exposure does look pretty large, it is a thin ribbon and does not have a lot of area. The tooth tested vital pre-op and the pulp looked very healthy. In five years? I see this tooth being just fine...with or without endo. From my experience I offered the patient the choice and he elected to choose the pulp cap—if I even give a choice.
John—The pre-op symptoms were mild cold sensitivity with no lingering. It was really only noted with ultrasonics or when the pt ate ice cream. There was no marginal decay—the pt actually wanted the crown replaced for aesthetic reasons. The margins were a bit bulky and the shade was off, but otherwise the crown looked like it was in good shape. The patient had NO post-op sensitivity, and the tooth is still testing vital...I will keep you posted on this one. …

croisé | Total Posts: 2,194 | Member Since: 10/10/2002 | Posted: 5/27/2005 8:26:03 AM | Post 12 of 66

By “etch,” I take it you are not referring to Sim 1, which John says will both etch and stop bleeding. So, if you apply NaOCl and the bleeding stops, then you apply H_2PO_4 onto the pulp, how do you prevent a return of the red stuff prior to bonding?


1. Remove decay
2. Bleach for a minute or two
3. Rinse
4. Etch with Ultradent’s etch
5. Rinse
6. OptiBond Solo
7. Cure
8. Cap with flow
9. Cure
10. Restore

I know everyone says that the etch starts the bleeding, but I just do not see it happening. …maybe it is my using one bottle after the total etch, hm, still don’t see the bleeding even starting. In this case, I believe that the bleach was on for a full two minutes.

OK—here is another one. Pt presented with severe cold sensitivity, but non-lingering...also sensitivity to sweets. Filling was just done about a year ago as well, maybe even less. I don’t have a pre-op, but here you can see the failing MO as well as the deep buccal excavation.

Removal of the MO composite revealed EXTENSIVE decay present.

On excavation, there was an exposure of the pulp horn—without bleeding. That was not a good sign, so I continued down the pulp horn and through solid structure until I did have some bleeding, and could visualize healthy pulp tissue.

Just at this point, I left the composite in the box, so as not to start tissue bleeding. This was removed after I dealt with the exposure. Same protocol and a direct restoration.

Two weeks out—cold sensitive still, but better and not lingering. Neither case has any throbbing, spontaneous, or hot sensitivity.

I do not feel as good about this case, as the extension that I had to do to get to the healthy tissue, but we will see. I know that some, even those who do a lot of DPCs, say carious exposure, go endo, but I am seeing good results. These are larger than most caps that I do, but I thought that they would be interesting to throw out there. …


…Would chlorhexidine be more appropriate to apply at the exposure? Have you tried it, and if so, what was your experience? I just wouldn’t think to use bleach, if we wanted a healthy pulp, but obviously I think wrong.
Chlorhexidine, I would think, would need to be on there a lot longer, also it is not going to stop the bleeding or get the cruddy tissue and debris out from around the periphery.

… Earlier this week, I did a tooth like the second case you posted. Big MO on # 14. After caries removal, I could see the MB pulp horn, but no bleeding. I could even stick an explorer 1-2 mm into it, and still no bleeding. I’ll admit, I did not cold test prior to treating the tooth. Pt had reported some cold sensitivity for a week or two.

I got a really bad feeling that maybe it was necrotic. (You know how sometimes the MB canal will be necrotic while the palatal is vital?)

Anyway, I chickened out and started the endo...and finally got down to some vital tissue in the MB area, but not until I was at the level of the CEJ. Thanks for posting. Good to see others run into the same “predicaments.” I just have to tell myself it’s not my fault if these teeth go south.

You are welcome Chris—I don’t feel any heat on this at all, as I have been doing this with success for over eight years. I think that is a fair time to define my results. Someone PM’d me and asked what success is or how I define it in these cases. Success is a happy patient who appreciates the work and effort, while understanding the risks and benefits.

In these cases for me? Success equals no endo, limited success equals buying a few years for the patient, while not compromising the tooth for future tx. For me that means bonded caps, not Dycal. … I wonder if the Waterlase may have a place here...not sure [if it’s] in my comfort zone.

Miguel, since you mentioned it, I do use my Waterlase to decontaminate the exposure site and stop the bleeding. I then put powdered CaOH right over the pulp (actually a mixture of powder and lidocaine) then Vitrebond, and then composite. I too have been amazed at the efficiency of doing this. I actually think you could uncover 50% of the pulpal roof, and as long as you could achieve hemostasis, you can still save the pulp. If there are no bugs in there and you have good vascularity, then the pulp won’t go necrotic.

Keith, I have a concern with using the WL [Waterlase] for this, as with the NaOCl I get the physical debridement of the crud on top aside from the hemostasis...what do you do to the area after lasing it to clean the debris?

I am also concerned with using CaOH on the pulp as everything I have seen with this has led to pulpal recession. I am open to hearing what you have to say on these two points.

Mike, on your second case—you can see where the pulp horn “should” be:

Do you intentionally remove hard tissue until you get bleeding from that pulp horn only?

And then do the DPC (direct pulp cap) protocol?

I’m thinking if you just leave the pulp horn untreated (no bleeding, but detectable exposure); there may be bacteria in there.

“Pathways to the Pulp” says that dentin within 2 mm (I think) of vital tissue has already been infected with “DA’ BUGS”...in other words, once the bugs are in the tubules, they must be removed mechanically if a DPC is to work.
Chris, I went into the space until I could see that there was vital tissue. This happened about 3/4 way down the horn, pretty close to the chamber.

Hm...I don't know what to say about that—I know that I am more aggressive than some in pulp capping, but I stand by my results. I am expecting the first case to be successful, but have some doubts about the second, but we will see. I remove all of the decay, even if it means an exposure. Others don't, but maybe they can explain their thoughts.

...What about scrubbing all your preps with full strength hypo, and then sealing whether you have an exposure or not? If hypo is good for cleaning the prep, and helps if you have an exposure, why not? Or do you think that's unnecessary and that the etch you use to seal the prep would kill the bugs anyway? Just wondering.

Let's say after you have finished a prep and you are going to seal it; you first use your ultrasonic scaler around it, clean with alcohol (I assume you're not drinking it!) scrub with hypo, wash, and seal?

Scottie—I pretty much always ultrasonic the proximal surfaces of preps. If I have an exposure, the hypo and seal are my priority. In the scenario that you noted without an exposure, I do use alcohol, then hypo, etch, bond, flow, and restore.

Miguel…what debris are you referring to from using the Waterlase? Ablation of the surface pulpal tissue should decontaminate the area and cause VERY LITTLE vascular disturbance to the pulp, plus you can easily stop the bleeding with the Waterlase. I then place the CaOH paste (very thin layer) over the exposure. This is ONLY to continue to provide a continued antibacterial environment for the first few days/weeks. I have long believed the only reason for CaOH to be thought of as a pulpal stimulant is that it kills bugs and doesn't hurt the blood supply. That simply provides a healing environment. The pulp forms reparative dentin and stays healthy. The CaOH works on the “china syndrome” as soon as the ions are chemically used up it is inert and has no more effect on the pulp. I don't see why a VERY THIN layer of CaOH paste is going to cause pulpal recession. No studies to site.

I have to say—in these posterior cases, the Isolite has become my standard of care for isolation. Neil Jessup, and my research, has shown that the Isolite is equal, actually slightly better than, the rubber dam in reduction of intraoral humidity. It is all about the protocol.

Thought that I would share another. The pre-op was a distal slot amalgam over an existing composite with extensive decay under both. Tested vital with complaints of cold sensitivity...multiple micro exposures on full caries removal

90 seconds of sodium hypochlorite on a cotton pellet, scrubbed and then set.
I am going to try to dig through Dentrix and get a six year on DPCs and endo incidence. …

… Case two—the molar, went belly up this week. Lingering, spontaneous; all the bad stuff. In review, I believed that this case was not the best candidate, but the patient understood the risks and wanted to give it a shot. I still stand by my 94% success rate, but wanted to toss this out there, as perhaps, not the best case to try it on. This one was actually on a staff member and I gave her low odds. I honestly don’t know if I would have offered the option to a regular patient.

While I could isolate the exposure, there really was no bleeding to speak of and I had to chase a carious exposure down a horn to get what even approached healthy looking tissue. So—just tossing the good with the bad in the mix with the off 6%.

OptiBond Solo Plus, PermaFlow. Completed restoration with Premise.


Great thread! Made me re-think my treatment protocol on my last patient.

A ten-year-old boy fractured tooth # 9 three days ago. The fracture amputated the most coronal aspect of the mesial pulp horn, creating literally, a pinpoint exposure. The tooth is asymptomatic, but he did feel some pain when I dried the fractured edge with a cotton pellet.

My plan was to:
1. Simply rinse and dry the tooth
2. Etch all the incisal and labial enamel
3. Use a SEBA
4. Bond the fragments (supplied by the patient) back in place with UltraBond
5. Veneer the labial with translucent Vit-l-escence

Normally, I use CaOH as well, out of habit and to prevent composite from being hydraulically driven into the pulp horn. However, in this case, it would prevent the re-seating of the fragment. I figured the composite will go where it goes!

Well, I don’t treat many kids in my practice, and now I know why. After spending 15 minutes explaining to the father all the options, endo, etc.; and covering my butt if the tooth should be symptomatic the next day, the father asked me to leave the room to talk to his son. He got down on his knees to talk to his son eye-to-eye and re-explained for another 15 minutes what I had just discussed. In the end the KID decided to postpone treatment.

He was re-appointed for another day next week. So the question is, who would restore without endo, and who would use NaOCl and re-bond one week post accident?

Find it online

Read the rest of the conversation and add your comments on Dentaltown.com. Follow this address to find the complete thread: http://www.dentaltown.com/idealbb/view.asp?topicID=50889

Bleeding ablated. Total etch. Still no bleeding.

OptiBond Solo Plus, PermaFlow. Completed restoration with Premise.