When Do You Recommend Going to a Cuspal Coverage Restoration?
Where is the Thin Gold/Porcelain Line?

This is an interesting discussion of the right time for the right restoration. Are you using cuspal coverage with the appropriate frequency? Log on to the message boards of Dentaltown.com today to participate in this discussion and thousands more.

As a former Army dentist who has done more than his share of MODBL/WFT amalgams... I still wonder occasionally about when to recommend a cuspal coverage restoration over a filling for a particular tooth. I personally don’t believe in partial coverage indirect restorations, so for me it is either a filling or it covers the entire occlusal surface (seen too many onlays with bad cracks and/or fractured cusps because someone was being “conservative”).

So what say you townies?

Has anyone ever authoritatively defined when a tooth needs to be covered or is it a gray area different for each practitioner like so many things seem to be in dentistry?

Thanks for your input. ■ Rob

Rob,

Textbook does say any filling beyond half the isthmus of the tooth requires an indirect restoration.

I personally would not want my entire tooth cut down for a crown if it was an MOB with the entire lingual wall thick and intact. I think a situation like this is perfect for an onlay. If the cusp is involved shoe it.

I think the problem with fractures in “conservative” dentistry like inlays and onlays is the fact the criteria of preparation were not followed. For example, rounded internal line angles are key. Material selection is also very important.

I personally feel that cusp covered direct restorations do not hold up to the occlusal load required of them. ■

I took over from a very conservative dentist that has been practicing for 35 years. All the patients have charts thicker than a textbook. He loved to place massive amalgams. For the most part, the amalgams were very well done, and have not had too many problems. I have been reluctant to tell these patients that they need crowns on all of these teeth. The last thing I want is for them to think; “Who is this new hotshot kid who thinks he knows more than my old awesome dentist.” So, what I say is, “You have a lot of huge fillings. Some of them will eventually require crowns. We will keep an eye on them, and if we see any cracks or if you have any sensitivity we will go ahead and put crowns on them.” I’ve had some of them crack, and the patients are ready to go with the crowns. Sometimes, if these same patients seem cooperative at their six month recall I’ll say, “Maybe we should consider going ahead and doing some of those crowns I was talking about last time.” Sometimes they will still want to put it off, but more and more I’m having people ready to go ahead and crown these teeth.
My personal philosophy for a new patient; if there is a crack in a tooth on one side or it does not extend under an old restoration or if it is on a premolar, it will be watched. If there is a crack on a molar or the crack extends to two sides of the tooth (MD or MB for example) or if the crack extends under a large old restoration or if there are any symptoms (sensitivity to biting, cold, etc.) then we will consider a crown.

I almost never do onlays or inlays. We have the CEREC, so I have done a few, but with insurance reimbursements the way they are it is hardly ever worth doing an onlay or inlay, when insurance will reimburse you so much more for a crown and the patient often has to pay less. I'm still new at this whole dentistry game, so my opinions will change over time, but this is how I feel right now.

I usually recommend an onlay whenever there is more than two-thirds of the tooth missing, but not half. Anything that needs an onlay I usually do in porcelain. Anything less than an onlay gets a composite. Much more conservative than indirect.

I rarely do a true full coverage crown. I find it too aggressive. Only if the patient had a crown already and needs a replacement, then he gets full coverage. There is just too much advantage for the patient in leaving as much tooth structure as possible, with high margins, away from the gum line and away from the occlusal surface. I don't like to leave cusps uncovered if doing an onlay.

Prior to CEREC, I did fillings or crowns only. When more than half of restoration encroaching into cuspal support or decay extending to any cusp automatically meant crown. Now with CEREC, I can do so much more conservative restorations preserving unaffected cusps. It's great and it looks beautiful. If there is cuspal support and without a CEREC, I would go ahead and crown it. I see too many large fractured cuspal fillings.

Do you recommend an onlay even when there is a cervical restoration, abfraction, decay, etc.? What if there are cracks extending down the buccal or lingual walls? Do you onlay the top and trust that it will arrest the progression of the cracks?

I will replace all cusps unless I absolutely cannot justify removing the last cusp. In other words, when doing indirect restorations, I look for every reason to replace all the cusps. I know some look for every reason to save a cusp, even if it is sliver thin. I would rather reduce the occlusion and know a cusp sliver will never break off later. But
I don't reduce down to the gingival. I almost always try to stay high away from the gingiva, even on my PFMS, if possible. If they have a problem with the aesthetics of that, then let's talk about all porcelain with supragingival margins. But after going to Bill Strupps course, and hearing how delicately he handles the gingiva, I am doing everything in my power to stay away from the gingiva.

Where do I get this from? Ever remove a crown that had deep subgingival margins? Now, you have to go down even farther, possibly invading biologic width. I have seen so many crowns at a practice I worked at that had unnecessarily deep subgingival margins, only because the dentist wanted long axial walls. Well, doing hygiene exams stink, because half his crowns have isolated pockets around them with inflammation. Chronic inflammation anywhere in the body is a serious thing. Don't be the cause of it. You can bond onlays. It works.

Make it so that if another dentist has to redo your work in the future, leave him with plenty of tooth structure leftover.

[Posted: 5/26/2009]

Every so often, I replace a large amalgam, often occlusals, before a crack even begins. But I don't crown it. I use composite. Hopefully I am avoiding any crack formation in the future because the filling is bonded, and holding the tooth together. There is no expansion and contraction of metal causing cracks. Possibly avoiding a crown for the tooth in the future.

I see tons of huge amalgams and crowns put on them. There are almost always big cracks under cusps or extending onto the pulpal floor sometimes so bad that I can't believe the patient doesn't have symptoms. There is almost always decay even if none is visible in their films. I would say that I hate these large amalgams and that no one should do them except for the fact that a lot of them have been there for 20 years... will my crown be there 20 years from now? I like to think if they do good homecare it will be, but 20 years is a good lifespan for any restoration. Would they have been better off with an onlay or crown? I think so, I think if all the cusps had been covered the cracks would not be there or would at least be less severe.

I don't have a lot of faith in composite's ability to reinforce teeth long term. I know the microscope guys have developed some new preparation styles to engage more enamel and strengthen the bonds durability which I use when I do large fillings. It will be interesting to see what their research shows over time (see David Clark's articles on preparation design for composite vs. GV Black design).

If you are looking for research articles discussing indirect vs. direct restorations vs. full coverage crowns there are many on PubMed. I have found several that indicate that indirect bonded restorations show benefit over full coverage crowns in being conservative and restoring the tooth back to its original strength. Meaning if you have the resistance and retention form there is no benefit of cutting the entire tooth down for a crown.

There was a study indicating that all-ceramic partial coverage restorations on natural molars had the same masticatory fatigue load and fracture resistance as the unrestored molar. Again, an indication for indirect restorations. There are many studies on premolar teeth indicating the strength is again at the strength of the unrestored tooth or very close to it while being conservative.

Amalgam restorations on three surfaces and over have higher fracture rates in studies than do resin restorations.
I disagree with the post that indicated if an MOD is done it is a direct restoration followed by a crown the next time the tooth is touched. Why not offer your patient a chance to restore the tooth with an indirect inlay and not worry about it again?

Inlays are as successful as onlays. The success and failure are due to knowledge of preparation design, material selection. This is a great service to your patient if you know how, what to do, and when.

Choosing when to restore a cusp is when the restoration is more than halfway up the cusp, if the cusp is undermined, or if the cusp is a functional cusp. Buccal cusps of lower molars that are undermined or heavily involved, you are better off shoeing.

I wrote an article on the temporization of inlays and onlays a couple of years ago. A study done by the ADA indicates that the average dentist places two to five inlays and onlays in an entire year. This number was absolutely astonishing to me. Why are so few of these restorations done? Education? Lack of knowledge of how to do it? Insurance companies not paying for them and allowing them to dictate your treatment?

I would challenge those dentists doing tons of three and four surface direct restorations to take a course on inlays and onlays from Ron Jackson. You will return doing your patients a better service, as well as adding to your bottom line. It is one area of dentistry that can allow you to increase your production significantly without having to advertise or drive in new patients. The research is there to support this treatment.

Also, you don’t need a CEREC. You need a good ceramist and a good temporization technique. Not a slight on CEREC. I just don’t think you need to spend $100,000 to do this type of dentistry.
Think of your CEREC as a $3,500 median per month. If your usual portion of lab fee that you can replace with the CEREC is equal or above that, then it is worth it because you do indirect restorations in one appointment. It is very convenient. You control all the steps, which is a great advantage and in about five years you are done with the payment. All that is left is the CEREC club. Then you are saving about $3,000 a month or more on lab fees. Most importantly, you are doing great work in one appointment. It is a big deal. It is so much less hassle for all.

If there is a cervical restoration but there is a lot of tooth structure remaining, meaning that the onlay margin would be away from the restoration margin, I won’t prepare the wall for a crown. I leave the onlay and the restoration separate. I will join them if any doubt the wall isn’t going to hold, but still won’t be crown, just an extension of preparation for the onlay. If I’m leaving a restoration separate, I’ll remove it and make sure the tooth under it is OK and replace it with a fresh restoration.

Almost always, I’ll remove all present fillings, assess the tooth, and almost always, end up creating a CEREC preparation. I reduce the occlusal height by about 2mm, take a picture and mill. Then if there are any cervical separate restorations, while milling I’ll refill those with composite.

I won’t bond anything on a crack. I don’t think it’s safe to do that. You can’t bond on a brown crack line. I’ll usually chase cracks and include them in my preparations. I’ll go to the gum line if I must. If I have to go beyond that, I will go PFM with metal collar. Usually I decide that during the treatment planning phase. If I see too many cracks or long crack lines extending to the gum line beyond enamel, I will usually go for full coverage conventional crown.

If you see a tooth with a large amalgam and cracks and decay, you should not be placing crowns on the old amalgam. You need to remove it and assess the tooth properly, reduce all weak walls, and remove all decay. Then if you have good walls left, place a new core, whether amalgam or composite, then prep for the crown. It’s the safest way to do it.

First of all, test for vitality before doing anything. If vital, then go ahead. If not, tell the patient there is doubt and recommend root canal treatment. Then you still need to remove all decay, all old amalgam, reduce weak walls, and assess restorability. If yes, send for root canal treatment, then proceed with core. Ideally, you do the core right after the endodontics.
I am doing more and more onlays and less crowns it seems. If a cusp gets thin with no dentin support on the enamel, then I include it in the prep design. When I tell a patient that I can cut down the whole tooth because insurance might pay a little more but it is aggressive, then I show them a full crown preparation vs. an onlay preparation, they will tend to choose the onlay. If a tooth needs a crown, then it needs a crown. Many times I don’t even know until I get in there and start removing tooth structure. I prepare the patient for a build-up and crown fee, so when I end up doing the onlay they feel that I was being conservative and saved them money.

I would always extend the prep for the indirect to cover any cervical restoration; this is what I would want in my mouth. If I’m paying for an indirect I don’t want a separate filling I have to worry about replacing periodically.

I think even more important than width of the old restoration is depth. A deeper restoration theoretically introduces more flexure on the remaining cusps via a longer lever arm during thermal expansion and contraction. I see more serious cracks under deeper amalgams than shallow.

That being said, check out the crack on the lingual of #19 in the photo and how shallow the amalgam is on the X-ray! It is wide. I am definitely crowning this tooth with full coverage. I do not want that crack going down into the furcation.

The crack might look bad, but it might only be in the enamel. Enamel has cracks, because that is the nature of enamel. Considering the restorations are very shallow, and it is obvious there is plenty of healthy dentinal cusp support, I would open the crack with a narrow diamond and chase the crack into the dentin. I bet the crack is very shallow and can be completely removed. Restore with composite. Check for balancing contacts.

This appears to be a young patient. Crowns are so destructive to tooth structure. Here is a link to a course that has completely changed how I approach restorative dentistry, www.toothconservingdentistry.com.

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