

WHY A CORE BUILDUP?

In today's restorative practice, we treat patients with substantial amounts of existing restorative dentistry. Old amalgam fillings, 20+ year old crowns and posterior composites that need to be replaced. The result of removing this failing aged dentistry often leaves us with :

- Subgingival caries
- Subgingival margins
- Furcations
- Root flutes
- Root concavities
- Biologic width issues
- No attached tissue



Fig 1. An everyday clinical condition that requires a perio-restorative protocol.

These conditions are in the subgingival environment and in order to achieve exquisite restorative results, periodontal corrective procedures are necessary to return the foundation to a healthy state. Traditionally, crown lengthening was indicated for deep subgingival margins not only to facilitate impression making, but to correct biologic width infringements. Attempting to make impressions, cement or bond restorations in this septic environment and expecting good results is unrealistic.

A periodontal and restorative protocol stressing the TEAM approach to patient care, called **BIOLOGIC SHAPING** has been documented [1] to address such issues with amazing clinical precision and long term success. It has distinct advantages over traditional crown lengthening and differs from traditional crown lengthening in many ways.

In order to benefit from biologic shaping and classic periodontal/ prosthetic treatment, a restorative commitment is needed PRIOR to periodontal treatment. This means old restorations and caries must be removed and a core and provisional restoration placed PRIOR to the periodontal procedure.

WHY A CORE FIRST?

1. **Assign prognosis first.**

Below is a case showing the restorative margin relationship between a fixed prosthesis and the tooth and bone. When open margins are evident, caries must be removed prior to surgery in order to render a prognosis.



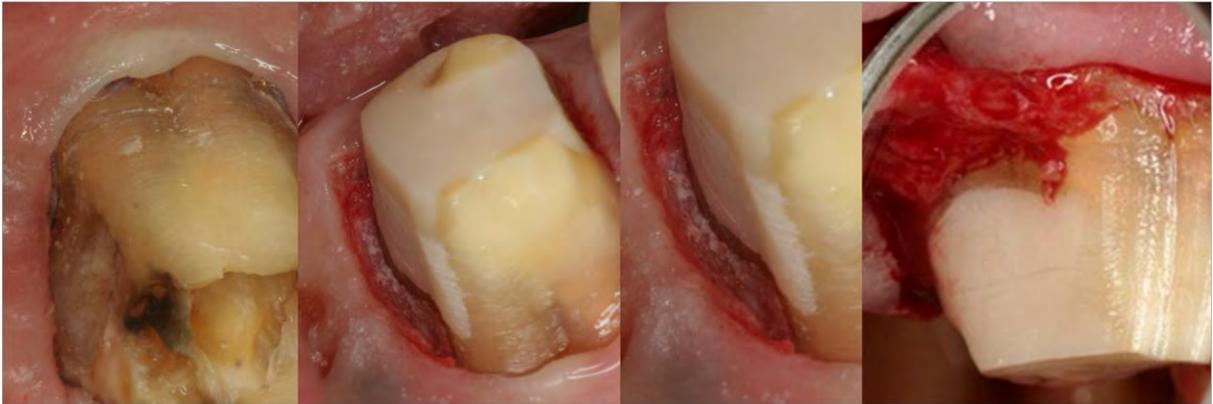
This case below shows a crown lengthening already completed prior to restorative exploration and the rendering of a prognosis. Unfortunately, once the crown was removed, extensive caries yielded a hopeless prognosis, the tooth was lost and an implant was placed.



2. **Determine apical extent of caries and establish a definitive margin before a bone/restorative relationship can be developed.**

The core is the **biological periodontal template**. Without the precise identification and location of the apical extent of the existing caries and resulting restorative margin, it is impossible for a periodontist to know where to position the bone in relation to a "guessed at" future margin. That is why periodontist's will often overdue the osseous portion of

surgery, hoping to give us plenty of room for our decay removal. This results in needless destruction of bone, often into furcations that otherwise would not have to be opened. No wonder many periodontist's today discuss extracting the incipient furcated molar in favor of an implant "while we still have good bone for the implant." This is really unnecessary and aggressive treatment. If we give the periodontist this core or biologic template, there is no guess work about final restorative margin placement and the resulting biologic width.



3. Give our periodontist 360 degree access to treat.

Without a provisional restoration, the periodontist has no ability to treat the tooth in question with 360 degree access. That is really handcuffing him/her. Imagine trying to remove furcations and subgingival anatomical issues with a definitive crown in place. It simply can't be done. Having the ability to remove the provisional during periodontal correction is invaluable.

The subgingival concavity on the mesial of this root could never be treated without direct access to it; therefore requiring a provisional crown to be in place prior to periodontal procedures.

The Core

It is essential for the restorative dentist to place a core buildup prior to periodontal correction. There would be no possible way for the periodontist to determine where to plan the positioning of soft tissue and bone if the core was not completed in advance of surgery.

BENEFITS OF ADHESIVE CORE BUILDUPS

1. Facilitates thorough caries removal.
2. Seals dentin tubules prior to definitive restoration.
3. Provides ideal prep form.
4. Eliminates undercuts in preparation.
5. Increases retention of provisional.
6. Allows a uniform thickness of definitive restorative material.
7. Minimizes impression distortion or tearing.
8. Provides the biologic periodontal surgical template.
9. Increases productivity.

Fig. Pre-operative view of leaking existing crowns.



Fig. Caries noted under old restorations.



Fig. Occlusal view after removal of old crowns.



Fig. Completed caries removal. Without this step PRIOR to periodontal corrective procedures, it would be impossible for the periodontist to have any guidelines as to where the resulting hard and soft tissue should be located for the ideal perio-restorative relationship.



Fig. Adhesive core buildups bonded in place. It is now possible to establish biologic, aesthetic and functional determinants required of the periodontist. This can only happen when all caries have been removed, an adhesive core placed and a contemplated restorative margin established.



Fig. Occlusal view of adhesive cores. Retraction cords are used to facilitate isolation and will be removed after the core is completed.



Fig. Occlusal and facial views of the cemented fixed provisional restoration. Not only is a provisional necessary because of the adhesive core protocol, but also allows the periodontist 360 degree access to allow them full opportunity to do their job.



4 week reline of provisional restoration

4 weeks after surgery, the provisional restoration is relined 1 mm shy (coronal) of the tissue margin. Remember, there is NO margin on the tooth at this point. The biologic shaping has completely removed any restorative margin from bone to occlusal/incisal. You see a perfectly smooth tube of tooth bone to occlusal. So, a question I often hear is what type of margin do you place at the 4 week reline? Answer.....

Feather edge the acrylic into the unprepared tooth 1mm shy of the tissue to allow additional coronal maturation of the attachment without restorative interference. The tooth is not touched with a bur at this visit. We still have 8-12 more weeks before we use a handpiece on these teeth. This full arch maxillary provisional was relined 1mm shy of the tissue, finished, polished and re-cemented with a light ring of marginal Durelon. This is 4 weeks post surgical. The entire arch was treated with biological shaping and SECTG. Surgery by Danny Melker. Restorative by Howard Chasolen.



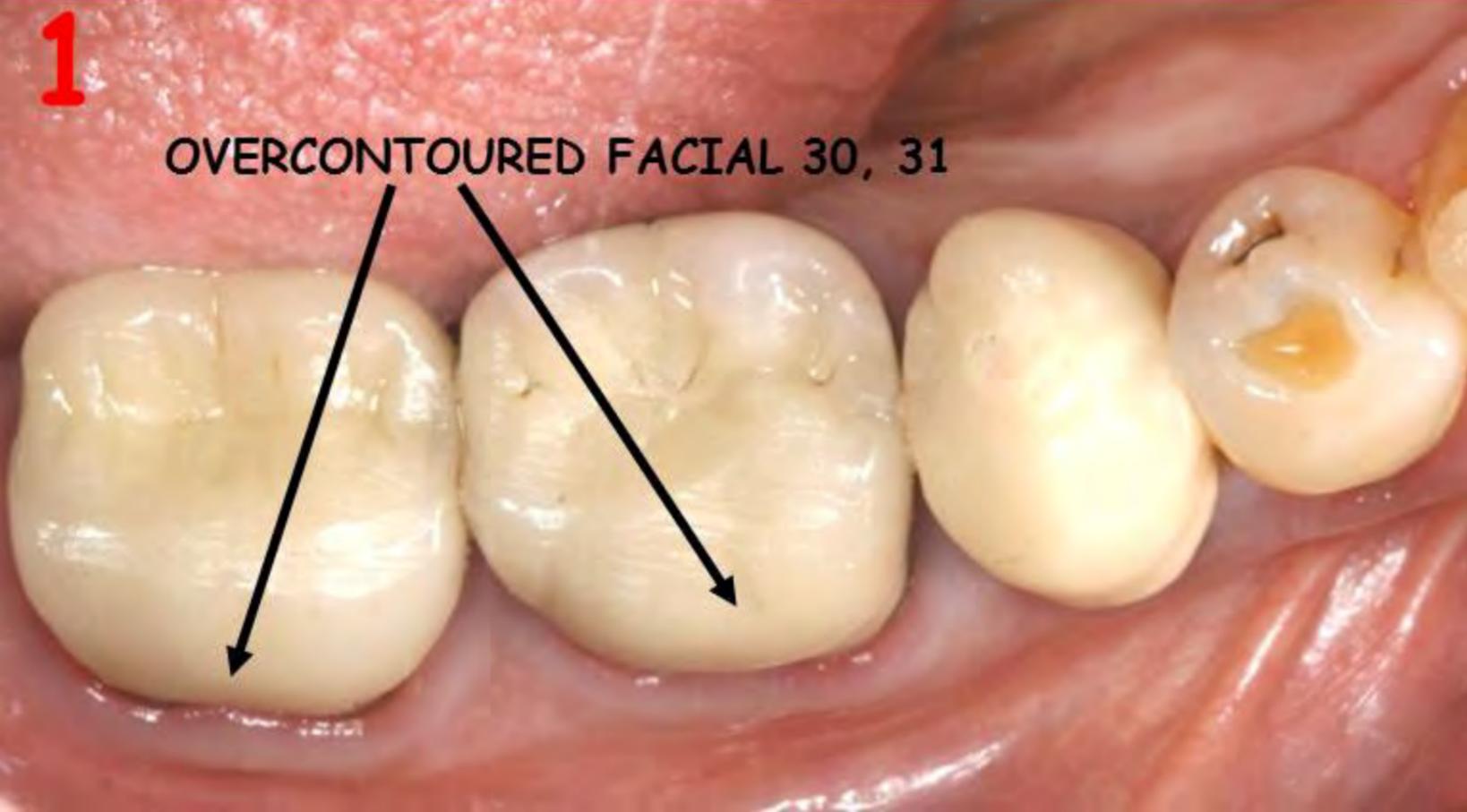
THE CORE BUILDUP - LEGEND

- FIGURE 1. This is a preoperative view of the mandibular right quadrant #28-31 in need of perio / restorative treatment. From this view the arrows indicate over-contoured heights of contour on the facial of #29, 30 and 31.
- FIGURE 2. This view depicts recurrent caries at the facial margins. These facial caries are subgingival and their location as well as the subgingival furcation involvement serve as a prime indication for caries removal, cores, surgical provisionalization and periodontal correction PRIOR to definitive restoration.
- FIGURE 3. The existing restoration has been removed. Even though this will be treated by the periodontist and a final impression WILL NOT be made today, great care is taken to respect the tissue. Note the massive caries, gross leakage and substantial volume of old restorative material.
- FIGURE 4. There are no deep grooves made by removing the old restoration. The urge to prepare a deep margin in an attempt to “clean up” the mess must be resisted. The most conservative feather or chamfer margin allowable is indicated. This will save unnecessary tooth removal during the surgical reshaping of the existing margin.
- FIGURE 5. Gross caries removal is accomplished with a high speed 330 carbide and diamonds. All old restorative material must be removed. Again, the tissue is respected. Attempting an adhesive procedure such as a core in a bloody environment is stressful, unpredictable and unnecessary. Because the initial superficial zone of caries may be remineralized and caries detecting solution may not be effective, preparation to the demineralized dentin is desirable.
- FIGURE 6. NaOCl (Clorox) is used to remove grinding debris in preparation for carries detector.
- FIGURE 7. Caries detector is placed with a Luhr lock syringe with a mini dento infuser tip. The die solution is used as an aid in “reading” and verification of caries status.
- FIGURE 8. I use a #4 steel round bur in a Kavo slow speed handpiece to facilitate more refined caries removal. I use a steel bur rather than a carbide bur because it is kinder to unaffected dentin.
- FIGURE 9. Possibly a bit old fashioned, but I like the tactile feel of a SHARP spoon excavator. This will be my last instrument to verify caries status.
- FIGURE 10. Lastly, lightly grinding the tooth with a diamond in a high speed handpiece will prepare the tooth for an adhesive core. This action removes any remaining carious dentin and the superficial smear layer. It may be desirable to place a micro groove for mechanical retention with an inverted cone bur (33 ½ bur).
- FIGURE 11. Prior to a core buildup I will often place a retraction cord to secure an adhesive favorable field. Frequently, the clinical condition dictates subgingival finish lines due to defective existing restorative dentistry. Caries removal procedures and their resulting finish lines may end on bone. However deep the resulting defect, a core is still necessary. At this stage, an Ultra-Dent #00 purple retraction cord is gently placed. It is soaked in hemodent and blotted dry with a 2X2 gauze pad prior to placement. Once placed in the sulcus, it is rinsed immediately.

- FIGURE 12. Strupp's disinfection triad step #(1)- 4% Chlorhexidine scrub (Dial surgical scrub). The tooth is scrubbed with 4% CHG. This will remove surface contaminants such as blood, grinding debris, saliva and handpiece oil. It is postulated this removes the gross superficial layers of the smear layer.
- FIGURE 13. Strupp's disinfection triad step #(2)- Tublicid (Global Dental). Tublicid is a chelating agent that removes the superficial smear layer.
- FIGURE 14. Strupp's disinfection triad step #(3)- Sodium Hypochlorite – NaOCl (Clorox).
- FIGURE 15. Rinse with water for 15 seconds.
- FIGURE 16. Etch using 32% BAC etch from Bisco. I use a 10 second etch.
- FIGURE 17. Rinse with water for 15 seconds. Do not completely air dry. Leave the dentin surface moist.
- FIGURE 18. Application of All Bond Primer A and B. I place 6-8 layers of All Bond Primer A and B waiting 5 seconds between applications.
- FIGURE 19. All Bond Primer and D/E resin.
- FIGURE 20. The application of D/E Adhesive. This is placed in a thin coat and lightly thinned with air.
- FIGURE 21. 20 second light cure.
- FIGURE 22. Placement of Core Paste in Centrix gun
- FIGURE 23. This image depicts the gross unrefined core buildup. It is essential that the core buildup reach the outermost aspect of the prepared tooth margin. A fully contoured core buildup allows the periodontist to reshape the tooth in the most conservative fashion. Underdeveloped cores either force an over- reshaped tooth or the incomplete removal of the old margin. Ensure the core is fully developed so the reshaping process meets the core as rapidly as possibly.
- FIGURE 24. A G-82 chamfer diamond (Pollard Dental) with copious water is used to refine the core. Notice the Core-Paste remains at the edge of the tooth margin.
- FIGURE 25. Minimal preparation in anticipation of reshaping. Remember after your initial preparation, your periodontist needs to remove your margin and then you need to eventually re-marginate again. Conservative finish lines are essential throughout every step of the case.
- FIGURE 26. Another example of a quadrant of old restorations removed.
- FIGURE 27. Cores placed and prepared. This is now ready for the surgical provisional restoration.

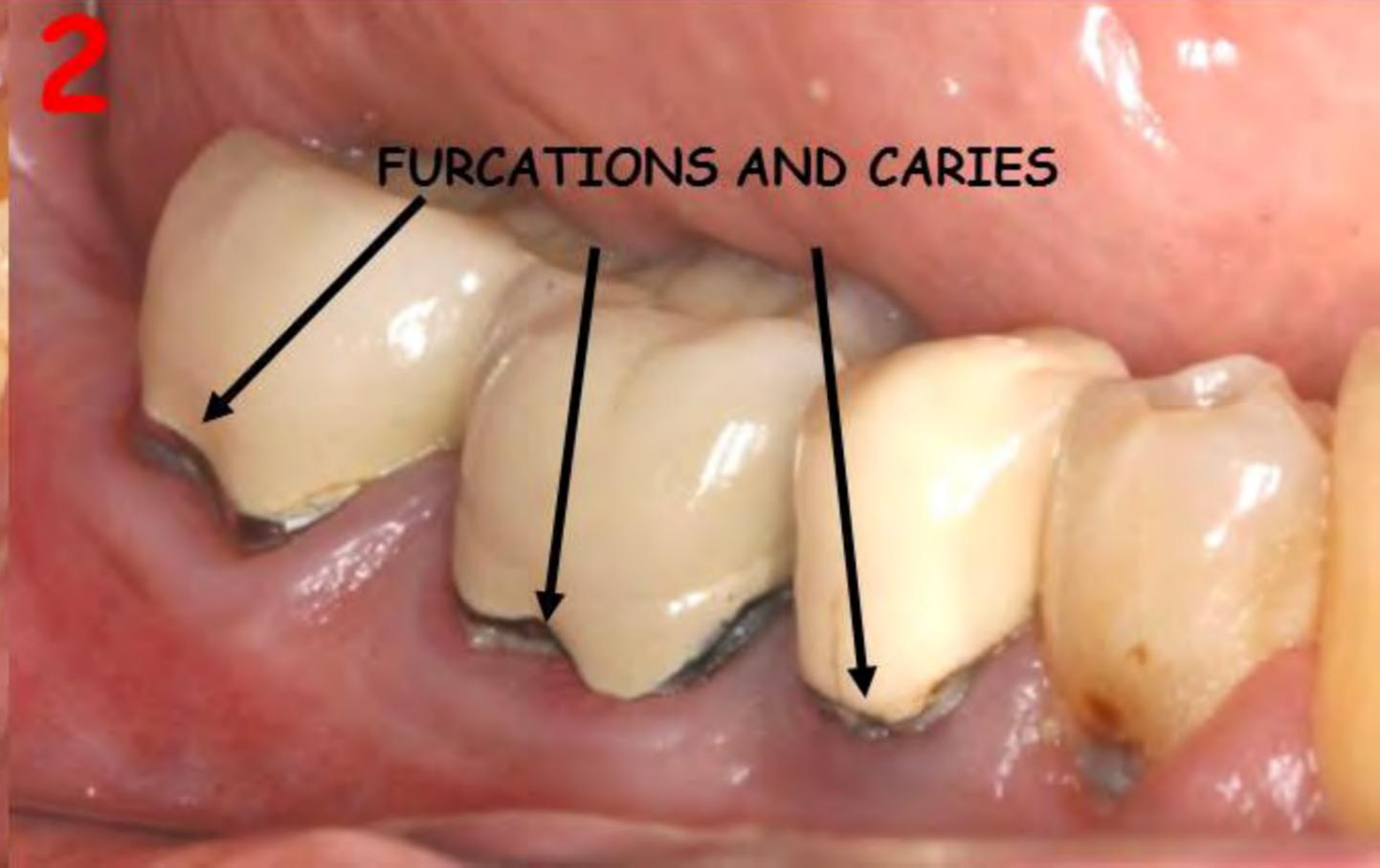
1

OVERCONTOURED FACIAL 30, 31



2

FURCATIONS AND CARIES

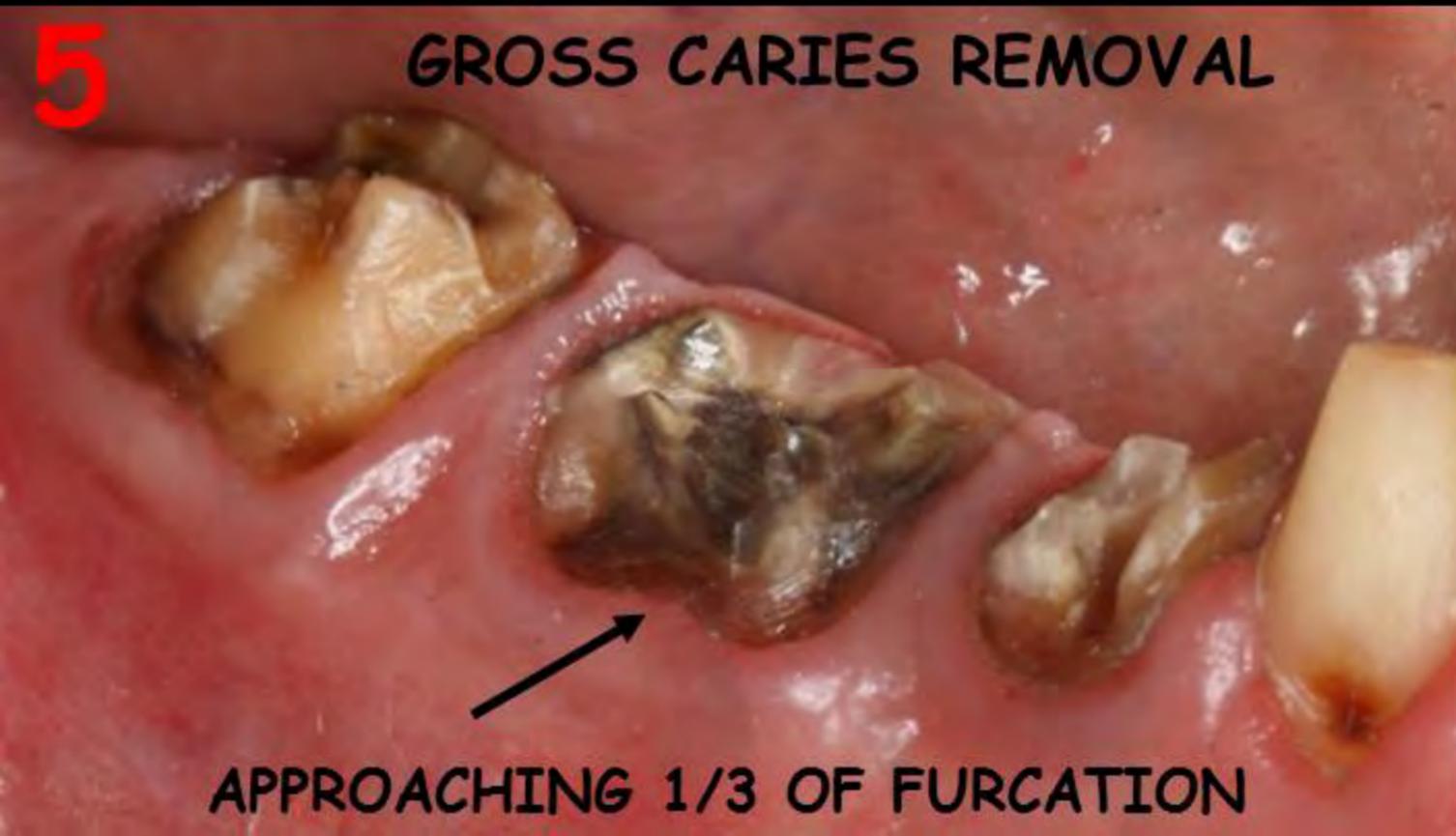




OLD RESTORATIONS REMOVED



SUBGINGIVAL CARIES AND FURCATIONS



7



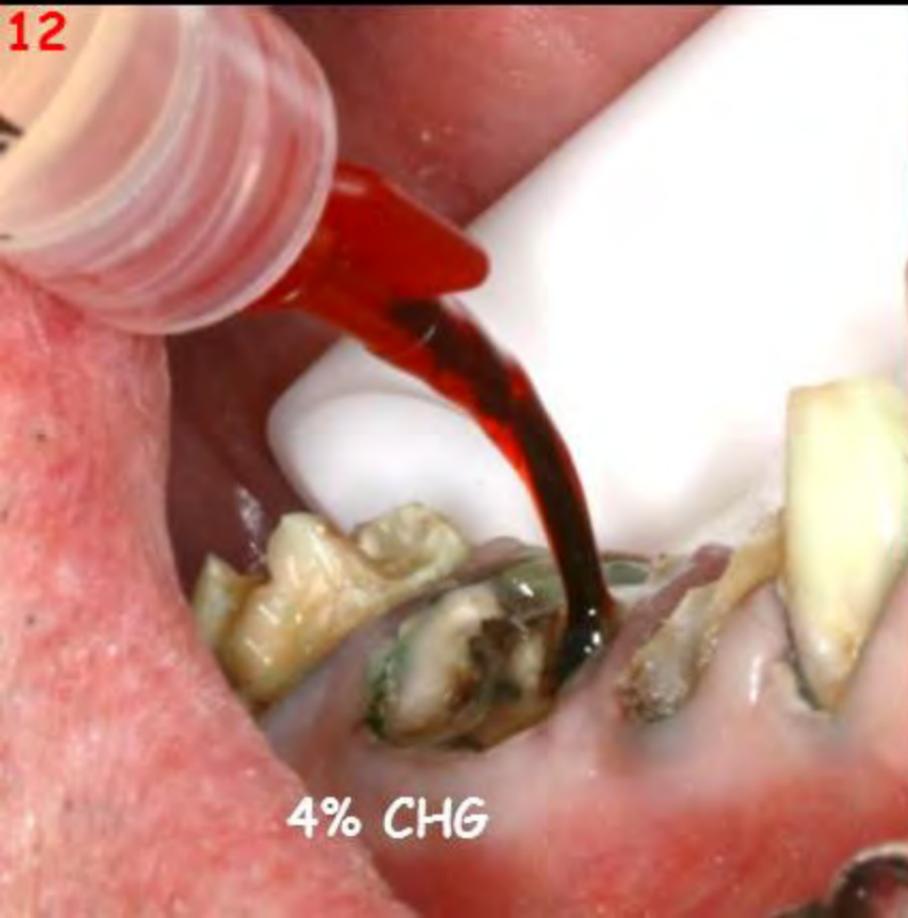
CARIES DETECTOR TO ASSIST IN DETERMINING CARIES STATUS



Case Report HH- cores



Case Report HH- cores



Case Report HH- cores



18



6 COATS OF ALL BOND PRIMER A&B THEN AIR DRY

Case Report HH- cores

19



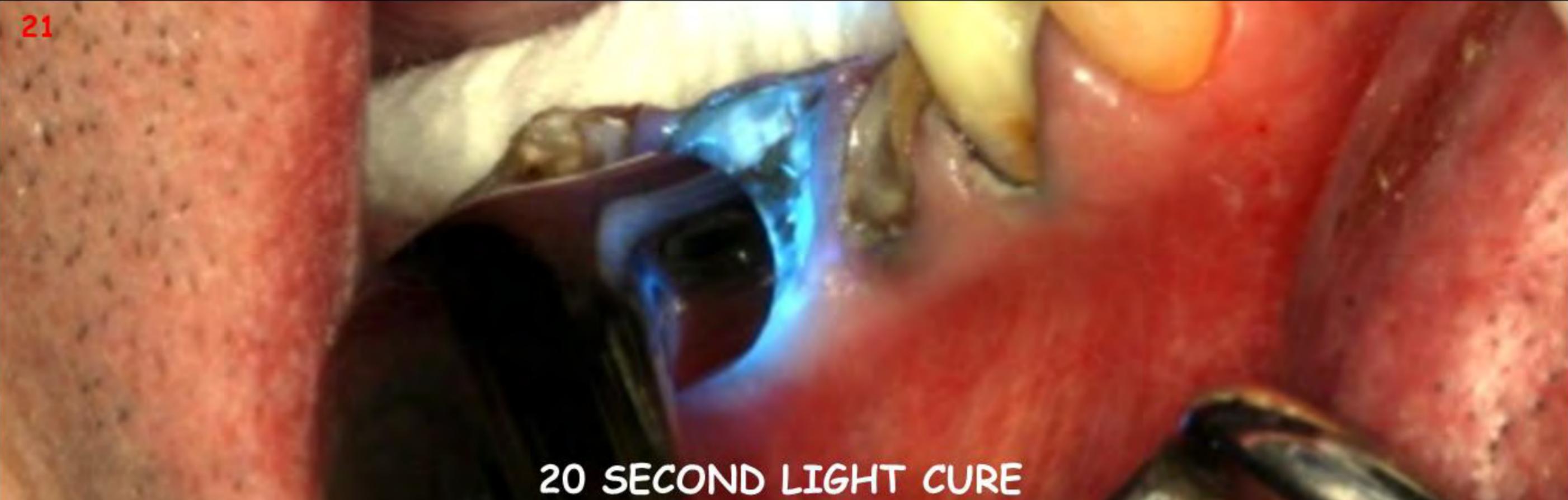
20



D/E ADHESIVE

21

20 SECOND LIGHT CURE

An intraoperative photograph showing a dental procedure. A blue light curing device is being used to cure a material. The device is positioned over a prepared tooth or core. The surrounding tissue is red and moist. The text "20 SECOND LIGHT CURE" is overlaid at the bottom of the image.

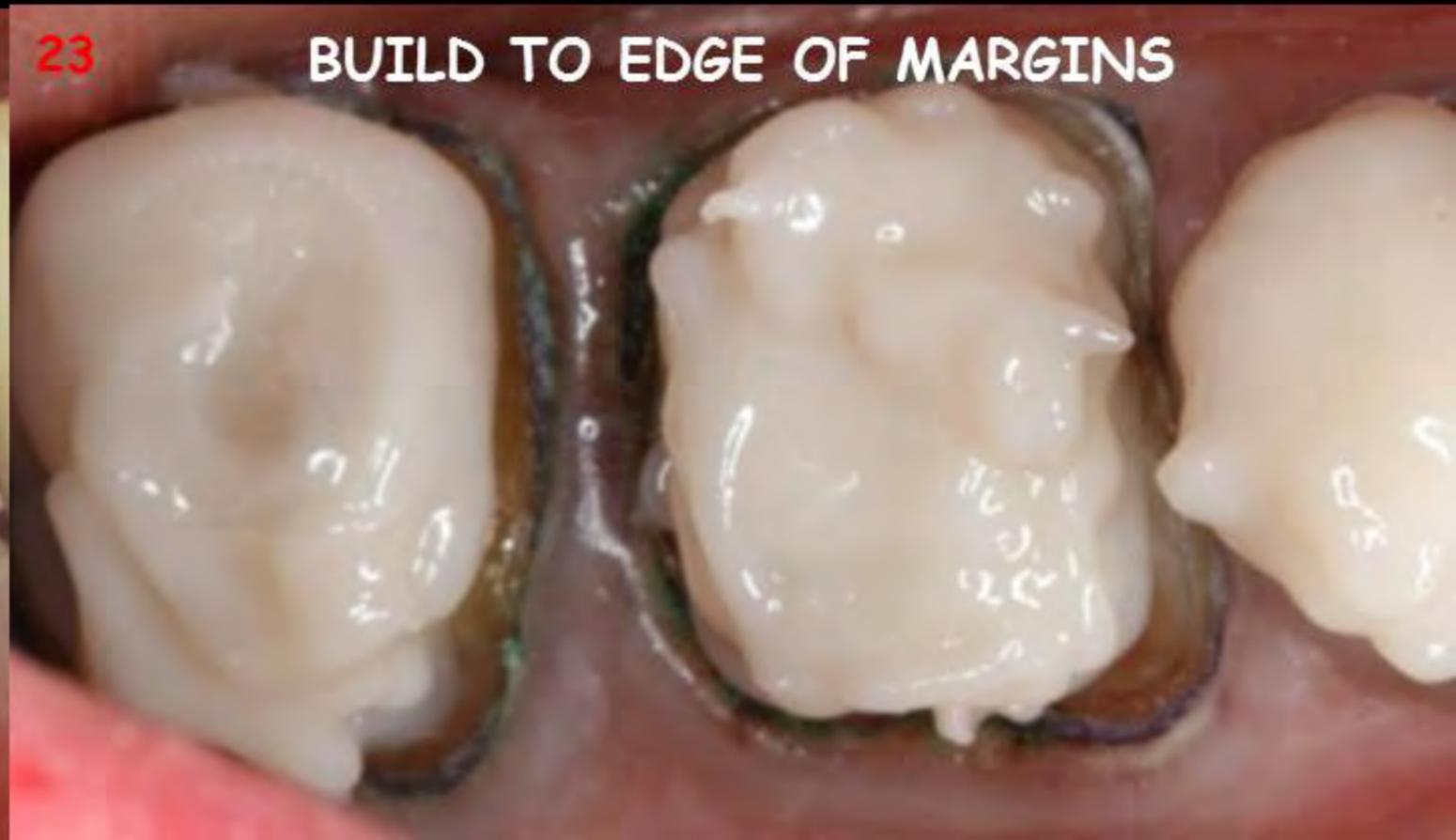
ENAMEL SHADE CORE PASTE

22



23

BUILD TO EDGE OF MARGINS



REFINE WITH G-82 DIAMOND AND WATER



25



MINIMAL MARGIN PREP

25





4 YEARS POST OP

