Treatment of Asymptomatic and Vital Cracked Teeth

In the era of cosmetic dentistry, it may seem unusual to discuss a case using gold restorations. In this case, Dr. Callahan used gold as a great option to hold up to the rigors of his open bite. Log on to the message boards of Dentaltown.com today to participate in this discussion and thousands more.

drjamie
Posted: 4/30/2008
Post: 1 of 27
Total Posts: 186

This patient presented with an irreversible vertical fracture of #18 with class eight mobility which I removed two weeks prior. It had previously been crowned and had RCT [root canal treatment] after having been crowned. I asked the patient why he had needed the crown originally, and his reply was the tooth had cracked. It was a through and through split through the furcation, and the tooth was removed in mesial and distal roots that had been held together by the crown. Most of the other posterior teeth in his mouth had been crowned except the upper left 12-15 (15 is now unopposed). Patient has an anterior open bite and posterior cross-bite only occluding on 13/14 on left and 2, 3, 4 on right – hence the cracks.

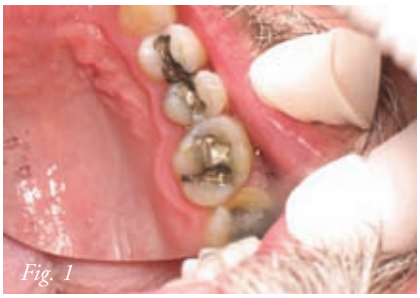
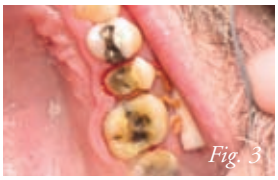


Figure 1: Obvious cracks throughout #13 and 14. You can see horizontal fracture on lingual of 13. Note crack through amalgam mesiodistally on #14.

Figure 2: Different angle.



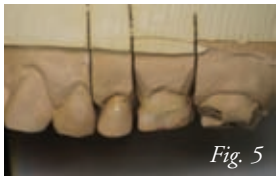


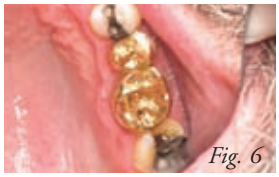
Figure 3: Amalgam removed, lingual cusp #13 flew off as amalgam removed. Too lazy to wait on hemostasis for photo.

Figure 4: Lab work: Keating. They do a very consistent and beautiful job with these for a very fair fee.

Figure 5: As you can see, minimal prep of buccal and incisal to hide gold as much as possible. More difficult to hide here because of cross-bite and occlusal scheme.

Figure 6: Seated, but not finished and polished.

Figure 7: Same, different angle.



continued on page 68

continued from page 66

Figure 8: Note occlusion... prone to create CTS.

Figure 9: Smile. Almost invisible.

Figures 10 & 11: Again this is just cemented but without finishing or polishing the supragingival margins. They burnish down to a handful of microns with just simple stones and points. That's the beauty of JRVT alloy.

A very conservative and fairly aesthetic treatment. I have been trying some of these style preps (minimal 1mm) with some of the processed and bonded indirect composites lately, with excellent short-term success. Hopefully they will last a long time. I realize gold is not an option for everyone and some will not tolerate it, but it can certainly provide excellent long-term service. Type III gold was used, JRVT alloy, which was later finished/polished with Shofu white stone, Brownie and

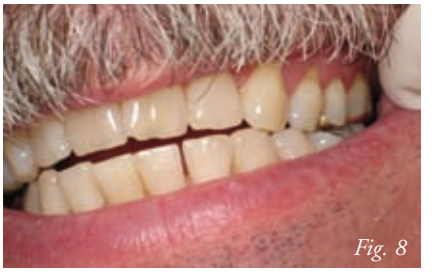


Fig. 8

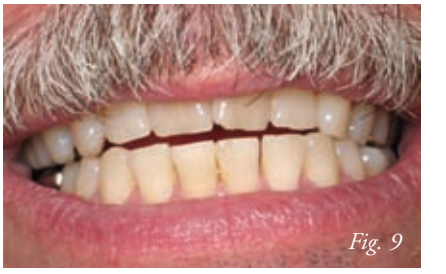


Fig. 9

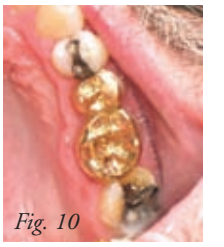


Fig. 10

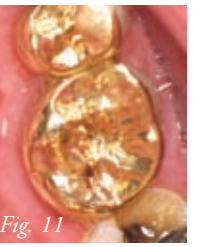


Fig. 11

Greenie in a friction grip low speed. Margins almost imperceptible. I just don't like sandpaper discs in the posterior. ■ James D. Callahan, Jr., DMD

Very nice my brother. I bet those will only last 30 years. ■ John Cannariato

drjcann
Posted: 4/30/2008
Post: 3 of 27
Total Posts: 7493

Very nice. What did you cement them with? ■

brettmansfield
Posted: 4/30/2008 ▪ Post: 4 of 27
Total Posts: 572

I use Fuji Cem resin modified glass ionomer (RMGI). I know I'm not a serious purist and should use zinc phosphate, but I don't. RMGI's are great. I let them harden for 10 minutes before my burnishing, etc.

John, I still use Zeiss prism 3.8 magnification. They rock. I don't think I can afford a bunch of microscopes yet. One day perhaps, but I think I will upgrade my Schein master handpieces first. Also, the guy is 50 years old, so I told him they would last at least 50 years, not 30. Of course they might one day need endo, but I doubt it. ■ James D. Callahan, Jr., DMD

drjamie
Posted: 4/30/2008 ▪ Post: 7 of 27
Total Posts: 186

Where do you get retention/resistance on the bicuspid? I'm a bit confused how the gold will be retained there. ■

kennyt77
Posted: 5/1/2008 ▪ Post: 10 of 27
Total Posts: 4673

Kenny, there is so much resistance and retention in that preparation you just can't see it well in the photos. There are perfectly parallel grooves on the mesiofacial and distofacial line angles, There are two, 1.5mm to 2mm walls like a staircase terrace as you go axially on the lingual toward the facial. I was almost unable to remove it from the mouth with no cement.

I build lots of retention into these. Look closely at the die photos. The mesial and distal walls are probably 4-5mm in length. The lingual, because of the "staircase design" has a long bevel/feather that extends sub-g below the fracture at least 2mm, then a flat step, then another parallel wall, another step on the prior amalgam floor, then another parallel wall on the lingual side of the buccal cusp. Three axial parallel walls of about 2mm each, in addition to the mesial and distal grooves and long walls.

If retention seems to be an issue, sometimes I will bond them in, but this one would be extremely unlikely to debond.

I have to be honest, I over-engineer. I have only been at this for eight years in this practice, but I have never had a crown come off that I placed... never. I certainly have had some porc. fractures, but none to come off.

Resistance is primarily in the opposing grooves, which will be more than sufficient. ■ James D. Callahan, Jr., DMD

drjamie
Posted: 5/1/2008
Post: 11 of 27
Total Posts: 186

continued on page 70

continued from page 69

drpeg
Posted: 5/1/2008
Post: 13 of 27
Total Posts: 68

Very nice onlays. Just one question about the preparations: Did you extend your gingival margins on the proximals, namely number 14, below the level of the fractures? Just wondering because it looks like the fracture lines still remain on the proximals of the molar. Still, they are excellent restorations that I would be proud to have in my mouth. ■ Paul

drjamie
Posted: 5/1/2008
Post: 14 & 16 of 27
Total Posts: 186

Paul, I did extend them below the fractures as far as I could see. They are slightly sub-g on the mesial and distal of #14. I think we should be fine with these as they are currently asymptomatic (and vital), but I always explain the unpredictability of CTS: bacterial migration, flexure, etc.

[Posted: 5/1/2008]

In this case, these were slightly more preventative than absolutely necessary in that there were no obvious symptoms. However, all of the patient's occlusion on the left side is on these two teeth (posterior X-bite, and anterior open bite). The crack on #14 extended from the mesial marginal ridge through the amalgam to the distal marginal ridge. When the crack runs through the restoration it is almost always visible on the pulpal floor of the amalgam preparation, indicating a vertical fracture as opposed to an oblique one.

Number 13 had a complete horizontal fracture (oblique) undermining the lingual cusp. I probably could have flicked it off with an explorer. It fell off when removing the occlusal amalgam. I don't know if all of the cracks present were 200 microns in width (.2 of a mm, right?) but that seems like a good threshold to go by when deciding to cover and crown cusps or not.

I am very conservative, and pretty much "if it isn't broken, don't fix it" and "the best dentistry is no dentistry" is my philosophy. I crown very few asymptomatic teeth. ■ James D. Callahan, Jr., DMD

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