



# Modern Composite Dentistry: CRUSH your next Class II

David Clark DDS Tacoma WA (also a Logan guy)

*featuring*

 BIOCLEAR

For a copy of today's presentations,  
you have two choices:

# Resource Library — Desktop

The screenshot shows the Bioclear Resource Library website interface. At the top right, the 'Library' link in the navigation menu is highlighted with a red box and a red arrow pointing to it. Below the navigation bar, the 'Presentations' filter button is also highlighted with a red box and a red arrow pointing to it. The main content area displays three presentation cards: 'Simply Better Composite Restorations' by David Clark DDS, 'The Great Tooth Killer: Epidemic of Cracked Teeth, the Science of Strong Teeth' by David Clark DDS, and 'Modern Composite Dentistry: CRUSH your next Class II' by David Clark DDS and Lauren Wilson DMD. A 'Back To Top' button is visible at the bottom right of the page.

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## Bioclear Resource Library

Search resources... Sort by

All Articles Free Presentations Tips & Tricks Videos Webinars

### Presentations

Simply Better Composite Restorations  
David Clark DDS

The Great Tooth Killer: Epidemic of Cracked Teeth, the Science of Strong Teeth  
David Clark DDS @bioclearmatrix.com

Modern Composite Dentistry: CRUSH your next Class II  
David Clark DDS Lauren Wilson DMD

Hinman — Modern Composite Dentistry: CRUSH your next Class II  
March 18, 2026

Back To Top

- 1) Go to [bioclearmatrix.com](https://www.bioclearmatrix.com)
- 2) Click "Library" at the top right
- 3) Click "Presentations"

# Resource Library — Mobile



1) Scan the QR code



OR type in  
[bioclearmatrix.com/resources/](https://bioclearmatrix.com/resources/)

2) Fill out the form

A screenshot of a mobile app interface. At the top, the status bar shows 12:06 PM. The app header includes the Bioclear logo, a search icon, a user profile icon, a menu icon, and a shopping cart icon with a '0' notification. Below the header, the page title is 'Home > Resource Library Form'. The main heading is 'Resource Library Form'. Below this, it says 'FILL OUT THE FORM BELOW TO GET STARTED' and 'After filling out the form you will be redirected to the Resource Library page.' The form itself is titled 'Bioclear Resource Library' and contains three sections: 'Participant's Name (Required)' with two input fields for 'First' and 'Last'; and 'Practice Name' with one input field. At the bottom, the browser address bar shows 'AA bioclearmatrix.com'.

3) Automatically redirects to  
Resource Library

A screenshot of the mobile app interface showing the 'Bioclear Resource Library' page. The status bar shows 11:54 AM. The app header is the same as in the previous screenshot. Below the header is a large image of a dental procedure. The page title is 'Bioclear Resource Library'. Below the title is a search bar with the placeholder text 'Search resources...'. There is a 'Sort by' dropdown menu. Below these are several filter buttons: 'All', 'Articles', 'Free', 'Presentations', and 'Tips & Tricks'. At the bottom, the browser address bar shows 'AA bioclearmatrix.com'.

Disclosures:  
Dr. Clark has financial interest in Bioclear



# Dental schools/GPR integrating the Bioclear Method





The **Bioclear Learning Center** provides a new pathway for dentists and their office to transition from traditional **GV Black dentistry**, to the extraordinary world of **modern direct dentistry**.



## Bioclear Learning Center Faculty



Dr. Rafael Bustamante  
Full Faculty



Dr. David Clark  
Founder & Full Faculty



Dr. Charles Regalado  
Full Faculty



Dr. Claire Burgess  
Full Faculty



Dr. Dan Henricksen  
Full Faculty



Dr. Marco Maiolino  
Full Faculty



Dr. Joshua Solomon  
Full Faculty



Dr. Abdelrahman Tawfik  
Full Faculty



Dr. Johan Hagman  
Full Faculty



Dr. Laurten Wilson  
Full Faculty



Dr. Stephanie Couperus  
Adjunct Faculty



Dr. David Carroll  
Full Faculty



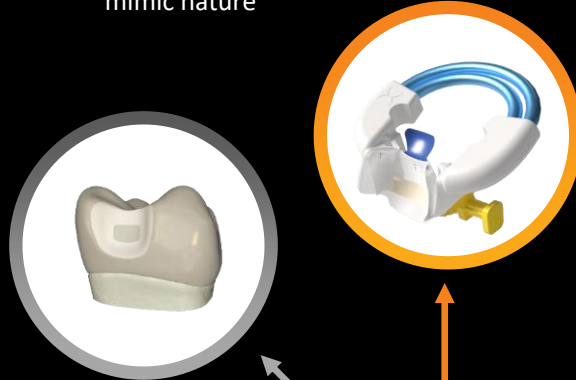
# BIOCLEAR LEARNING CENTER

Tacoma USA · Solihull UK  
Varberg Sweden · Cairo Egypt  
Syracuse Italy · Taubate Brazil  
Livermore CA (Bioclear pediatrics)  
Seoul Korea · Madrid/Barcelona  
Sydney Australia · Provence France  
Baghdad Iraq

# A Modern Method for Composite Restorations

## Anatomic HD Clear Matrices

- Anterior & Posterior Matrices designed to mimic nature



## Preparation Design

- Designed for composite
- Minimizes stress concentration
- Maximizes enamel involvement

## Bioclear Blaster or Equivalent for Biofilm Removal

- Uses aluminum trihydroxide w/ water
- Allows bonding to uncut enamel
- Allows infinity edge margins

## Injection Mold Composite

- Injection mold warmed [Kuraray Majesty anterior composites](#) and [3M bulk fill](#) in Class I and Class II restorations
- Like the inverse of my mullet haircut: Party in the front Business in the back

## Rock Star Polish

- Coarse discs for reduction
- “Rock Star” polish with [Bioclear Magic Mix](#) and disposable cup
- [Bioclear RS Diamond Polisher](#)

Systematic restorative protocol for esthetic long-term clinical outcomes

Does **composite resin** as an **amalgam** substitute protect the tooth from breaking in a Class I or Class II?

Nope!



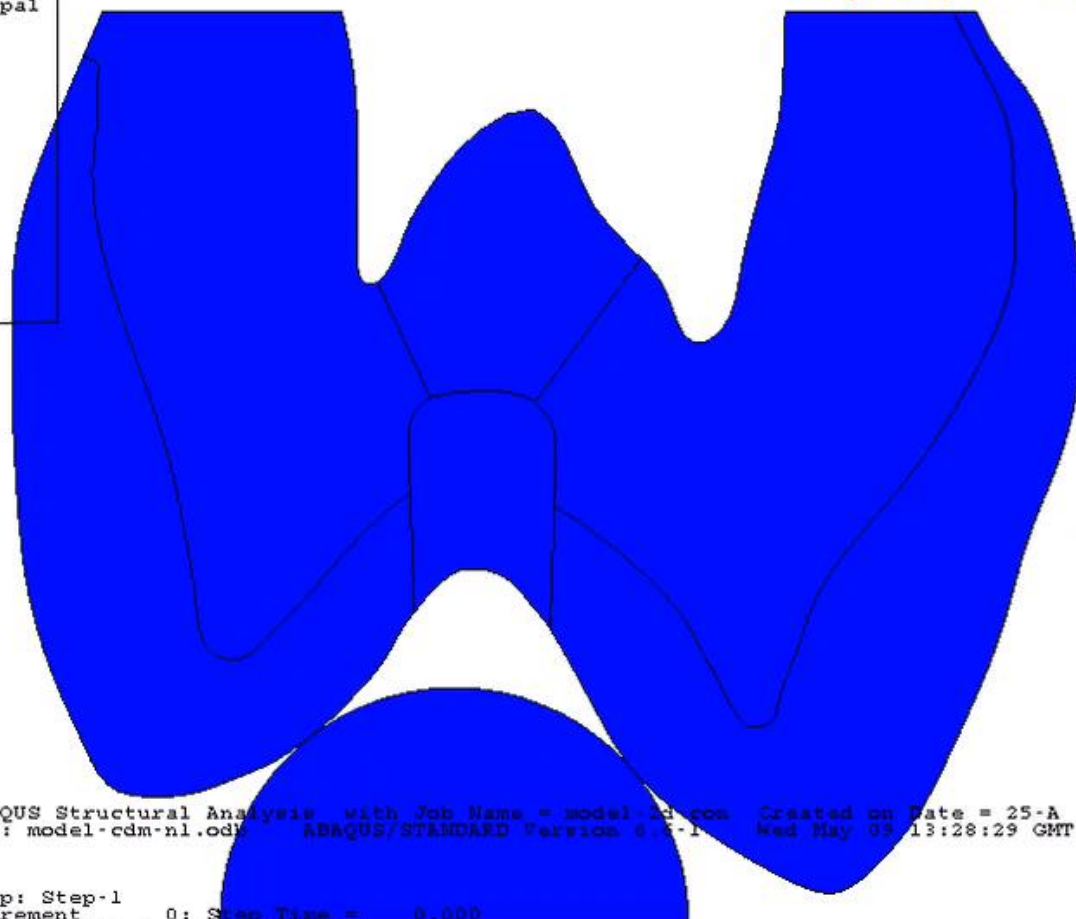
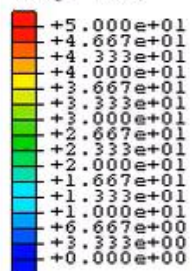
# THE SCIENCE OF STRONG RESTORED TEETH



DR. DAVID CLARK

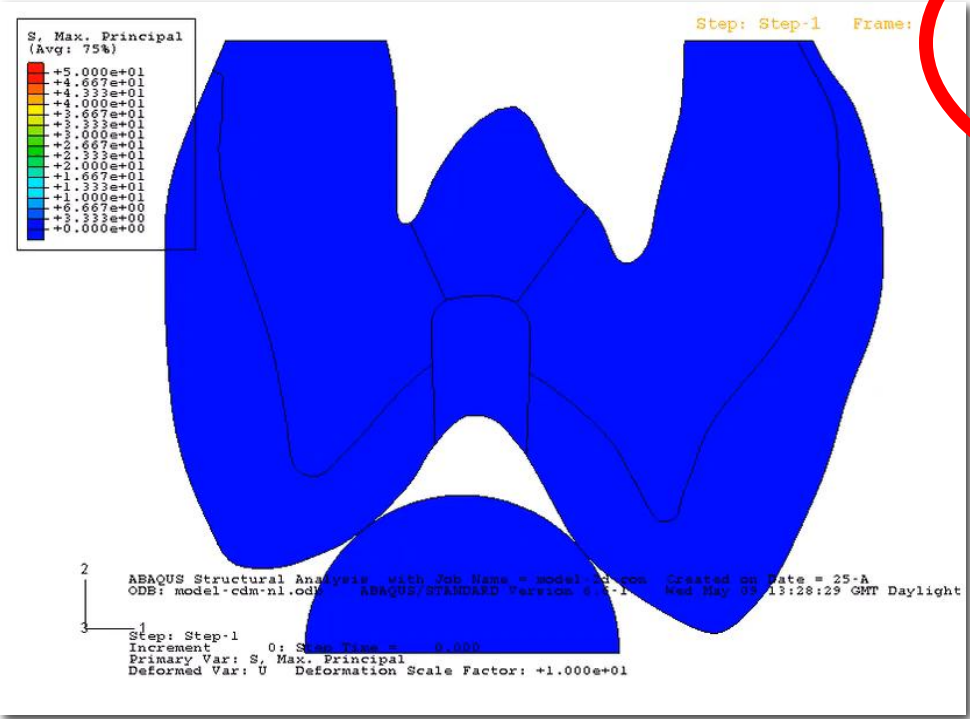


DR. ALEX FOK

S, Max. Principal  
(Avg: 75%)2  
3

ABAQUS Structural Analysis with Job Name = model-2d.ron Created on Date = 25-A  
 ODB: model-cdm-nl.odb ABAQUS/STANDARD Version 6.5-1 Wed May 03 13:28:29 GMT Daylight

Step: Step-1  
 Increment: 0: Step Time = 0.000  
 Primary Var: S, Max. Principal  
 Deformed Var: U Deformation Scale Factor: +1.000e+01



## Friday Courses



### [The Great Tooth Killer: Cracked Teeth Prevention, Diagnosis, and Treatment 3 CE 8:00AM-11:00AM](#)

- Audience: All Dental Professionals
- Location: Room 420, Boise Centre East
- by Dr. David Clark, Sinclair Matrix

Currently the diagnosis and treatment of cracked and fractured teeth is largely symptom based and is therefore often a sad, end stage diagnosis. The fracturing process is one of dentistry's last great mysteries and is poorly understood throughout the generalist and specialist dental community. In this engaging and entertaining lecture, you will learn to understand and diagnose pathologic cracks utilizing magnification and other modalities, and treat long before symptoms arise or the tooth becomes unsalvageable.

#### Objectives:

- Learn: Learn to have confidence identifying early tooth fracturing
- Learn: Learn why new Class II cavity preparations and other modalities are crucial to prevent eventual tooth fracture
- Learn: Receive a blueprint for diagnosis and treatment of complete and incomplete fractures
- Learn: Understand the Fissurotomy, Calla Lily, and Overlay preparations for Class I and Class II restorations



## Hands-On Workshop: Better, Faster, Prettier Composite Dentistry - 3 CE 1:45PM-4:15PM



- Audience: Hands-On Workshop Pre-registered \$100
- Location: Room 410 C, Boise Centre East
- **by Dr. David Clark, Bioclear**

Experience a fresh approach to modern composite dentistry with Dr. Clark. Say goodbye to traditional techniques like layering, condensing, and burnishing. Join us to master injection molding, achieving precise margins, smooth contours, and flawless, mirror-like restorations in both black triangle and Class II scenarios.

- Learn: The 6 steps to achieve rock solid posterior contacts in even the most difficult cases
- Learn: How can you combine flowable & regular composites with the injection molding technique & when to use bulk fills
- Learn: Treating the dreaded black triangle, especially common after tray aligner therapy
- Learn: How to handle heated composites

# Epidemic of Cracked Teeth



“Around” the tooth versus  
“In” the tooth



# Step by Step Guide for Injection Molded Class II

# 1<sup>st</sup> Pillar of Modern Composite

Disclosing of Biofilm, then  
Blasting to remove Biofilm plus  
remove Protein Pellicle

# Part 1 | Biofilm Removal

If you were going to paint a wall that looked like this....



...you'd prepare the surface to receive the paint and have it stay long-term.

Photo courtesy of Dr. David Clark

21 | © 3M 2019. All Rights Reserved.

We need to do the same with teeth...



Clean teeth surfaces allow for

- Better adhesion
- Difference between “Flash” and an infinity edge at the Tooth Restoration Interface

∞ BIOCLEAR

Does 37% phosphoric acid  
(gel etchant)  
remove biofilm?

Composite  
Heating: Trend  
or the future of  
placing the  
material?

 **HEAT  
SYNC**  
by BIOCLEAR

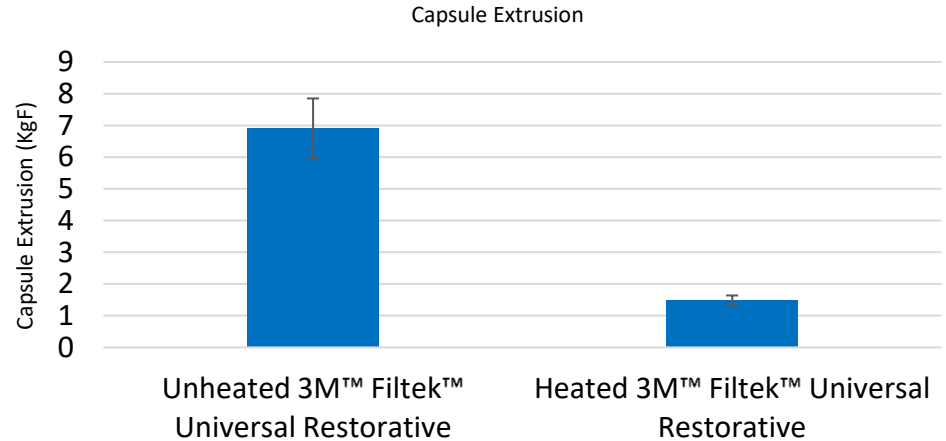


**Bioclear HeatSync  
Composite Warmer  
pre-set to **155° F****

# Composite warming

## Why warm?

- Handling preference
- Lowers capsule extrusion force by 75-80%



3M internal data

14% of dentists survey stated they use some type of device to warm their composite prior to placement.

3M Market Research, January, 2018 N=304 Dentists (US, Russia, UK, Brazil, Germany)

# Conclusions

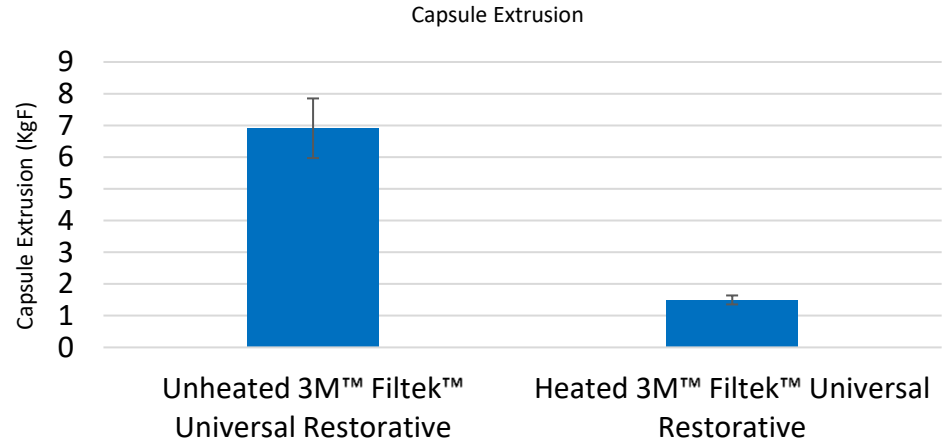
- Preheating a syringe of Filtek™ Bulk Fill Posterior to 60 °C for twenty 1 hour increments does
  - NOT harm mechanical properties such as
    - Diametral tensile strength
    - Flexural strength
  - NOT harm cure properties such as
    - Depth of cure
    - Cusp deflection (polymerization shrinkage stress)
  - NOT harm esthetic properties such as
    - Color and opacity
    - Polish retention

From: Does Preheating a Dental Composite Degrade its Post-Cure Properties?  
T.D. Dunbar et al., *J Dent Res* 95 (Spec Iss A):952, 2016 ([www.iadr.org](http://www.iadr.org)).

# Composite warming

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Let's go back to 2007...

“Dr. Clark, aren't we supposed to layer everything?”

# Studies do not support layering to mitigate polymerization stress

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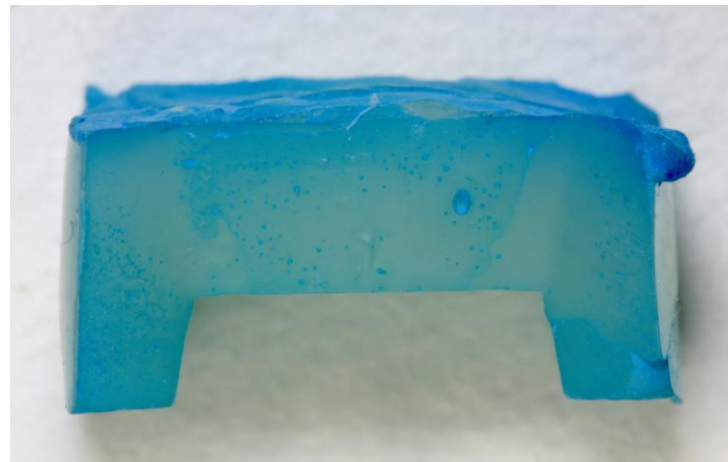
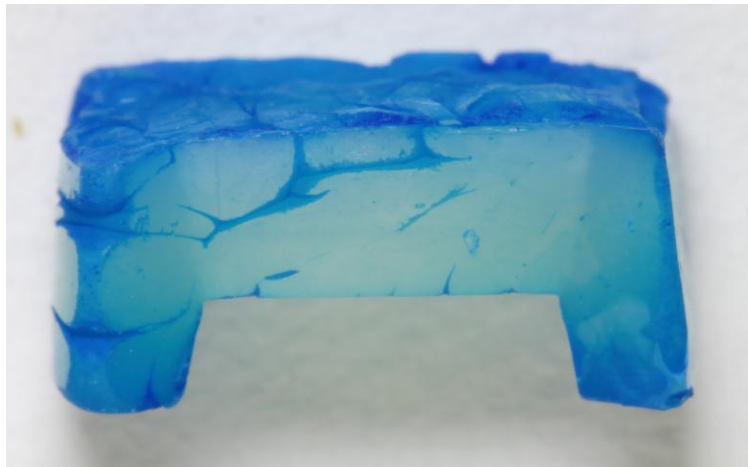
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- ◆ Does Incremental Filling Technique Reduce Polymerization Shrinkage Stresses?  
Versluis A, et.al., J Dent Res March 1996; 75(3): 871-878
- ◆ An In Vitro Study of the Effect of Restorative Technique on Marginal Leakage in Posterior Composites  
Neiva IF, et.al.; Oper Dent 1998, 23:282-289
- ◆ Microleakage and adaptation of Class II packable resin-based composites using incremental or bulk filling techniques  
Gallo JR, et.al., Am J Dent 2000; 13: 205-208
- ◆ The Effects of Adhesive Thickness on Polymerization Contraction Stress of Composite  
Choi KK, et.al., J Dent Res 2000; 79(3): 812-817
- ◆ Microleakage of Posterior Packable Resin Composites with and without flowable liners  
Leevailoj C, et.al., Oper Dent 2001; 26: 302-307
- ◆ Marginal adaptation of Class II resin composite restorations using incremental and bulk placement techniques: and ESEM study  
Idriss S, et.al., J Oral Rehab 2003; 30: 1000-1007
- ◆ A reappraisal of the incremental packing technique for light cured composite resins  
Rees JS, et.al., J Oral Rehab 2004; 31: 81-94
- ◆ Cuspal deflection and depth of cure in resin-based composite restorations filled by using bulk, incremental and transtooth-illumination techniques  
Carlos E. Campodonic, DDS 2011, October 2011 JADA

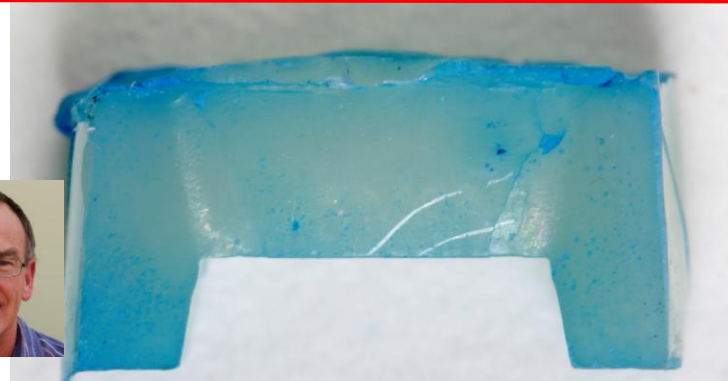
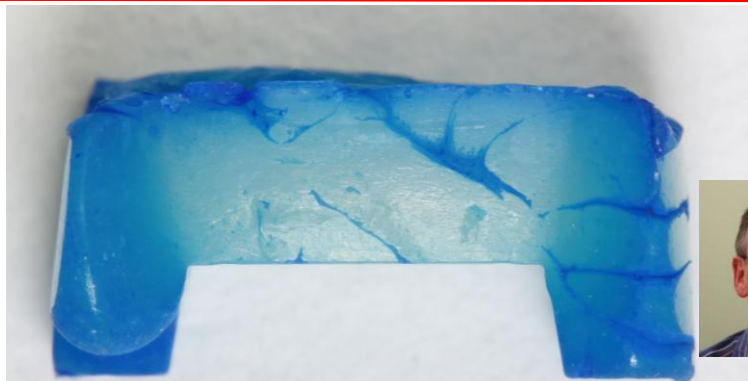
## Hand-Packed and Layered

## Monolithic and Injection-Molded

Dr. #1



Dr. #2



Courtesy Dr. Richard Price

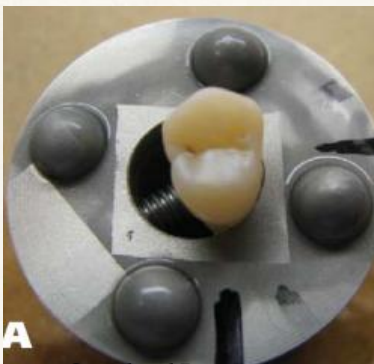
A microscopic image of a tooth with a filling. A dark spot is visible at the interface between the filling and the tooth, indicating microleakage. The text is overlaid on a dark blue semi-transparent box.

Is layering a good thing or a bad thing?

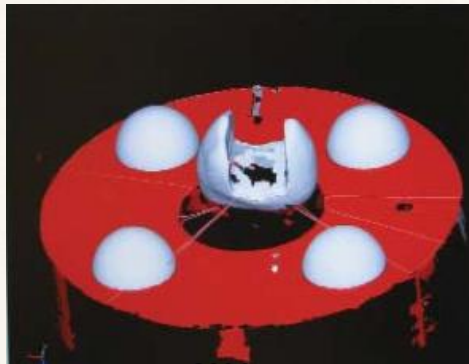
Does layering relieve stress and reduce microleakage? **NO**

# October 2011 JADA

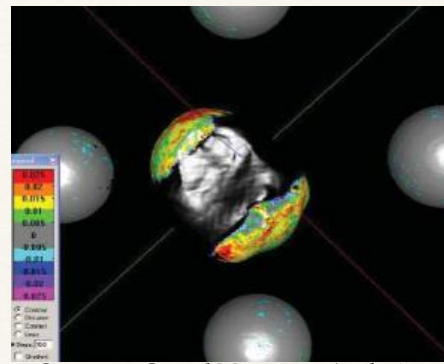
## Cuspal deflection and depth of cure in resin-based composite restorations filled by using bulk, incremental and transtooth-illumination techniques



Completed Restoration



COS Scan



Computer Cuspal Movement Analysis

**"Conclusions:** Cuspal deflection was not affected by filling techniques."

"Filtek Supreme Plus had lower curing values below a depth of 2 mm."

**"Clinical Implications.** When using resin-based composite restorative materials, clinicians should be more concerned about the effect of filling techniques on curing depth than about how these techniques affect shrinkage stresses."

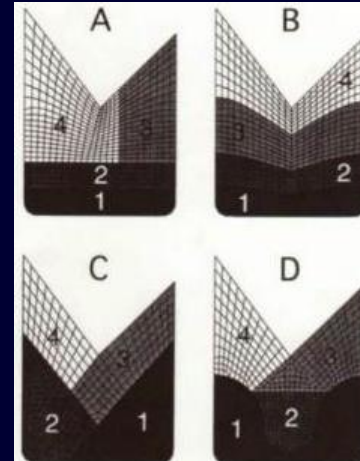
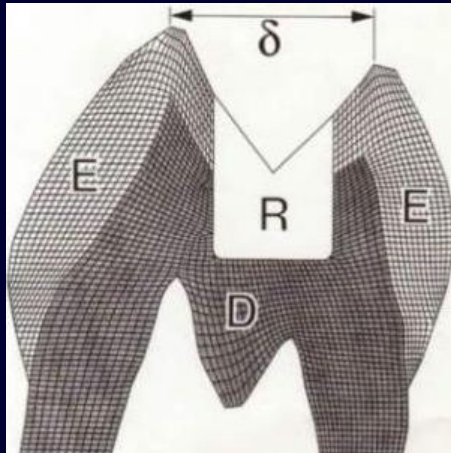
## Does an incremental filling technique reduce polymerization shrinkage stresses?

Versluis A, Douglas WH, Cross M, Sakaguchi RL.

Minnesota Dental Research Center for Biomaterials and Biomechanics, University of Minnesota, Minneapolis 55455, USA.

### Abstract

It is widely accepted that volumetric contraction and solidification during the polymerization process of restorative composites in combination with bonding to the hard tissue result in stress transfer and inward deformation of the cavity walls of the restored tooth. Deformation of the walls decreases the size of the cavity during the filling process. This fact has a profound influence on the assumption—raised and discussed in this paper—that an incremental filling technique reduces the stress effect of composite shrinkage on the tooth. Developing stress fields for different incremental filling techniques are simulated in a numerical analysis. The analysis shows that, in a restoration with a well-established bond to the tooth—as is generally desired—incremental filling techniques increase the deformation of the restored tooth. The increase is caused by the incremental deformation of the preparation, which effectively decreases the total amount of composite needed to fill the cavity. This leads to a higher-stressed tooth-composite structure. The study also shows that the assessment of intercuspal distance measurements as well as simplifications based on generalization of the shrinkage stress state cannot be sufficient to characterize the effect of polymerization shrinkage in a tooth-restoration complex. Incremental filling methods may need to be retained for reasons such as densification, adaptation, thoroughness of cure, and bond formation. However, it is very difficult to prove that incrementalization needs to be retained because of the abatement of shrinkage effects.



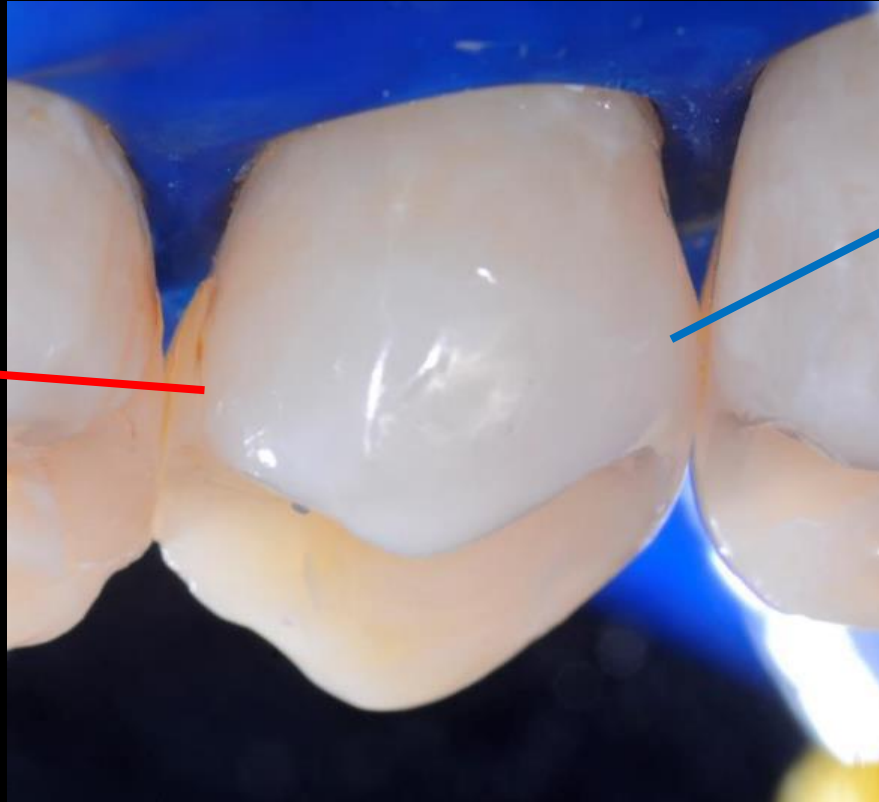
# Epidemic of Failing Composites





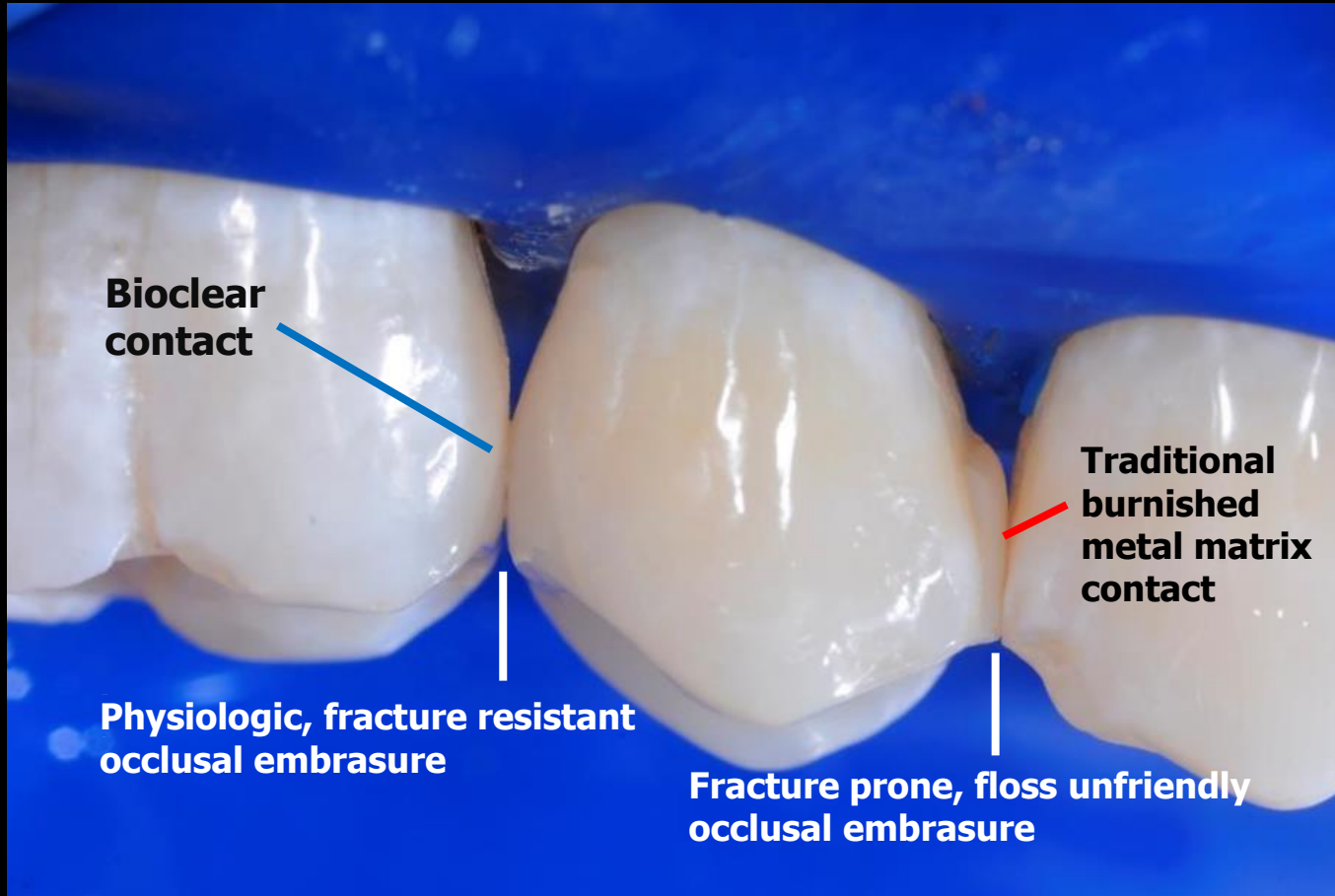
# Let's compare old vs. new

Traditional box prep restoration with staining margins and burnished mediocre shape.

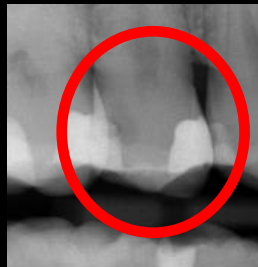


Bioclear restoration with Evolve Matrix, Twin Ring Universal, and Diamond Wedge combined with an infinity edge.

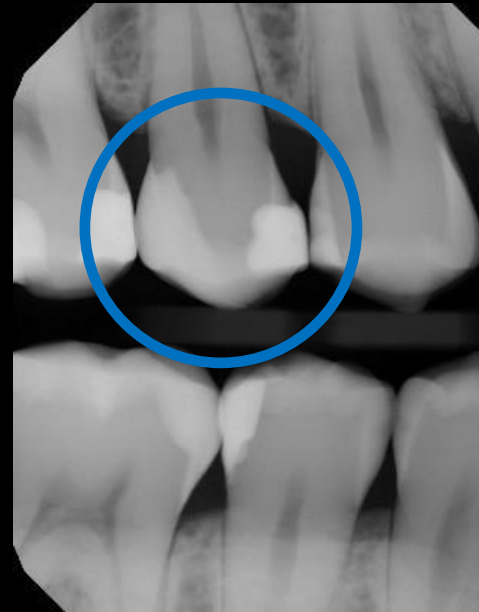
# Buccal View Post-Op

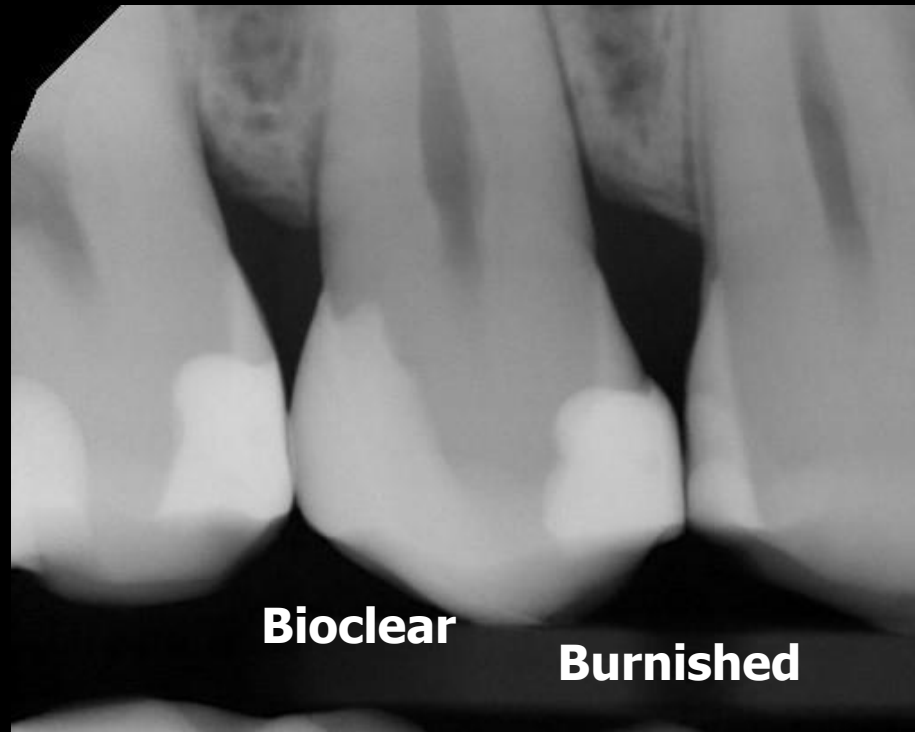
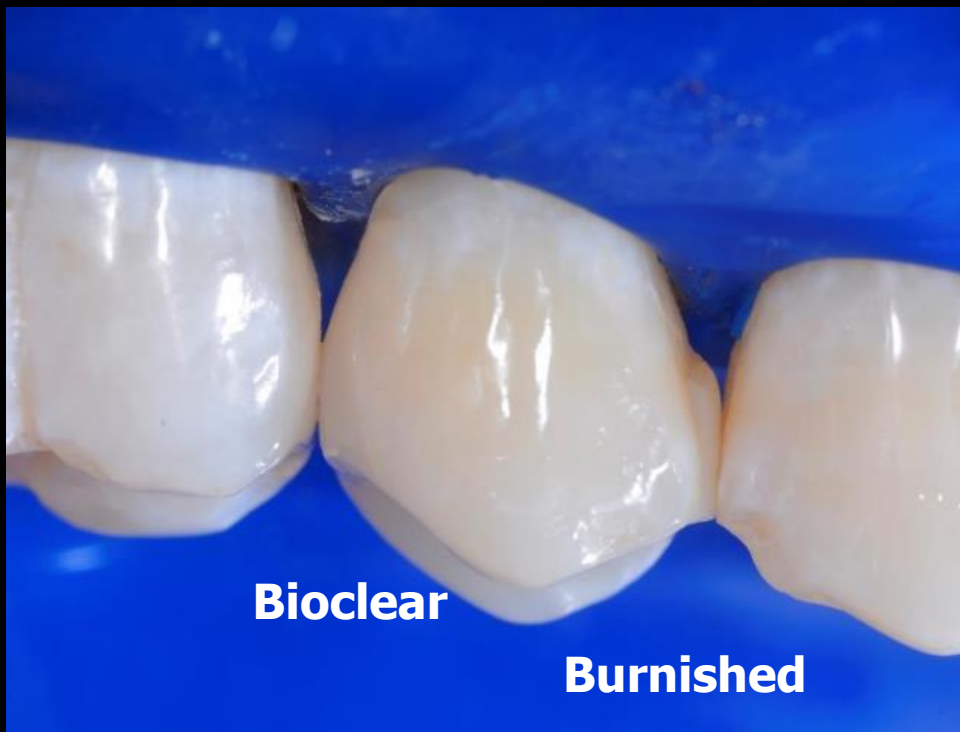


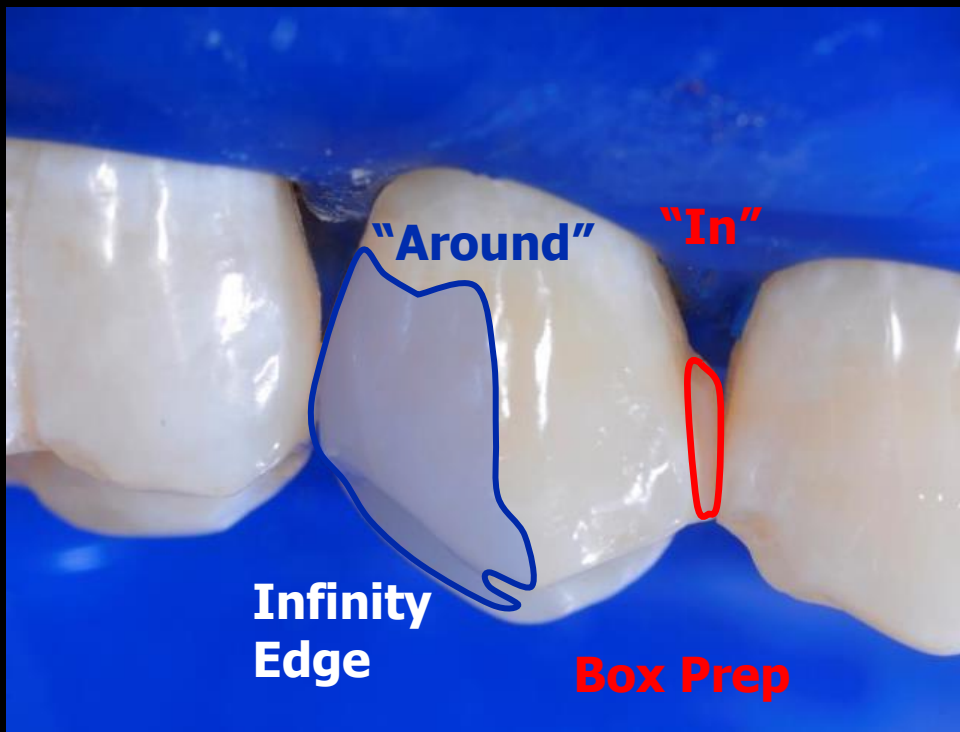
## Pre-Operative Radiographs



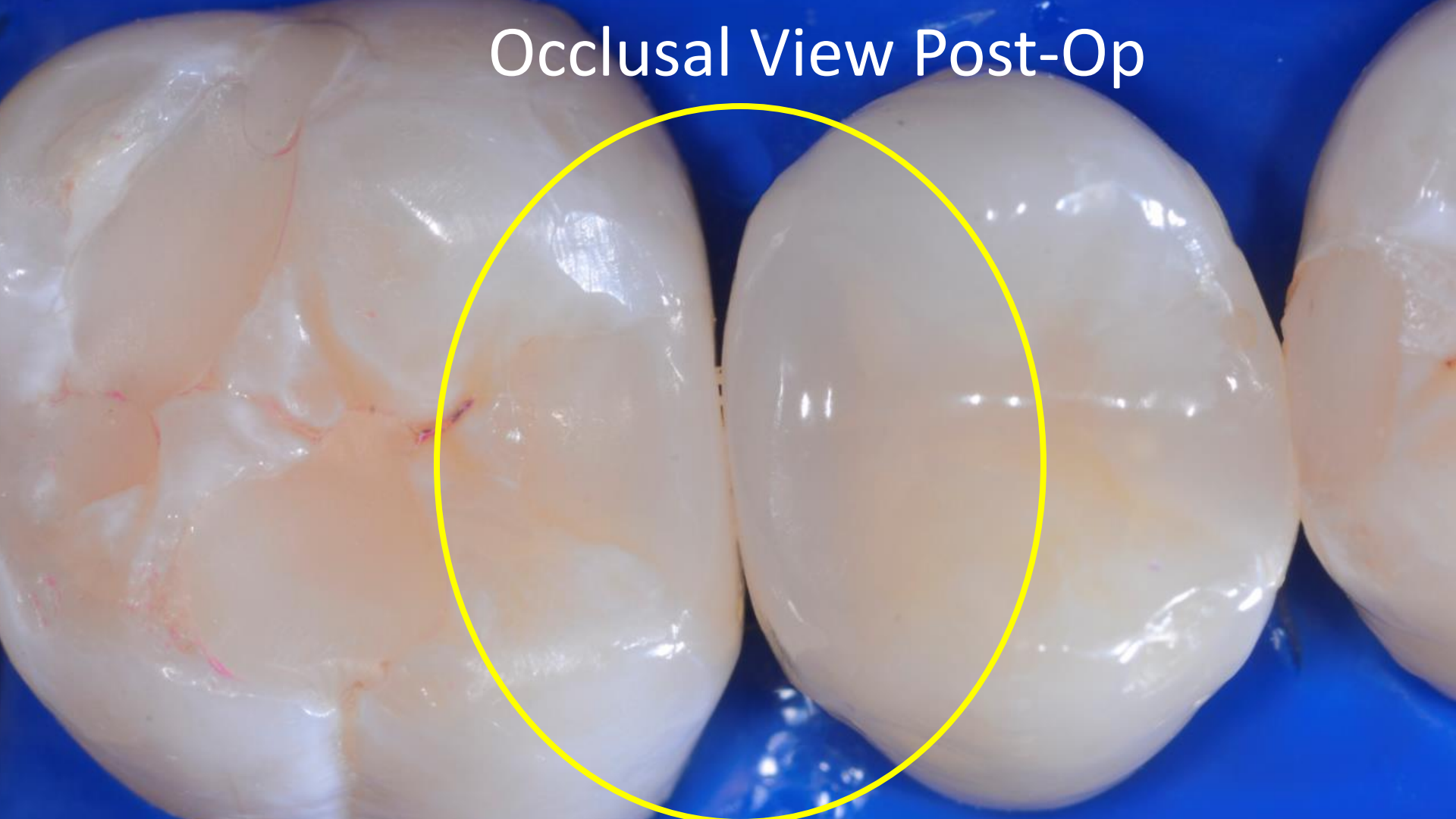
## 1 Year Post-Operative







Occlusal View Post-Op



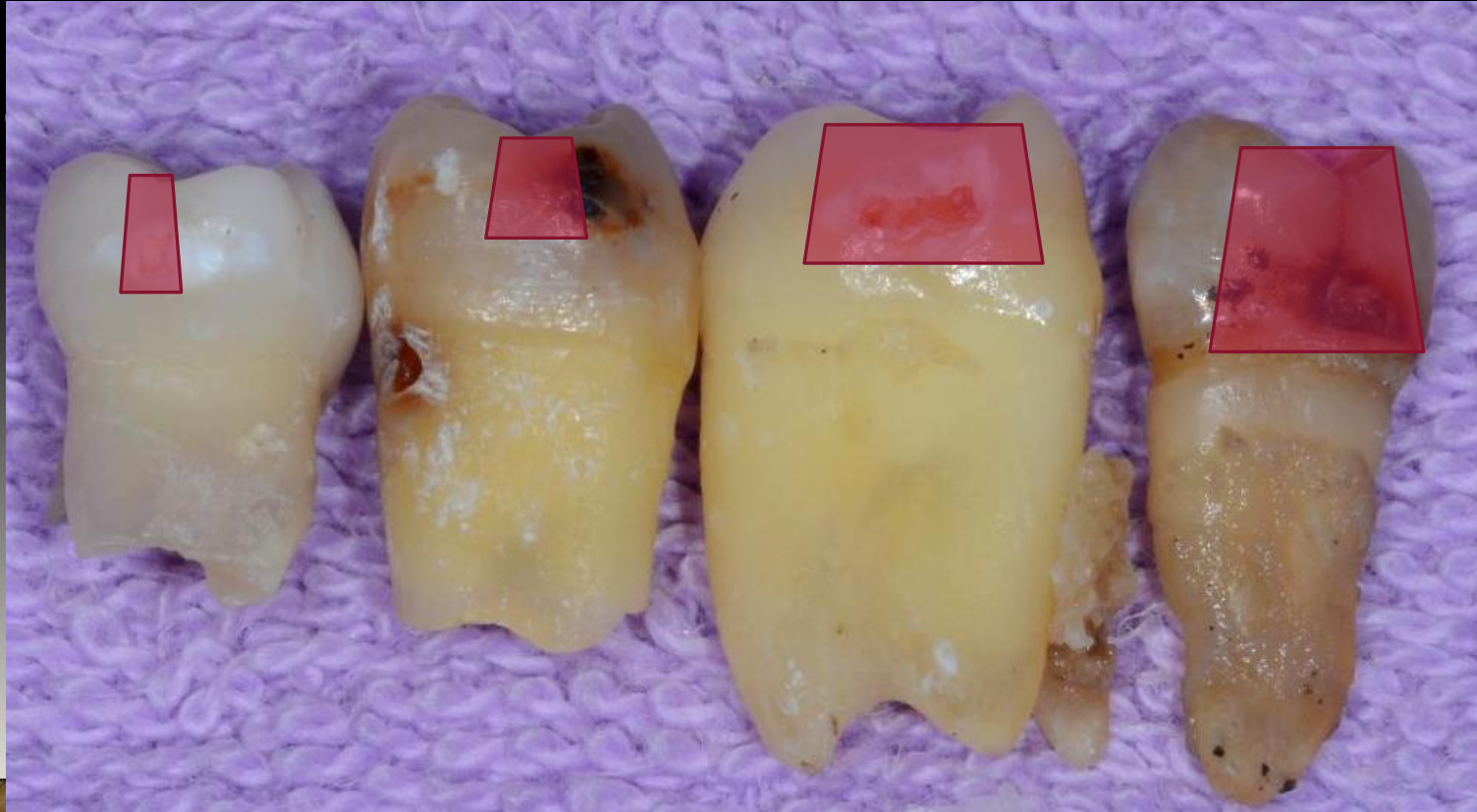
# CAVITATION VS APRISMATIC ENAMEL



WHY WOULD WE PUT A MARGIN IN THE *DISEASE ZONE*?



# FOUR WAYS TO CUT A TRAGIC SLOT PREP



LET'S PUT IT ALL TOGETHER WITH EVOLVE



# The Bioclear Evolve All In One Kit





One of the many  
problems with a Slot  
Prep



One of the many  
problems with a Slot  
Prep



















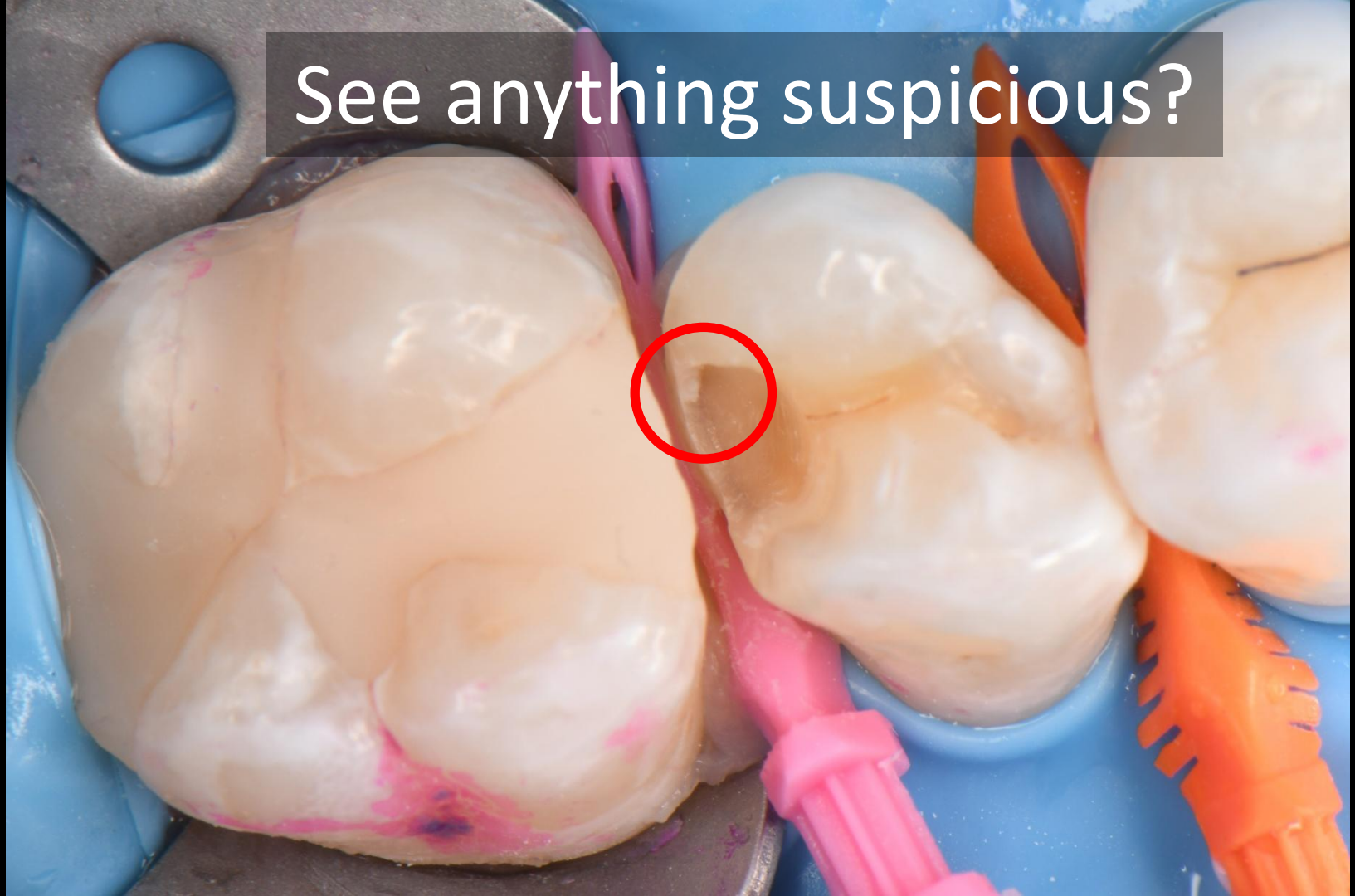








See anything suspicious?











Completed Clark Class II





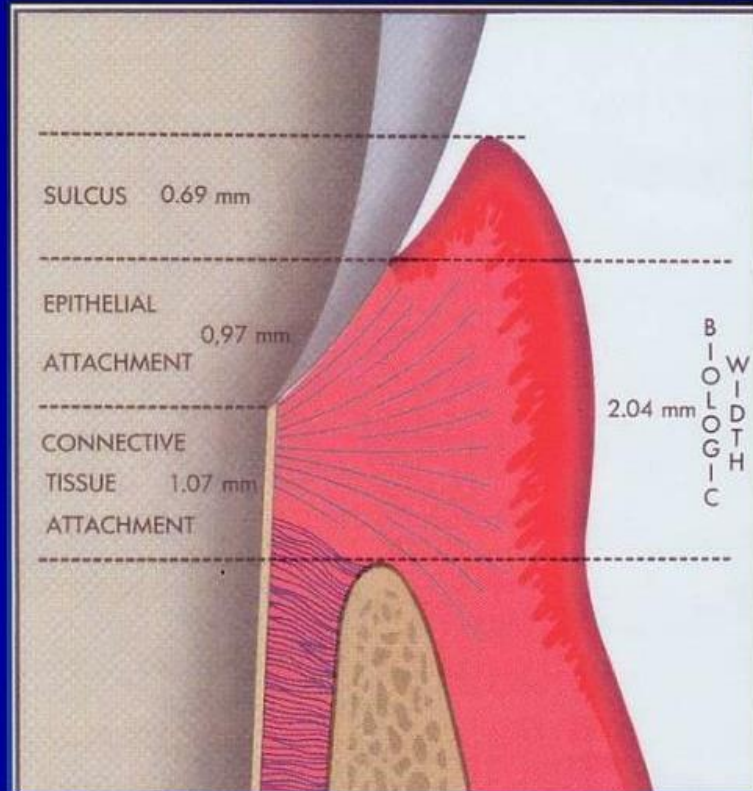
What's my  
reference?

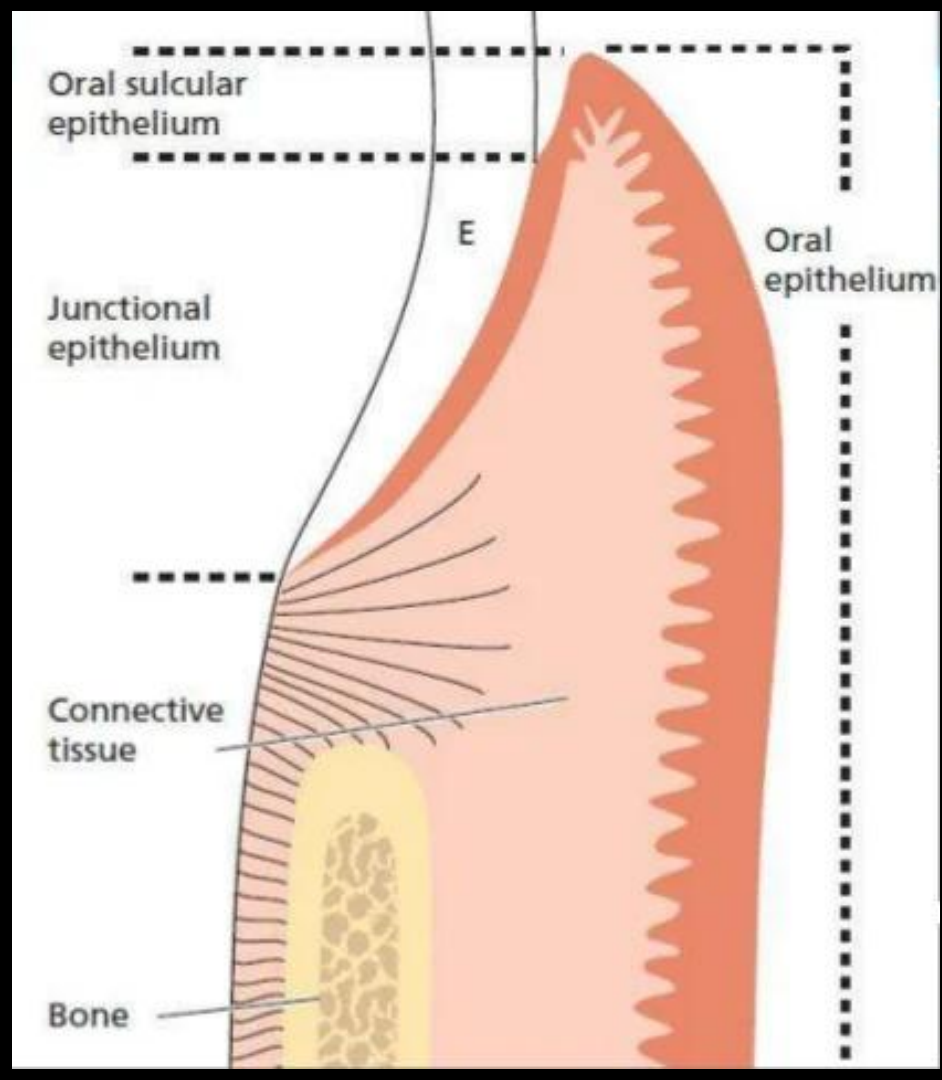
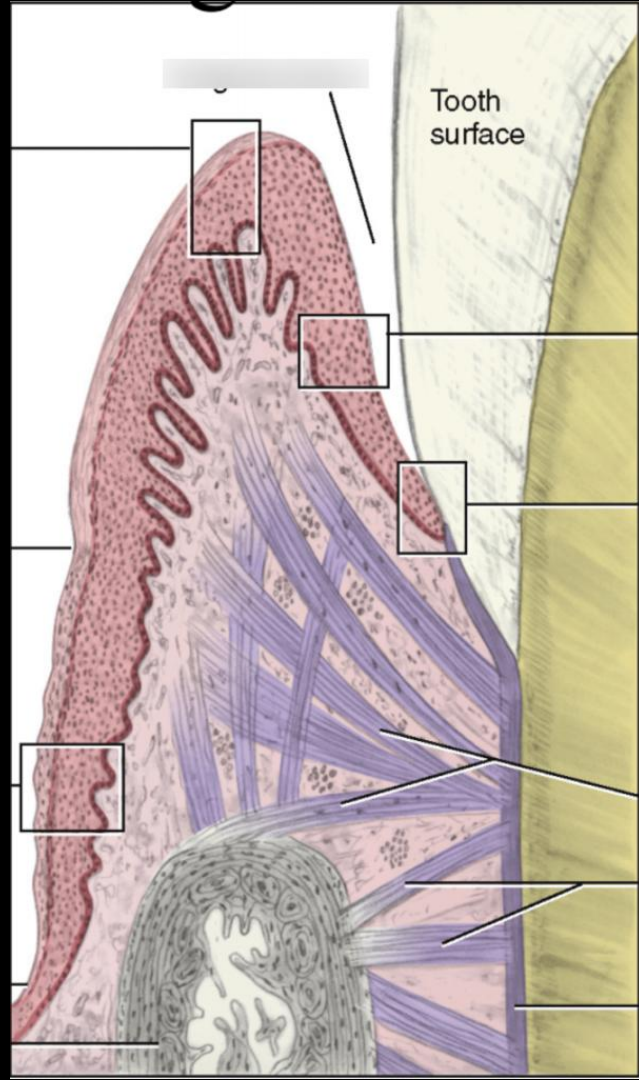


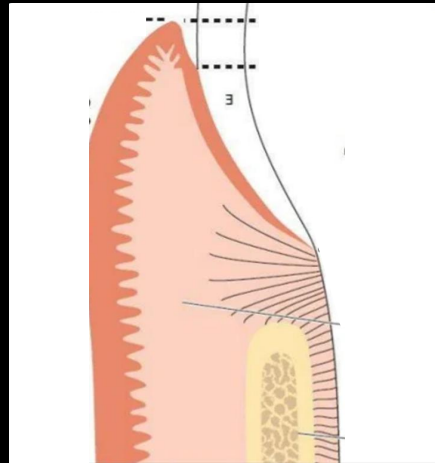
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reference?

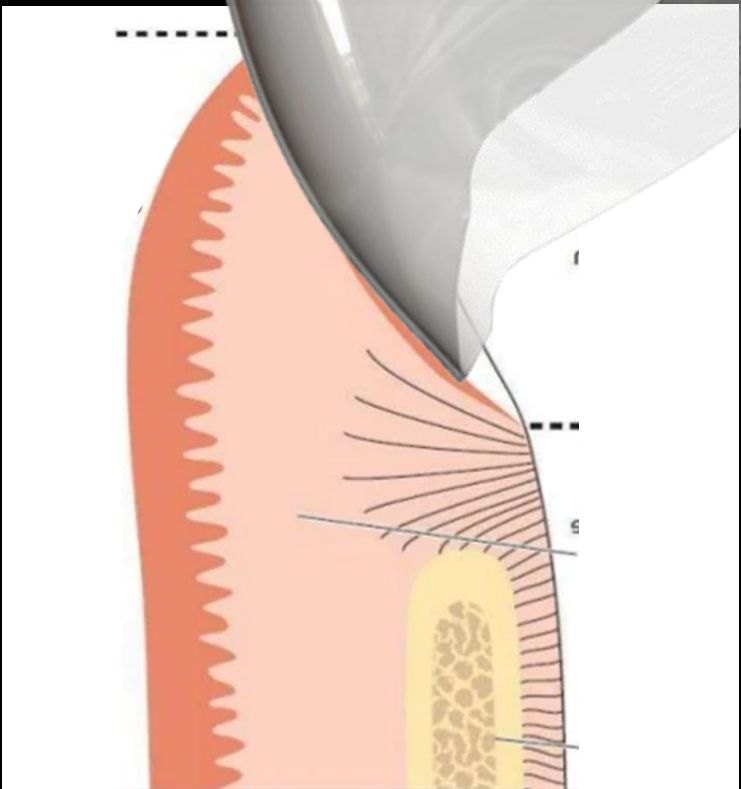


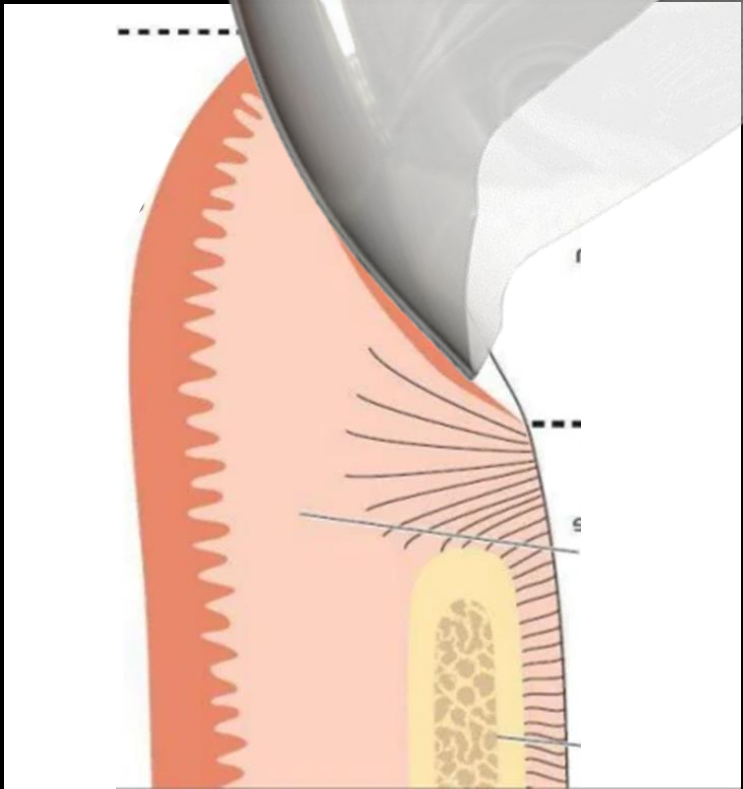


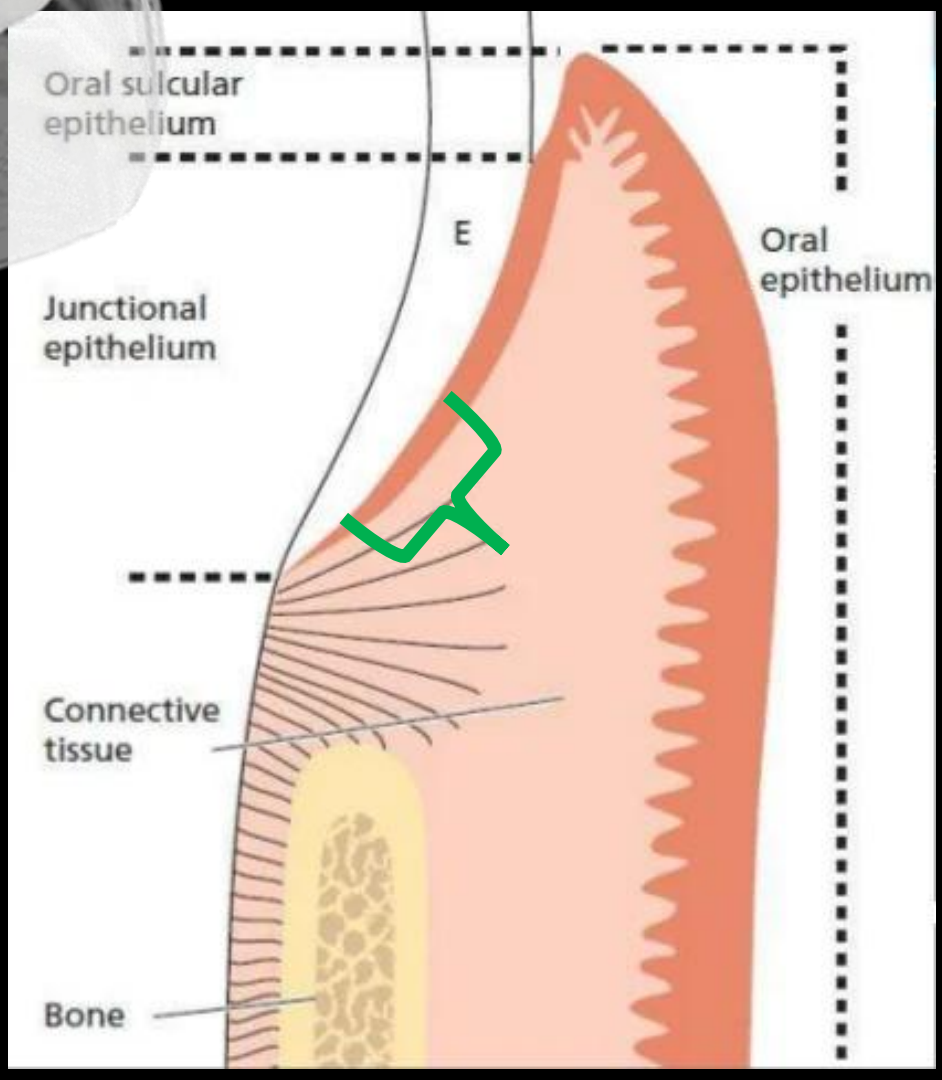
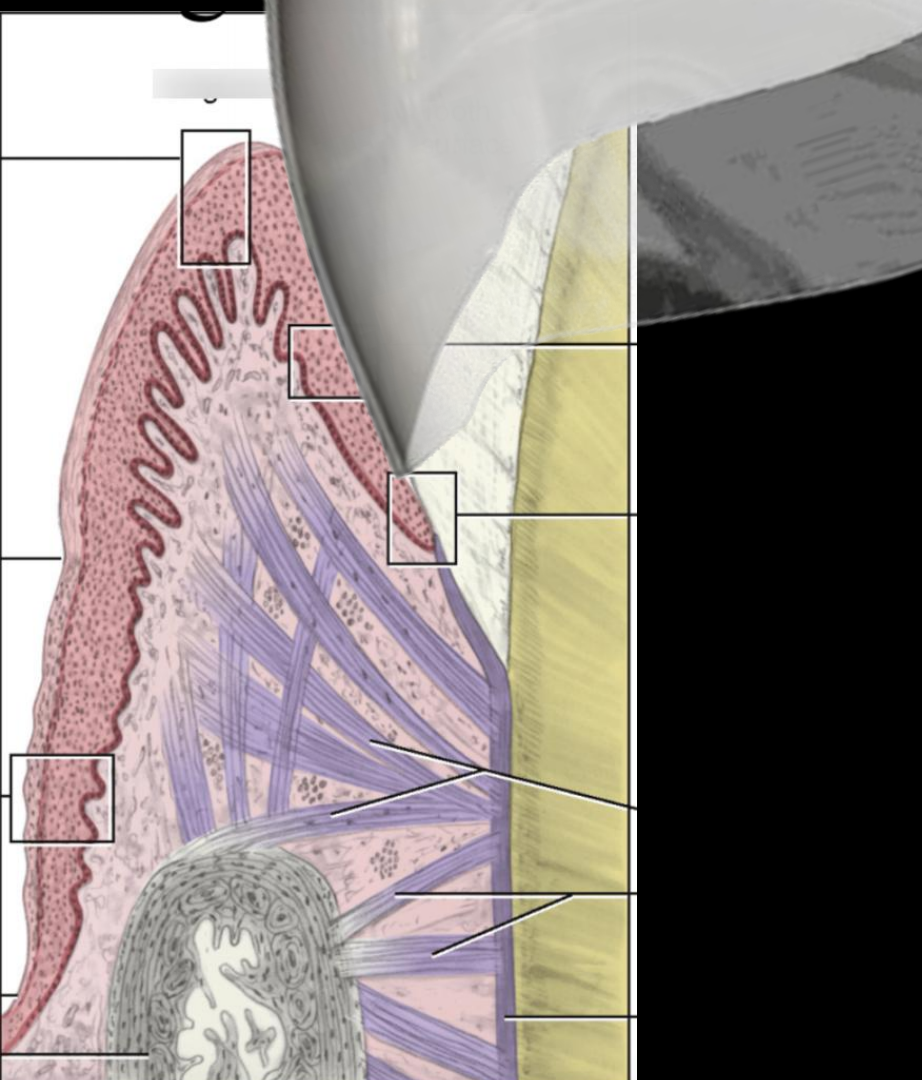












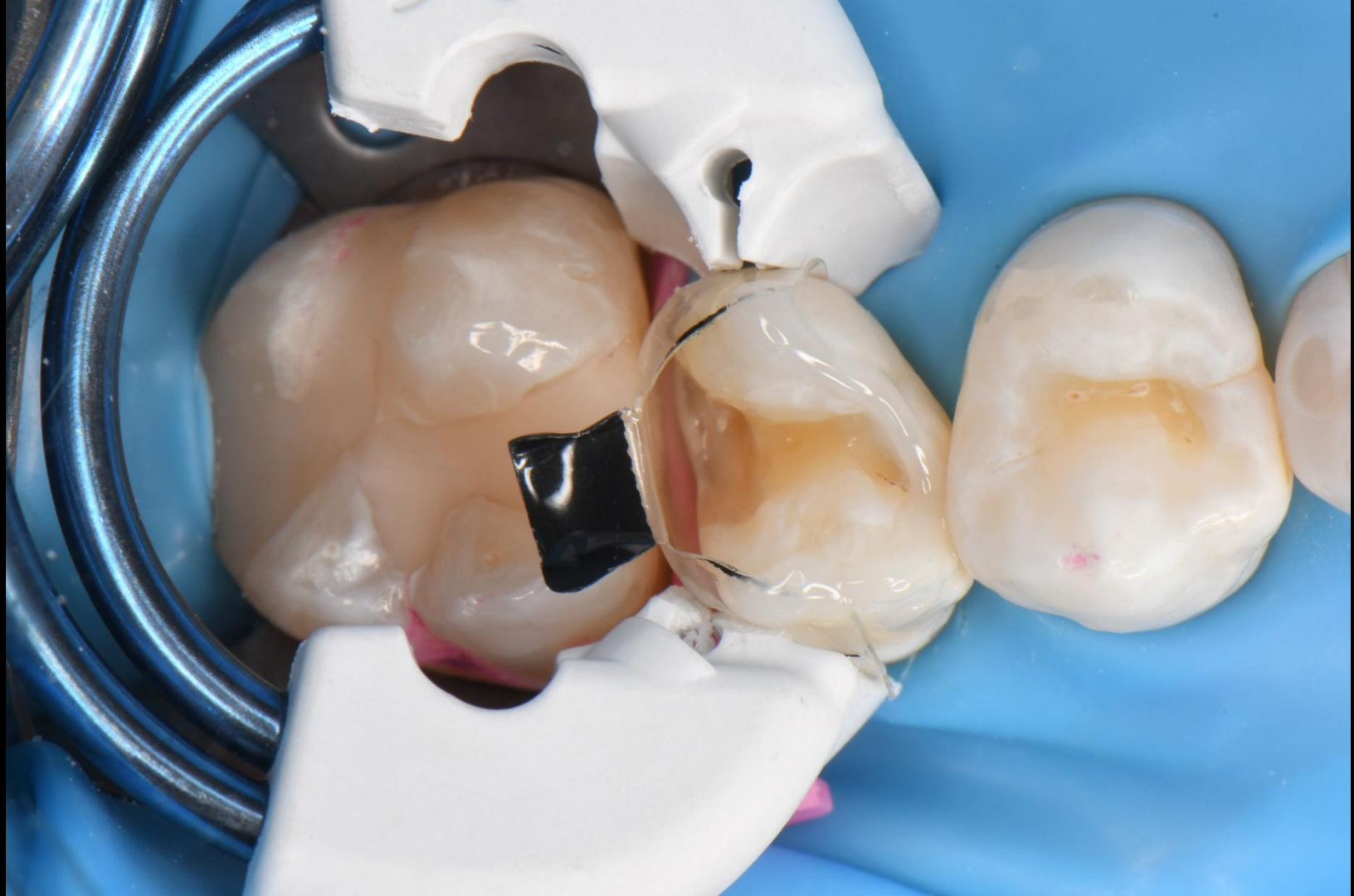


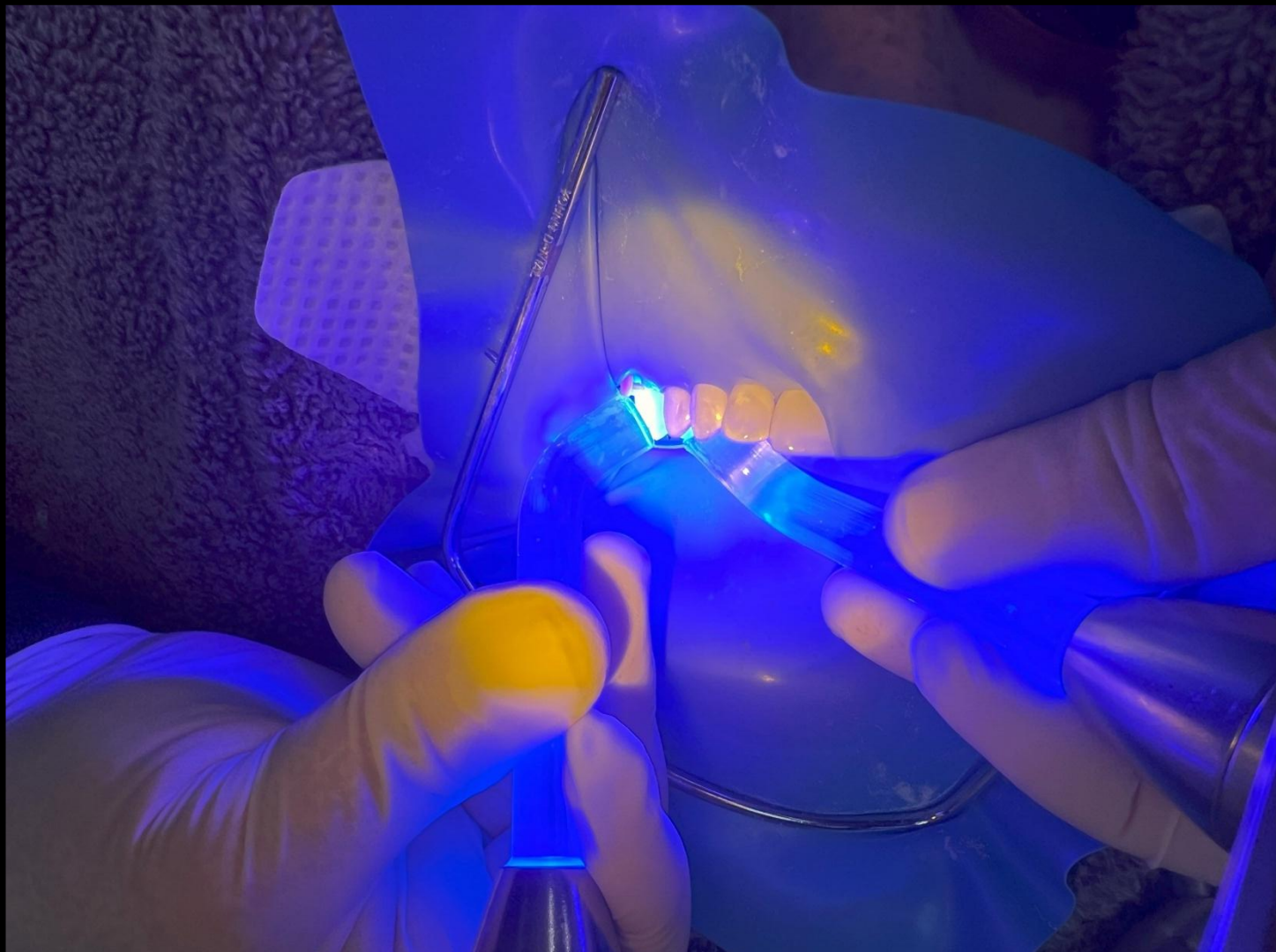




















"In the tooth"



"Around the tooth"



# Similar Case: Pre-op, post op, and 3 year follow up



# Monumental changes from 1890

- Adhesive Dentistry
- Engineering
- Fluoride
- Abundance of fermentable carbohydrates
- Doubling of average lifespan

# Common Concerns with Posterior Composite Restorations

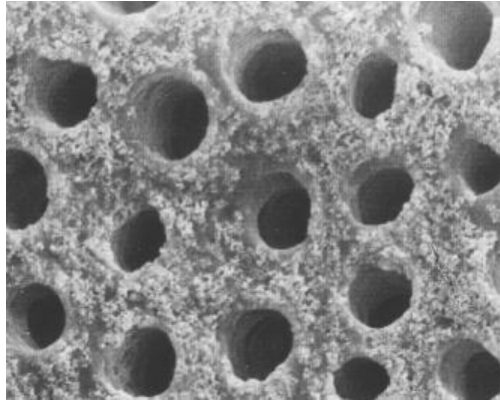
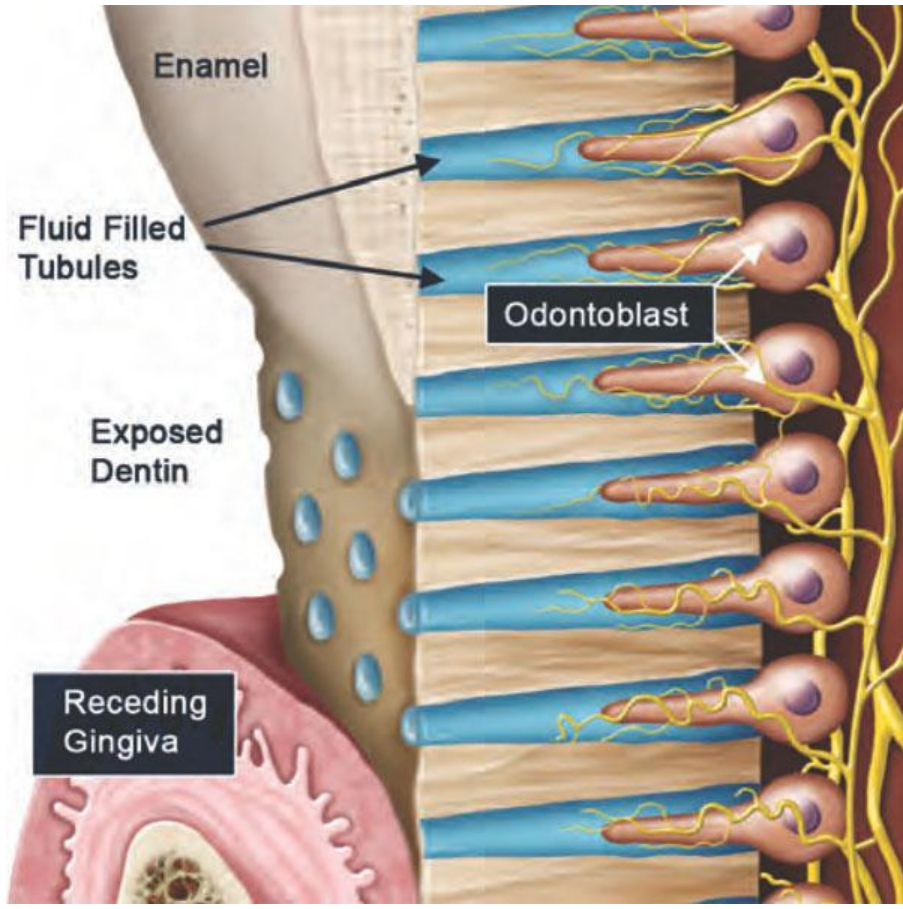
Longevity

Posterior composites in one study showed a  
350% higher failure rate than did  
amalgam restorations

(2.4 years longevity versus 8.9 years for amalgam)

Palotie U, Vehkalahti M. Acta Odontol Scand. 2002 Dec;60(6):325-9. Reasons for replacement and the age of failed restorations in posterior teeth of young Finnish adults.

# Epidemic of Sensitivity



# Contact Issues

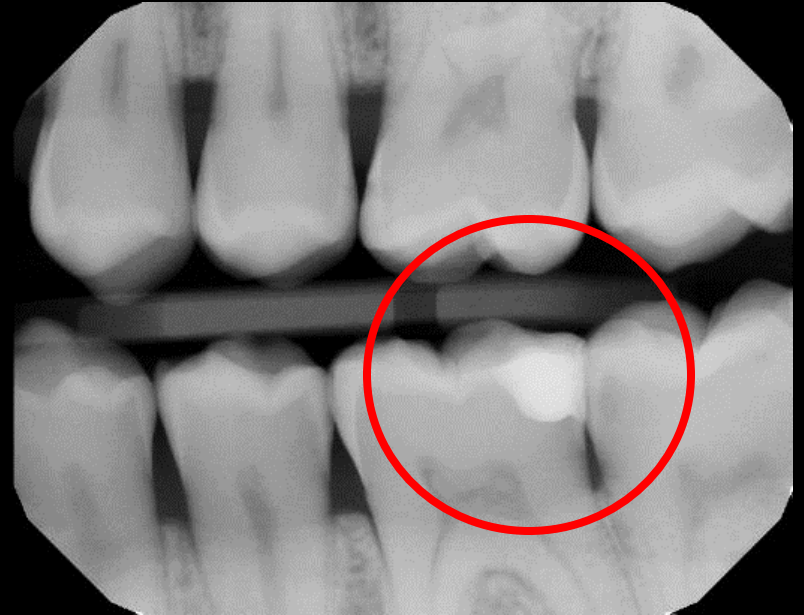
Point contacts

Burnished contacts

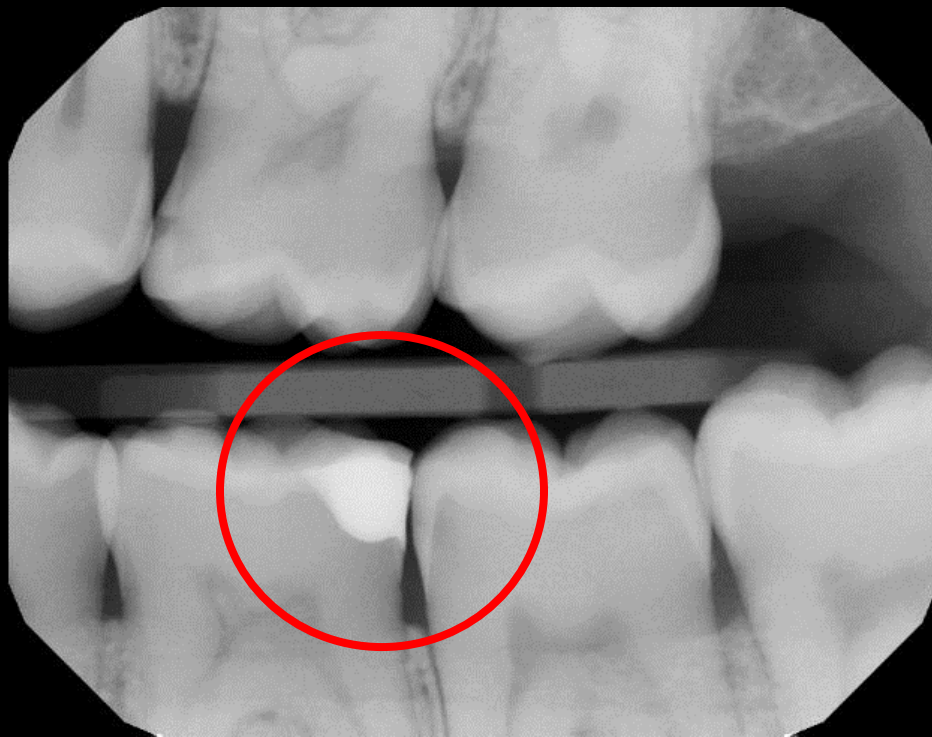
Open contacts

Overhangs

# Contact Issues



# Contact Issues



# Amalgam based matrix





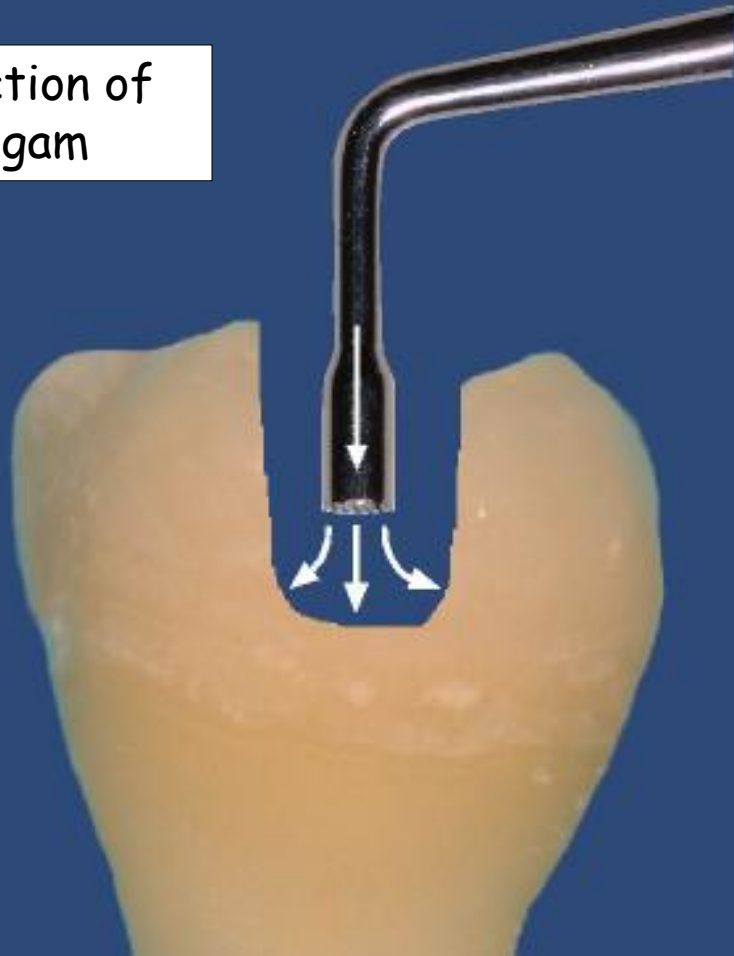
“cone of shame”-Amalgam based matrix



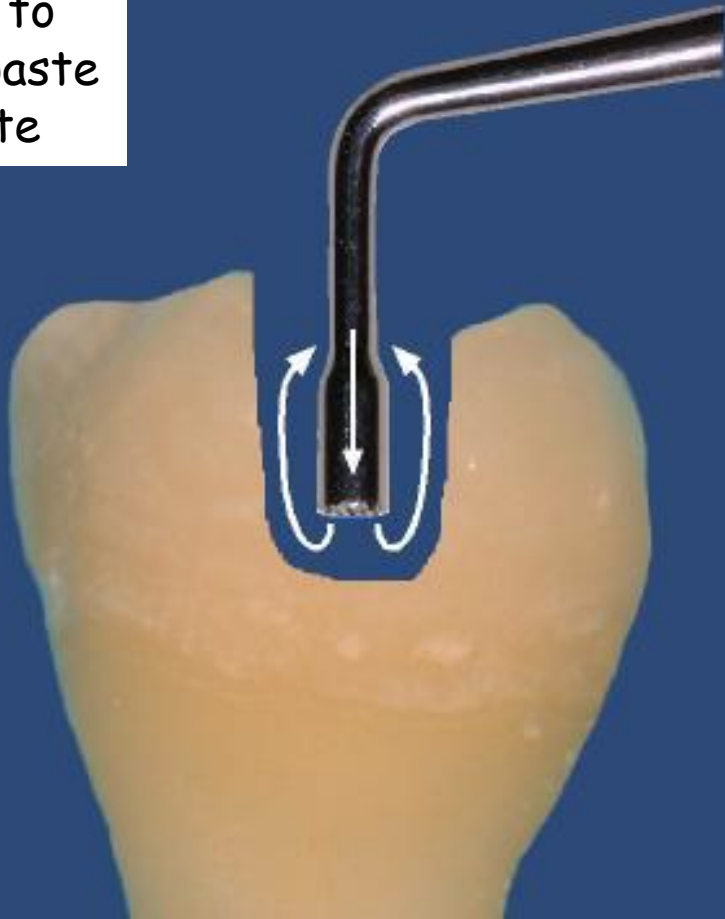
The S.K.K. or...  
**Silly Kissy  
Contact**

Why?

Compaction of  
amalgam

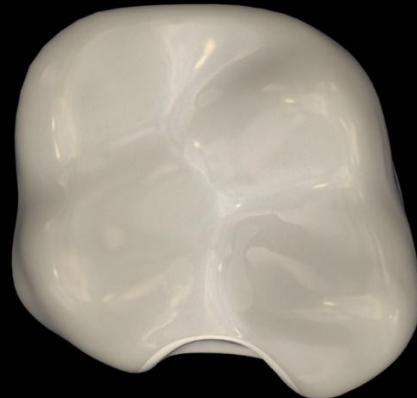


Inability to  
condense paste  
composite



# Modern Class II Cavity Preparation Design

# The Prep?





before

# The Bioclear method





Infinity edge  
of the T.R.I.

# The Bioclear Injection Molding Approach

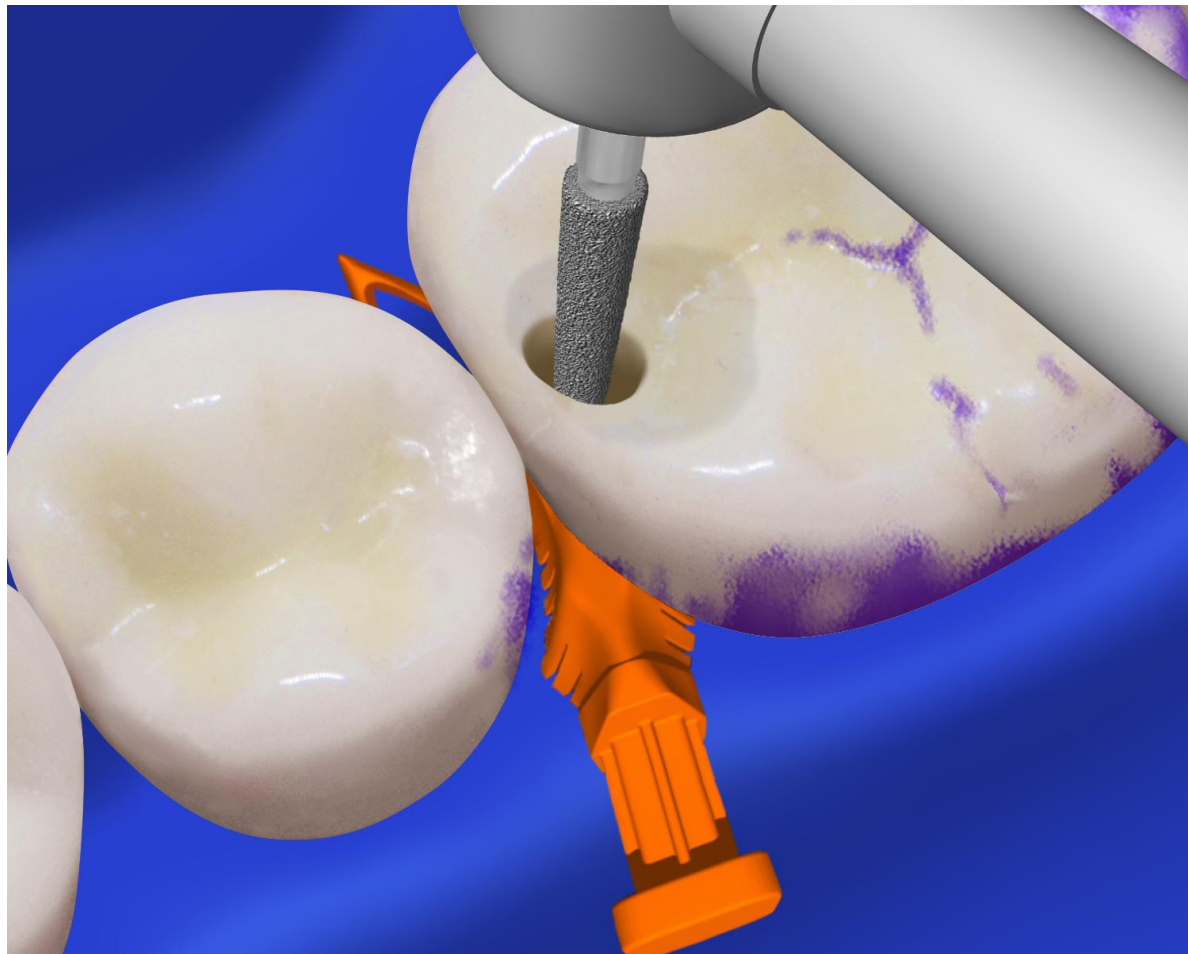


Failing composite;  
traditional preparation

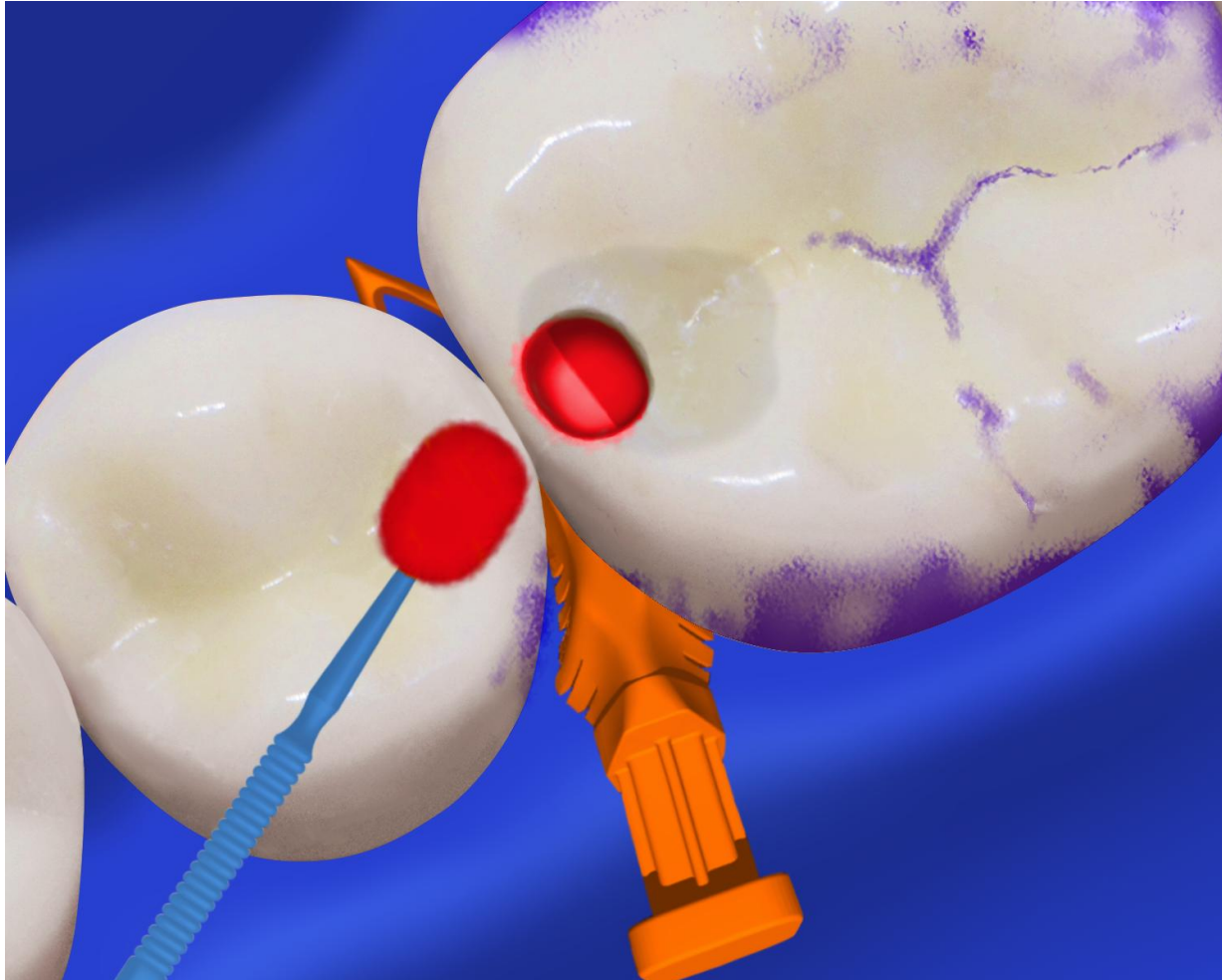


Re-Restored using the  
Bioclear Evolve System and Method

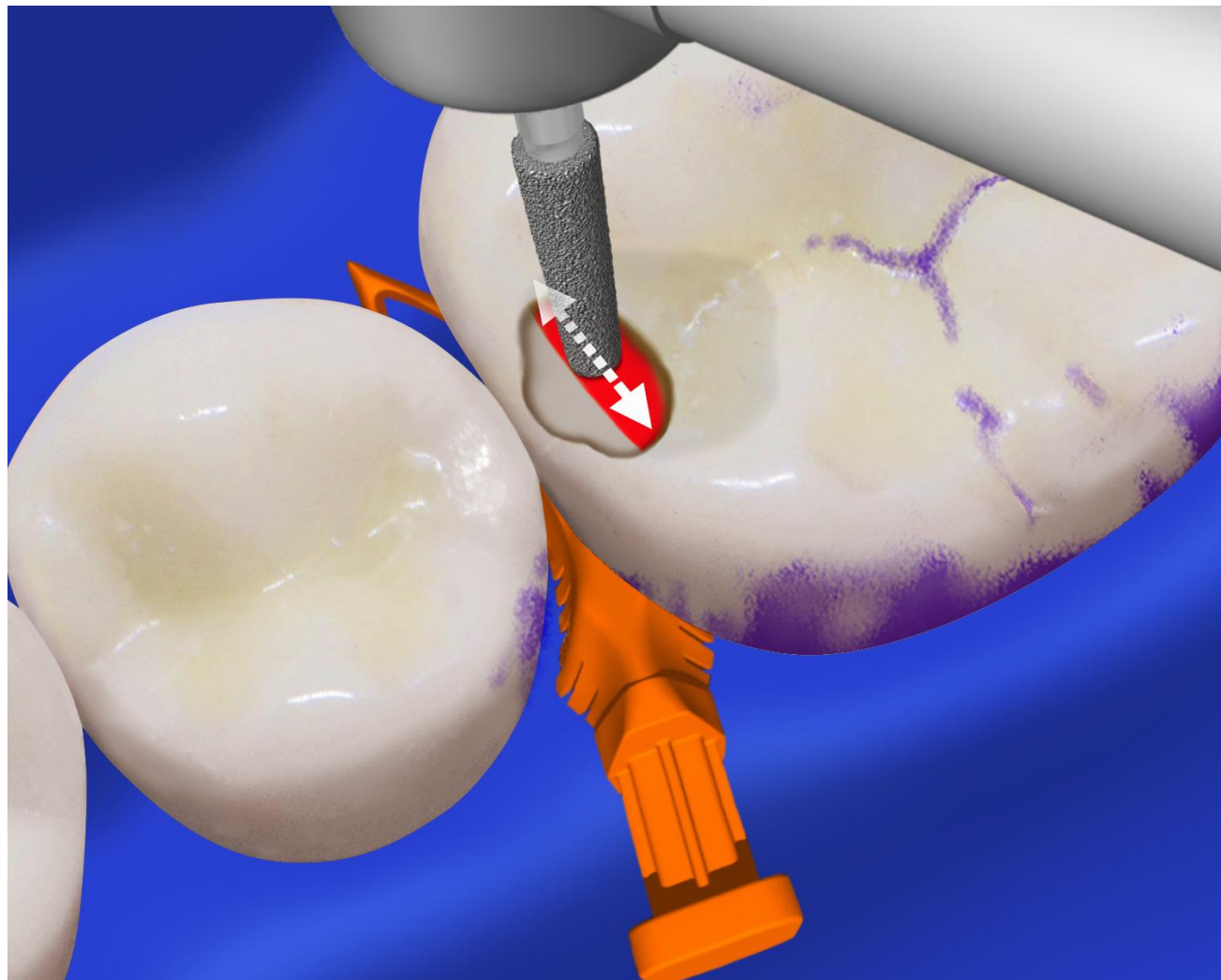
3) SS White Bur #3 is dropped into the at the suspected cavitation area. (Bur is used with water coolant)



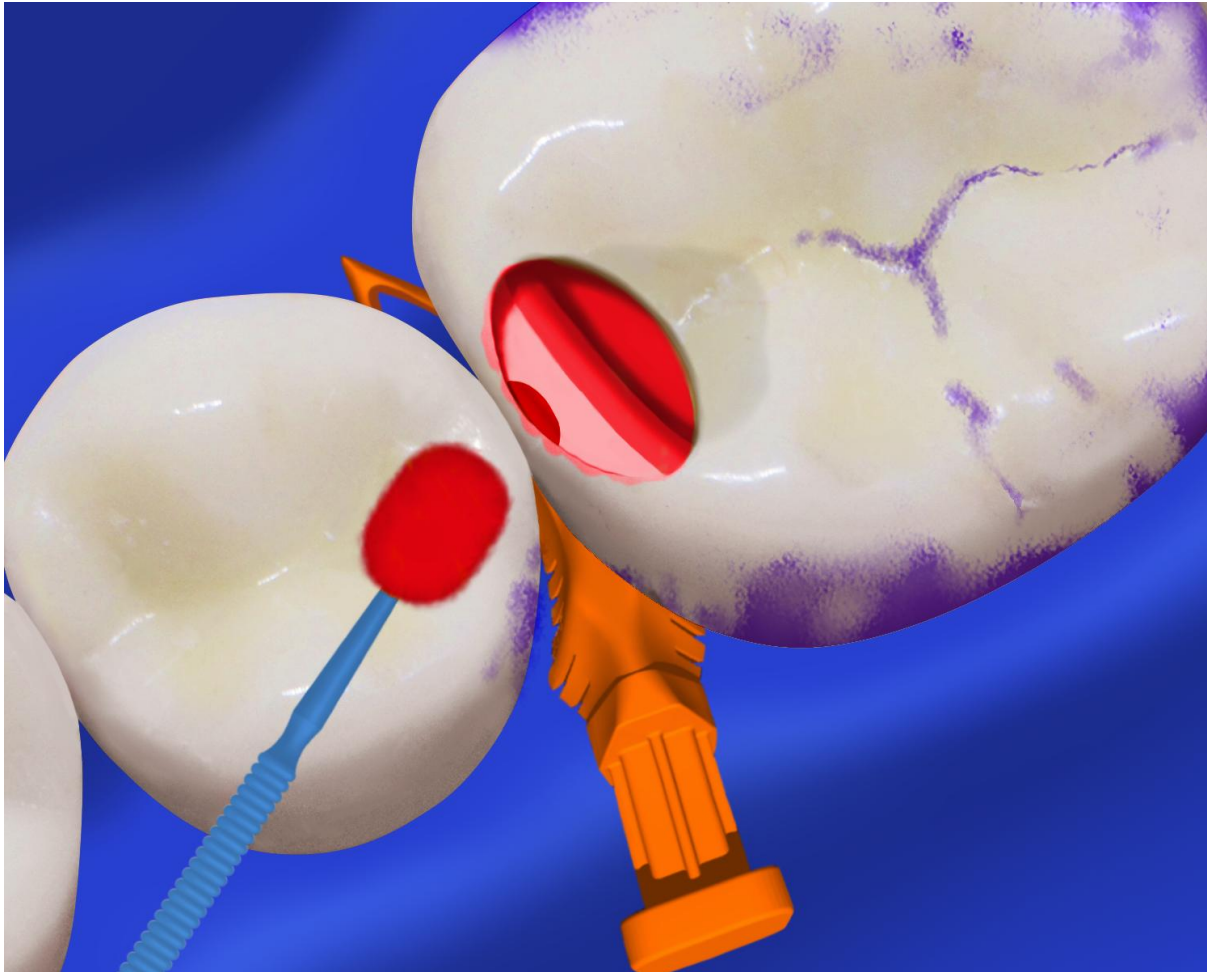
4) Caries indicator identifies dentin caries. Assessment of cavitation and caries to adjust bur movements. Axial dentin caries and healthy DEJ tissue should not be removed.



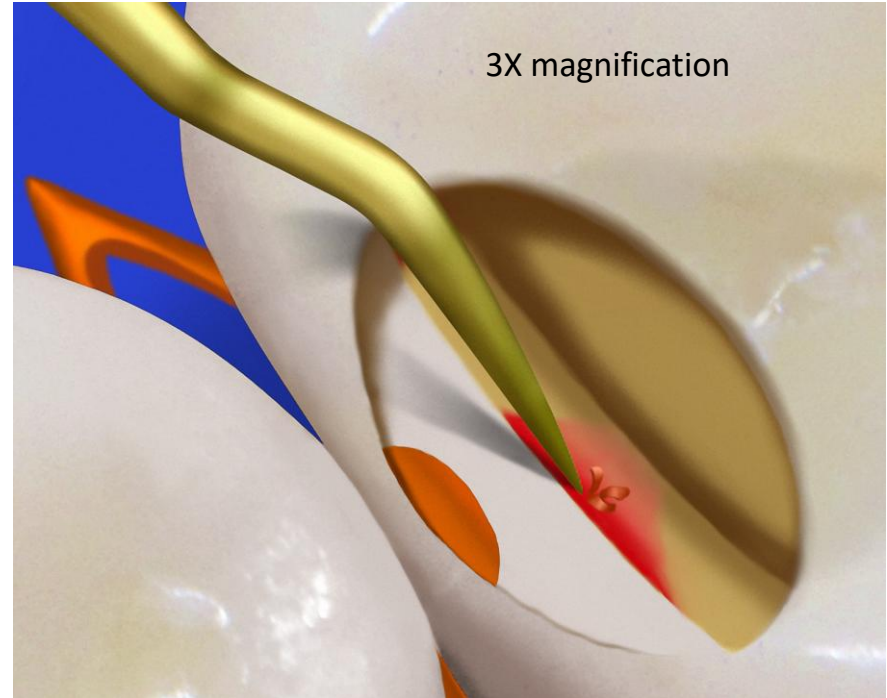
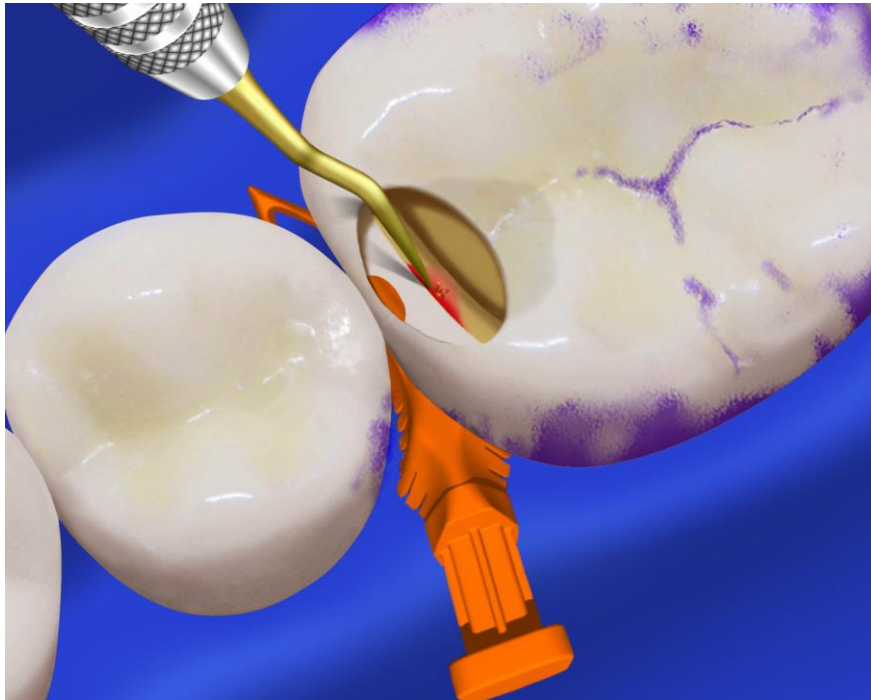
5) SS White bur #3 is kept *inside* of the cavity prep as DEJ caries removal proceeds.



6) Second caries indicator application. indicator application is repeated as needed until a negative stain is produced (clean dentin at the DEJ).

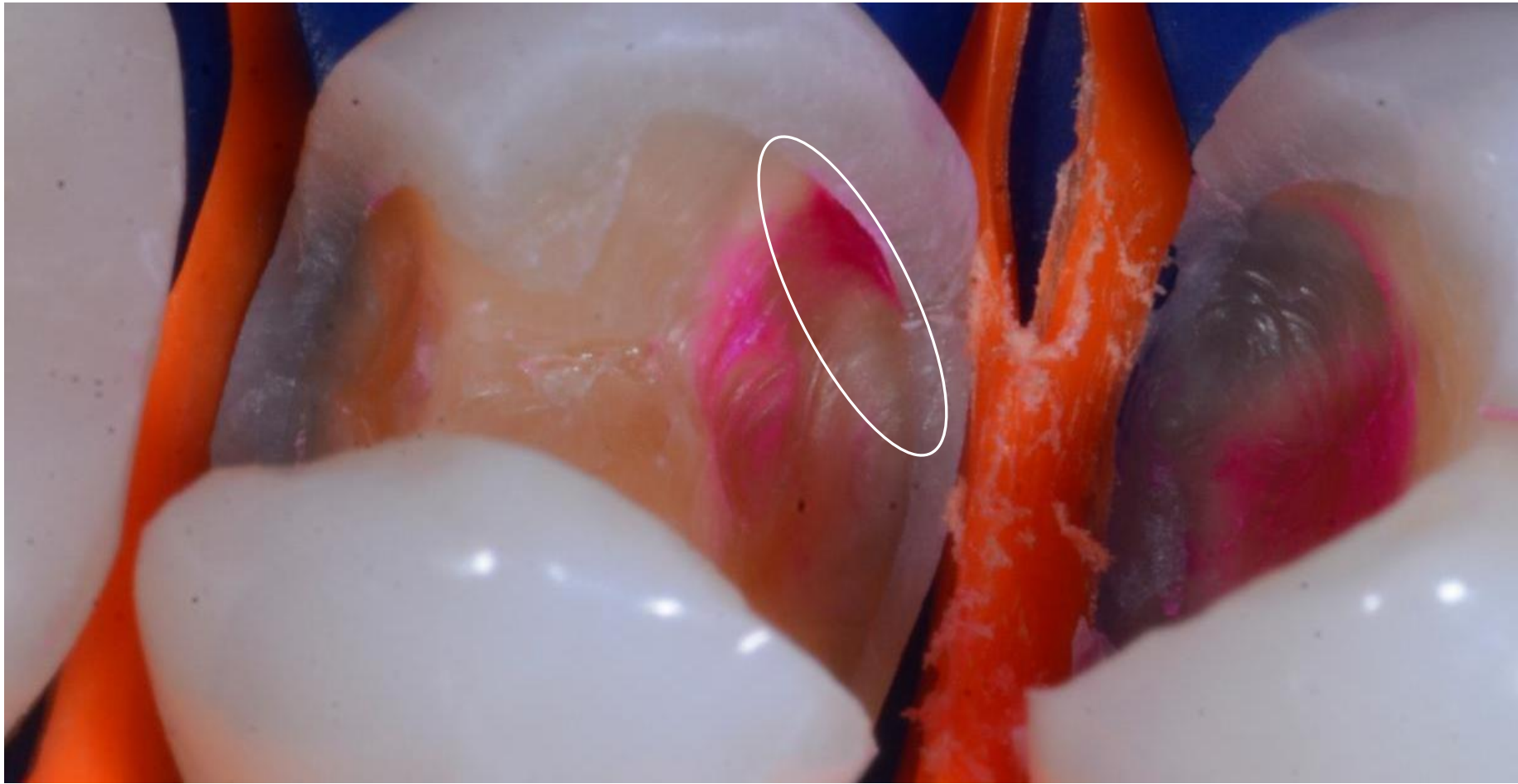


7) Clark explorer is used to achieve tactile test of healthy vs. carious DEJ dentin. Cumulative diagnosis with hardness test and caries indicator is recommended.

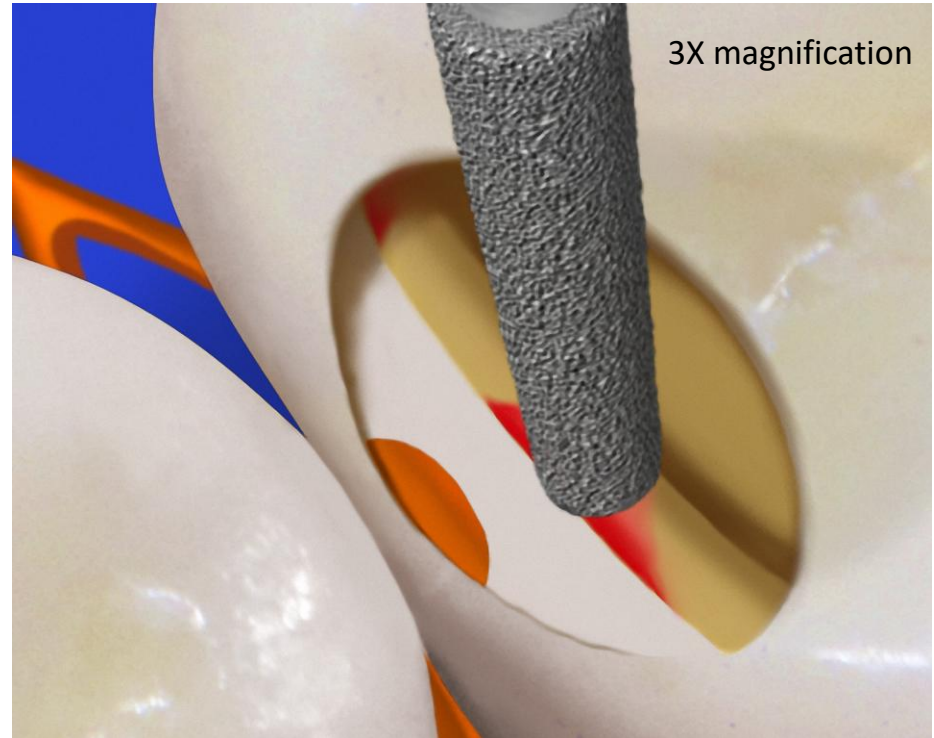
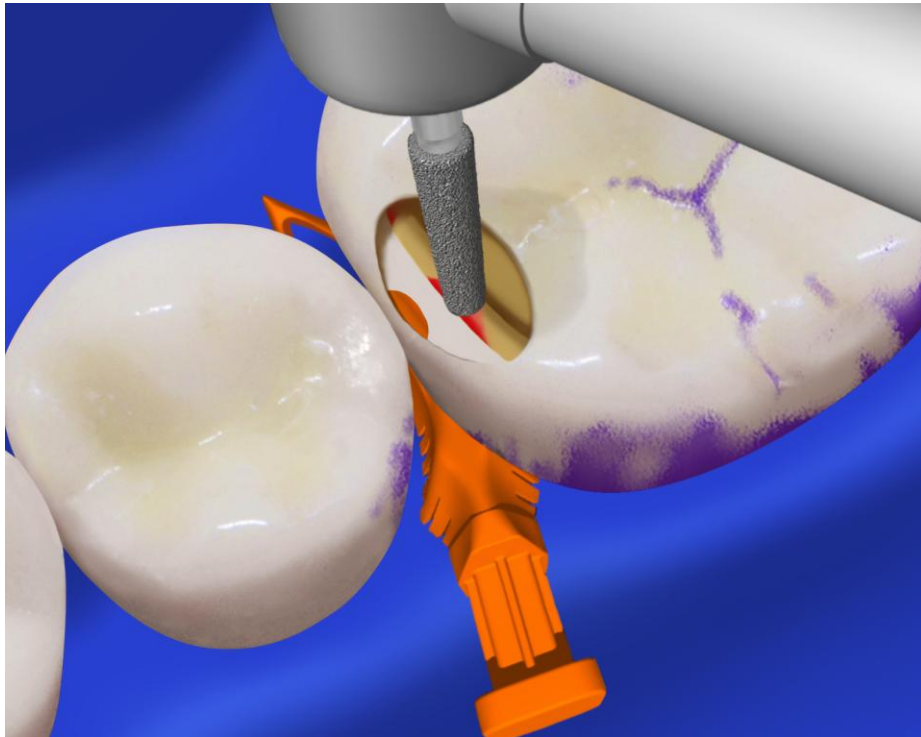




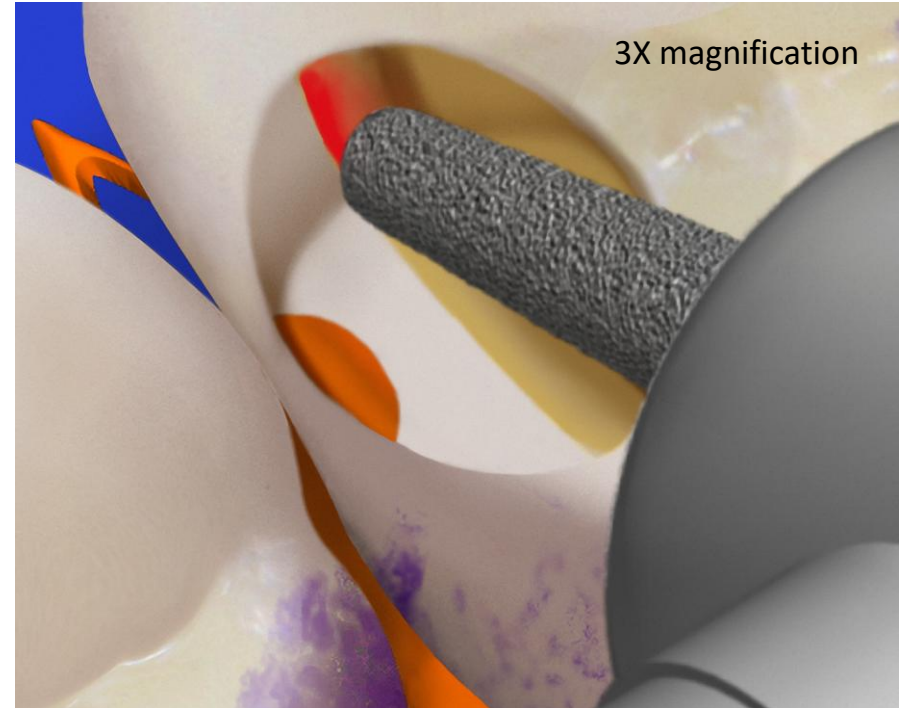
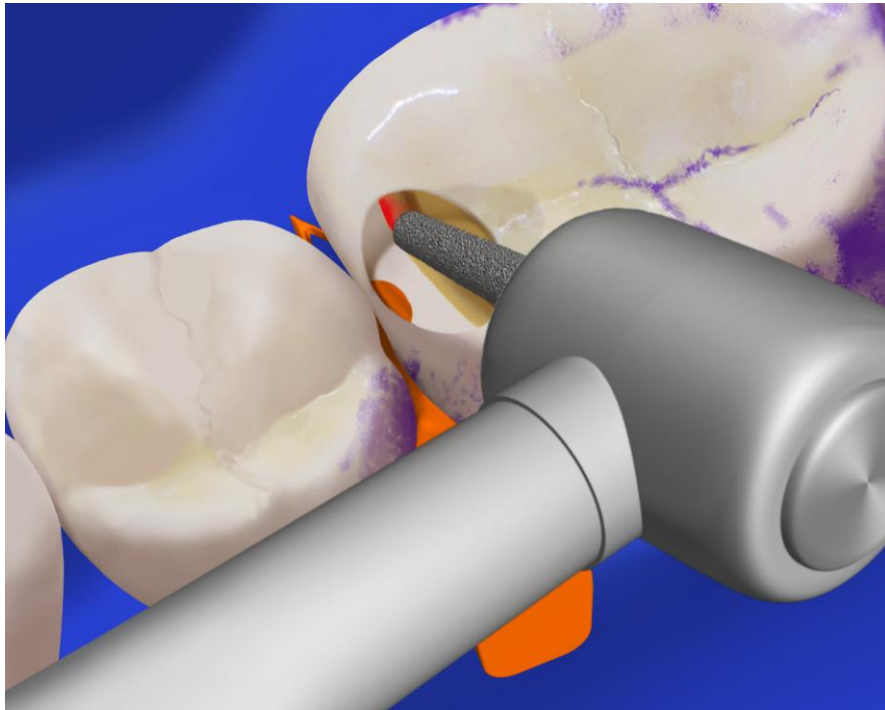




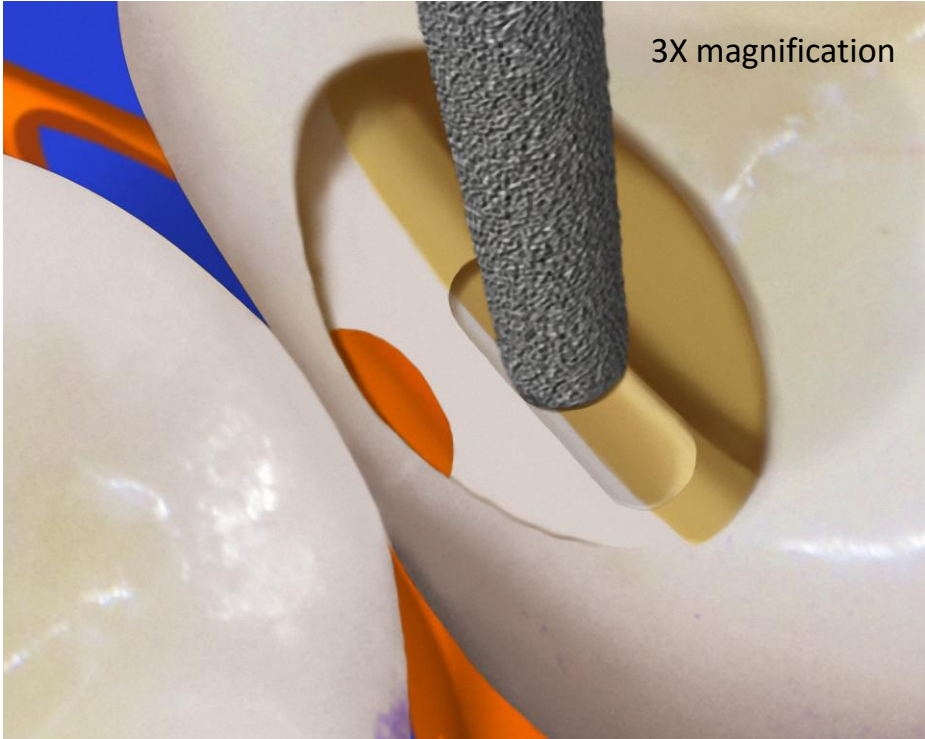
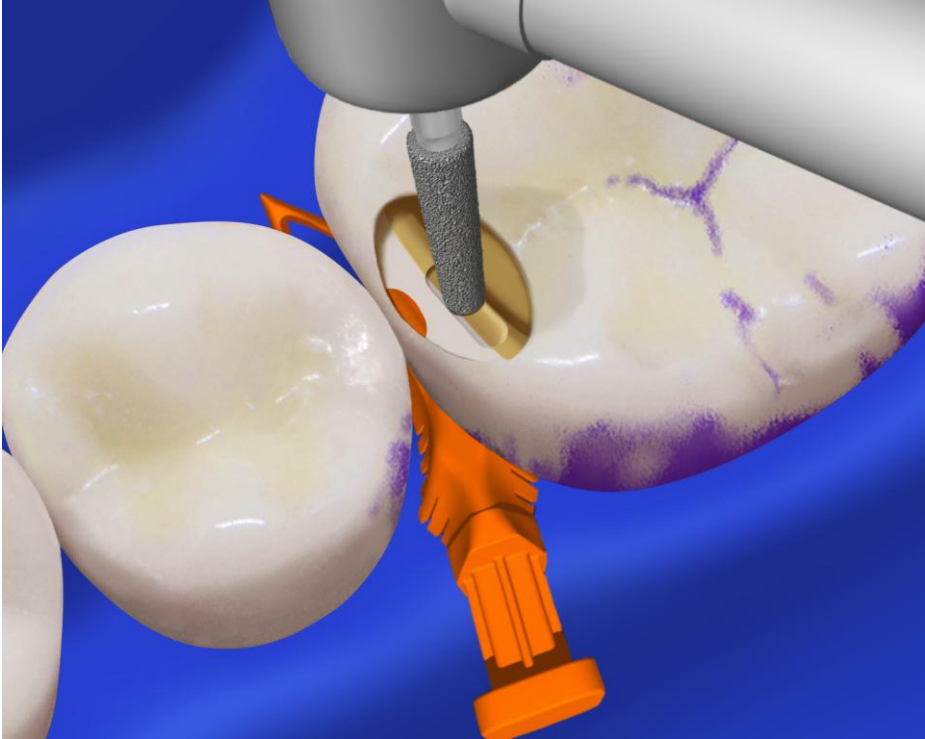
8) Final DEJ caries removal on gingival zone with SS White #3 bur



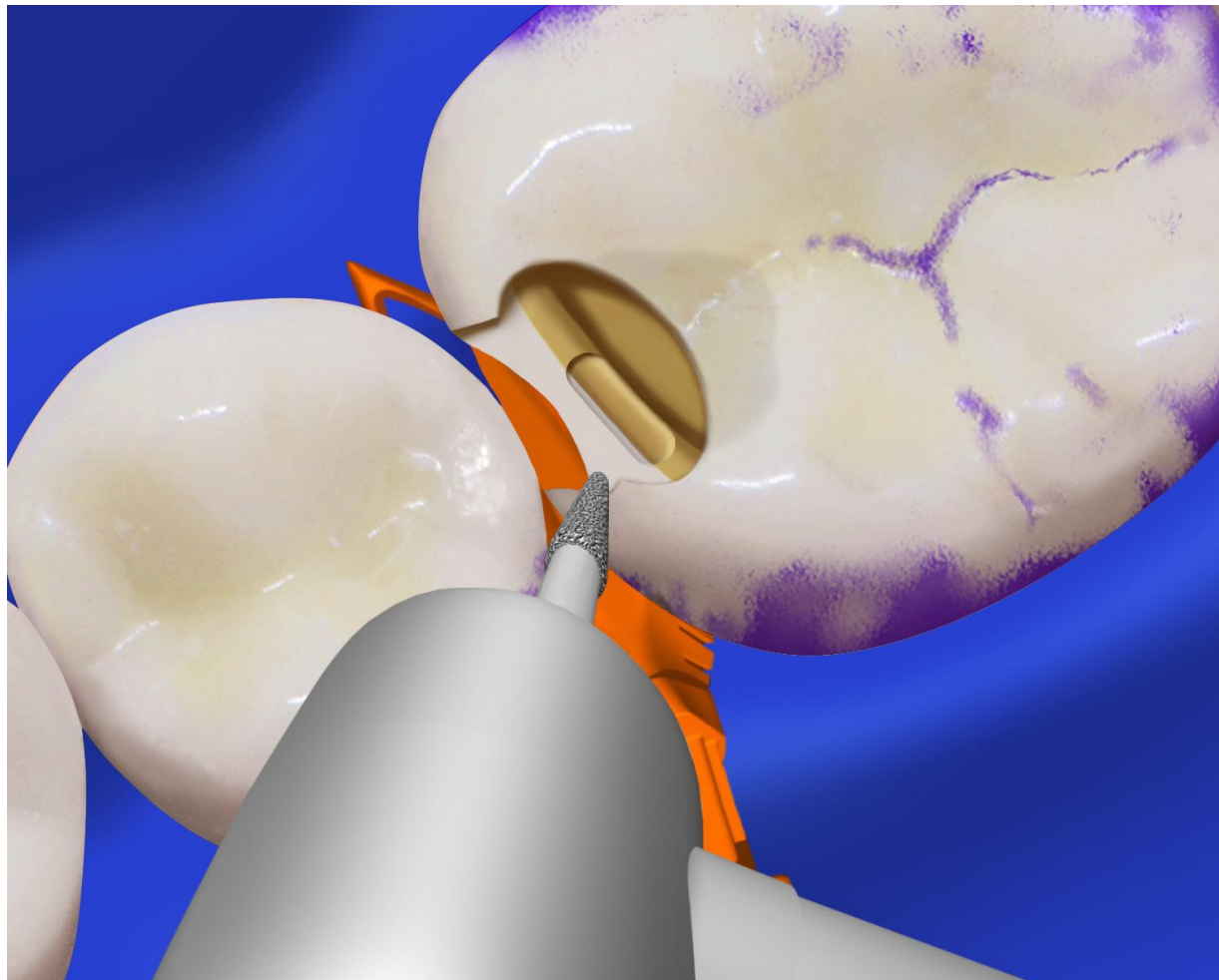
9) Buccal and caries at DEJ is also performed. Angle of bur can be changed for conservative access.



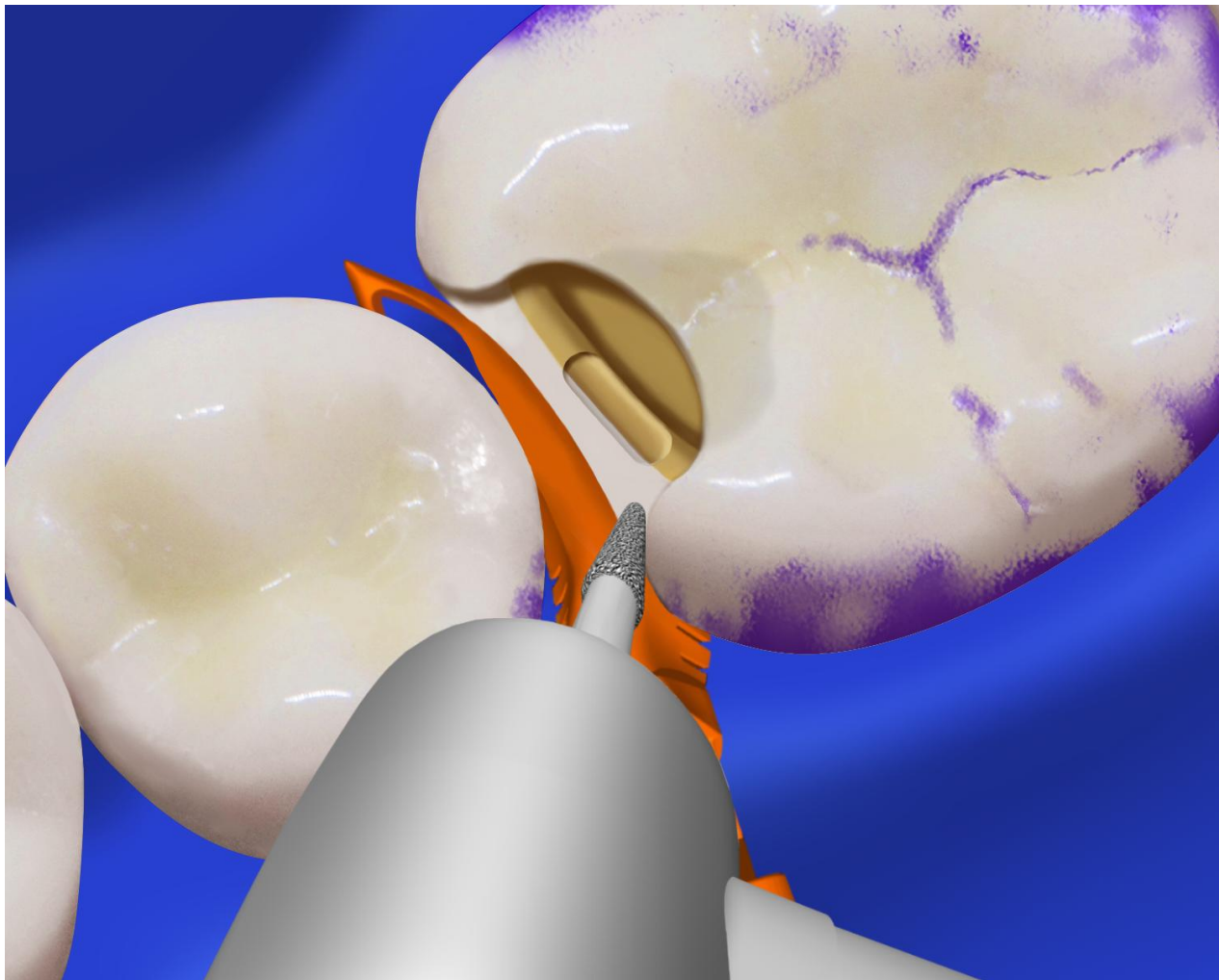
10) Final caries removal at DEJ is shown and natural cavitation area is shown.



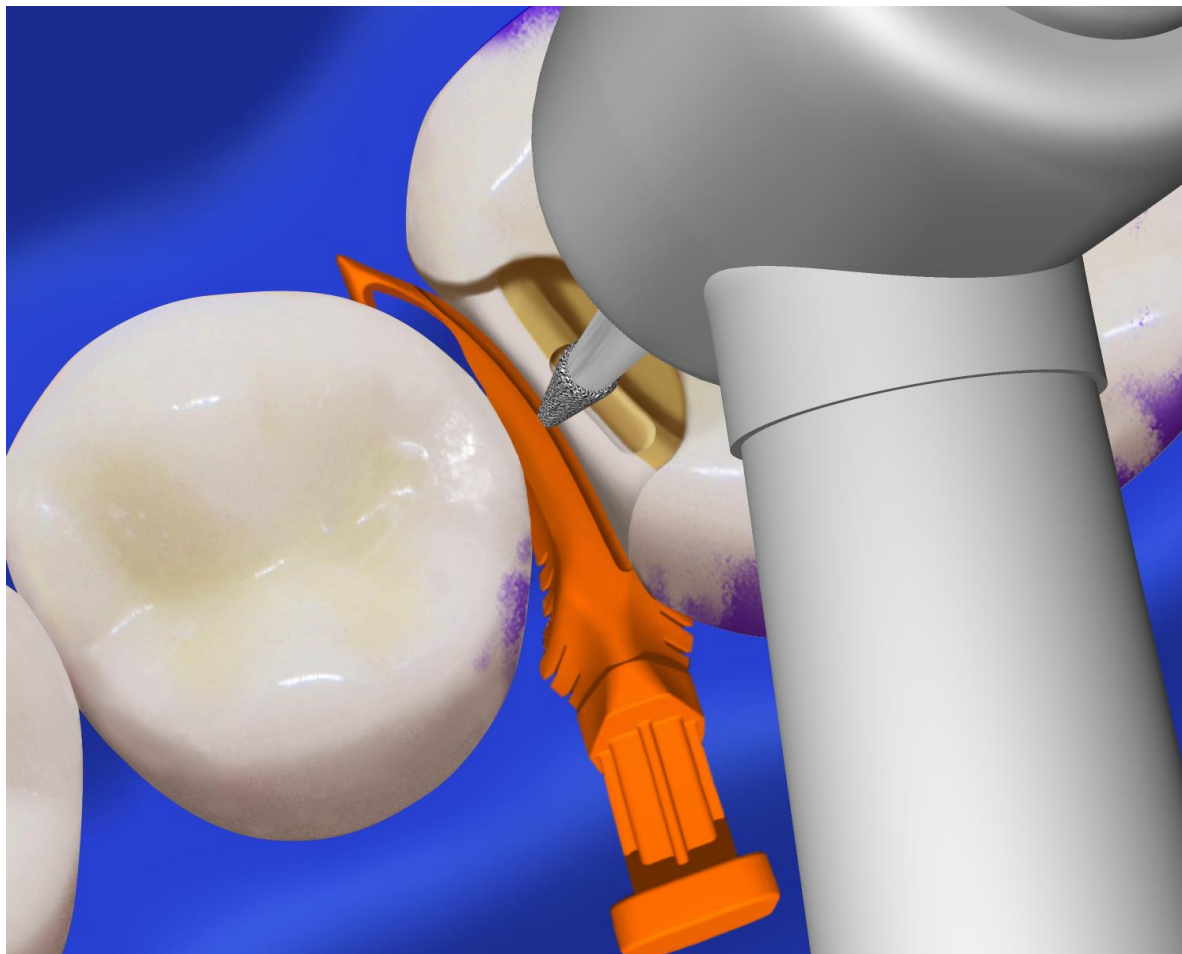
11) SS White Bur #6 is used to break all contacts. Bur can be used either wet or dry)

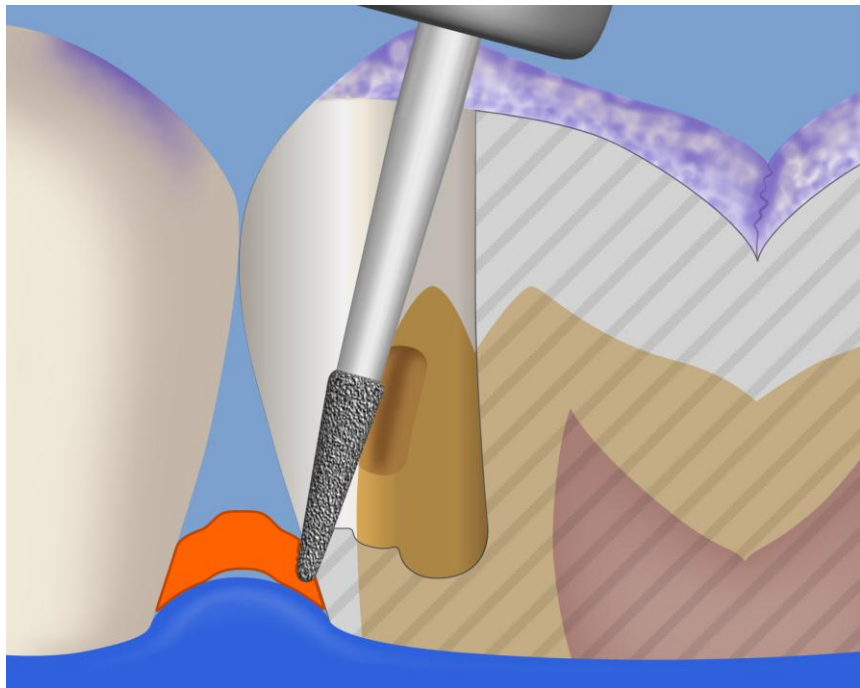


12) SS White bur  
#6 Bur is used to  
create the radius  
bevel.

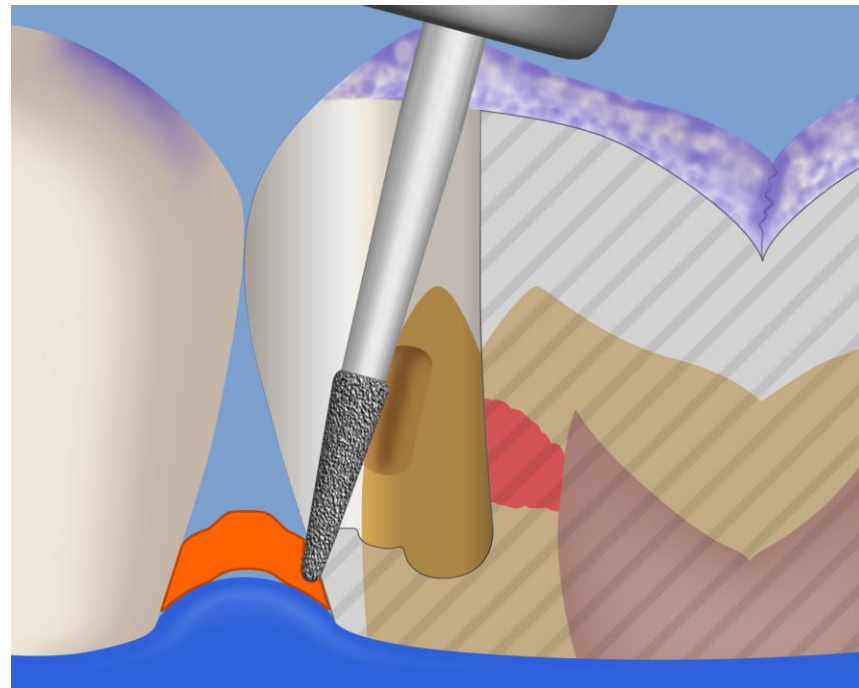


13) Create the gingival bevel.  
Diamond wedge can be removed if wedge is an encumbrance to bur.



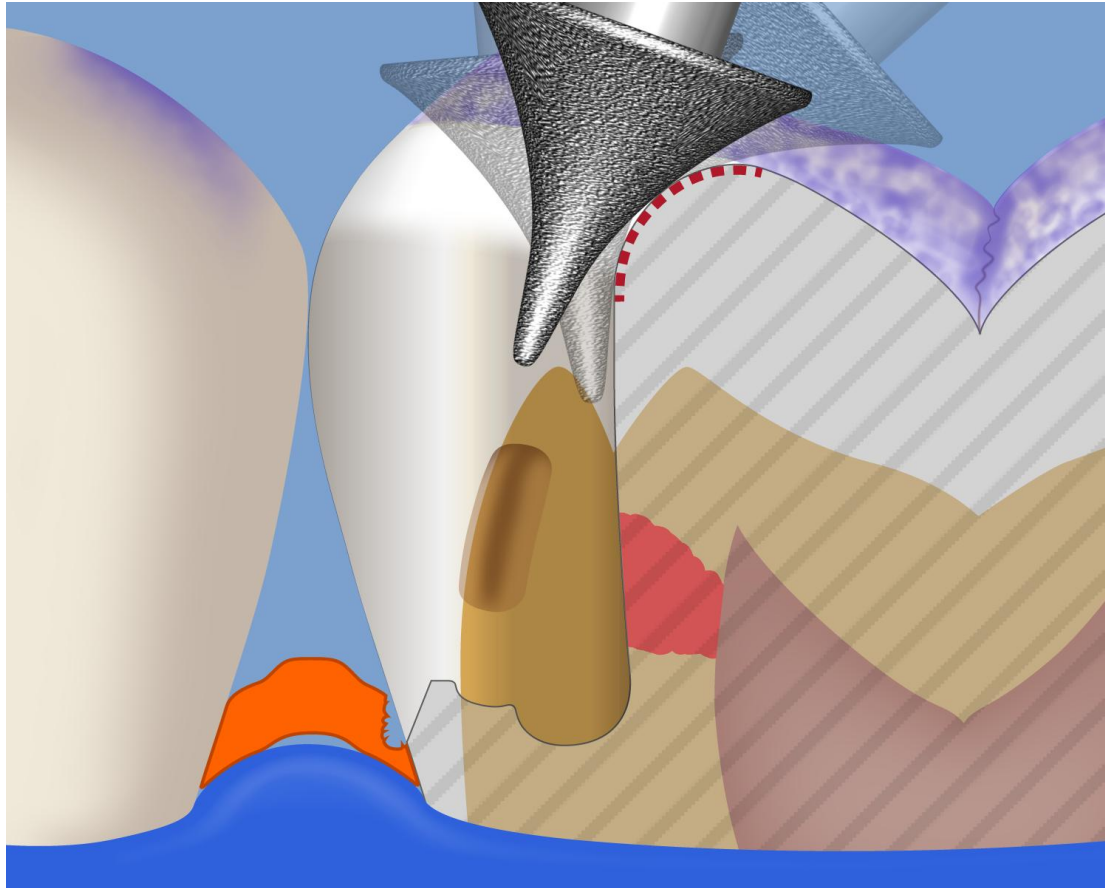


Cross section view of step 13

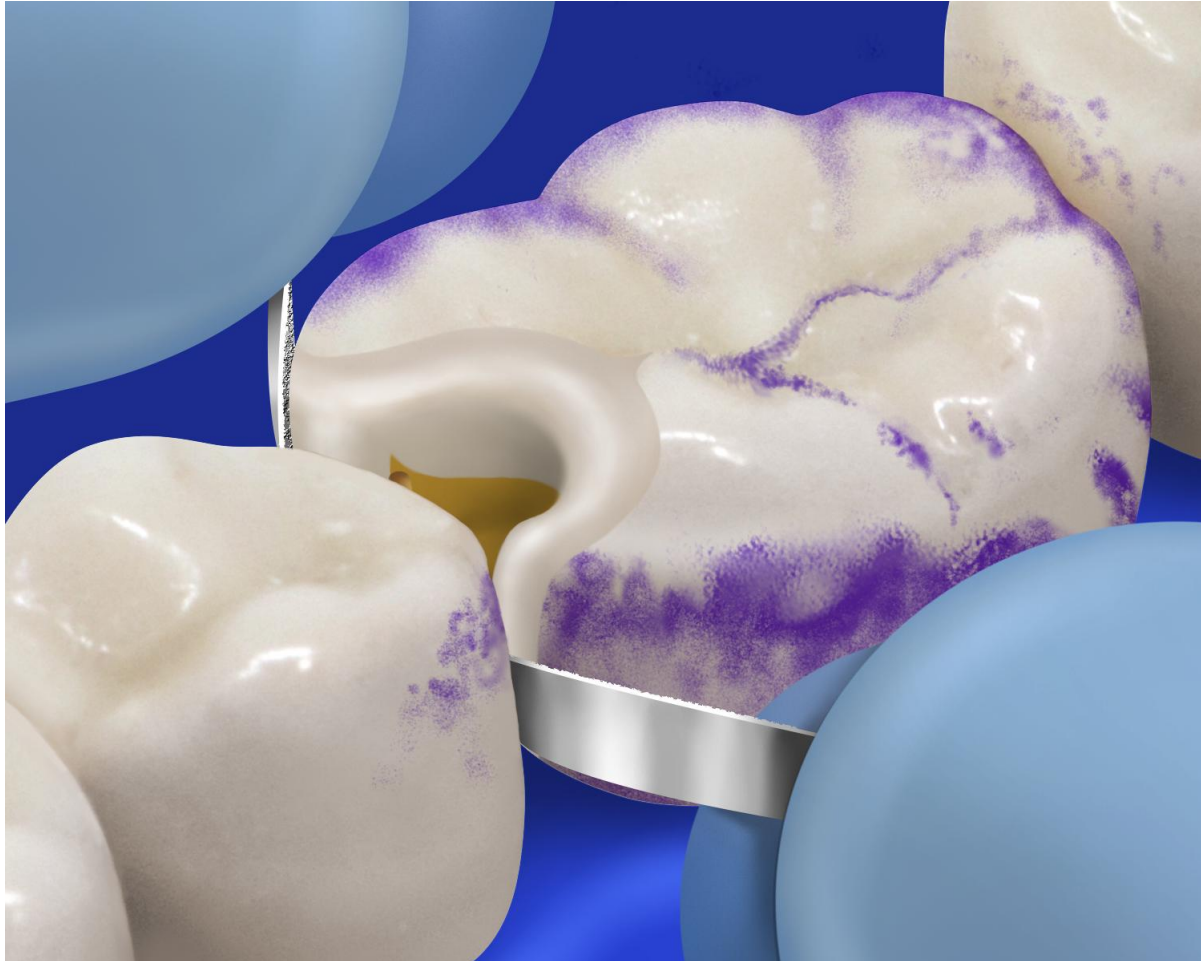


Cross section view of step 13 with  
Selective Caries Removal

14) SS White Calla  
Lily bur #3 is used  
to create radius  
bevel/compression  
joint on occlusal  
enamel.



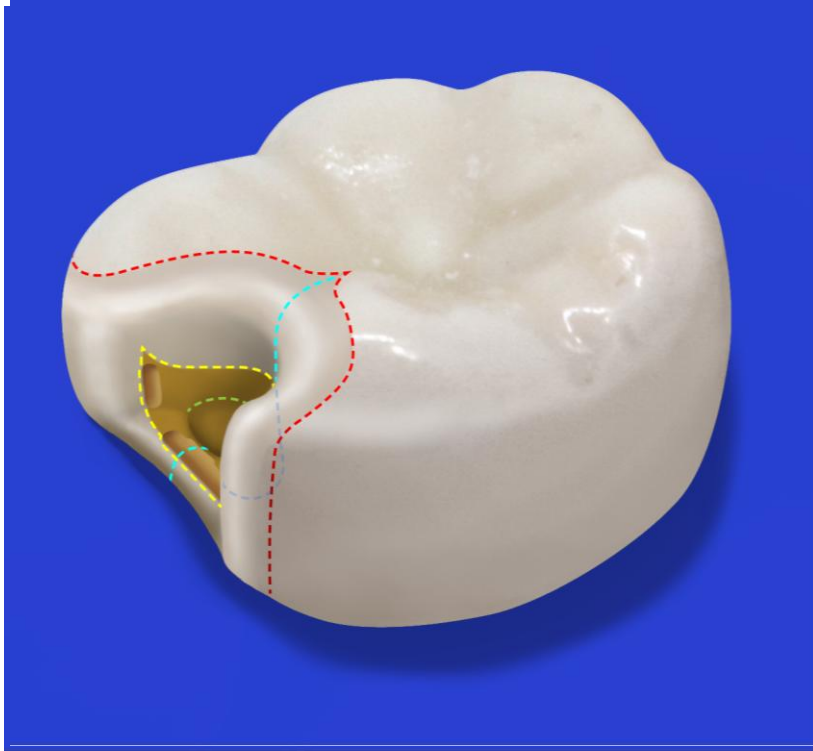
15) SS White strip removes loose enamel rods on entire preparation and hard deposits in the infinity edge area apical to the gingival bevel.



16) Bioclear Blaster with aluminum tri-hydroxide is used to clean inside and outside of preparation.



# Final views of completed Bioclear Class II Preparation.



# Max Planck *Nobel Prize, 1918*



“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.”

Are all  
Separators  
Equal?

**NO!**



Stretched to 20mm ONCE!!!





And now most of the power is permanently lost

Once the yield of the metal/shape is reached, the metal undergoes plastic deformation

Stretched to 20mm Twenty Times

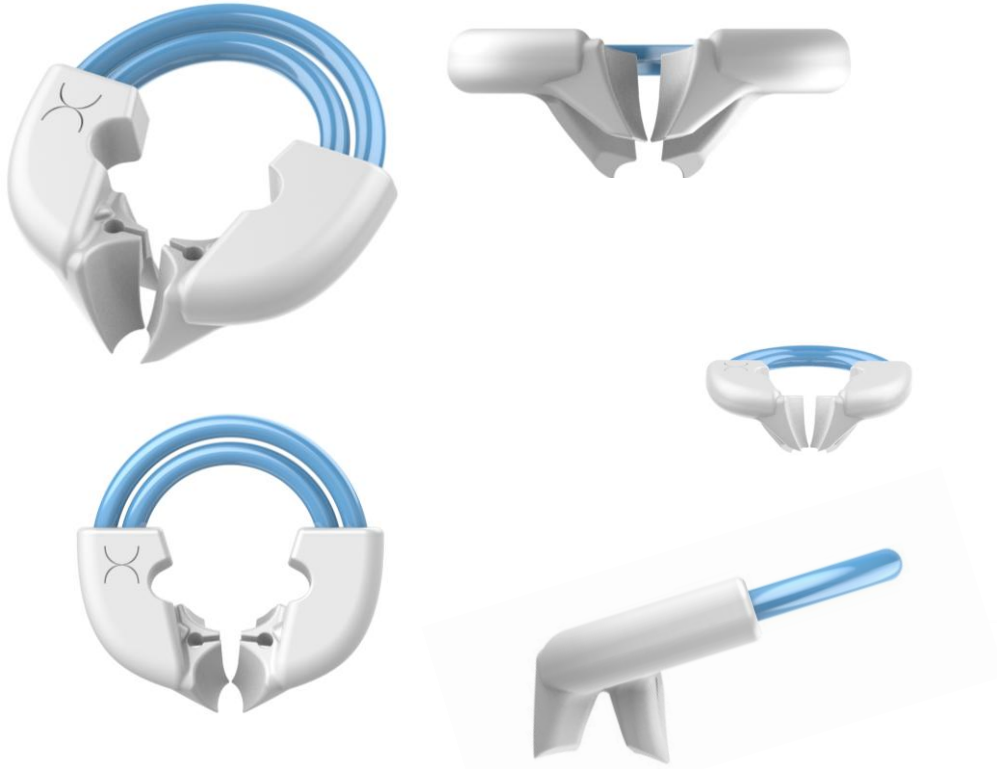


Stretched to 20mm Twenty Times



# TwinRing Universal

∞ BIOCLEAR





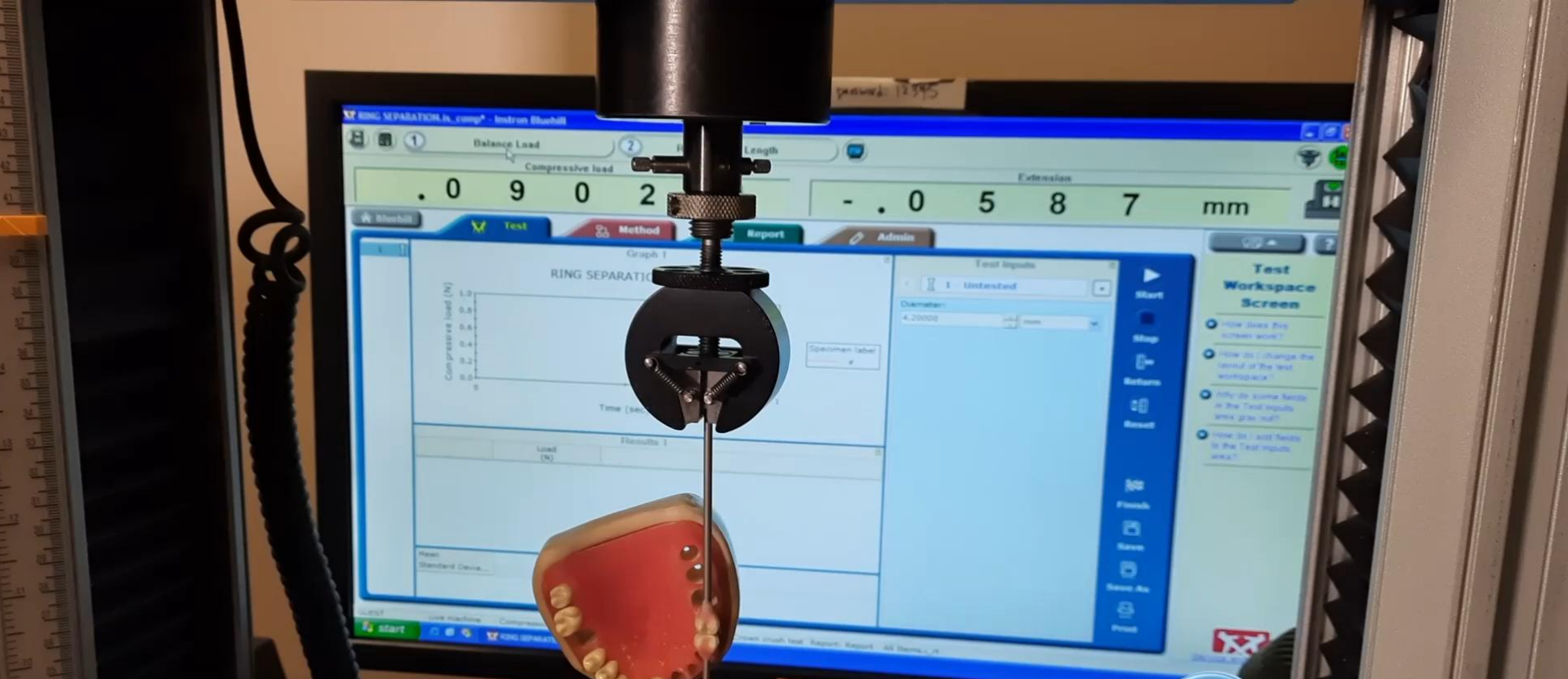
## How do we win the *Snug Contact Game?*

- Power
- Strategy
- Technique



## How do we win the *Snug Contact Game?*

- Power
- Strategy
- Technique



### Nate Lawson DMD PhD

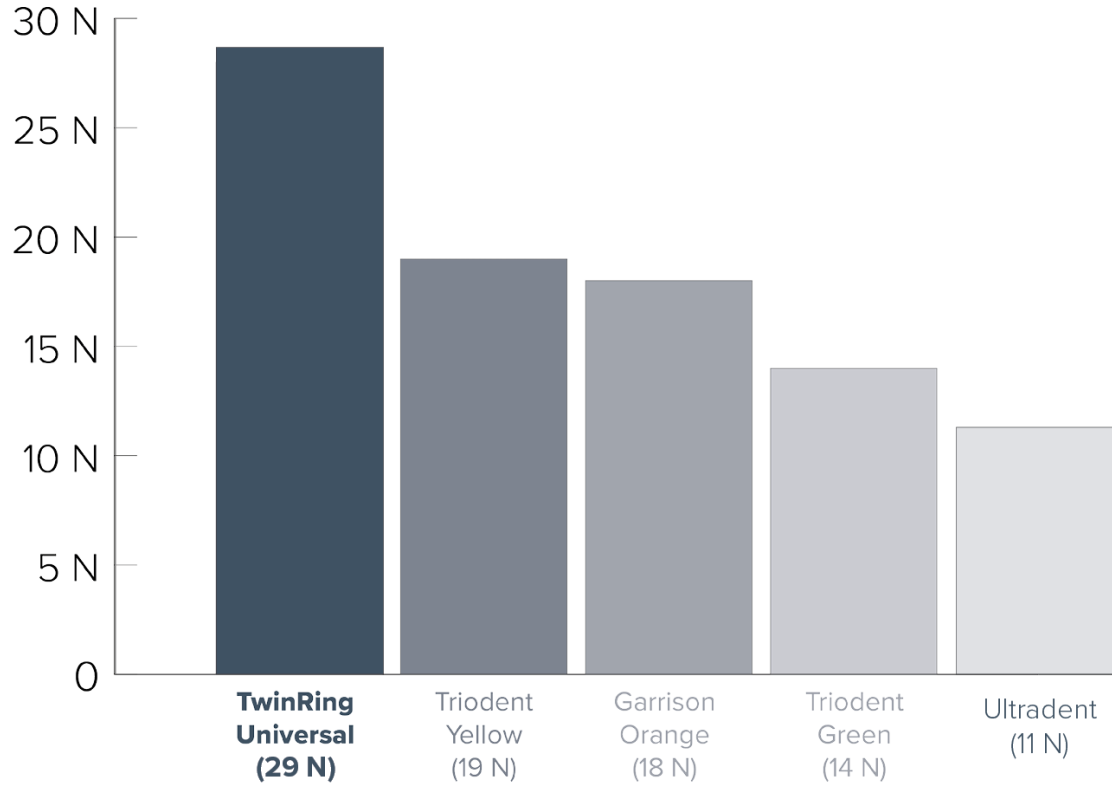
Director of the Division of Biomaterials and Pranit Bora. BDS, MDS.

Resident, Division of Biomaterials UAB School of Dentistry



TwinRing Universal  
28 N

# TwinRing Universal Instron Comparison



Note: Rings tested are not new and some rings stretch out quickly and lose up to half of their power after multiple uses. 1N = 1kg (m/s/s)

# The slip-off test



∞ BIOCLEAR

# Bioclear Matrices - Posterior





# EVOLVE --- MATRIX

## Premolar



## Molar



EVOLVE  
MATRIX

## Premolar Evolve: Width & Profile

- Evolve premolar matrices come in one width and profile – Black – to fit a variety of premolar tooth shapes

### BLACK EVOLVE

Designed with an aggressively rounded emergence profile. Shaped specifically for premolar teeth, these matrices can be used anywhere you would typically use a Biofit matrix or BT matrices on premolars.

Tip: Rotate the matrix into place.



Premolar Normal  
Width

# Black Premolar Evolve

BIOCLEAR



5 Sizes

5mm

6mm

7mm

8mm

10mm

- Curved profile
- Normal width for a premolar



## 5 Sizes

5mm

6mm

7mm

8mm

9mm

- Curved profile
- Normal width

# Molar Evolve: Width & Profile

- Evolve matrices come in three widths and profiles – Blue, Orange, and Pink – to fit a variety of posterior tooth shapes

## BLUE EVOLVE

Designed with an aggressively rounded emergence profile and an average width. Blue Evolve is suitable for the majority of posterior cases.

Tip: Rotate the matrix into place.



Normal width

## ORANGE EVOLVE

Features a flatter emergence profile than the Blue Evolve. Orange Evolve is perfect for patients with average-sized molars where the tooth is too flat for the Blue Evolve

Tip: Use the Orange Evolve if the Blue Evolve inverts



Wide Molar



3 Sizes

6mm

7mm

9mm

- Curved/straight profile
- Wider width

∞ BIOCLEAR

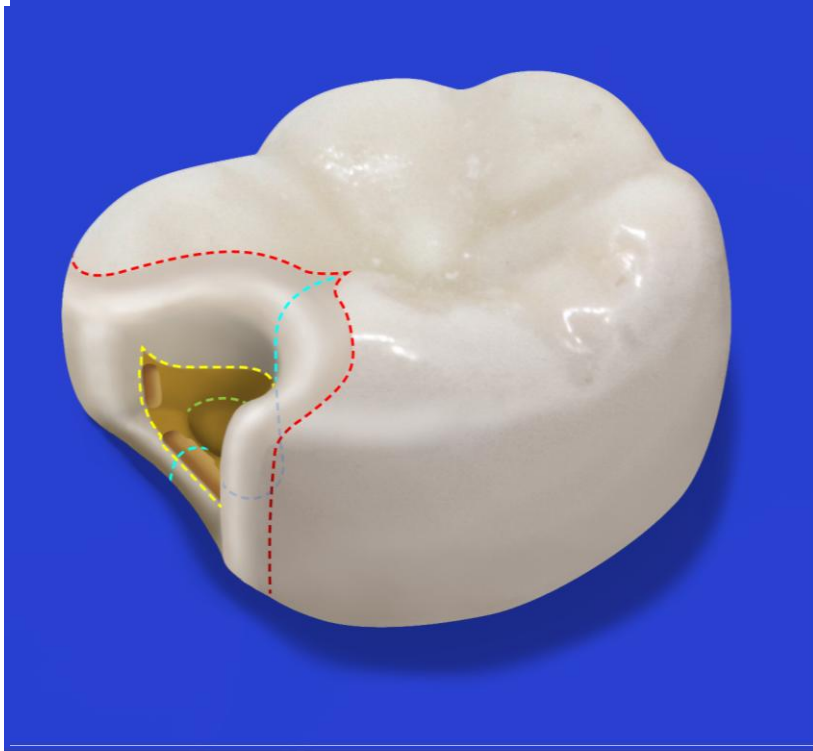
# The Adjustable Push-Pull Instrument

*for Ideal Contacts*



**EVOLVE MATRIX SYSTEM**

## Final views of completed Bioclear Class II Preparation.



Natural Contacts

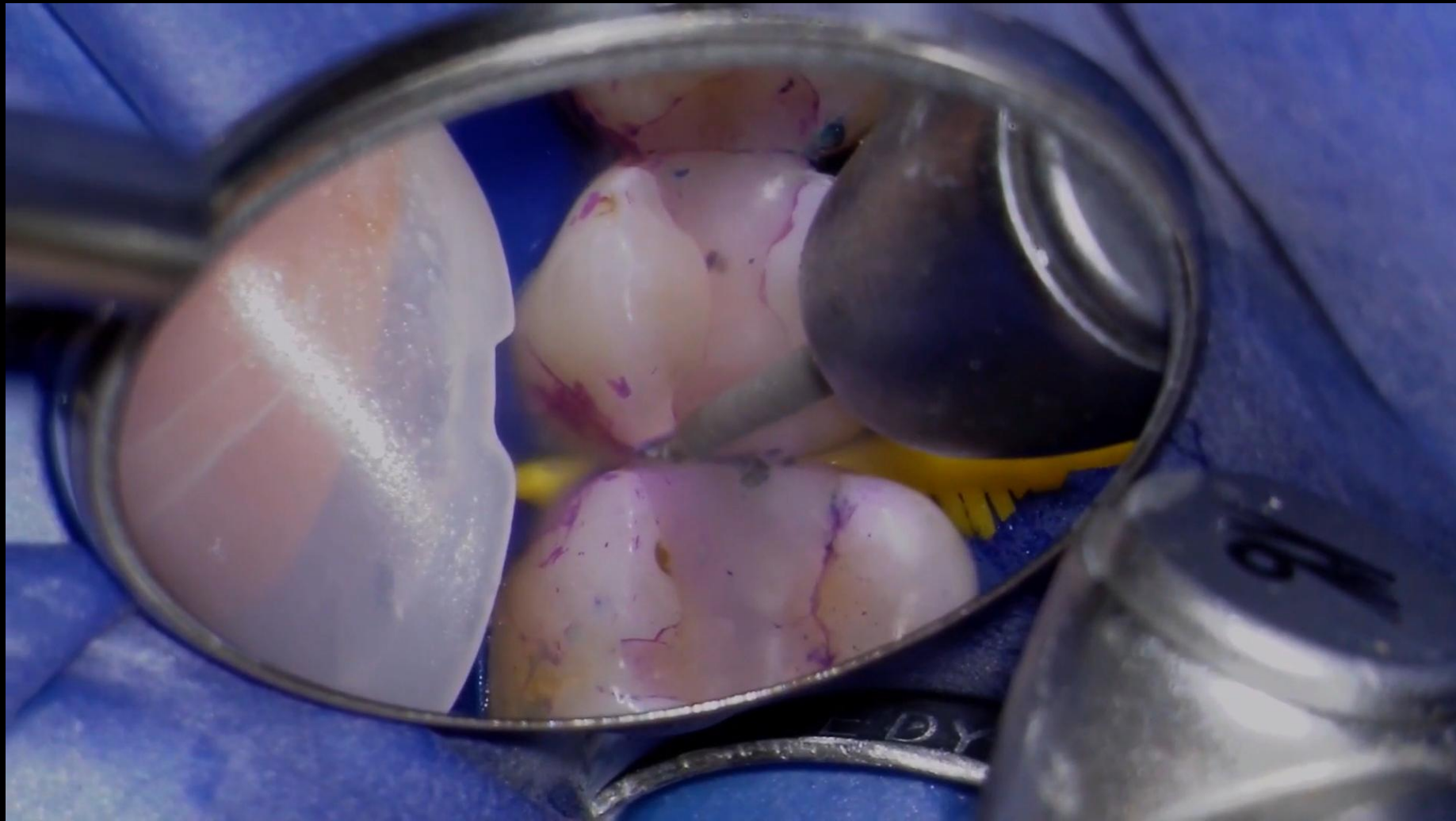


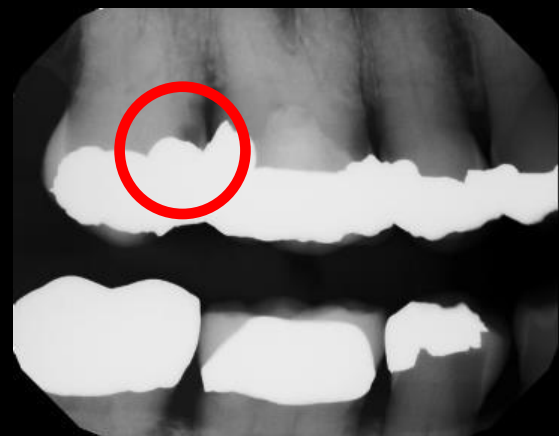
Traditional Composite Contacts



**What about deep decay?**

Three-Point Spot Weld plus  
Deep Margin Acquisition (DMA)  
Clinical Video





## Deep Margin Acquisition (DMA)



Inside the prep to our reference = 6mm

- What Evolve matrix color should you choose and what height?
- What's my reference?











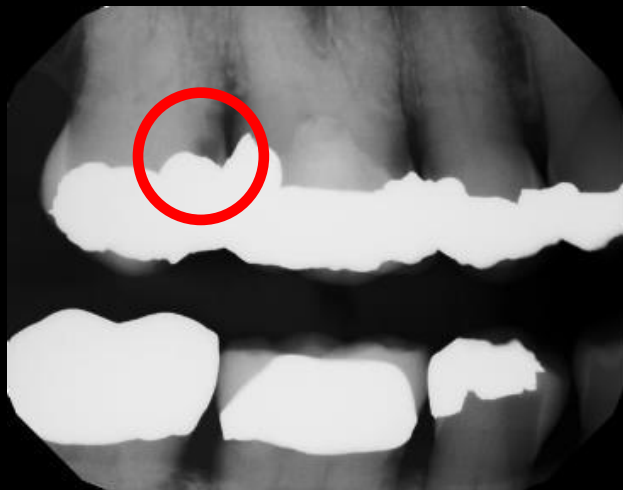




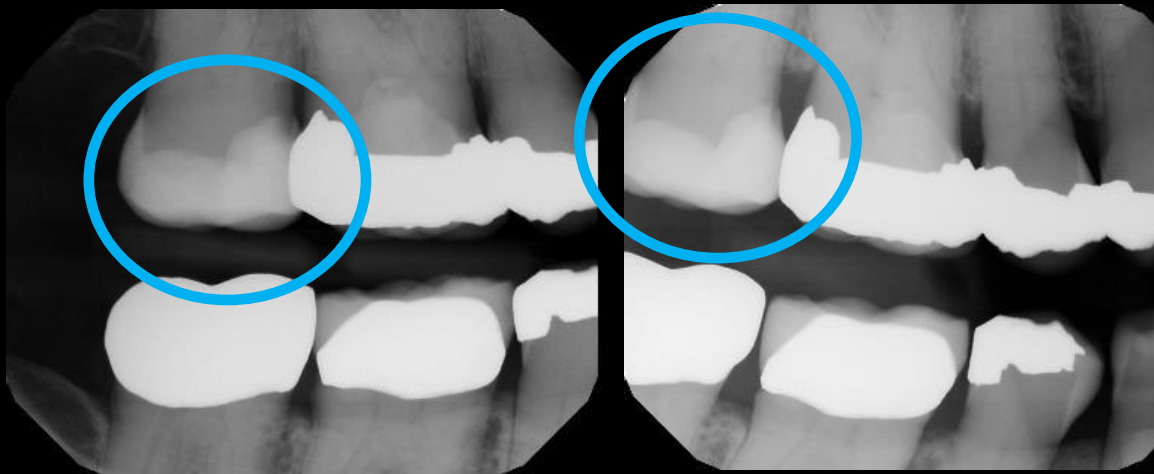




Pre-op



Post-op (two views)

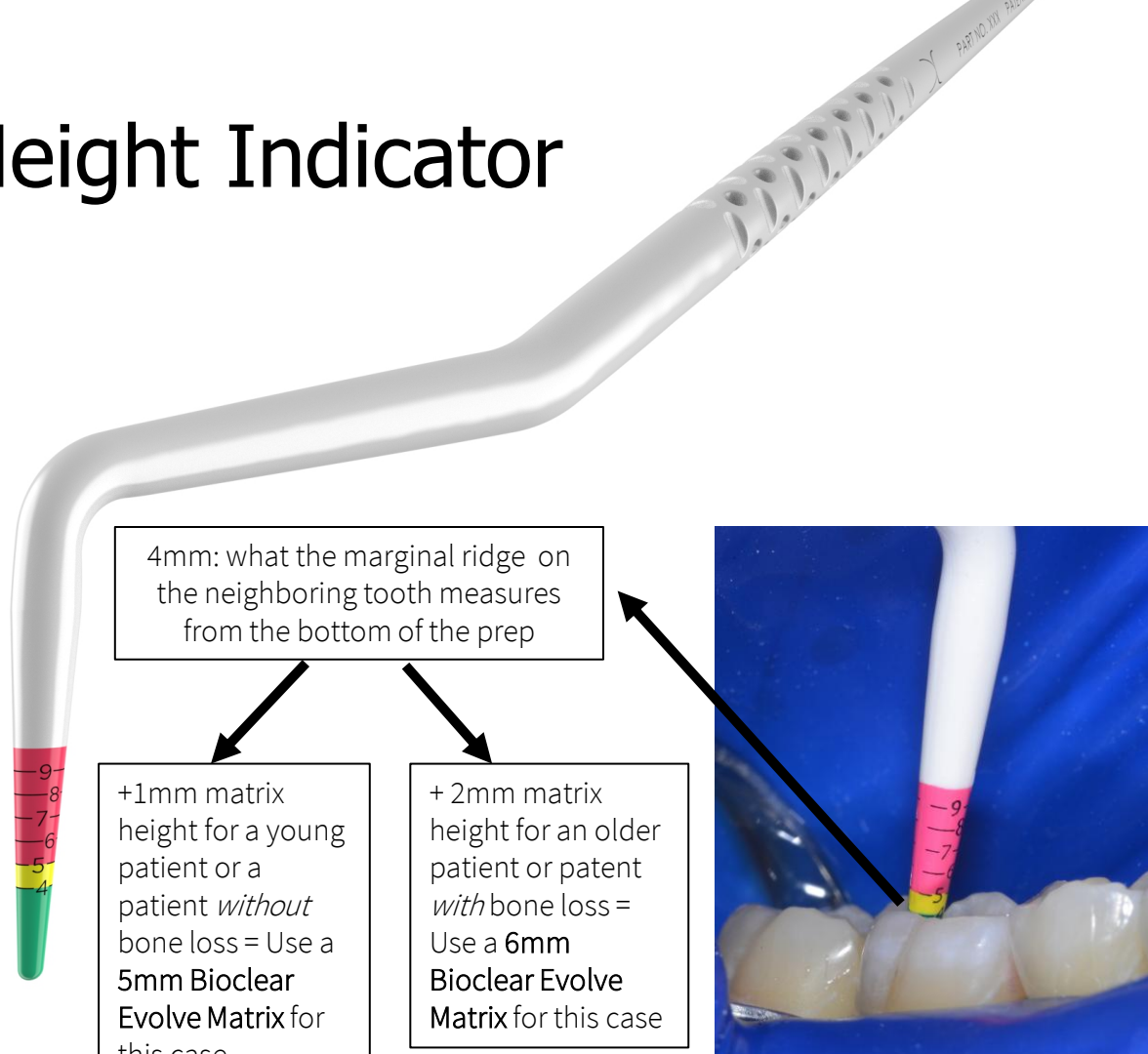


# Evolve Matrix Height Indicator

## Matrix Height Indicator:

Numbers are printed on the indicator so the correct Evolve matrix for a restoration is chosen the first time. This helps reduce waste when incorrect matrices are chosen.

Once you have measured the depth of the cavity in relation to the marginal ridge of the neighboring tooth, you will generally need to add 1-2mm from that reading.



# Evolve Matrix Height Indicator

## Go/No-Go:

The colored tip indicates if a cavity prep can be cured in one layer or if more must be used.

**Red:** NO-GO the composite will be deeper than 5mm

**Yellow:** GO WITH CONDITIONS

**Green:** GO



*Tip: The best reference point is the marginal ridge of the neighboring tooth. If you are doing a back-to-back restoration and no marginal ridge is available, then use the gauge to estimate the height the composite should be when you are finished injection molding but before curing.*



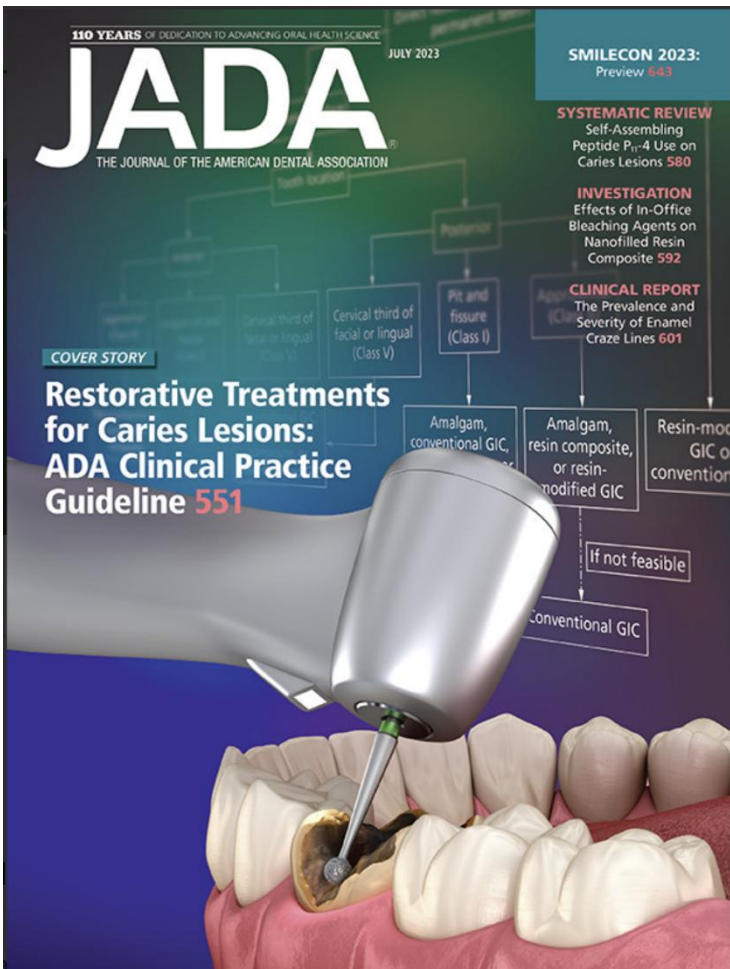


 **DIAMOND**  
WEDGE



# The modern composite procedure

- Adhesion versus mechanical retention
- Preparation design based on engineering
- Compression Joints vs Tension Joints
- Biofilm Removal and the Infinity EdgeTooth Restoration Interface
- **Selective Caries Removal**
- Monolithic injection molding
- Rock Star Polish



**Table 1.** Definitions of carious tissue removal approaches and clinical presentation of caries lesion.

CARIOUS TISSUE REMOVAL APPROACHES (THAT IS, THE EXTENT OF CARIOUS TISSUE REMOVED)	
<b>Nonselective Caries Removal</b>	Carious tissue is removed until hard dentin is reached. Also known as complete caries removal.
<b>Selective Caries Removal</b>	Carious tissue is removed until soft or firm dentin is reached. Also known as partial or incomplete caries removal.
<b>Stepwise Caries Removal</b>	Carious tissue is first removed until soft dentin is reached and then a temporary restoration is placed. Months later, the restoration and carious tissue are removed until firm dentin is reached and a permanent restoration is then placed. Also known as 2-step caries removal.
<b>No Carious Tissue Removal</b>	No carious tissue is removed prior to the placement of a definitive restoration.
CLINICAL PRESENTATION OF CARIES LESIONS	
<b>Moderate Caries Lesion</b>	International Caries Detection and Assessment System codes 3 and 4
<b>Advanced Caries Lesion</b>	International Caries Detection and Assessment System codes 5 and 6

**Clinical Practice Guideline**

**Cover Story**

**Evidence-based clinical practice guideline on restorative treatments for caries lesions**

A report from the American Dental Association

Check for updates

Supplemental material is available online.

Vineet Dhar, BDS, MDS, PhD; Lauren Plicher, MSPH; Margherita Fontana, DDS, PhD; Carlos Gonzalez-Cabezas, DDS, MSD, PhD; Martha Ann Keele, DDS, PhD; Ana Karina Mascarenhas, BDS, MPH, DPH; Marcelle Nascimento, DDS, MS, PhD; Jeffrey A. Platt, DDS, MS, Gregory J. Sabino, DDS, PhD; Rebecca Stavitt, DDS, PhD; Norman Trautloff, DDS, MS; Douglas A. Young, DDS, EdD, MBA, MS; Domènec T. Zoro, DDS, MS; Sarah Parke, MS; Olivia Longhart, MPH; Kelly K. O'Brien, MD; Alonso Carrasco-Labra, DDS, MSc, PhD.

**ABSTRACT**

**Background.** An expert panel convened by the American Dental Association (ADA) Council on Scientific Affairs together with the ADA Science and Research Institute's program for Clinical and Translational Research conducted a systematic review and developed recommendations for the treatment of moderate and advanced cavitated caries lesions in patients with vital, non-endodontically treated primary and permanent teeth.

**Types of Studies Reviewed.** The authors searched for systematic reviews comparing carious tissue removal (CTR) approaches in Ovid MEDLINE, Embase, Cochrane Database of Systematic Reviews, and Trip Medical Database. The authors also conducted a systematic search for randomized controlled trials comparing direct restorative materials in Ovid MEDLINE, Embase, Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform. The authors used the Grading of Recommendations Assessment, Development, and Evaluation approach to assess the certainty of the evidence and formulate recommendations.

**Results.** The panel formulated 16 recommendations and good practice statements: 4 on CTR approaches specific to lesion depth and 12 on direct restorative materials specific to tooth location and surfaces involved. The panel conditionally recommended for the use of conservative CTR approaches, especially for advanced lesions. Although the panel conditionally recommended for the use of all direct restorative materials, they prioritized some materials over the use of others for certain clinical scenarios.

**Practical implications.** The evidence suggests that more conservative CTR approaches may decrease the risk of adverse effects. All included direct restorative materials may be effective in treating moderate and advanced caries lesions on vital, nonendodontically treated primary and permanent teeth.

**Key Words.** Evidence-based dentistry; clinical practice guideline; direct restorative materials; caries; general dentistry; pediatric dentistry; American Dental Association.

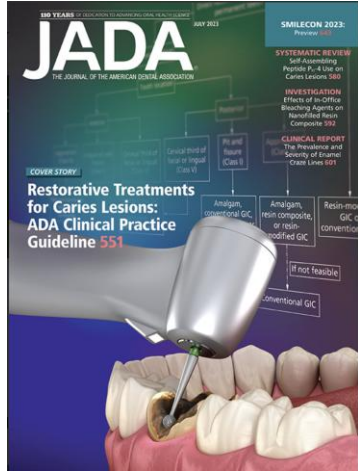
JADA 2023;154(7):551-566  
<https://doi.org/10.1016/j.jada.2023.04.011>

**R**estorative dentistry is integral to managing caries.<sup>1</sup> The decisions involved in restoring teeth are complex and based on the balance of several factors such as prognosis, caries risk and activity assessment, and clinical or radiographic signs of caries.<sup>2,3</sup> When indicated, various carious tissue removal (CTR) approaches (that is, the extent of carious tissue removed) and direct restorative materials are available to restore moderate and advanced (Table 1) caries lesions on vital, nonendodontically treated primary and permanent teeth.

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Association. All rights  
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JADA 154(7) • <http://jada.ada.org> • July 2023

551

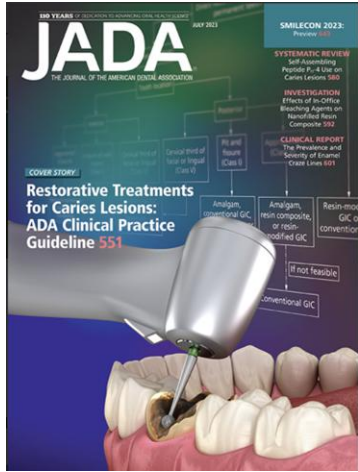


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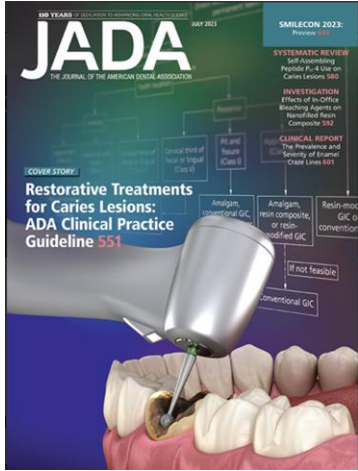
“To treat **moderate caries lesions** of vital permanent teeth, the panel suggests prioritizing the use of SCR over nonselective i.e., complete caries removal.”

Evidence to Decisions: 1) Desirable and **undesirable effects**, 2) Values and preferences, 3) Cost, 4) Acceptability, 5) Feasibility



**“Undesirable effects of traditional caries removal: Patient discomfort during treatment, pulp exposure, pulp necrosis, pulpal complications due to infection, and tooth loss.”**

July 2023



# Selective Caries Removal (SCR) is the new standard of care

**BOOM!\***

\*Just one hundred and thirty-three years later

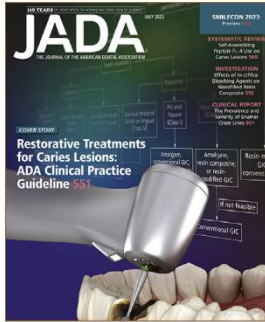
# JCDA article the next month (August 2023)

## ADA Publishes Guideline on Restorative Treatments for Caries Lesions

A new American Dental Association (ADA) clinical practice guideline suggests conservative methods to treat tooth decay in primary and permanent teeth could lead to better outcomes when used with common restorative materials. An expert panel of dentists developed guidelines on this topic after extensive review of approximately 300 published studies.

The guideline, published in the July 2023 issue of *The Journal of the American Dental Association*, contains 16 recommendations regarding treatment of moderate and advanced tooth decay in primary and permanent teeth that have not received orthodontic treatment. It suggests that conservative carious tissue removal (CTR) is less likely to result in adverse outcomes like nerve exposure or a failed filling. The recommendations also identify selective CTR as an effective treatment option in most cases of moderate or advanced decay in primary and permanent teeth.

This is the ADA's second clinical practice guideline in a series on caries treatment. The new restoration guideline, and existing recommendations on non-restorative treatment for tooth decay, are available at: [ada.org/cariesguidelines](http://ada.org/cariesguidelines) \*



“An expert panel developed guidelines after an extensive review of 300 published studies.”

“(SCR) is less likely to result in adverse outcomes...”

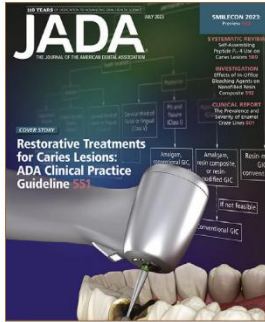
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“(SCR) Could lead to better outcomes with **ordinary restorative materials** (i.e. no more liners or bases)”

# The Art and Science of Perfect Contacts: How do we best temporarily displace the teeth so that when the matrix comes out, the teeth “bounce” back together?

1. If the contact is intact, we gently sand the contact until it is friendly, then the matrix itself plus gentle prying of the teeth will displace the teeth
2. Use a wedge
3. Use a powerful separator
4. Spot Weld/Push Pull Technique

The Art and Science of Perfect Contacts: How do we best temporarily displace the teeth so that when the matrix comes out, the teeth “bounce” back together?

## 5 The Direct Contact Strut

The Art and Science of Perfect Contacts: How do we best temporarily displace the teeth so that when the matrix comes out, the teeth “bounce” back together?

Before we talk about posterior contacts let's quickly review ideal Anterior Bioclear

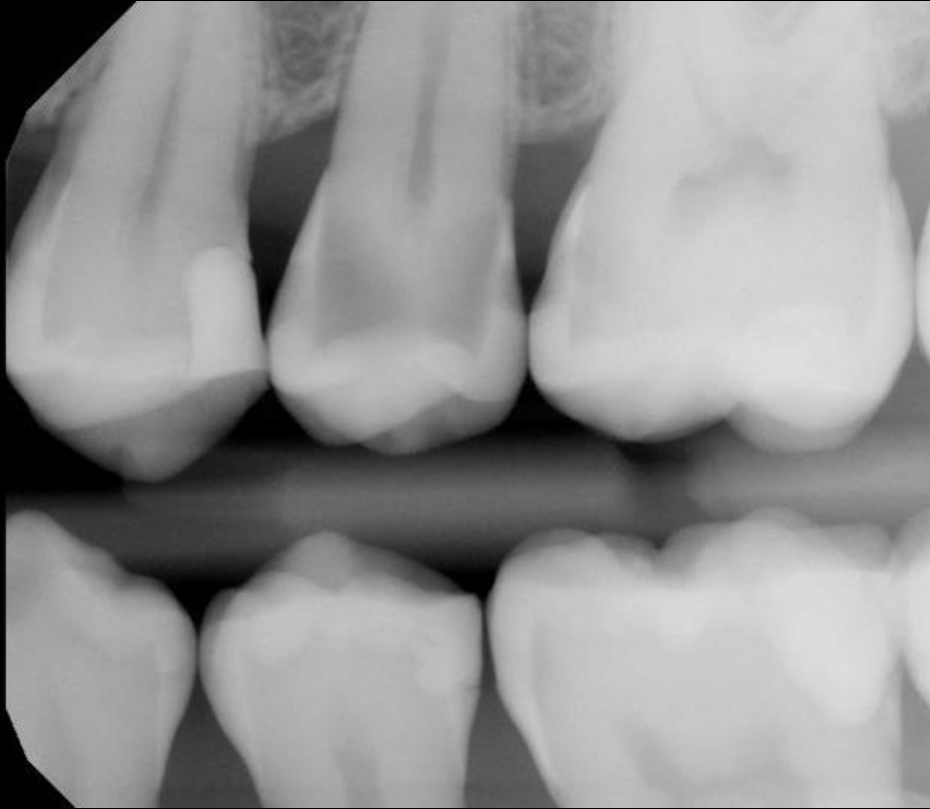


# Quadrant Strategy

1. Do the unilateral contact last
2. Understand Vector Physics
3. Broken Contacts on the neighboring tooth are **Free Money**
4. How many teeth in the quad are you pushing against? Try to work from mesial to distal ie terminal tooth last.
5. Don't just think in terms of "separating teeth". That's an oversimplification
6. Beware of ankylosed teeth in older patients. Plan accordingly

# Selective Caries Removal plus Deep Margin Acquisition clinical case





“Your website says you are a Certified Bioclear Provider offer the Selective Caries Technique (Modified Hall) as an alternative to root canals”

“My current office recommends endo, post, buildup & crown, but I have no pain”



11/10/20	BIO	2999A	Selective Caries Removal	13	\$175.00	\$0.00	\$175.00
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<b>Subtotal for This Phase:</b>					\$175.00	\$0.00	\$175.00
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11/10/20	BIO	299.8	BIOCLEAR POSTERIOR OVERLA	13	\$1,032.00	\$0.00	\$1,032.00
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<b>Subtotal for This Phase:</b>					\$1,032.00	\$0.00	\$1,032.00
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**\$1,207.00**



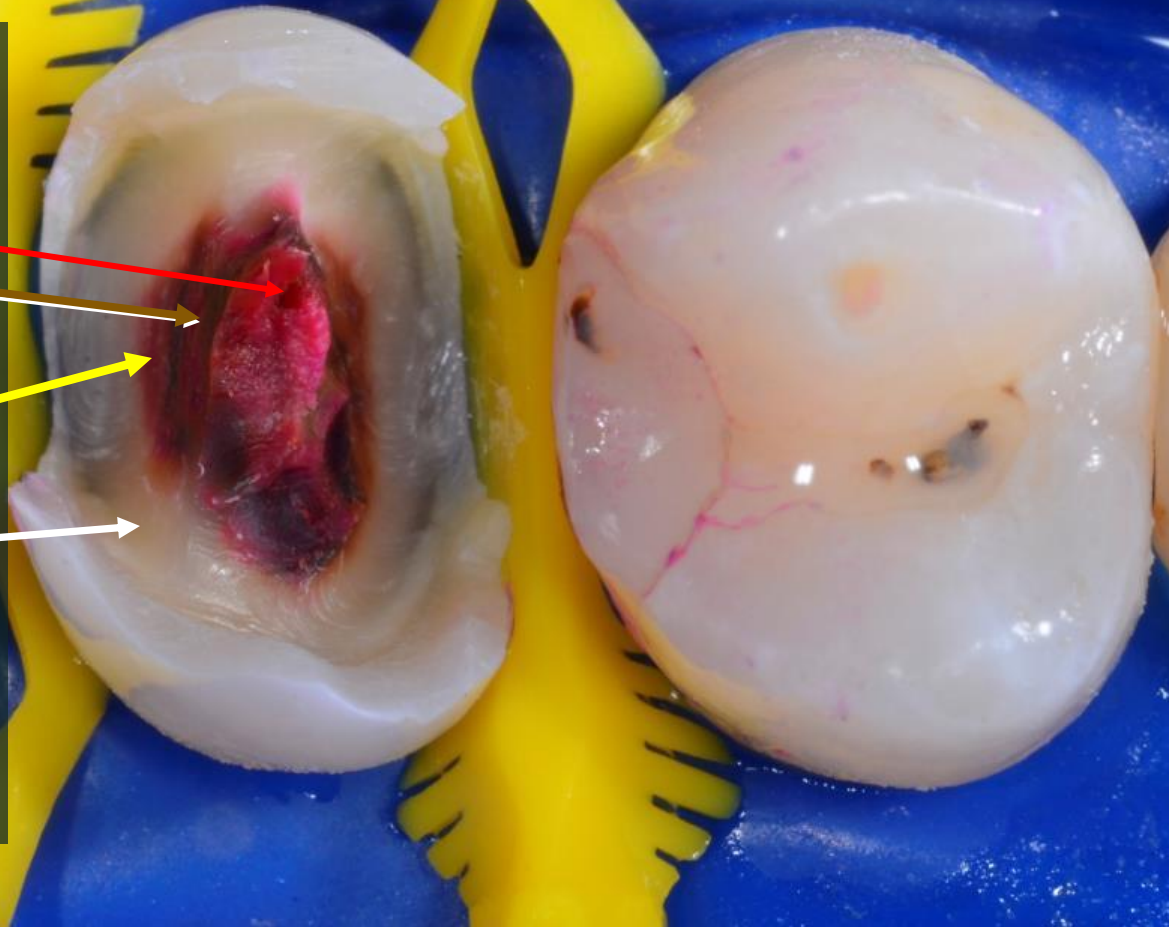






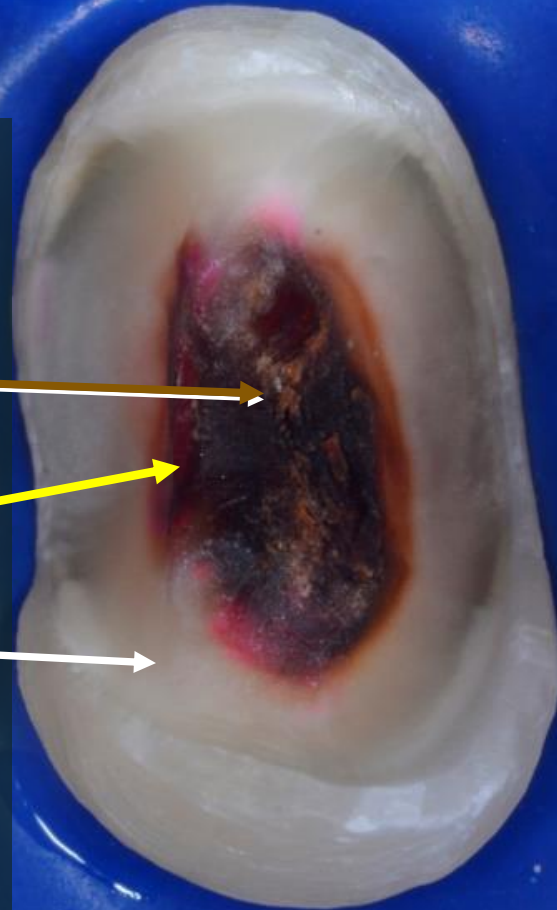
**Simplification of dentin zones for restorative dentist:**

- 1) **Loose Dentin**
- 2) **Smooth Soft Dentin**
- 3) **Affected Dentin:**  
**hard-ish and funny color**
- 4) **Sound Dentin**



**Simplification of dentin zones for restorative dentist:**

- 1) **Loose Dentin**
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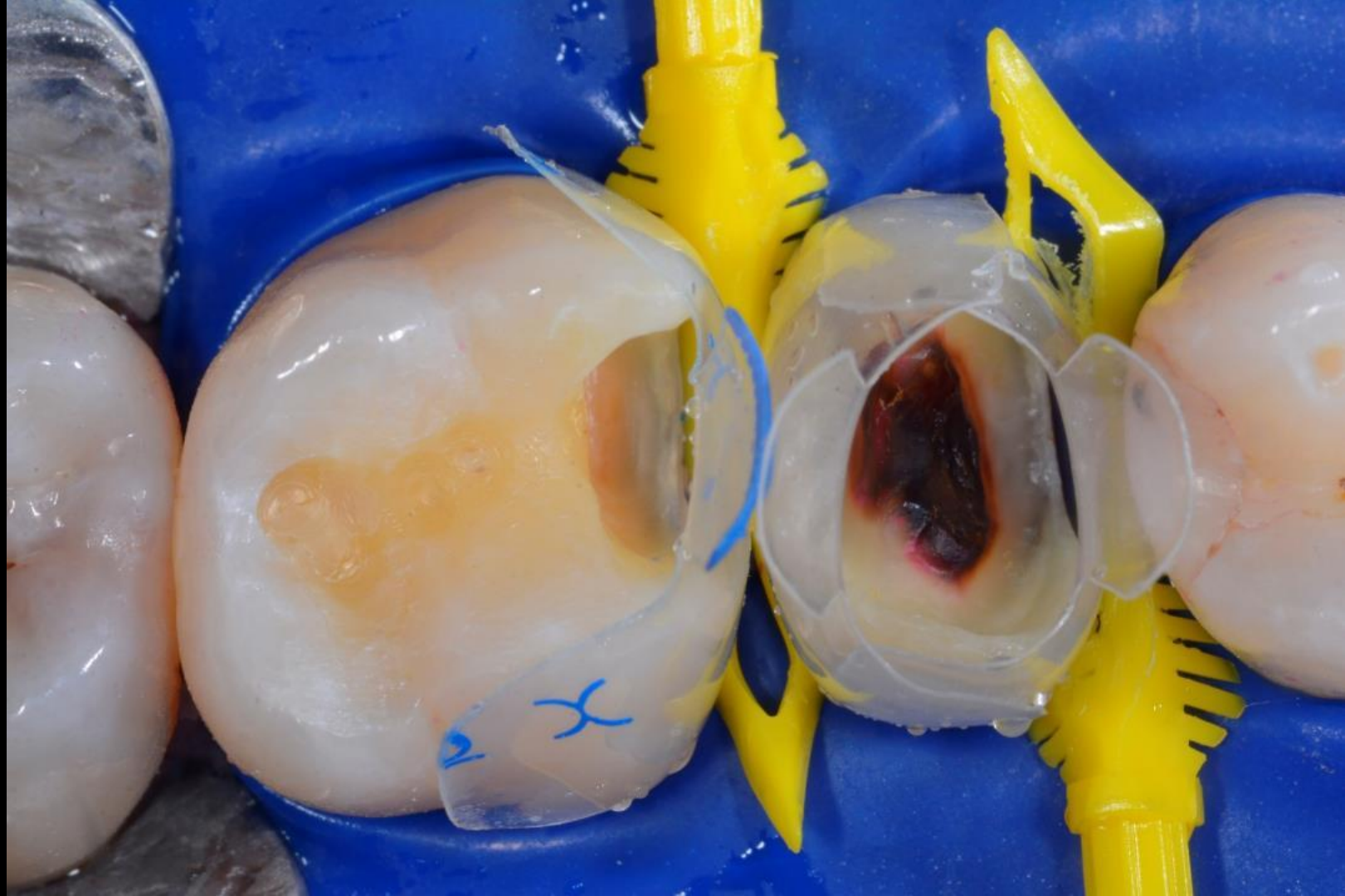


# Deep Margin Acquisition







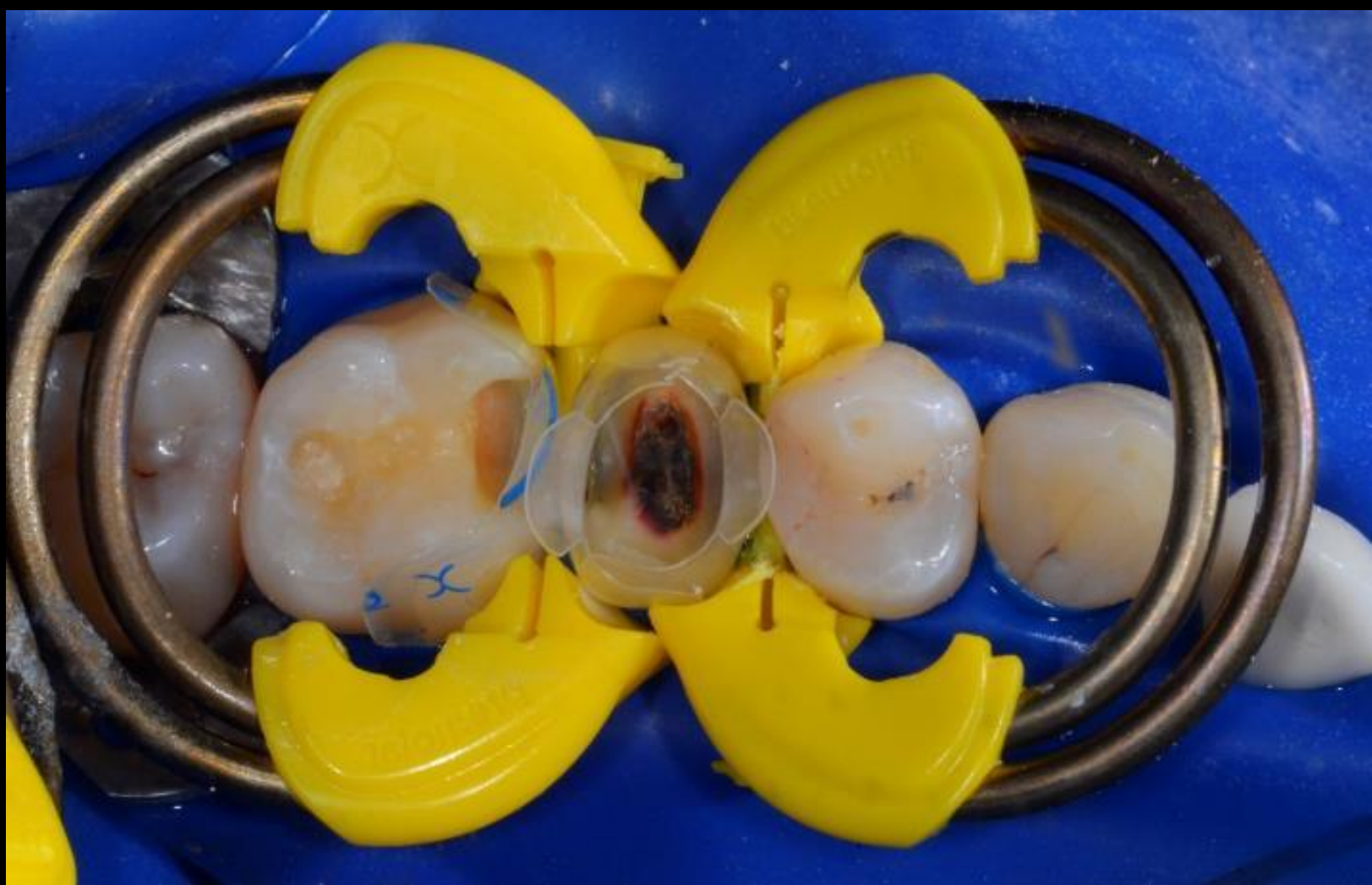


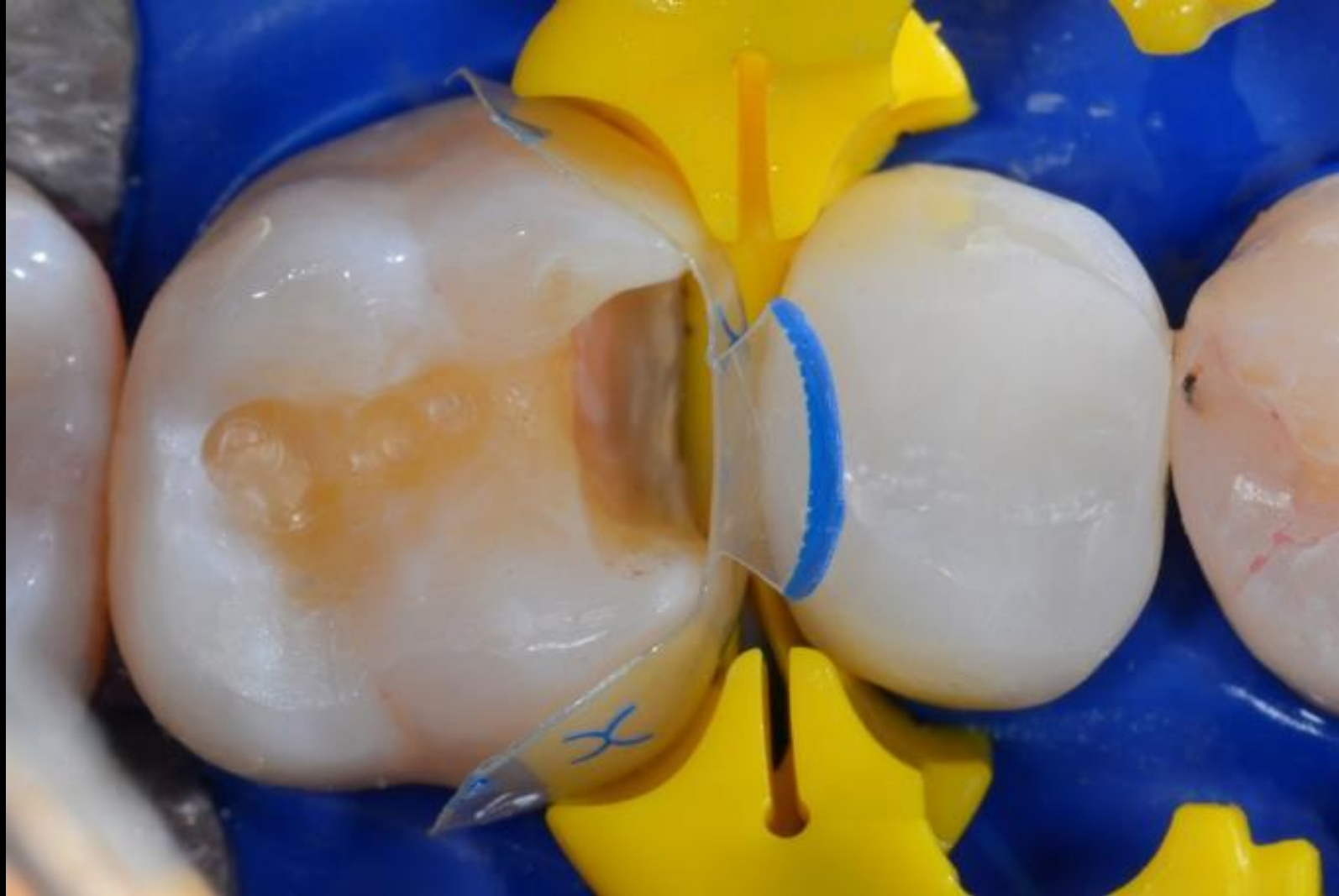




## 8 keys to ideal contacts with Injection Molding

- ✓ Change the Prep
- ✓ Pre-wedging
- ✓ Choose the correct matrix height
- ✓ Optimize the neighboring contact
- ✓ Progressive wedging
- ✓ Place separator like a rubber dam clamp
- ✓ Spot Weld Push/Pull.. Rehearse first★
- ✓ Quadrant Strategy Do the unilateral contact last













2018



2020



2020 post op



hopeless



hopeful

# 2 week follow up



# 3-year follow up



Mid treatment



post-op



3-year follow up





# Quadrant Strategy

1. Do the unilateral contact last
2. Understand Vector Physics
3. Broken Contacts on the neighboring tooth are **Free Money**
4. How many teeth in the quad are you pushing against? Try to work from mesial to distal ie terminal tooth last.
5. Don't just think in terms of "separating teeth". That's an oversimplification
6. Beware of ankylosed teeth in older patients. Plan accordingly

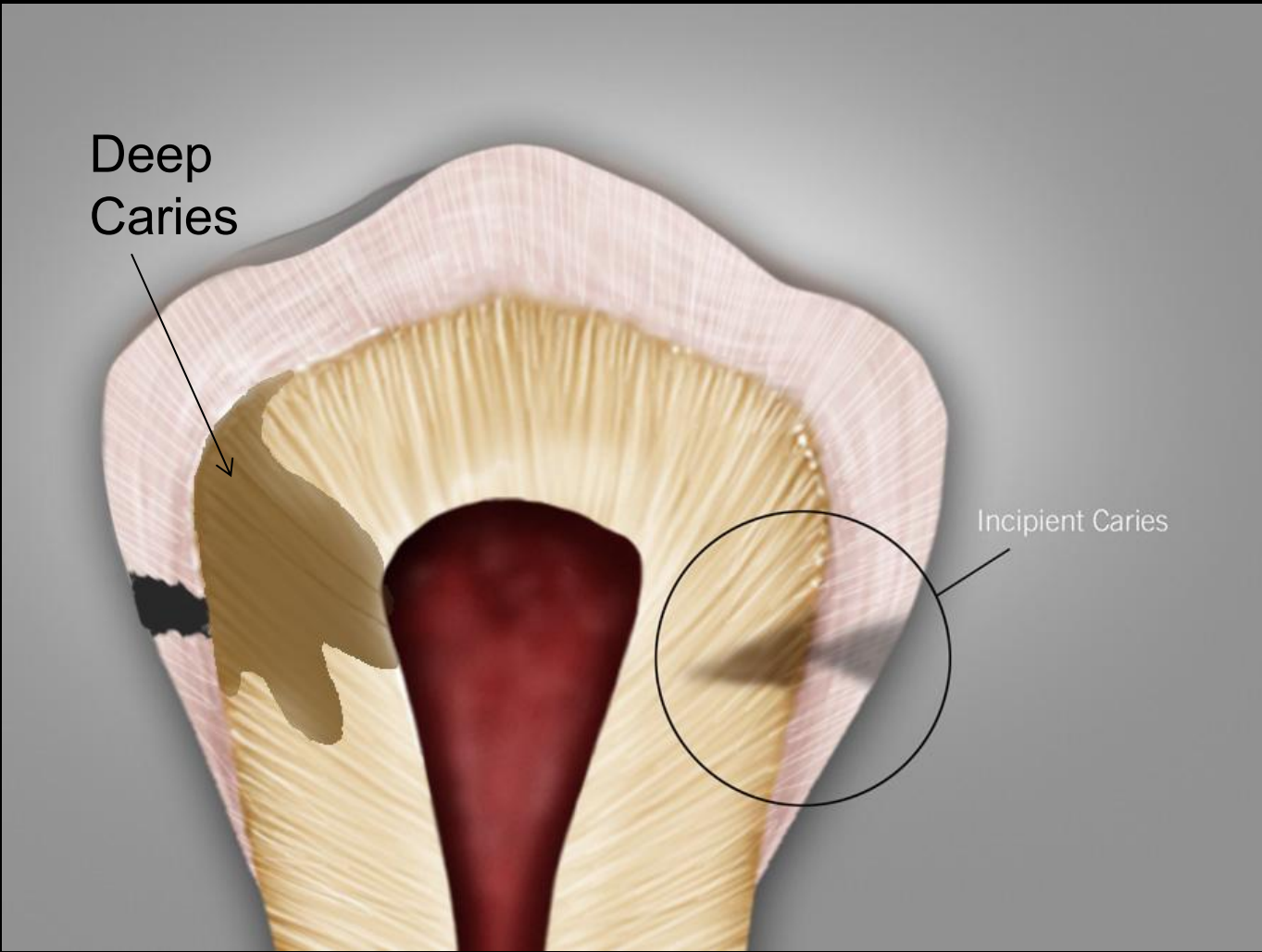
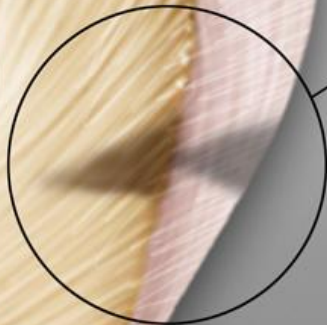
# Caries Progression and Selective Caries Removal (SCR) or Modified Hall Technique



Deep  
Caries



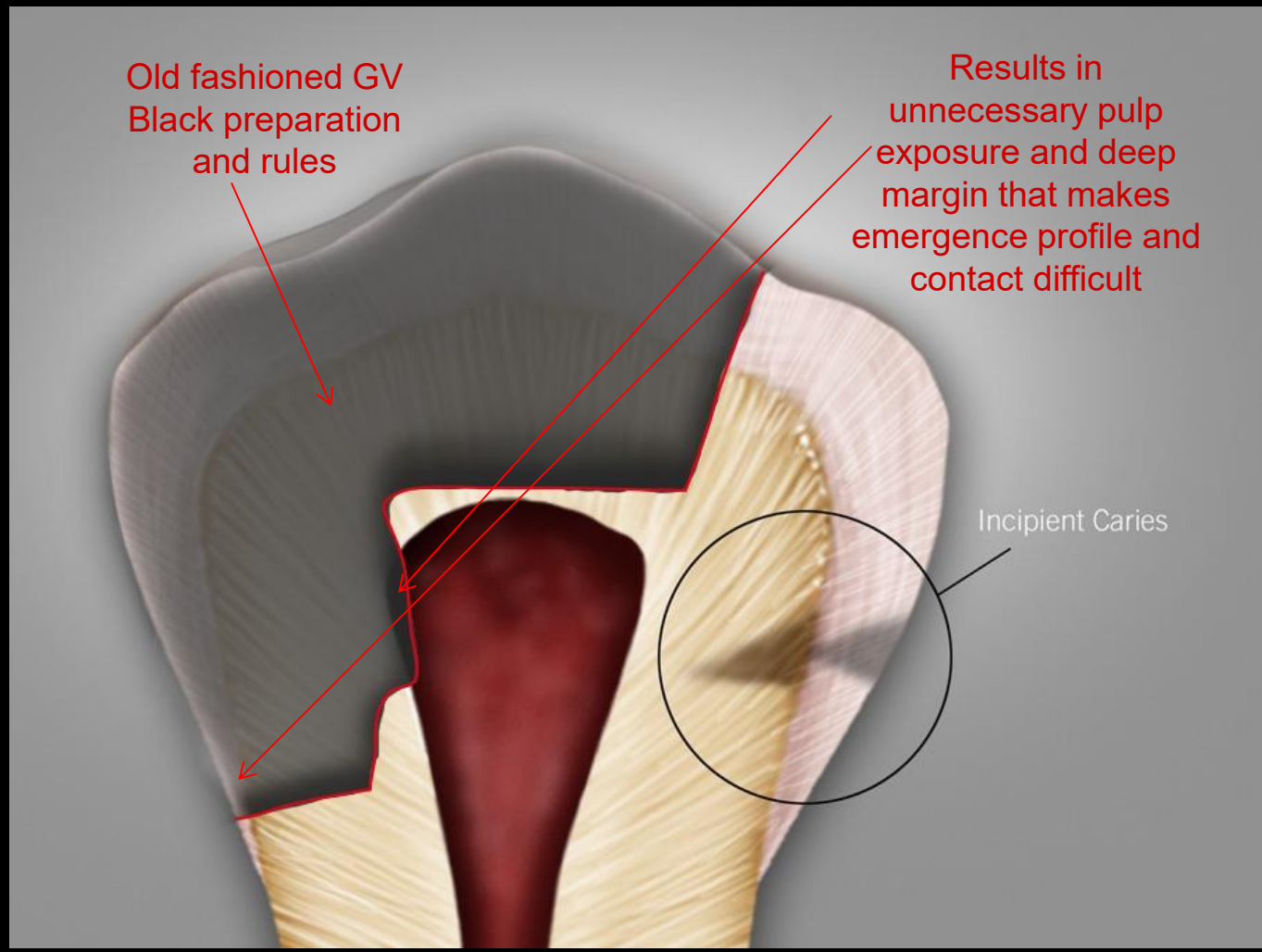
Incipient Caries



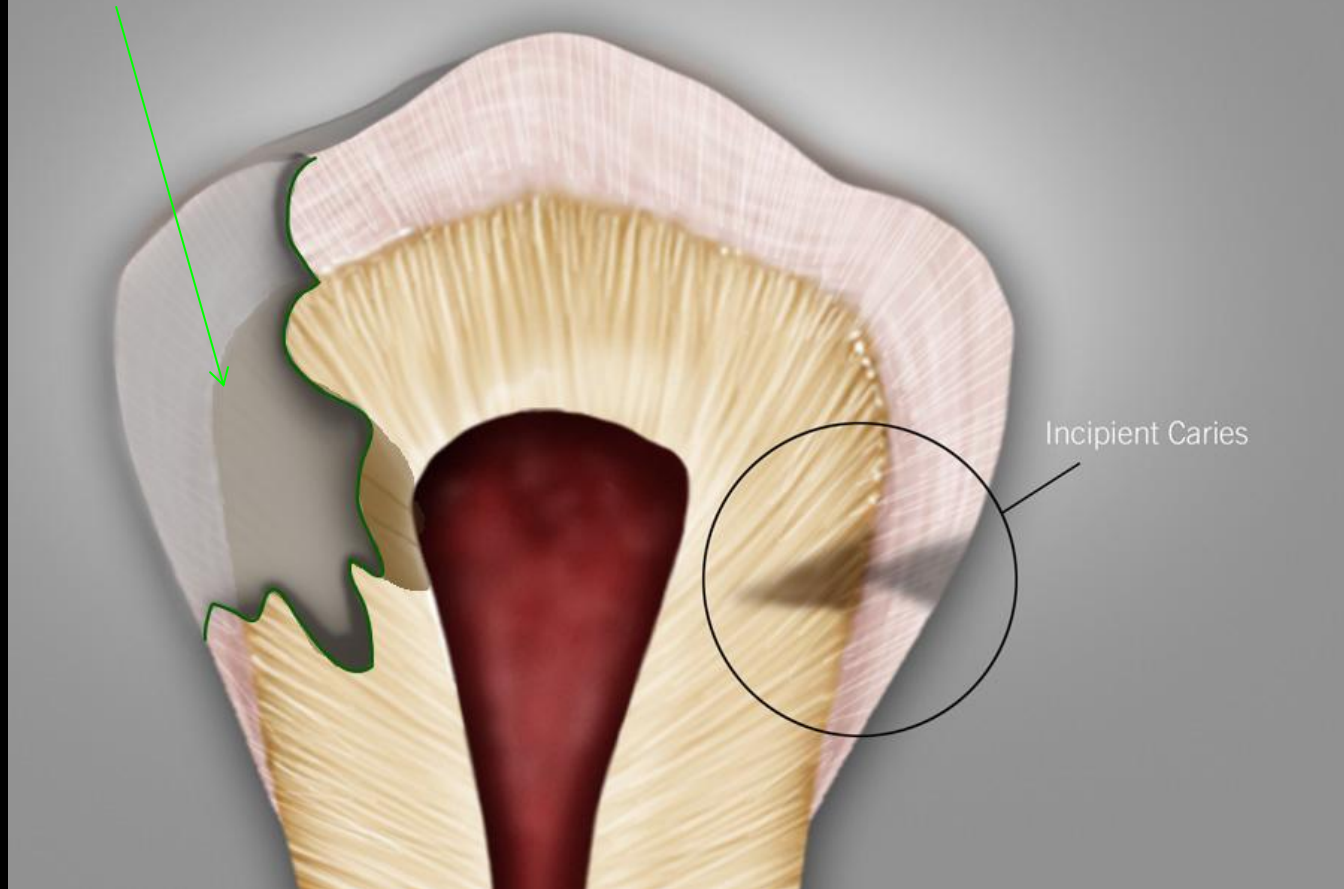
Old fashioned GV  
Black preparation  
and rules

Results in  
unnecessary pulp  
exposure and deep  
margin that makes  
emergence profile and  
contact difficult

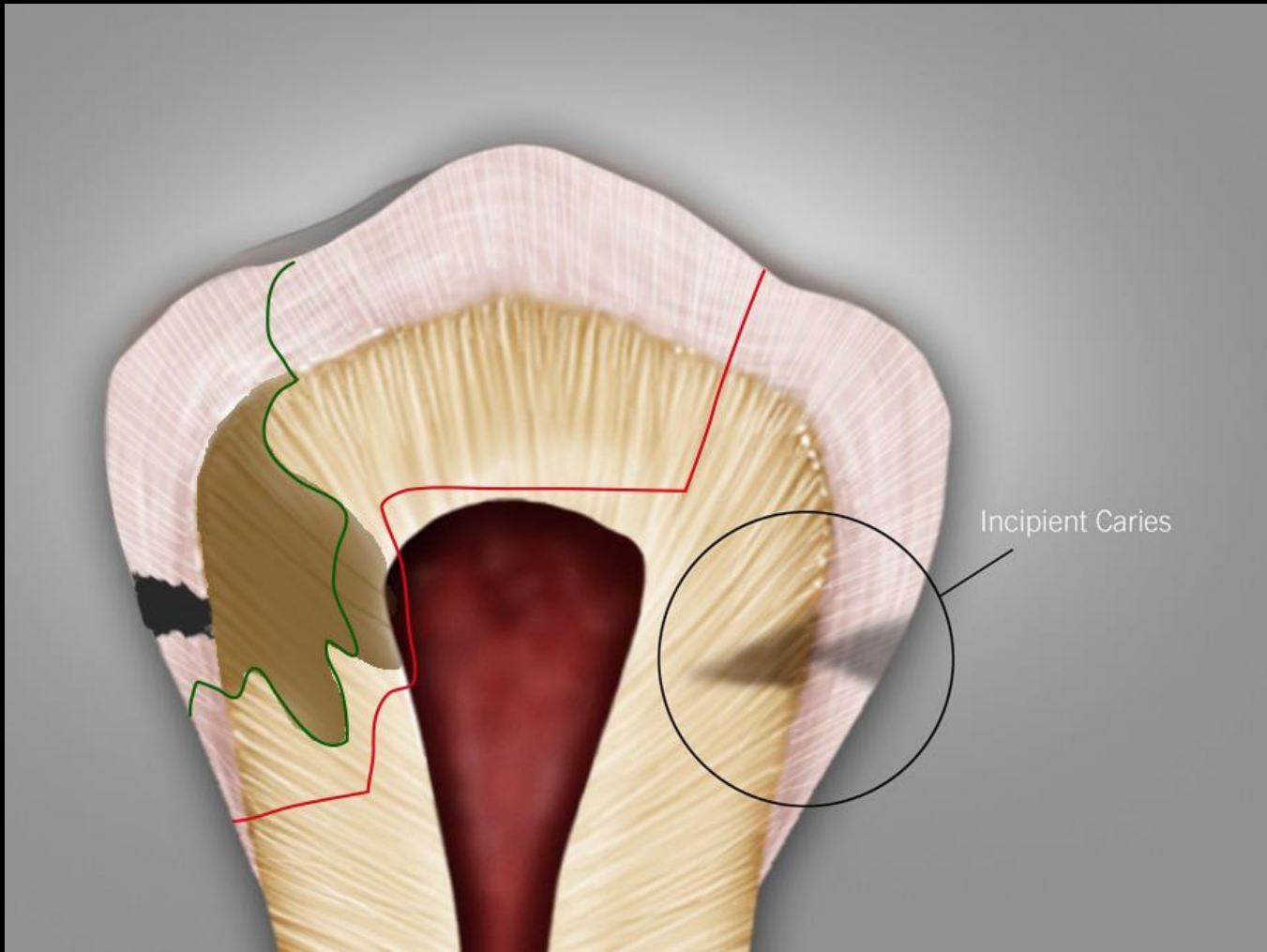
Incipient Caries



Modern "Clark Class II"



Incipient Caries



Incipient Caries

# What is the ultimate pulp capping agent?

- DyCal?
- RMGI?(Vitrebond/Fuji IX)
- MTA?
- Dentin in a Capsule? (Septodont)
- Caulk Snuggly stuff?
- Bonded resin?
- None of the above?

What is the ultimate pulp capping agent?

- A well sealed TRI and a **beret of soft smooth dentin**  
(Past al dente dentin)

# What are the 3 rules of pulp capping?

1. Don't expose the pulp
2. Don't expose the pulp
3. Don't expose the pulp

Hundreds of Selective Caries Removal (SCR) studies show remarkably and consistently high success rates. SCR is preferred by most patients over RCT or pulpotomy.

Qualitative and Quantitative Radiographic Assessment of Sealed Carious Dentin: A 10-Year Prospective Study	Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010	Objective: the objective of this study was to assess radiographic outcomes after partial carious dentin removal performed in deep caries lesions over a 10-year period.	10-year survival rate of the pulp: 100% in 13 teeth	Sealing of carious dentin arrested the caries process, promoted deposition of tertiary dentin, and induced mineral gain in the radiolucent zone.
The Monitoring of Deep Caries Lesions After Incomplete Dentine Caries Removal: Results After 14-18 Months	Clin Oral Investig 2006	Objective: this paper aims to assess radiographic changes after incomplete carious dentine removal and tooth sealing.	Survival rate of the pulp: 97% in 31 teeth	Complete dentine caries removal is not essential to control caries progression.
The Hall Technique: a randomized controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 23 months	BMC Oral Health 2007	Objective: Study the simplified method of managing carious primary molars using preformed metal crowns cemented with no local anesthetic, caries removal, or tooth preparation, and compare to traditional pulpotomy and metal crown.	2-year survival rate was 89%, outperforming traditional treatment by 11%	The Hall technique was preferred to conventional restorations by the majority of children, carers and GDP's.
Long-Term Survival of Indirect Pulp Treatment Performed in Primary and Permanent Teeth with Clinically Diagnosed Deep Carious Lesions	Journal of Endodontics 2010	Objective: Examine clinically and radiographically the 3-year survival of teeth treated with Indirect Pulp Treatment	3-year survival rate was 96% for 125 primary molars and 93% for 45 permanent teeth.	IPT performed in primary and permanent teeth of young patients may result in a high 3-year survival rate Note: Frank decay was retained.
Outcomes of Partial and Complete Caries Excavation in Permanent Teeth: A 18-Month Clinical Study	Contemp Clin Dent 2018	Objective: Clinical and radiographic outcomes of partial caries removal vs. complete caries removal in permanent teeth with deep carious lesions.	Survival rate of the pulp: 92.5%	Leaving a layer of soft, wet dentin adjacent to the pulpal wall could be an elective treatment option for mature permanent teeth with deep carious lesions.
Clinical Performance of Sealed Composite Restorations Placed Over Caries Compared with Sealed and Unsealed Amalgam Restorations	JADA 1987	Objective: To identify differences in the clinical outcomes of carious lesions sealed with composite vs. amalgams placed over caries-free preparations.	Survival rate of the pulp: 100%	There was no significant clinical difference between occlusal caries sealed with composite vs caries-free occlusal preps restored with amalgams over 2 years.
Sealing vs Partial caries Removal in Primary Molars: a RCT.	BMC Oral Health 2014	Objective: To assess the efficacy of arresting dentinal caries either with sealants or partial caries removal and composite restorations	18-month survival rate of the pulp: 100% for 17 teeth	Composite sealing of caries can arrest their progression therefore its complete removal is not necessary.
Conventional Caries Removal and Sealed Caries in Permanent Teeth: A Microbiological Evaluation	J Dent 2012	Objective: To compare bacterial load after conventional carious dentine removal with incomplete carious dentine removal and	Survival rate: 100%	It is not necessary to remove all carious dentin before a restoration is placed.

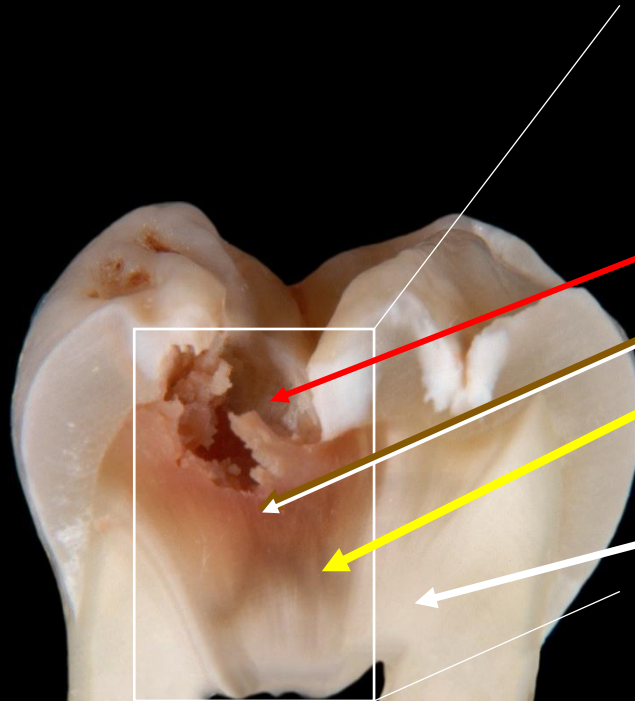
Partial Caries Removal in Deep Caries Lesions: A 5-Year Multicenter Randomized Controlled Trial	Clin Oral Investig 2018	Objective: To evaluate the effects of partial caries removal on pulp vitality five years after the procedure was performed.	Five-year survival rate: 80% of 121 teeth	Partial caries removal reduced the occurrence of pulp necrosis.
Effect of Different Liners on Pulpal Outcome After Partial Caries Removal: A preliminary 12 Months Randomized Controlled Trial	Caries Res 2019	Objective: To compare the effects of liners on pulp health outcomes 12 months after partial caries removal and restoration with composite.	12-month survival rate of the pulp: 94.6%	Partial removal of carious dentin does not interfere with pulp vitality or restoration survival, and liners are not necessary for the success of the procedure.
The Hall Technique 10 Years on: Questions and Answers	Br Dent J 2017	Objective: To review the success rate of sealing carious lesions.	5-year survival rate of the pulp: 97%	Sealing carious lesion is successful and this method is now regarded as a viable management options for carious primary molars
Sealing caries in primary molars: Randomized control trials, 5-year results	J Dent Res 2011	Objective: To compare clinical and radiographic failures of sealing carious lesions vs complete caries removal	5-year survival rate of the pulp: 95% of 264 teeth	Sealing caries outperformed conventional caries removal methods in preserving tooth vitality.
Ultrastructural and Microbiological Analysis of the Dentin Layers Affected by Caries Lesions in Primary Molars Treated by Minimal Intervention	Pediatr Dent 2007	Objective: To understand the effects that sealing carious lesions has on bacteria left in carious dentin.	60-day survival rate of pulp: 96%	Bacterial population decreased by 96% and carious dentine showed better tissue organization following sealing of the lesion.

In Contrast, Direct Pulp Capping study showed a much higher failure rate than SCR

Prognostic Factors for Clinical Outcomes According to Time After Direct Pulp Capping	JOE 2013	Objective: Identify what factors are significant for the survival rate of the pulp THREE YEARS after direct pulp capping with MTA and Dycal.	3-year Survival rate of the pulp: 67.4% of 70 teeth capped with MTA; 52.5% of 105 teeth capped with Dycal.	Selection of pulp capping material is important for pulp survival.
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# Selective Caries Removal or the Modified Hall Technique

Don't expose the pulp, establish a clean TRI and maintain frank caries where possible.



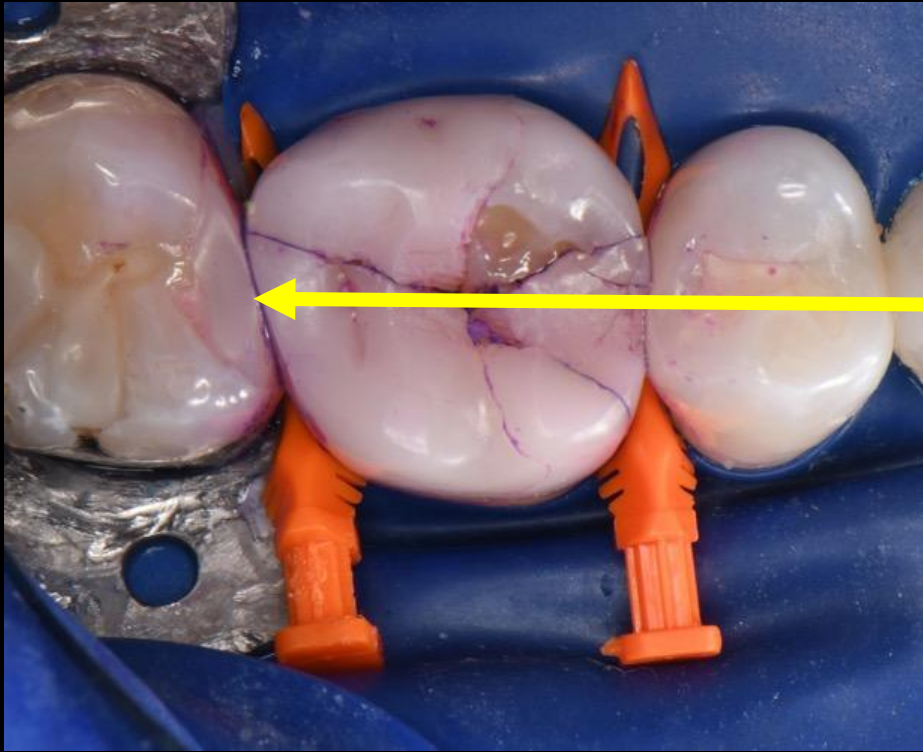
**As a restorative dentist:**

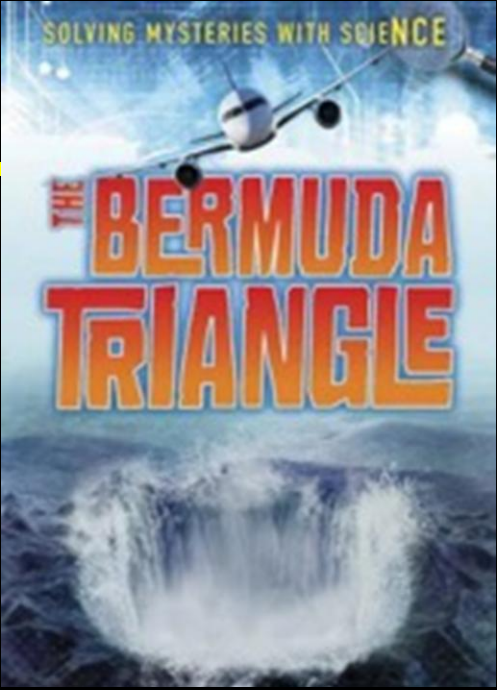
- 1) Loose Dentin
- 2) Pasta al Dente Dentin
- 3) Affected Dentin: hard-ish and funny color
- 4) Sound Dentin

The new “Long Diamond Wedge” Available  
in all five Diamond Wedge shapes

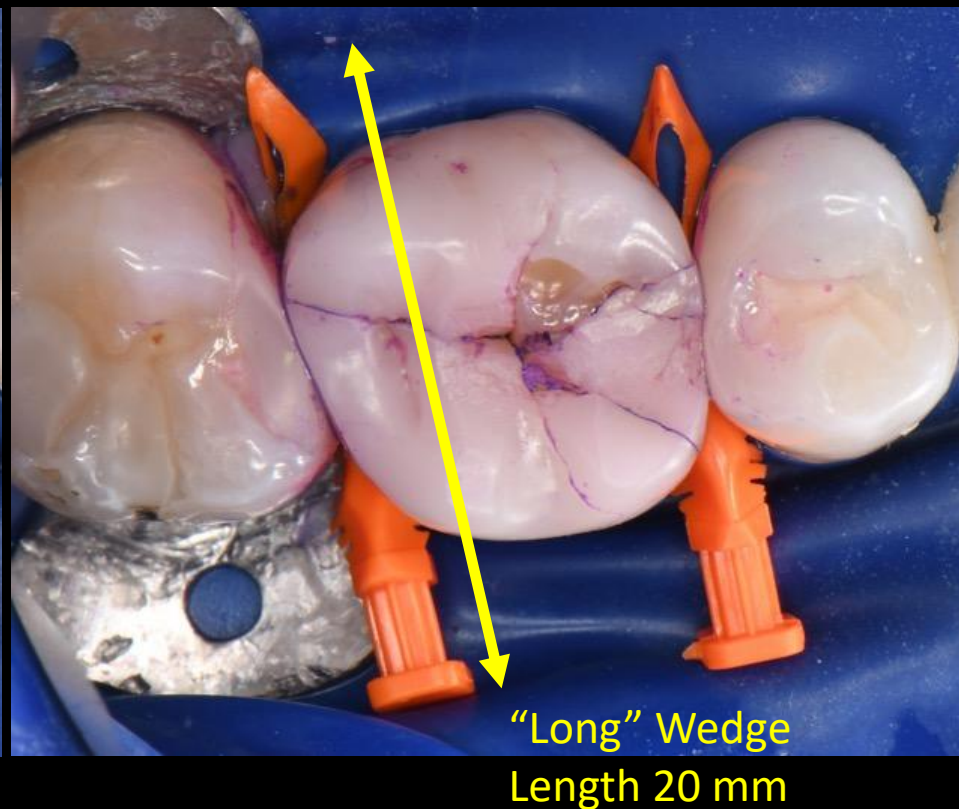
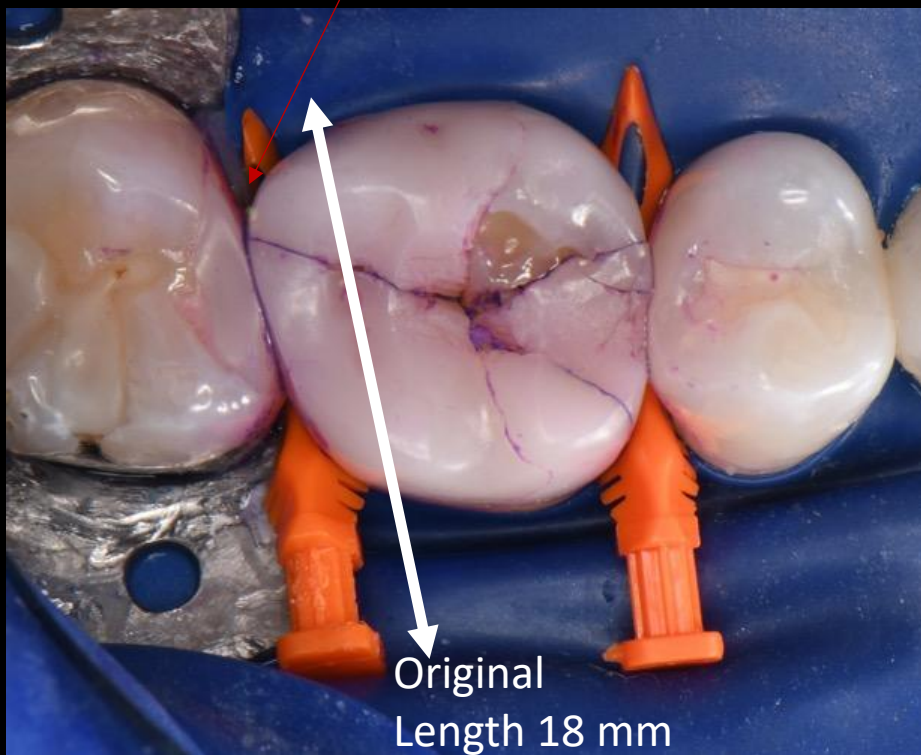




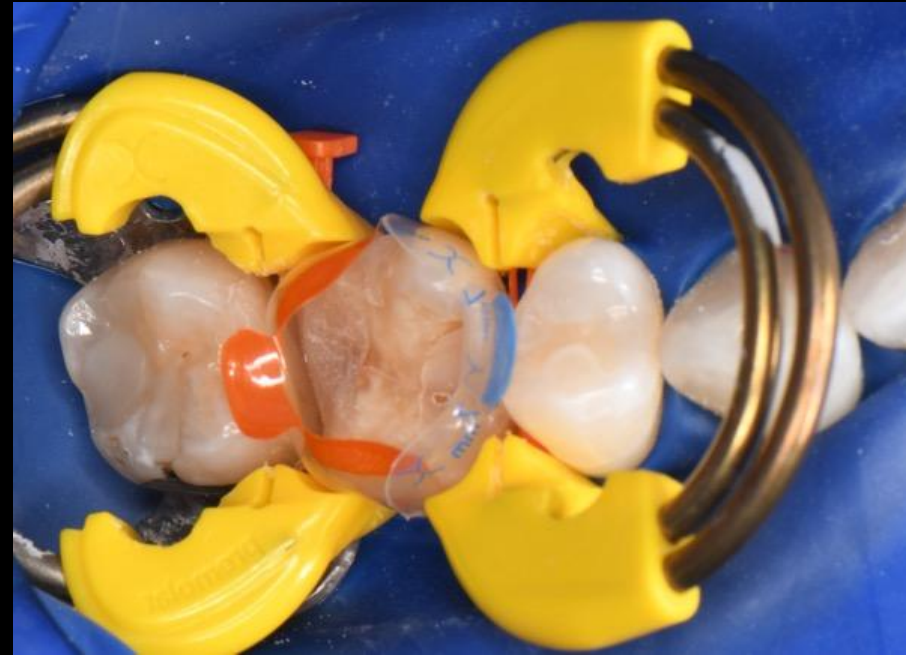




The new “Long Diamond Wedge” Available  
in all five Diamond Wedge shapes



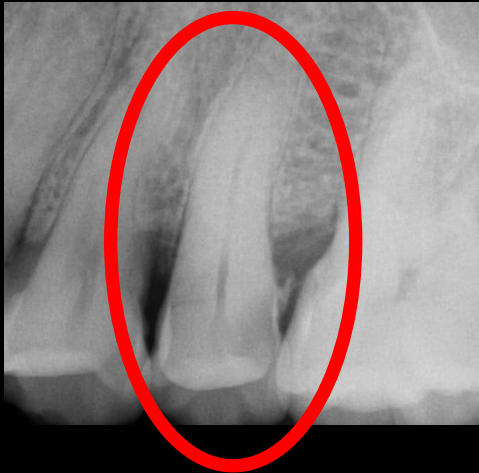






Arturo's first appointment:

- Flight Risk
- Chief Complaint – painful food impaction 13-14
- Limited Resources
- Not a good candidate for multi-appointment
- Calculus Removal took longer than the prep
- Little to no post operative pain
- SCR (Modified Hall): 0999 code \$175 add'l fee





### Wedging Strategy:

- Always pre-wedge
- Wedge “Nesting”
- Bottom wedge is small pink elevates the actual wedge
- Furcal “green” wedge

















# ∞ BIOCLEAR

## Stop by convention booth #14 to...

- ✓ Hear more about Bioclear courses
- ✓ Meet our team of Bioclear experts
- ✓ Order products
- ✓ Register for courses
- ✓ Learn why Bioclear is a BIG DEAL!



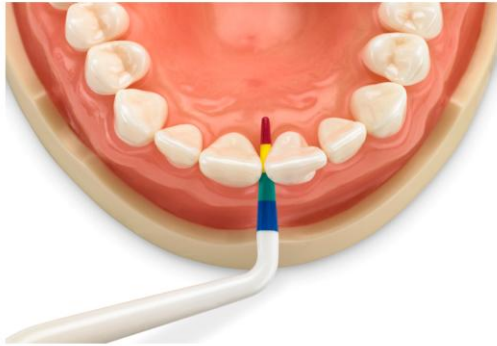
Treat yourself to a weekend with ∞ BIOCLEAR

# BLACK TRIANGLE

## CERTIFICATION COURSE

18 CE CREDITS

This three-part live hands-on certification course will teach you how to treat black triangles, gingival recession, root abrasions, and perform confident restorations. In becoming a certified Bioclear black triangle doctor, you'll increase your overall skill and knowledge of Bioclear and learn to market your new skills to patients.



### Upcoming Dates:

Denver  
October 9<sup>th</sup>  
2026

Walnut Creek  
August 21<sup>st</sup> 2026

*Limited spots available!*

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& sign up for your  
local BT Course!



**BEFORE**



**AFTER**



**BEFORE**



**AFTER**



## ∞ BIOCLEAR LEARNING CENTER

The Bioclear Learning Center aims to improve restorative outcomes and raise patient expectations of modern composite dental care by providing dentists with continuing education and certification in the practice of the Bioclear Method.

- The Learning Center is equipped with exclusive, patented Bioclear tools, equipment, and your own operatory setup
- Small class sizes with hands-on, interactive curriculum modules
- Online class options available at the convenience of your practice
- Operate a Tell, Show, Do education model
- Learn and understand the Five Pillars of the Bioclear Method

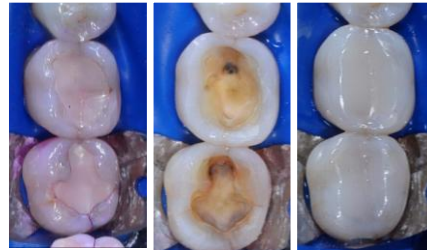
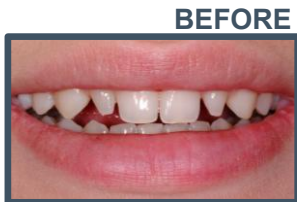
# 4-DAY CORE ANTERIOR & POSTERIOR COURSE

## 36 CE CREDITS

This course builds a strong foundation in the Bioclear Method and an understanding of Bioclear products. The focus of the course is indirect methods on adult dentitions as an alternative procedure to porcelain crowns and veneers.

Students will learn the foundation of posterior and anterior restorations and are introduced to the engineering principles involved in the design of the new non-retentive compression-based preps. Students collaboratively practice all applications of the Bioclear Method during intensive, hands-on exercises that simulate posterior and anterior restorations.

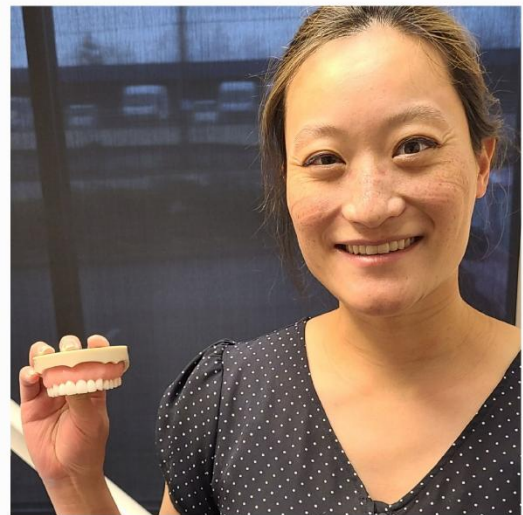
### LEARN MORE













# Last week's attendees at the certification course





# 2026 Certification Courses



- Core Anterior + Core Posterior • Complex Cases & Problem Solving
- Smile Design & Comprehensive Anterior Rejuvenation • Bioclear Alumni Summit

## January

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## February

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## May

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# 2027 Certification Courses



- Core Anterior + Core Posterior • Complex Cases & Problem Solving
- Smile Design & Comprehensive Anterior Rejuvenation

## JANUARY

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## FEBRUARY

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## NOVEMBER

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## APRIL

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## DECEMBER

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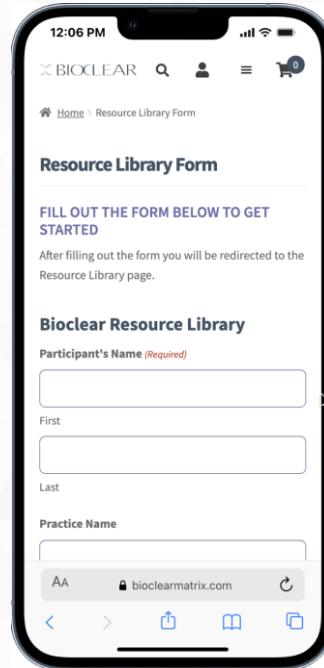
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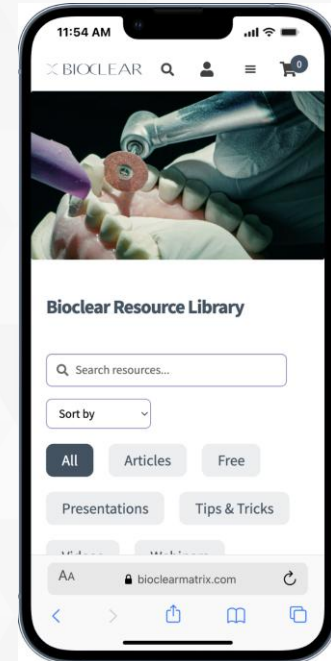
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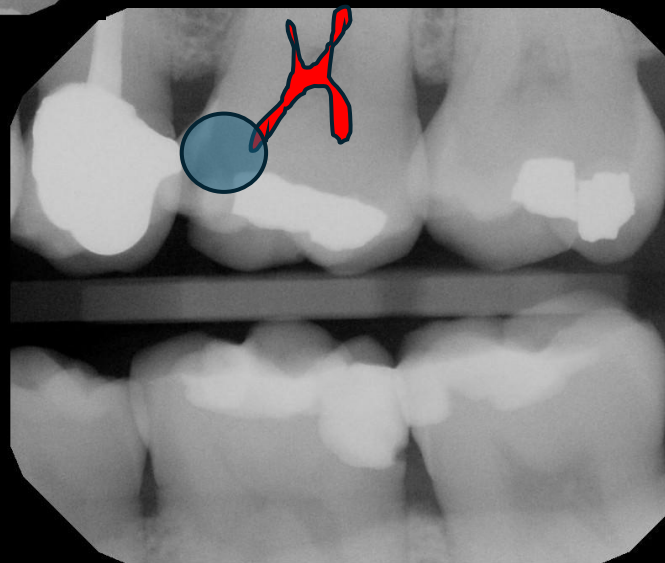
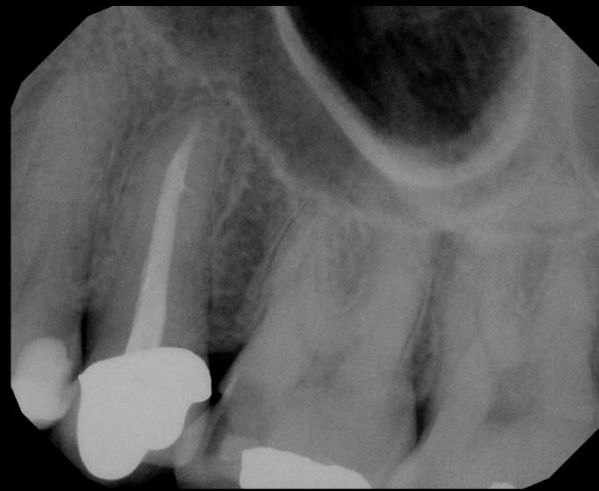
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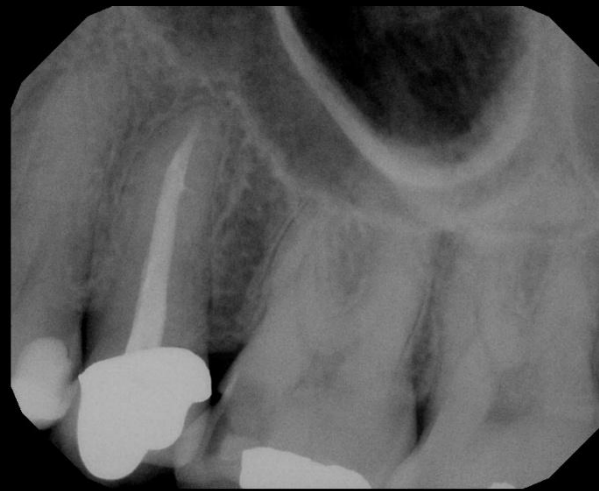




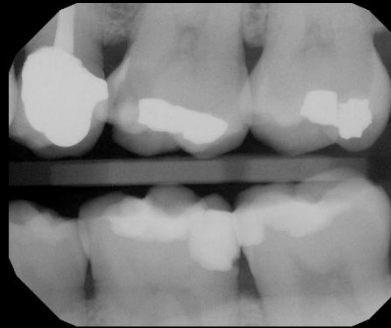
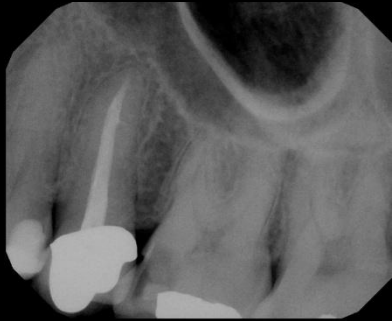
Dr. Rafael Bustamante  
Full Faculty at the  
Bioclear Learning enter







- Selective Caries Removal
- Calla Lilly Compression Based Cavity Preparation for a Cracked Tooth
- Deep Margin Acquisition
- Dealing with a Furcation



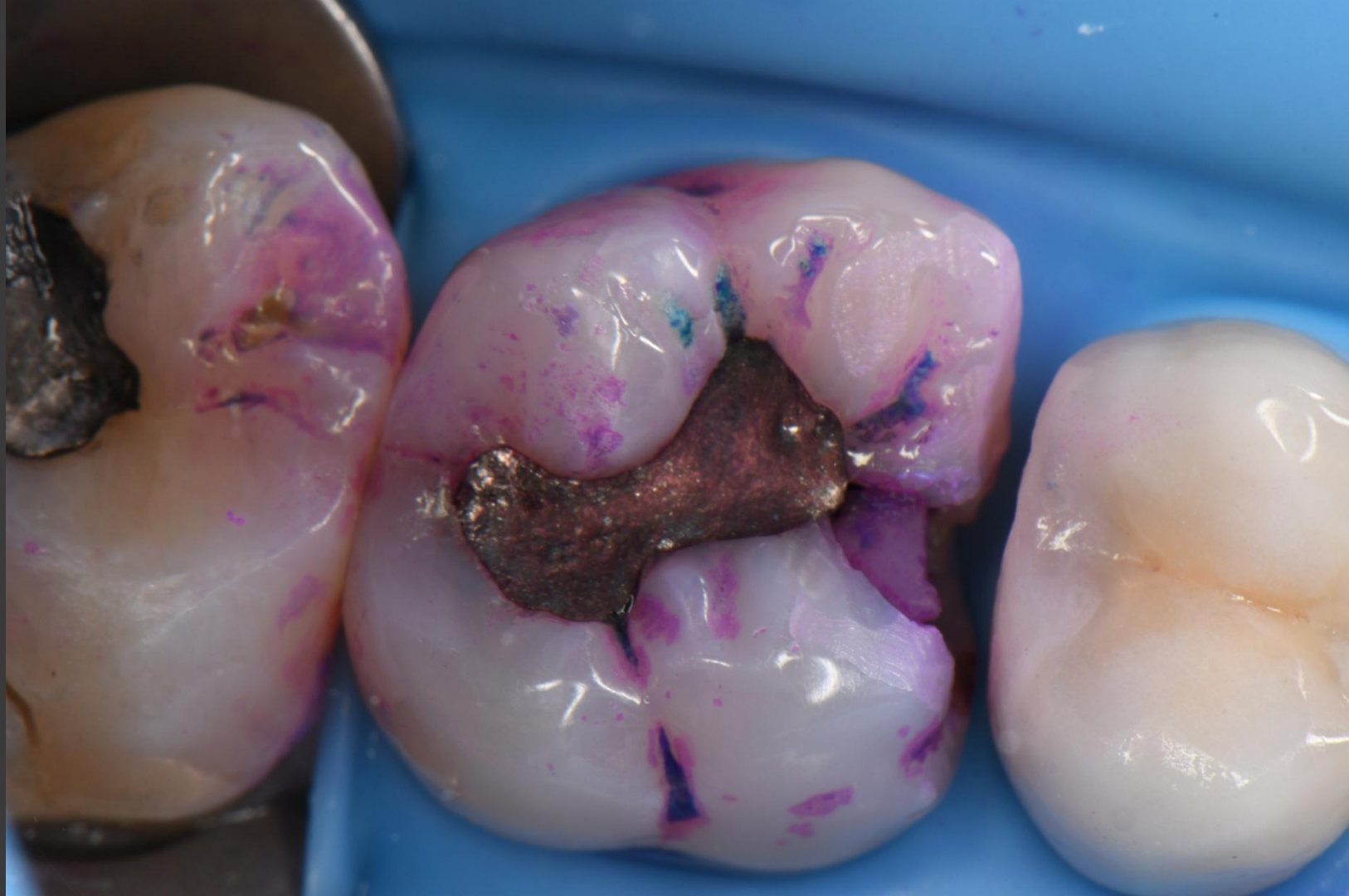
This is *Dr.*  
*Bustamante's* finger  
BTW

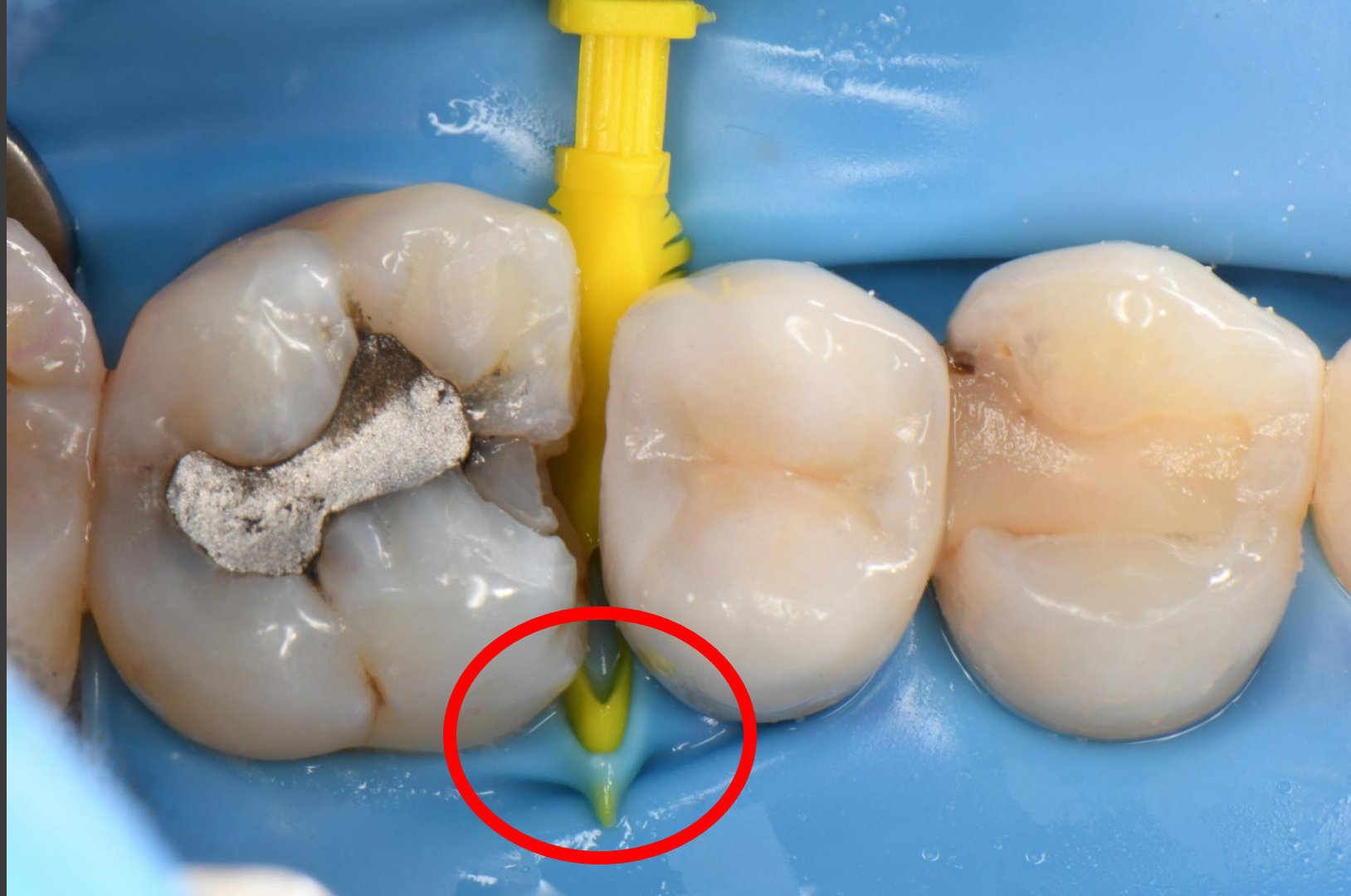




What changed between pre and post rubber dam photos?



















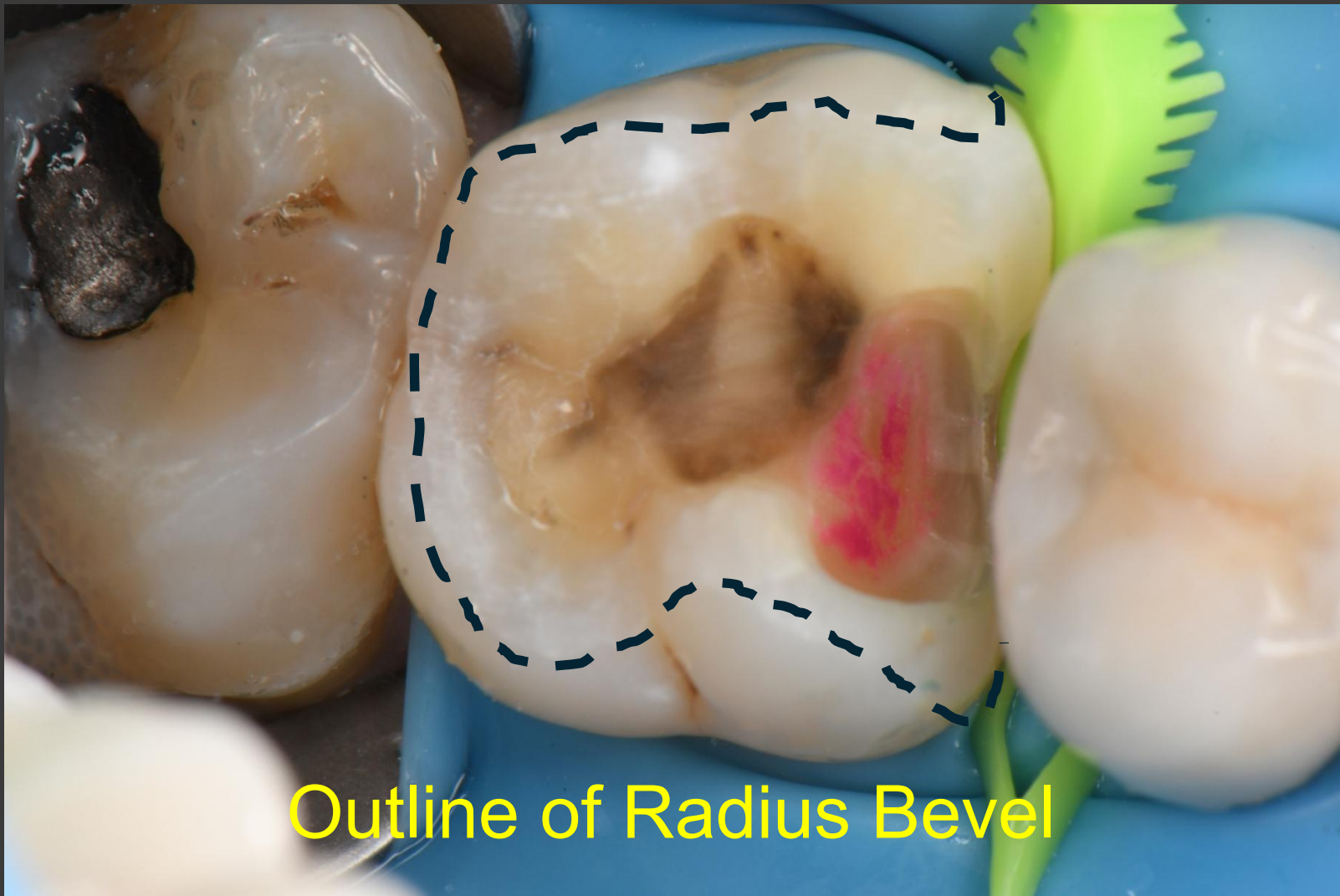
The new “Long Diamond Wedge” Available  
in all five Diamond Wedge shapes



Long (Double-Hump) Furcal Wedge







Outline of Radius Bevel

Before Blasting

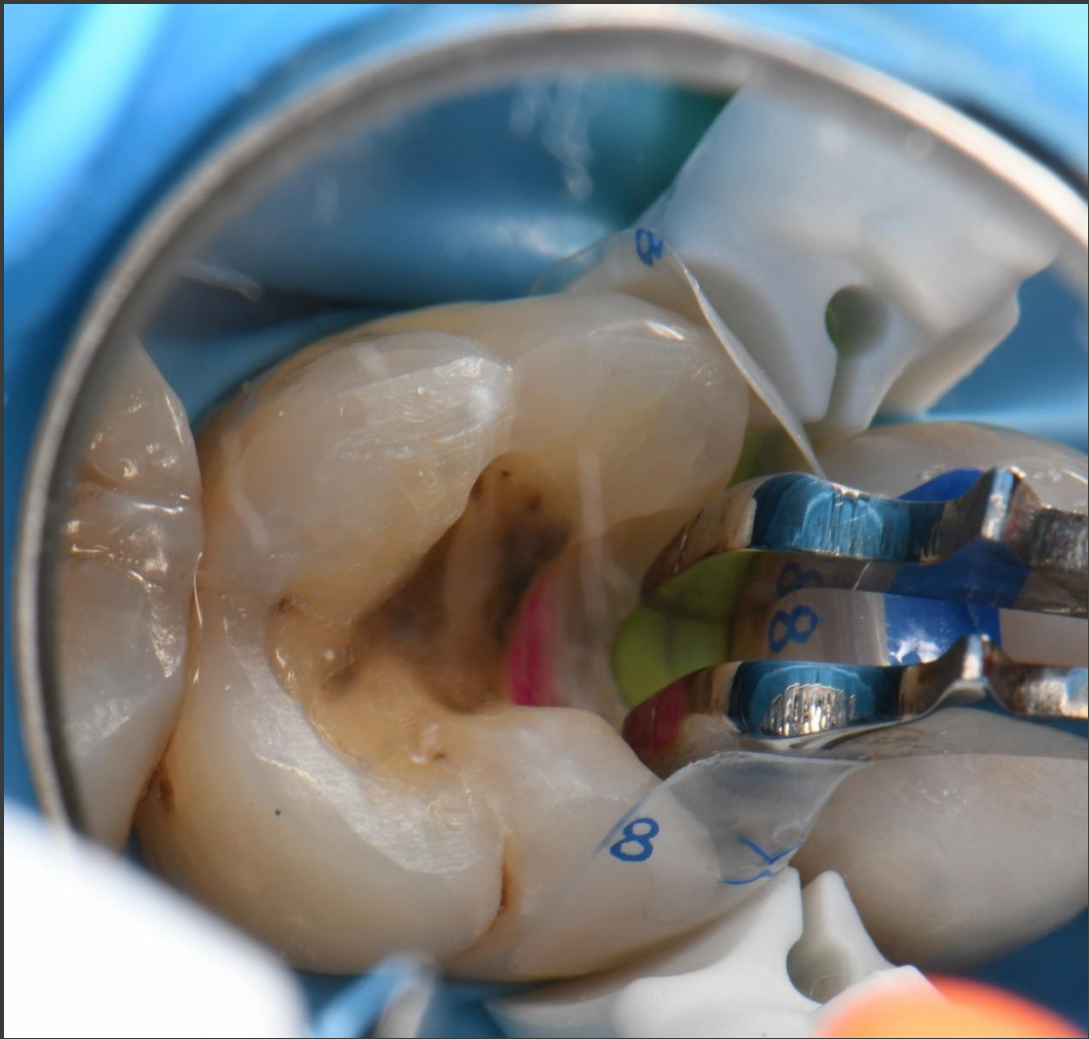


After Blasting and Final  
Radius Beveling



















## 8 keys to ideal contacts with Injection Molding

- ✓ Change the Prep
- ✓ Pre-wedging
- ✓ Choose the correct matrix height
- ✓ Optimize the neighboring contact
- ✓ Progressive wedging
- ✓ Place separator like a rubber dam clamp
- ✓ Spot Weld Push/Pull.. Rehearse first★
- ✓ Quadrant Strategy Do the unilateral contact last



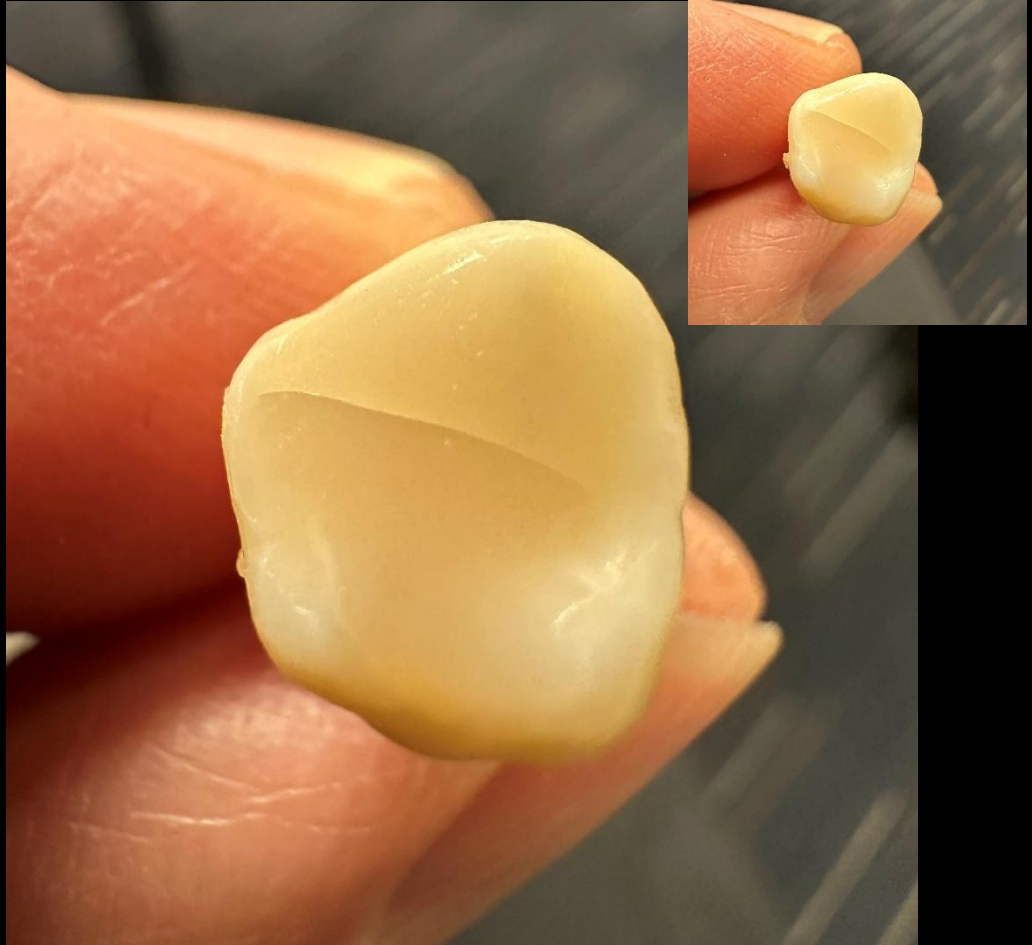


YIKES!!

GC “Bulk Injectable”

## Discussion:

Polymerization shrinkage stress and cuspal deflection is very real but challenging to explain



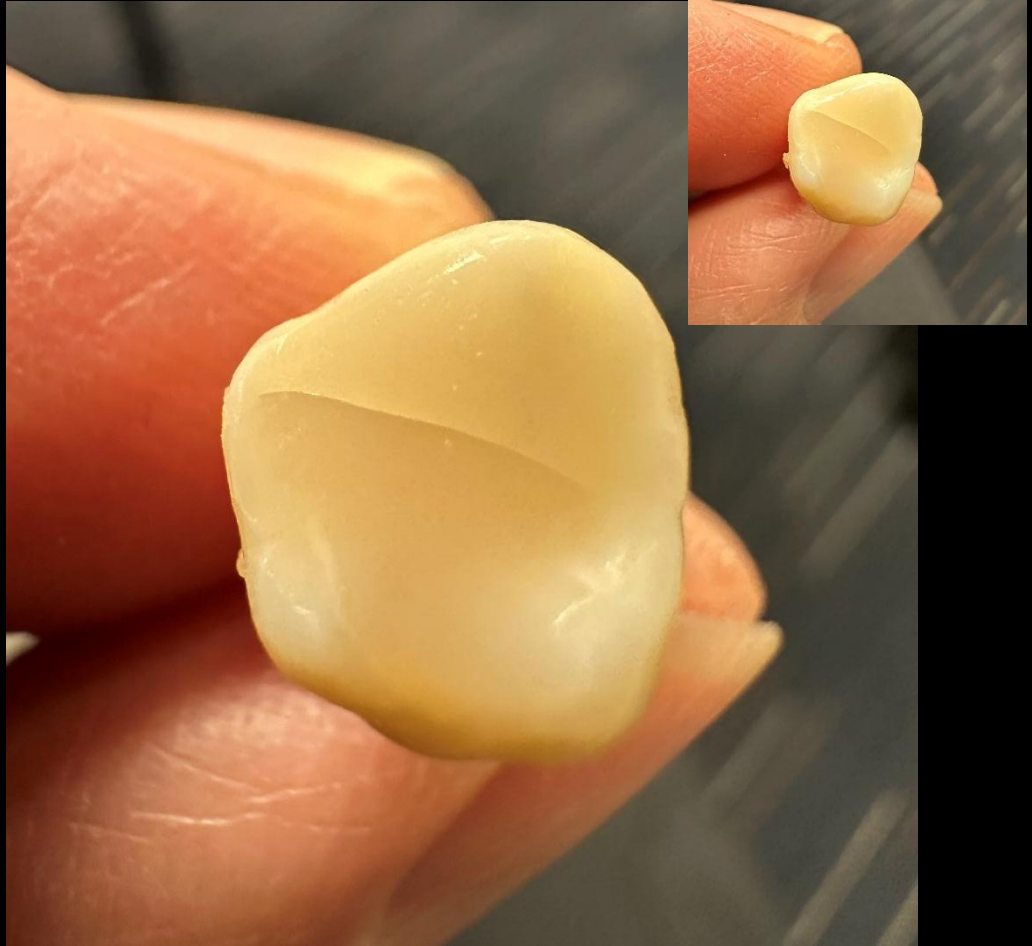
## Discussion:

The volume of composite, and residual strength of the tooth are key players. If half of tooth is missing, ie there is a good sized hole in the occlusal or interproximal, we are recommending Filtek One (bulk fill paste) plus Filtek bulk flow.



## Discussion:

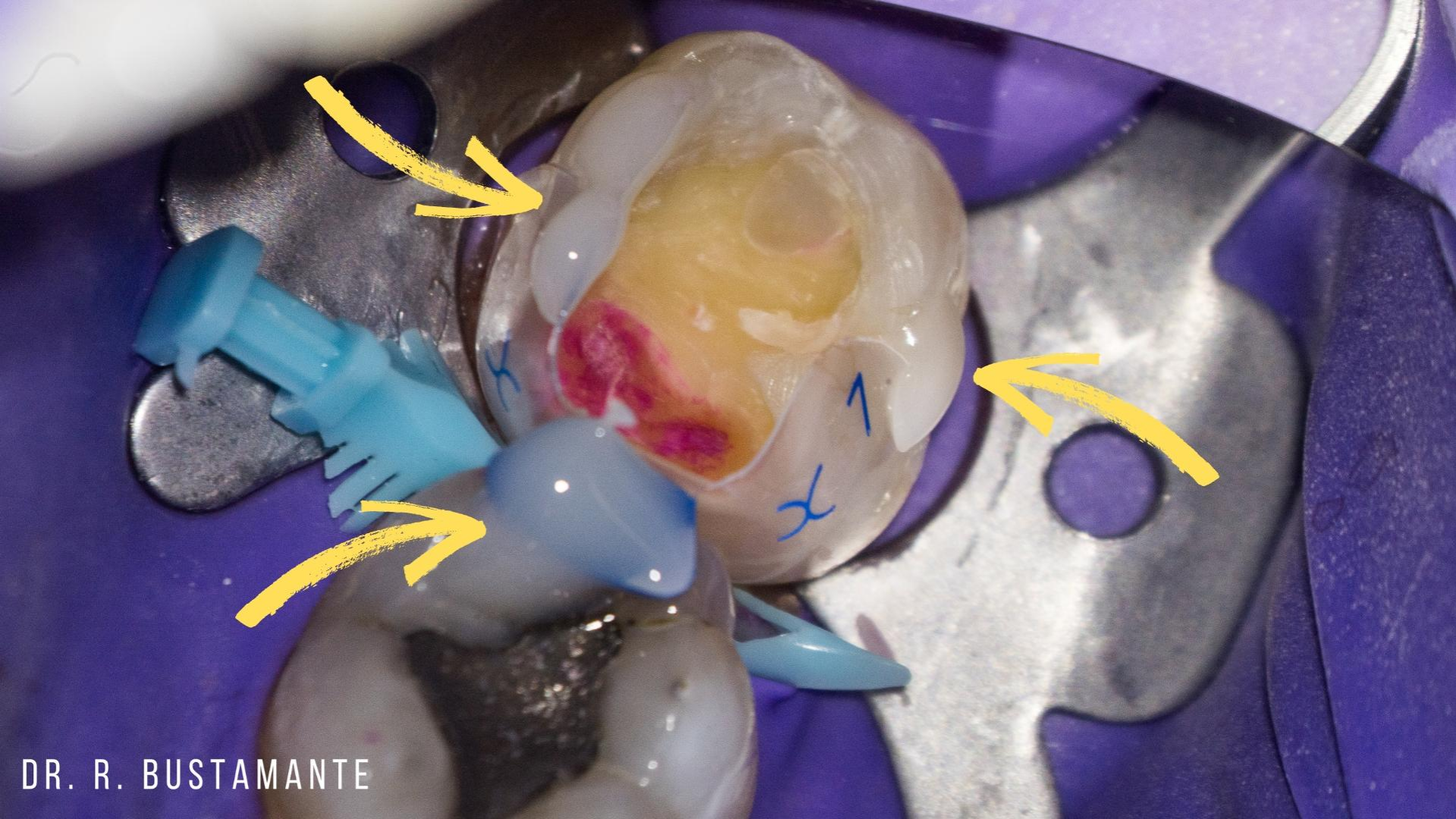
Unless it's a tiny Class II  
You need the Rock Stars:  
**Filtek One Paste and  
Bulk Flow together**







DR. R. BUSTAMANTE

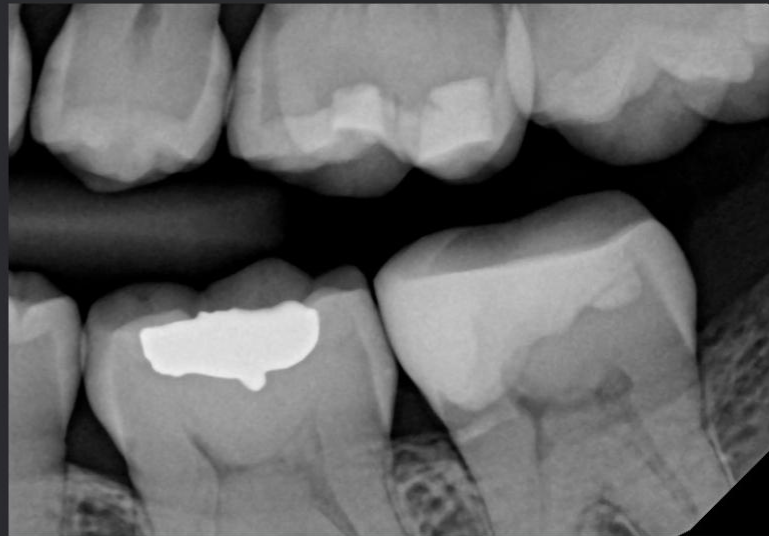


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Before



After





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DR. R. BUSTAMANTE



DR. R. BUSTAMANTE



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DR. R. BUSTAMANTE



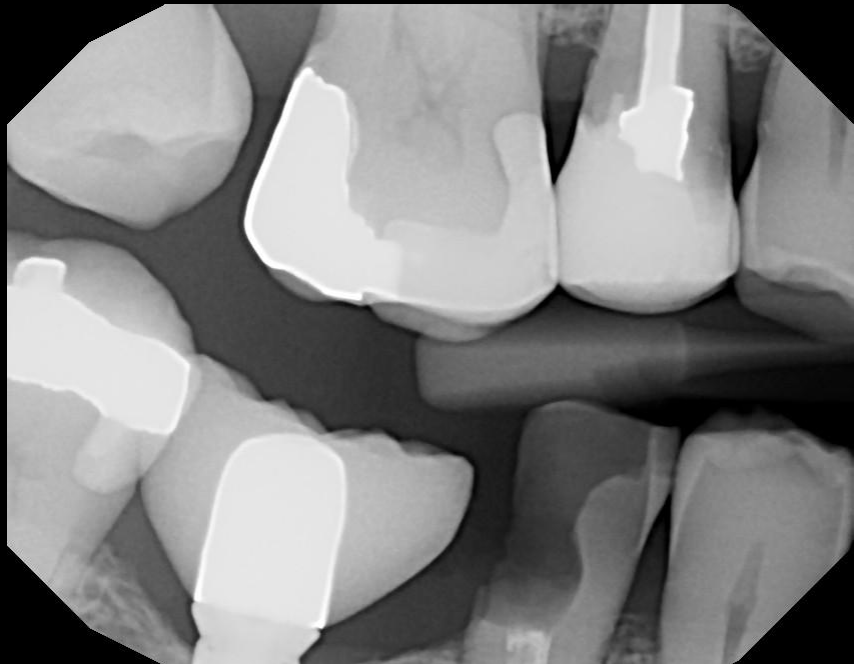
DR. R. BUSTAMANTE



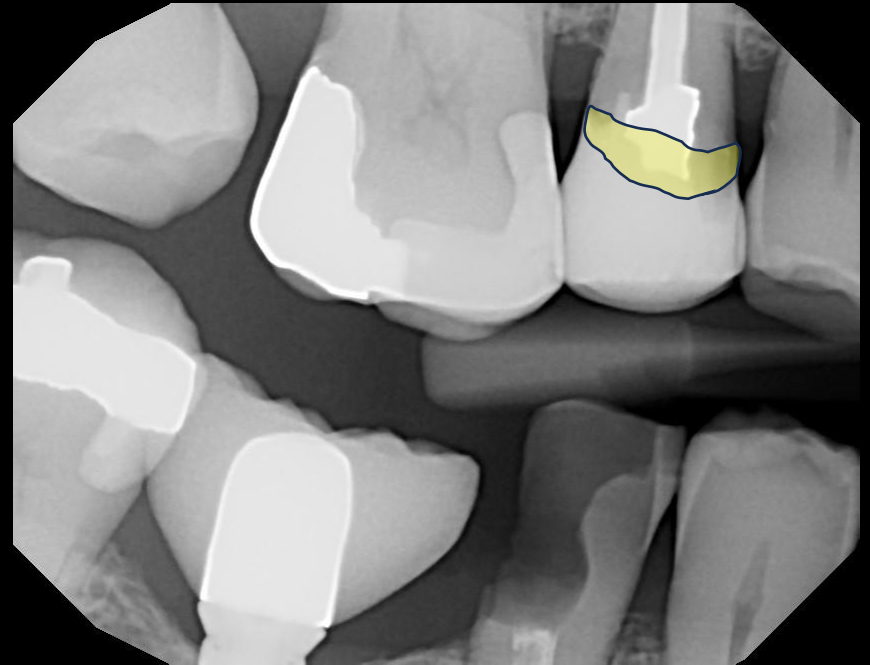
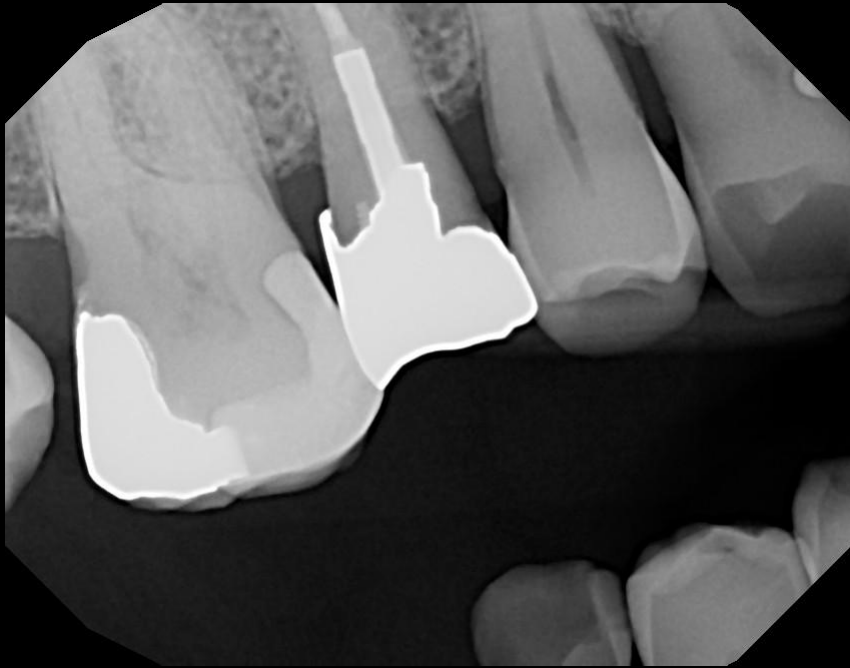
DR. R. BUSTAMANTE



DR. R. BUSTAMANTE



# Bioclear Additive Ferrule



# 16-MONTH FOLLOW-UP





3M™ Filtek™ One  
Bulk Fill Restorative

# Scientific presentation

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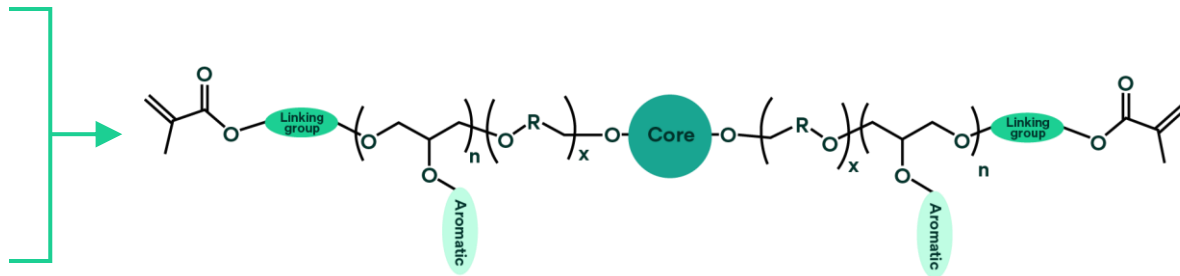
# Technology



# Innovative methacrylate monomers for lower shrinkage and proven stress relief

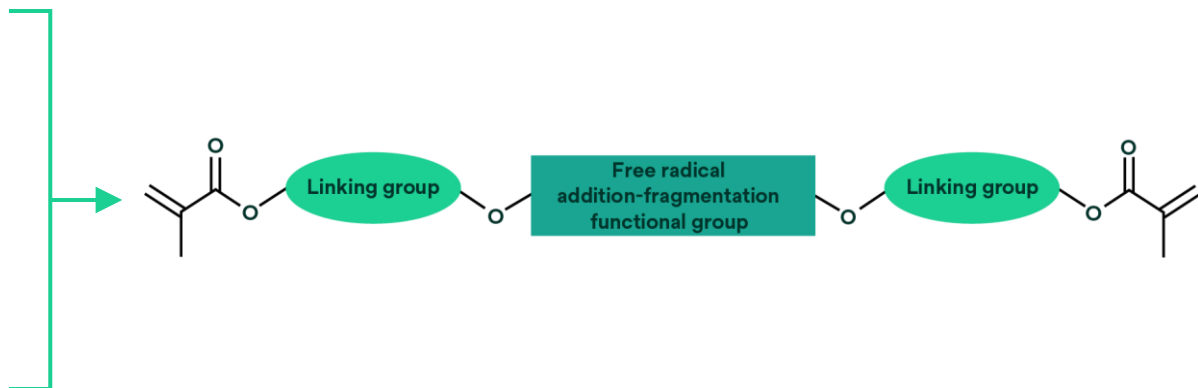
## AUDMA: Aromatic urethane dimethacrylate

- Higher molecular weight with less number of reactive groups
- Moderates volumetric shrinkage
- Contributes to stress reduction



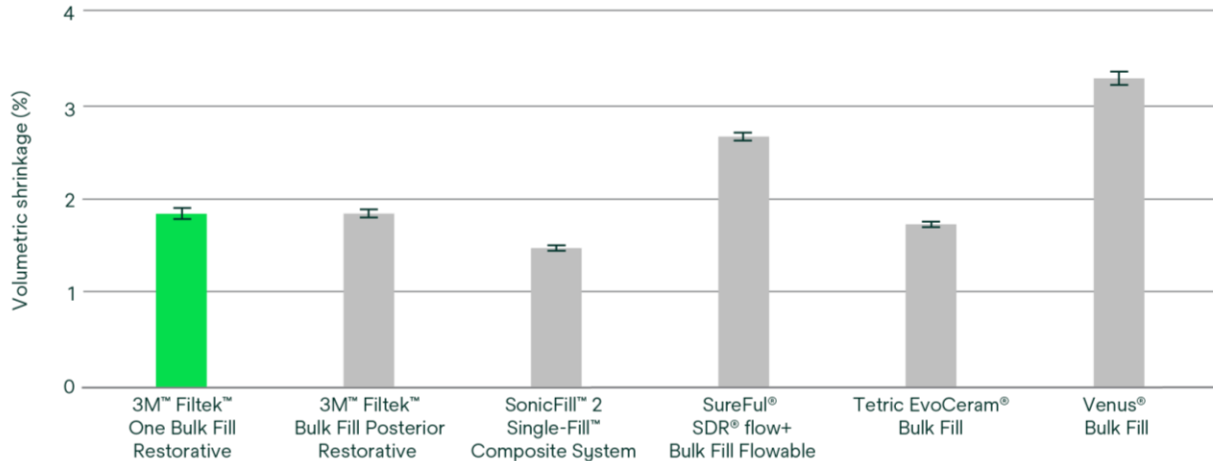
## AFM: Addition-fragmentation (AF) monomer

- Reacts into developing polymer network through terminal methacrylate bonds like other dimethacrylate monomers
- Central AF group can fragment and release stress
- Fragment may then polymerize into network in a lower stress orientation compared to its pre-fragmented state



# Polymerization shrinkage

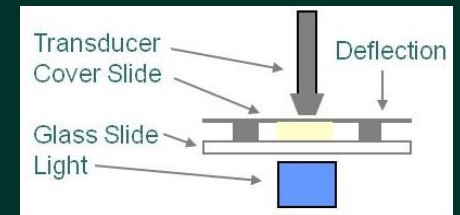
Comparison of common bulk fill composites



Source: Solventum Internal Data

## 3M™ Filtek™ One Bulk Fill Restorative

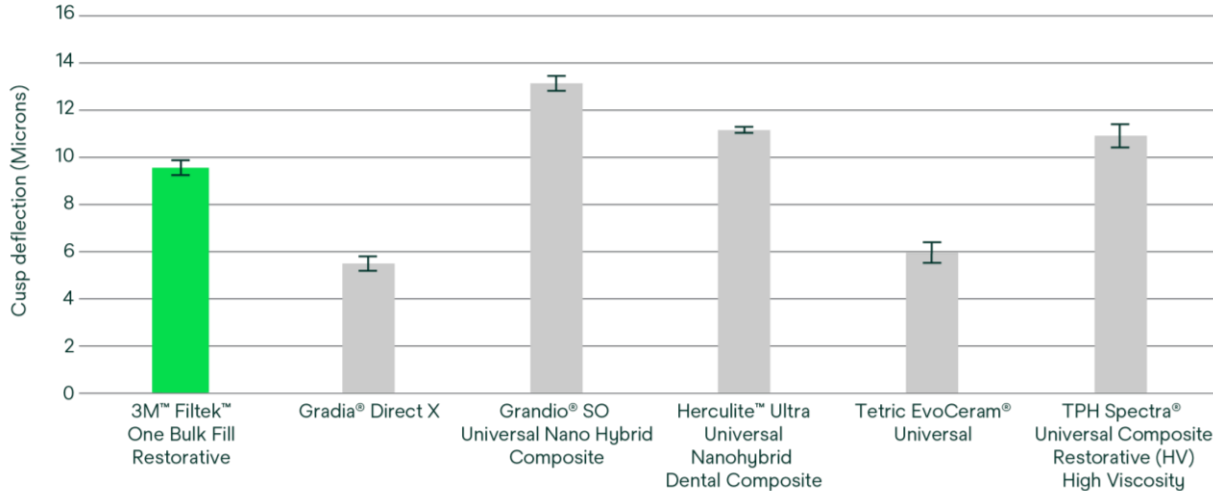
is equivalent to 3M™ Filtek™ Bulk Fill Posterior and has lower polymerization shrinkage than Venus® Bulk Fill, Surefil® SDR® Flow +.



Bonded disc method

# Polymerization stress

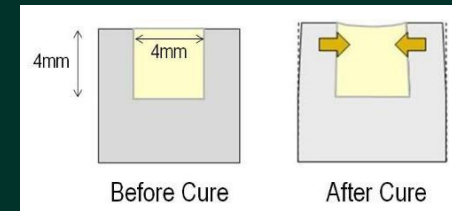
Comparison of common universal composites



Source: Solventum Internal Data

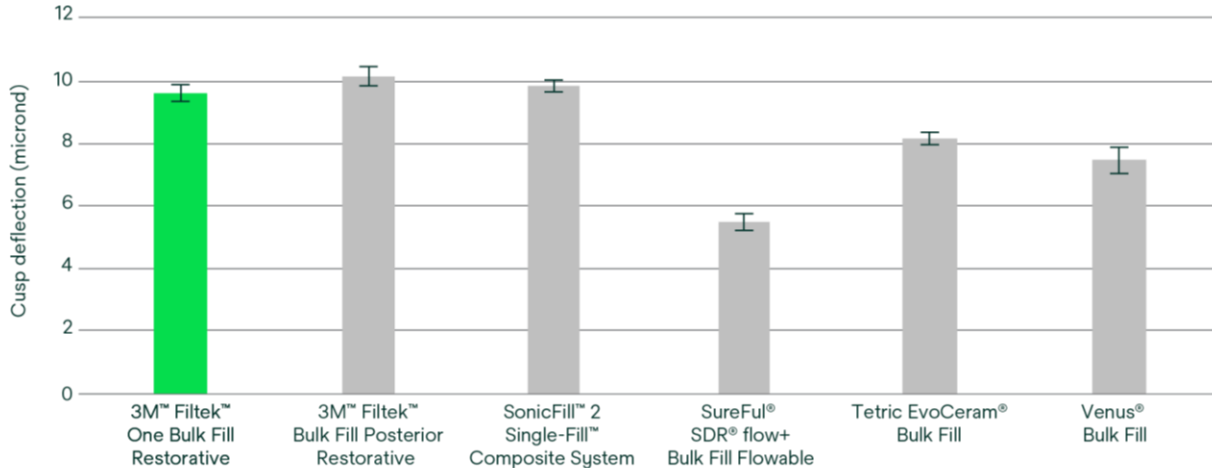
## 3M™ Filtek™ One Bulk Fill Restorative

has similar polymerization stress when placed in bulk compared to many of the universal materials that are placed in increments.



# Polymerization stress

Comparison of common bulk fill composites



Source: Solventum Internal Data

**3M™ Filtek™ One Bulk Fill Restorative**

has similar polymerization stress compared to 3M™ Filtek™ Bulk Fill Posterior Restorative and SonicFill™ 2.

