



Modern Composite Dentistry Toronto Crown and Bridge Study Club 2025

David Clark DDS Tacoma WA

featuring

 BIOCLEAR

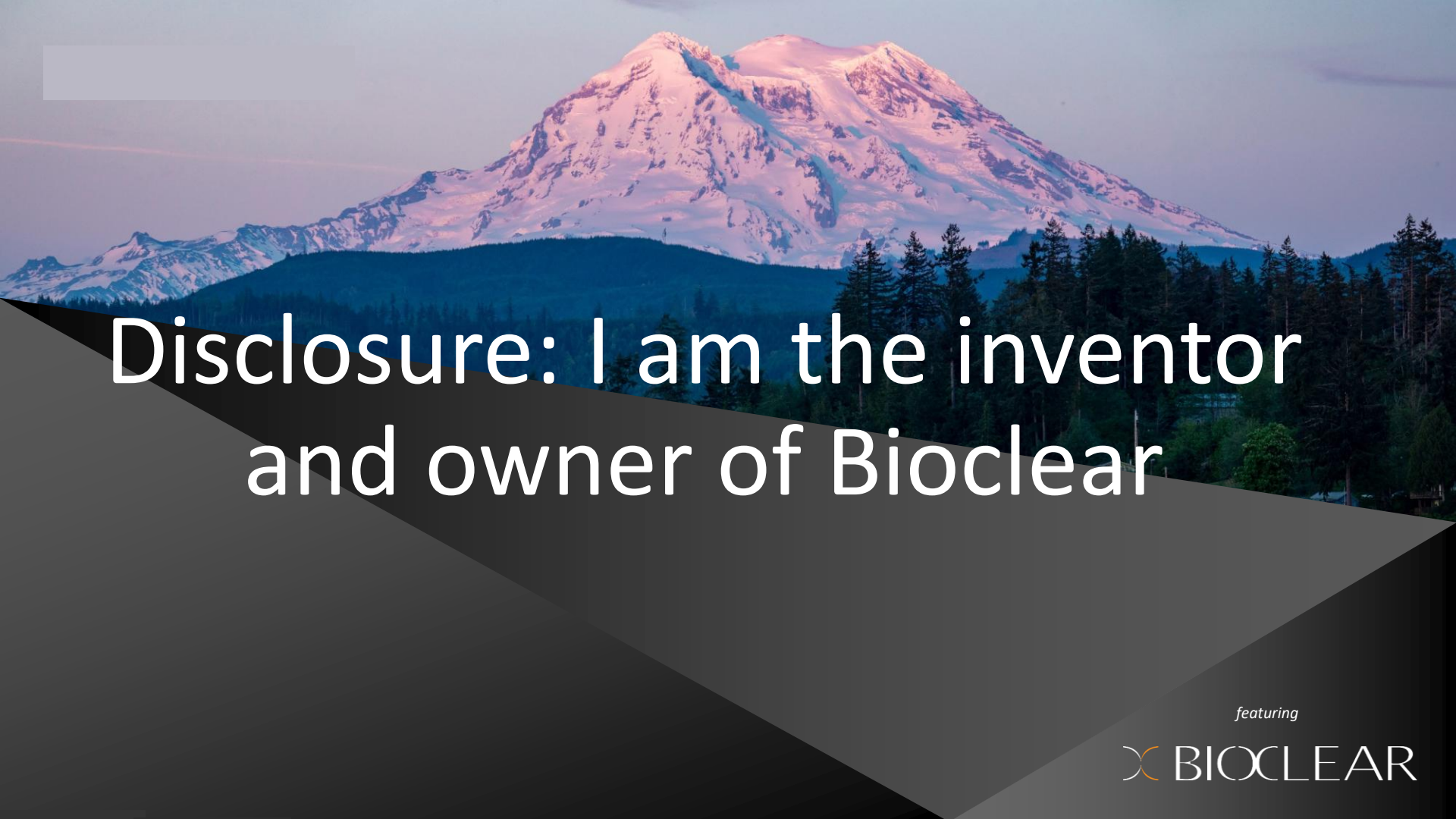


BIOCLEAR LEARNING CENTER

Tacoma USA · Solihull UK
Varberg Sweden · Cairo Egypt
Syracuse Italy · Taubate Brazil
Livermore CA (Bioclear pediatrics)
Seoul Korea · Madrid/Barcelona
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For a copy of today's presentation,
Learning Center info or the essential
Bioclear Library, email us at:

lectures@bioclearmatrix.com

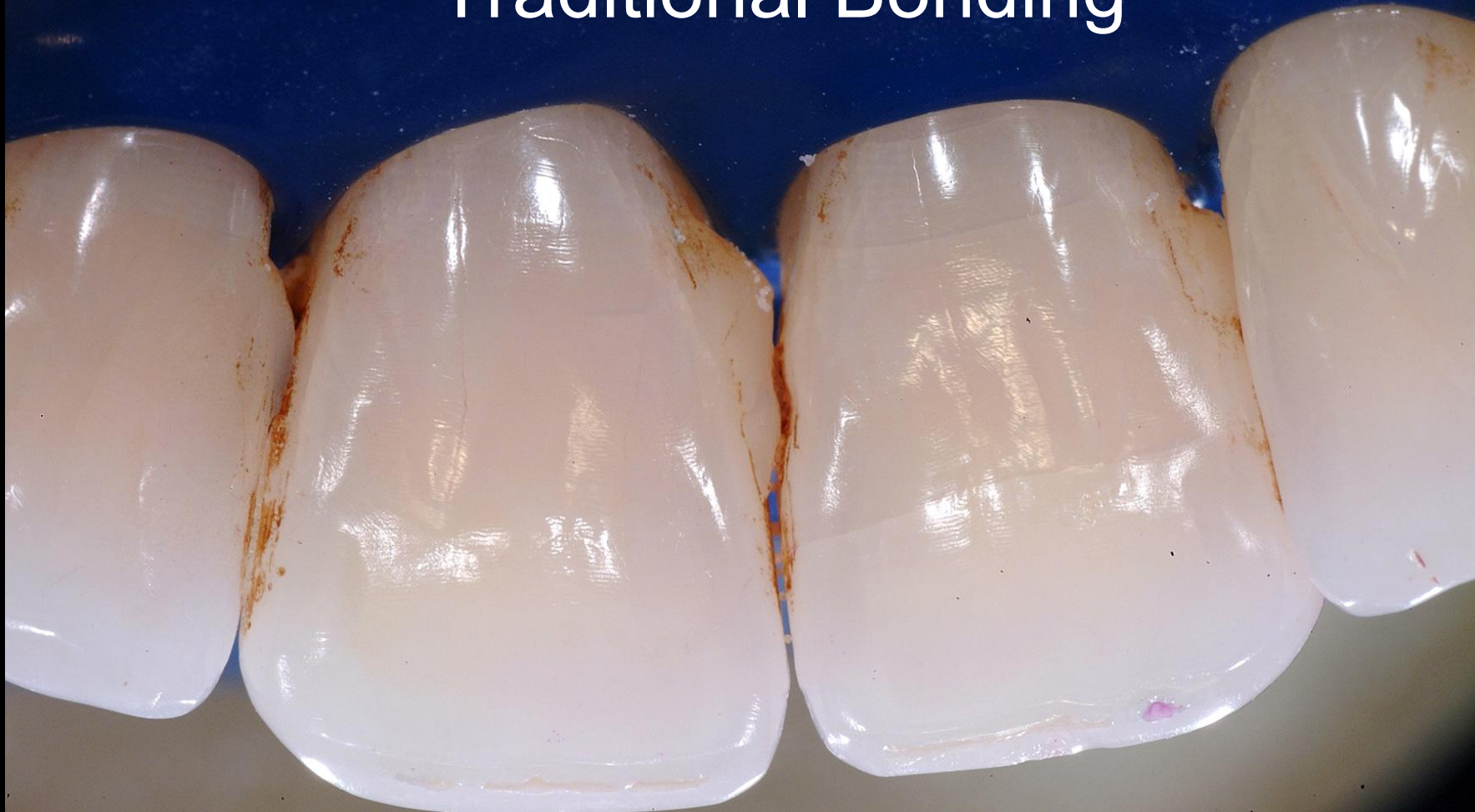


Disclosure: I am the inventor
and owner of Bioclear

featuring

 **BIOCLEAR**

Traditional Bonding



Bioclear Method



The Matrix and the Method Matter



Modern Method for Composite Restorations

Clear Anatomic Matrices

- Anterior & Posterior Matrices designed to mimic nature

Preparation Design

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

Biofilm Removal

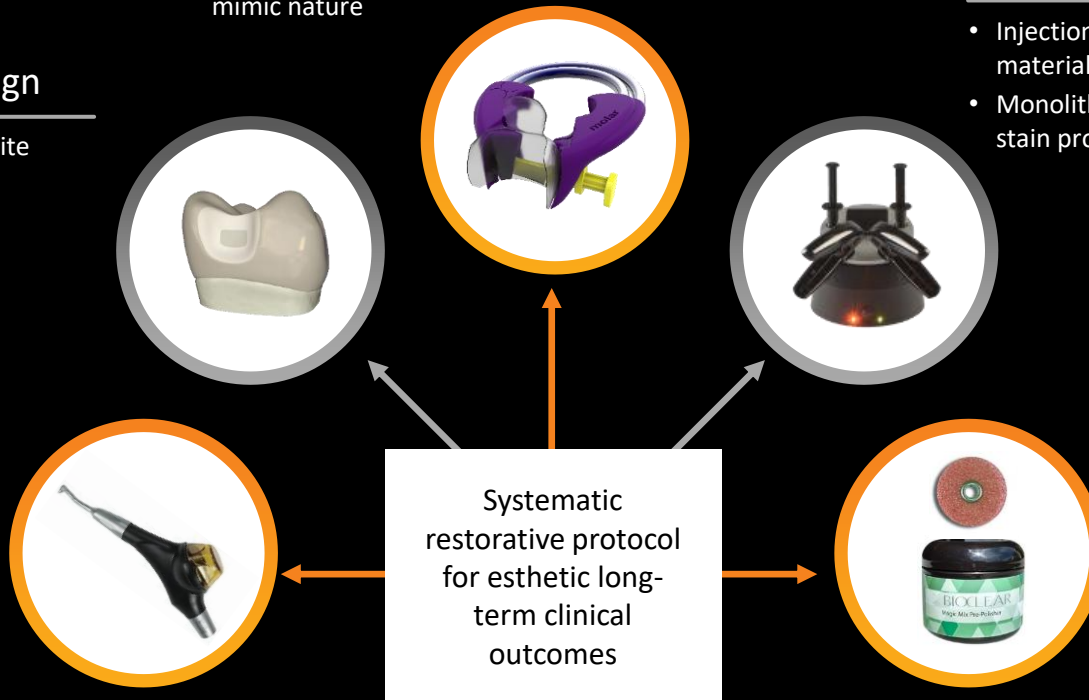
- Remove biofilm before bonding
- Allows bonding to uncut enamel
- Allows infinity edge margins

Injection Molded Composite

- Injection mold warmed Restorative materials
- Monolithic strength and Infinity Edge stain proof margins

Final Polish

- “Rock Star” polish with Bioclear Magic Mix & RS Polisher



Meet Erica: 35-year-old female
finishing her 2nd round of orthodontics



Erica just finished her ortho and she's not happy



What are Erica's chief complaints?



What were the options given when she complained to her orthodontist?



What was the TX Plan when she got back to her
General Dentist?



What were the TX Plans when she consulted with the periodontist?



➤ Bioclear can fix almost everything if you follow the method



- Take photos from a lateral view. The patient doesn't see this (but everyone else in the room does)





➤ Gauge the triangle space **before** the rubber dam









- “Aquarium” matrices and “Shield” matrices











Pre-Operative



1-Year Post-Operative



Pre-Operative



1-Year Post-Operative



Pre-Operative



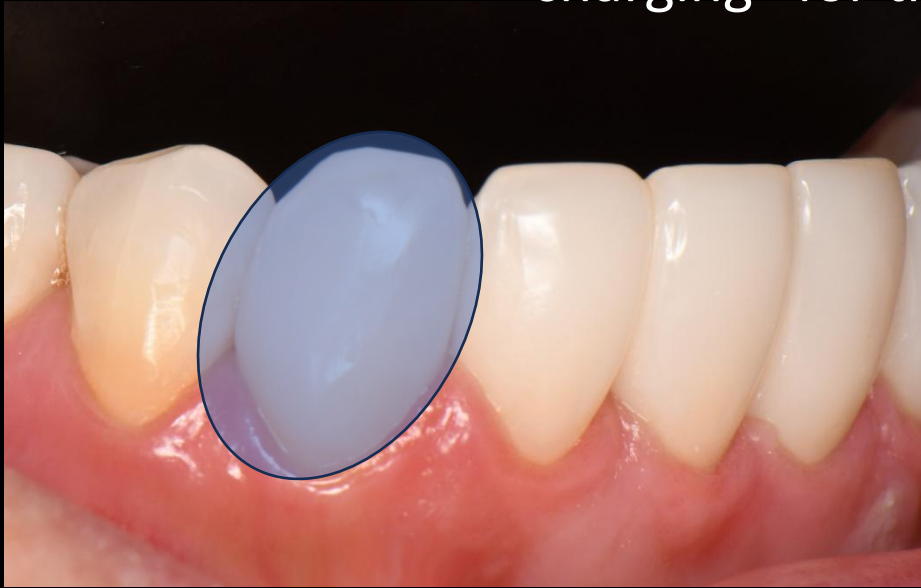
1-Year Post-Operative



If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area



If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area

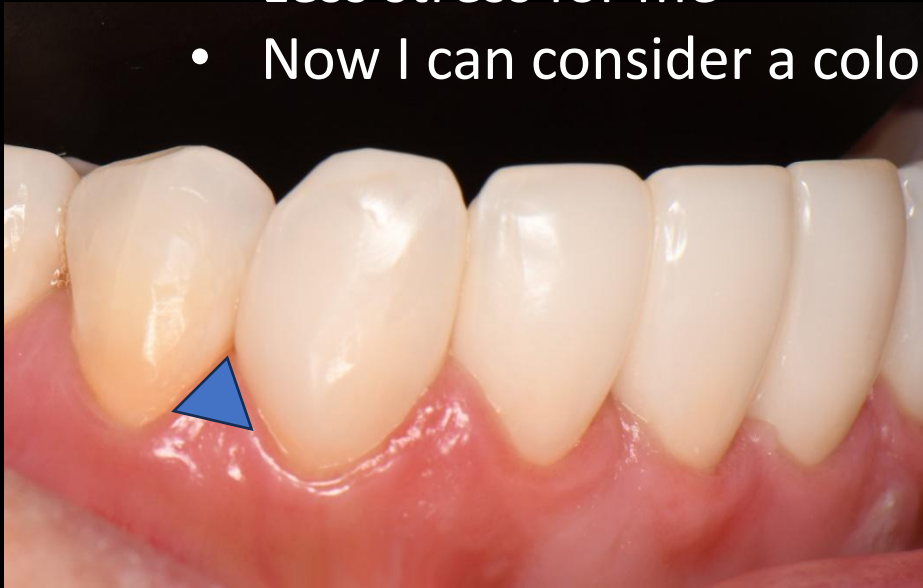


If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area



Why cover the WST (Whole Stinking Tooth)

- Easier than marginating
- Less stress for me
- Now I can consider a color upgrade



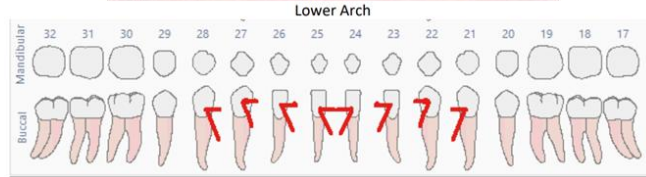


CLINIC

3402 South 38th Street, Tacoma, WA 98409
O: 253-474-7635 E: Patient@BioclearClinic.com

Date: 03-08-2021

Patient Name: Erica
Consultation Date: 03-08-2021
Treating Doctor: David Clark



Appointment time required to complete treatment One Day: 7am to 4pm with 10 day follow appointment.

- **Lunch and Breaks:** We provide a protein liquid drink for lunch. Be sure to eat breakfast prior to appointment. You will receive breaks to rest your jaw and use restroom.
- **Night Guard:** To protect your Bioclear restorations. Requirement for 5 yr. warranty of restoration. REFERRED: Night guard to be fabricated by your local dental provider.
- **Whitening Tray Options:** 1 Kit: (Kit include: custom upper and lower trays and bleach) Following Bioclear restoration placement for take home maintenance. Cost: \$250

Tooth #	Description	Fee
Comprehensive Evaluation: complete oral evaluation, color, size determination, photos.		
•	Bioclear Comprehensive Evaluation	\$289

Bioclear Black Triangle: To close negative space between teeth and rejuvenate tooth to youthful appearance.
Tooth # 21/22, 22/23, 23/24, 24/25, 25/26, 26/27 Bioclear Black Triangle Closure Multiple \$1,200 per Bioclear Black Triangle Closure.


Erica, you have the option to complete 5 or 7 Black Triangle Closures.

5 Black Triangles
7 Black Triangles :

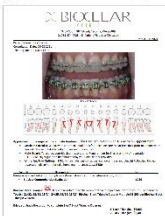
\$4,000 - \$8,000

\$5,600-\$11,200

- **Lunch and Breaks:** We provide a protein liquid drink for lunch. Be sure to eat breakfast prior to appointment. You will receive breaks to rest your jaw and use restroom.
- **Night Guard:** To protect your Bioclear restorations. Requirement for 5 yr. warranty of restoration. REFERRED: Night guard to be fabricated by your local dental provider.
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5 Black Triangles \$4,000 - \$8,000
7 Black Triangles \$5,600-\$11,200

“David please don’t just show us a bunch of before and after photos.”

Tell us HOW to do your method”

Key Takeaways from Erica's case:

- Use a shield matrix or shield matrices when possible
- What's a shield matrix?
- What are aquarium matrices
- Doing the whole tooth is easier than half a tooth
- The "flowable clamp" for anterior rubber dams
- Use very small hole punch on your rubber dam



Pre-Operative



1-Year Post-Operative



Key Takeaways from Erica's case:

- Remove the matrix/matrices after injection molding before you move on to achieve a tighter contact
- You don't want or need a shield matrix on a tooth once you have injection molded (same principal as above, to get tighter contacts)
- We will utilize this principal when we talk about quadrant strategy for Class II restorations later



Decision Fatigue

Checklist Manifesto

Treating a Single Black Triangle























2-year follow up



2-year follow up

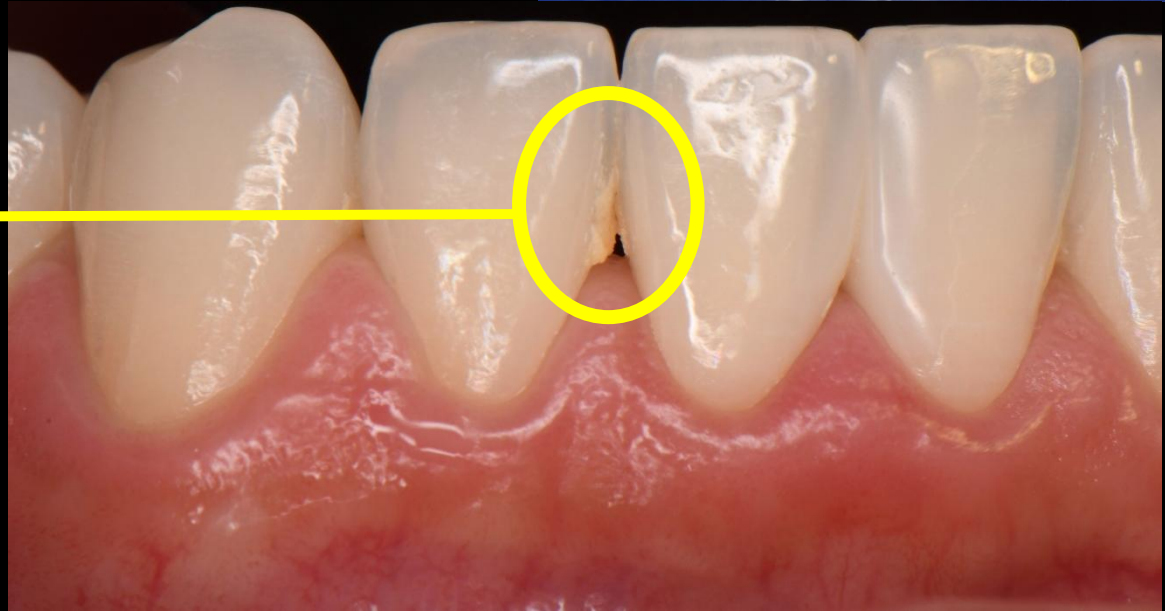


2-year follow up

➤ The new Bioclear BT matrices have a specific shape i.e. shoulder blades that deflect bacterial accumulation



unrestored



➤ The new Bioclear BT matrices have a specific shape i.e. shoulder blades that deflect bacterial accumulation



Injection over -
molded





The
BACHELOR  **RETTE**



The BACHELORETTE

The Bachelorette is a hugely popular American reality dating show where one woman dates about 25 men, eliminating them each week until she chooses a final partner—often ending in a proposal. It's a cultural staple in the U.S., famous for its romance, drama, and devoted fanbase.



The
BACHELOR  **RETTE**



Black triangle closure for
[@TaylorPaul](#)


TikTok
@drjamesheaton



The
BACHELOR  **RETTE**

Season 21 averaged
2.39 million viewers
per episode.



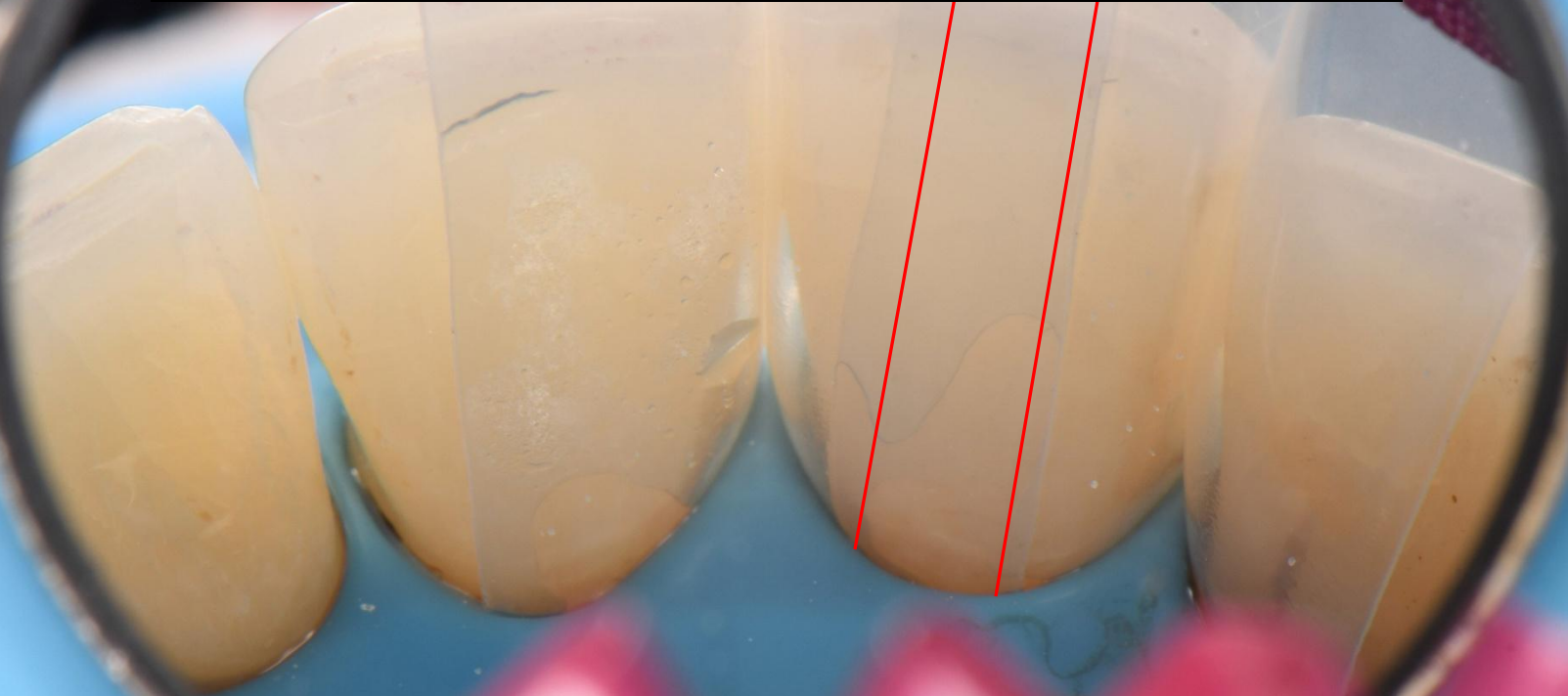
A recent Black Triangle patient that flew from
Boston to Seattle for treatment







Ideally, we want 2-3 mm overlap of matrices on lingual and about 1 mm of overlap on the facial

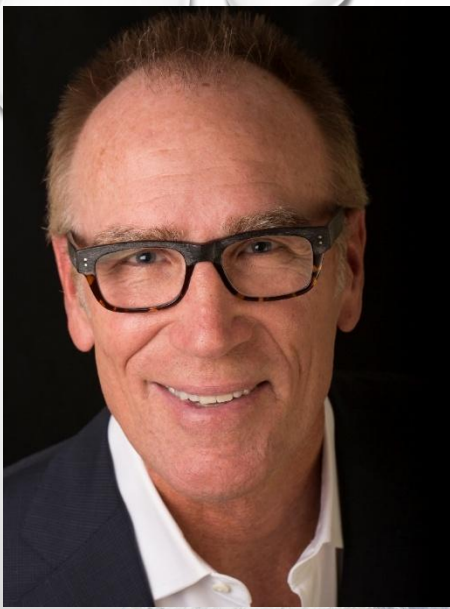












Bioclear Cases 5 Year and 4 Year
Post-ops
Untouched-NO refresh
on either case
Majesty ES Classic and Flow

@dr.young.aesthetics

@dr.young.aesthetics





@dr.young.esthetics



9-28-2021

@dr.young.esthetics



9-28-2021

2 years p/o



@dr.young.esthetics

A close-up photograph of the upper front teeth (incisors) showing the result of a dental procedure 4 years post-operation. The teeth are bright white and appear healthy. The central incisors are slightly rotated inward, and the lateral incisors are slightly rotated outward, creating a balanced smile. The gingiva (gums) is pink and appears healthy. The text "4 years p/o" is overlaid in the center of the image.

4 years p/o

@dr.young.esthetics

@dr.young.esthetics



@dr.young.esthetics



@dr.young.esthetics

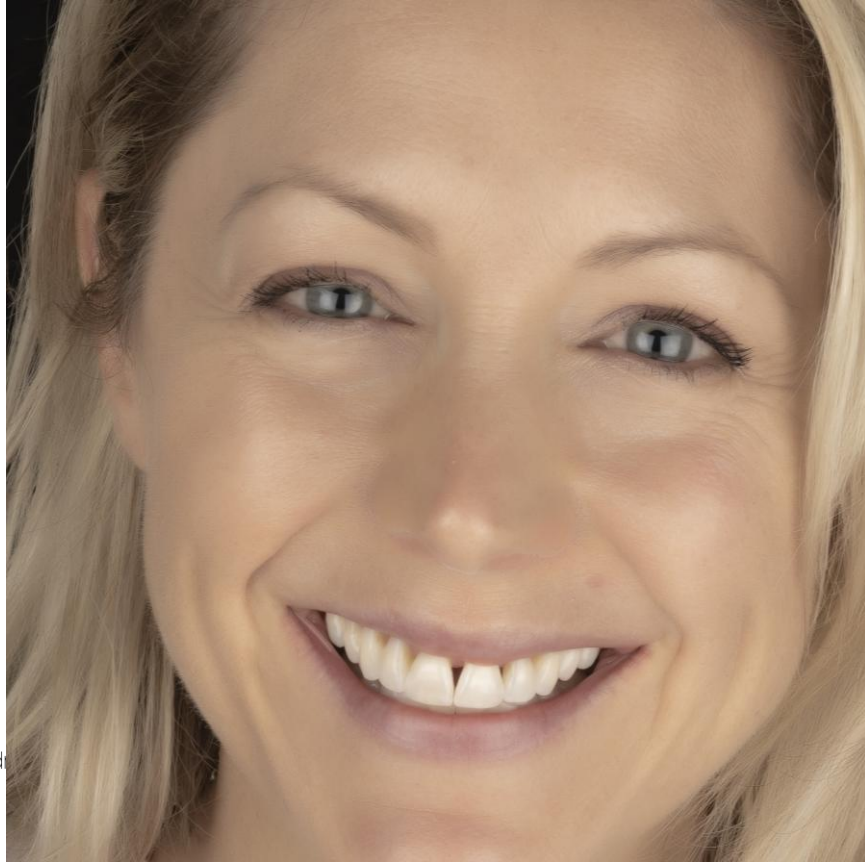


[@dr.young.esthetics](#)



@dr.young.esthetics







4 Years Post-Op

@dr.young.esthetics

As I see it: The race is on!

We will see porcelain performance
from composite (color and polish
retention)

As I see it: The race is on!

We are moving away from hand manipulated composite and toward injectable paste and “super flowables”

Dental schools/GPR integrating the Bioclear Method





Journal of the California Dental Association






ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/ucda20

Minimally Invasive Cosmetic Restoration of Teeth Associated with Open Gingival Embrasures. Descriptive Case Series

Álvaro Ferrando Cascales, Rubén Agustín Panadero, José Amengual Lorenzo, Salvatore Sauro, Antonio Mendoza Rodríguez, Raúl Ferrando Cascales, Ronaldo Hirata & David Clark

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ABSTRACT

The aim of this study is to evaluate the performance of the restorations and soft tissues at 2 years using direct composite resin with injection molding technique to solve open gingival embrasures, also known as black triangles.

Materials and Method: An observational study of a case series was conducted for the treatment of black triangles. The criteria evaluated in each of the restorations were: color stability, polishing, maintenance of surface gloss, staining in the tooth/restoration margins, secondary caries, radiographic appearance of the restored emergence profile, probing depth and bleeding on probing (of the restored proximal surface), presence of plaque (of the restored proximal surface), detachment, delamination, and fracture of the restoration. The following patient satisfaction criteria were evaluated using the visual analog scale (VAS): aesthetic, functional and overall satisfaction.

Results: A total of 36 restorations were performed in the anterior aesthetic area between canines (24 upper and 12 lower). The mechanical and biological survival rate of restorations were both 100% (95%CI: 90.3–100%). Regarding mechanical complications, there were no restorations showing secondary caries, alteration of color, staining in the tooth/restoration interface, detachment, delimitation or fracture during the entire follow-up (0%; 95%CI: 0–9.7%). Regarding biological complications, there were no restorations measuring probing depth higher than 3 mm or showing an unusual radiographic appearance during the entire follow up (0%; 95%CI: 0–9.7%).

Conclusions: The composite injection technique using anatomical matrices is a cost-effective, minimally traumatic, predictable, and reproducible approach to achieve anterior black triangles closure and creation of pseudopapillas.

ARTICLE HISTORY

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KEYWORDS

Composite resin; dental marginal adaptation; cosmetic dentistry; gingival recession; matrix band; dental papilla

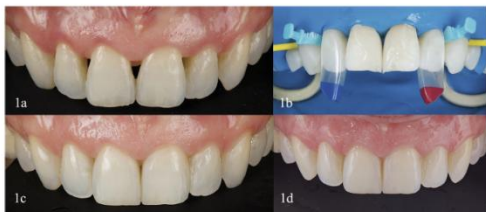


Figure 1. Clinical case I. (a) Initial intraoral front view. (b) Detail of the isolated teeth. Anterior HD diastema closure upper mesial-distal. Bioclear matrix systems. Bioclear was used to treat the central black triangle. The specific matrices for black triangles installed on the sides (black triangle kit, Bioclear matrix systems, Bioclear) can be seen, they are color coded and the red one has a lower profile than the blue one, which allows us to close a larger area of the anterosuperior sector in which the black triangles can be seen. (c) Two weeks review. (d) Two years review, highlighting the periodontal health and restorations integrity.

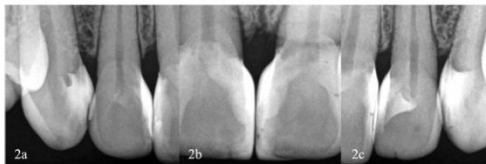


Figure 2. Clinical case II. Two weeks radiographic control composition to check the adaptation and the absence of retentive areas, the radiopacity of the composite allows us to observe the new artificial amelocementary junctions proximally. (a) Adaptation of composite in the papilla area from right mesial upper canine to distal upper right central incisor. (b) Good composite adaptation between centrals incisors drawing the new natural emergence profiles. (c) Adaptation of composite in the papilla area from left distal upper central incisor to mesial upper left canine.



Figure 3. Clinical case III. (a) Initial intraoral front view. (b) It was performed a back triangles closure from canine to canine. Anterior HD an DC diastema closure upper mesial-distal. Bioclear matrix systems. Bioclear was used. (c) Two weeks review. (d) Two years review, highlighting gingivitis due to plaque accumulation and loss of polish because the patient never returned to maintenance.

tion) and the status of the restoration (color stability, polishing, maintenance of surface gloss, detachment, delamination and/or fracture of the restoration if present by visual inspection).

McNemar's test was used to assess changes in the presence of complications between 1-year and 2-years. Chi-squared independence and Fisher's exact test was used to assess the relationship between the different complications

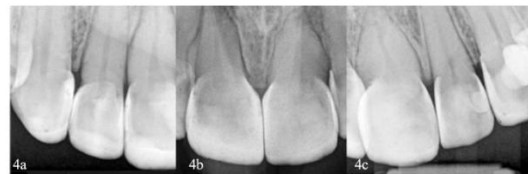


Figure 4. Clinical case II. Two weeks radiographic control composition to check the subgingival marginal composite integrity and the absence of gaps and retentive areas, the radiopacity of the composite allows us to notice the pores absence and the continuity of the restoration without undercuts. (a) Adaptation of composite in the papilla area from right mesial upper canine to distal upper right central incisor. (b) Excellent adaptation of the composite between the central incisors drawing the new natural and progressive emergence profiles. (c) Adaptation of composite in the papilla area from left distal upper central incisor to mesial upper left canine.

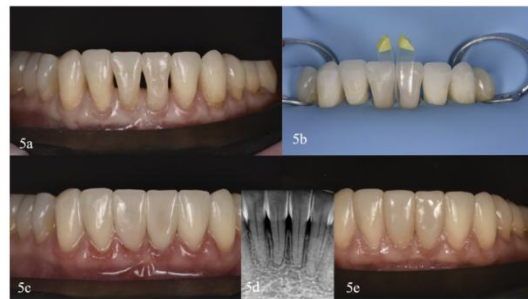


Figure 5. Clinical case III. (a) Initial lower intraoral front view. (b) Detail of the isolated teeth. The small yellow specific matrices for black triangles installed on the central black triangle (black triangle kit, Bioclear matrix systems, Bioclear) can be seen. (c) Immediate result just after removed the rubber dam. (d) Two weeks radiographic control (e) Two years review, highlighting the periodontal health and good polish of the restorations.

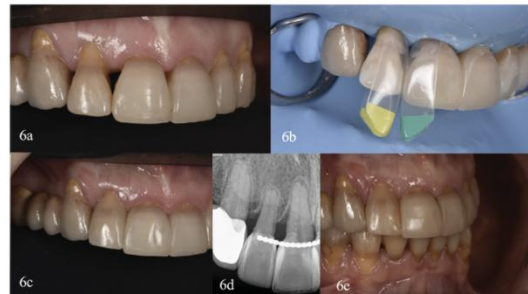


Figure 6. Clinical case IV. (a) Initial intraoral lateral view. (b) Detail of the isolated teeth. The largest yellow and green specific matrices for black triangles were selected (black triangle kit, Bioclear matrix systems, Bioclear). (c) Two weeks clinical control (d) Radiographic control at two weeks. (e) Two years review, highlighting the restoration integrity.

Table 3. Incidence of complications (mechanical and biological) and survival after one and two years of clinical behavior.

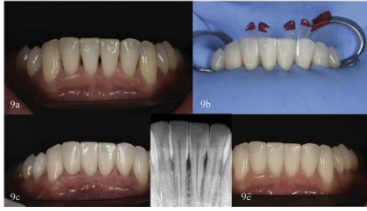


Figure 9. Clinical case VII. (a) Initial lower Intraoral front view. (b) Detail of the isolated teeth, the small red specific markers for black triangles installed can be seen, to do the injection molding procedure at the same time fibra triangle kit. Bioclar matrix systems, Bioclar). (c) Two weeks clinical review. (d) Two weeks radiograph control. (e) Two years review, highlighting the stability of periodontal health and good polish.

Table 1. Restoration survival and outcomes (restorative parameters).

Location	N	Color stability	Polishing	Maintenance surface gloss	Secondary caries	Staining tooth/restoration interface	Detachment, delimitation, fracture
Maxilla (case 1) 1 year	6	Yes	Not necessary	Yes	No	No	No
Maxilla (case 1) 2 years	6	Yes	Not necessary	Yes	No	No	No
Maxilla (case 2) 1 year	6	Yes	At one year	No (small insignificant loss)	No	No	No
Maxilla (case 2) 2 years	6	Yes	At two years	No (loss of surface gloss)	No	No	No
Maxilla (case 3) 1 year	6	Yes	Not necessary	Yes	No	No	No
Maxilla (case 3) 2 years	6	Yes	Not necessary	Yes	No	No	No
Maxilla (case 4) 1 year	5	Yes	At one year	No (small insignificant loss)	No	No	No
Maxilla (case 4) 2 years	5	Yes	At one year	No (small insignificant loss)	No	Yes (one tooth of 5)	No
Maxilla (case 5) 1 year	1	Yes	Not necessary	Yes	No	No	No
Maxilla (case 5) 2 years	1	Yes	At two years	No (small insignificant loss)	No	No	No
Mandible (case 6) 1 year	6	Yes	At one year	No (small insignificant loss)	No	No	No
Mandible (case 6) 2 years	6	Yes	At two years	No (small insignificant loss)	No	No	No
Mandible (case 7) 1 year	6	Yes	Not necessary	Yes	No	No	No
Mandible (case 7) 2 years	6	Yes	Not necessary	Yes	No	No	No

Table 2. Restoration survival and outcomes (periodontal and radiographic parameters).

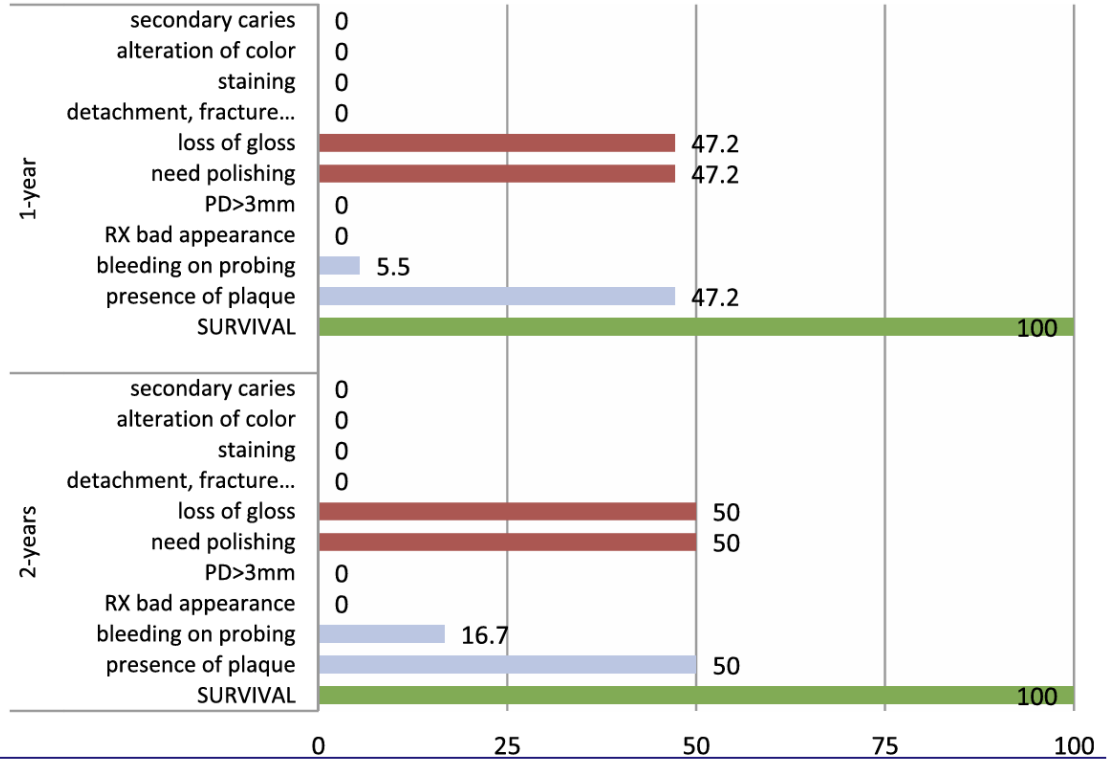
Location	N	Probing depth	Bleeding on probing	Presence of plaque	Radiographic appearance
Maxilla (case 1) 1 year	6	1-3 mm	No	No	Correct emergence profile
Maxilla (case 1) 2 years	6	1-3 mm	No	No	Correct emergence profile
Maxilla (case 2) 1 year	6	1-3 mm	No	Little on proximal surfaces	Correct emergence profile
Maxilla (case 2) 2 years	6	1-3 mm	Yes (2 tooth of 6)	Little on proximal surfaces	Correct emergence profile
Maxilla (case 3) 1 year	6	1-3 mm	No	No	Correct emergence profile
Maxilla (case 3) 2 years	6	1-3 mm	No	Little on proximal surfaces	Correct emergence profile
Maxilla (case 4) 1 year	5	1-3 mm	No	Yes (1 tooth of 5)	Correct emergence profile
Maxilla (case 4) 2 years	5	1-3 mm	Yes (1 tooth of 1)	Little on proximal surfaces	Correct emergence profile
Maxilla (case 5) 1 year	1	1-3 mm	No	Yes (2 tooth of 6)	Correct emergence profile
Maxilla (case 5) 2 years	1	1-3 mm	Yes (2 tooth of 6)	Little on proximal surfaces	Correct emergence profile
Mandible (case 6) 1 year	6	1-3 mm	No	Little on proximal surfaces	Correct emergence profile
Mandible (case 6) 2 years	6	1-3 mm	Yes (2 tooth of 6)	Little on proximal surfaces	Correct emergence profile
Mandible (case 7) 1 year	6	1-3 mm	No	No	Correct emergence profile
Mandible (case 7) 2 years	6	1-3 mm	No	No	Correct emergence profile

(47.2%; 95%CI: 30.9-63.5%) showed plaque at 1 year, increasing to 18 (50%; 95%CI: 33.7-66.3%) at 2 years. All complication rates did not change statistically from 1 year to 2 years. The most relevant increase was bleeding ($p = .125$) (Table 2).

At 1 year, no association was found between bleeding and other complications: loss of gloss ($p = .216$), need for polishing

($p = .216$) or presence of plaque ($p = .216$). Loss of gloss and polishing were always observed in the presence of plaque ($p < .001$). At 2 years, loss of gloss and polishing were significantly more frequent when bleeding ($p = .019$) or plaque ($p < .001$) were present. In addition, bleeding rate was 50% in teeth with plaque and absent in teeth without plaque ($p = .019$) (Table 3).

Complications and Survival rate



The background features a light gray gradient with several faint, concentric white circles centered around the text. Scattered throughout are realistic-looking water droplets of various sizes, some with highlights and shadows, giving a fresh and clean aesthetic.

Live

Demo

Patients' ranking of interdental "black triangles" against other common aesthetic problems

Joanne Cunliffe, Iain Pretty

Dental Health Unit, Manchester Science Park, United Kingdom.

The European journal of prosthodontics and restorative dentistry. 12/2009; 17(4):177-81.

Abstract

The purpose of this study is to assess patients' aesthetic perceptions of interdental "black triangles", both in terms of the number of triangles visible and their severity; and to ascertain how patients rank the presence of "black triangles" against other aesthetic problems. It is based on a questionnaire of 80 randomly selected individuals who were asked to rate the aesthetics of digitally-manipulated images. Patients' perceptions of interdental "black triangles" were compared with their perceptions of other 'non-aesthetic' features. Interdental "black triangles" were rated as the third most disliked aesthetic problem below caries and crown margins. This study demonstrates the importance of interdental "black triangles" to patients, and therefore, as they can occur during prosthetic treatment, must be discussed with patients prior to commencing therapy.



Rank these
dilemmas from
ugliest to least
ugly condition.
Based on
PATIENT
PERSPECTIVE





Interdental "black triangles"
were rated as the **third** most
disliked aesthetic problem
below caries and dark crown
margins.

Interdental "black triangles" were rated as the third most disliked aesthetic problem above crowded or dark teeth.

#1



#2



#3



#4



#5



Unfamiliar negative space evokes the intuitive feeling that something is wrong:

- age
- disease
- neglect
- poverty
- lower IQ
- genetic disorders
- and even death.







Dr. Michael Scott
Lubbock, TX

Before



After



Dr. John Yun
Toronto, ON





Dr. David Carroll,
Prosthodontist,
Aventura FL





Dr. Scott Kollen
Vancouver, BC



Dr. Scott Kollen
D.M.D.






Dr. Antonio
Mendoza,
Barcelona
Spain





 vnsdentistry

Bioclear Matrix System

8 HOURS AGO

Bioclear Learning Center Faculty



Dr. Charles Regalado
Spokane WA



Courtesy Dr. Charles Regalado



Courtesy Dr. Charles Regalado







Courtesy Dr. Charles Regalado





Courtesy Dr. Charles Regalado



Courtesy Dr. Charles Regalado



Courtesy Dr. Charles Regalado

Annie

Severe Black Triangle Case
Charles Regalado DDS

2-year follow-up



Courtesy Dr. Charles Regalado



Courtesy Dr. Charles Regalado



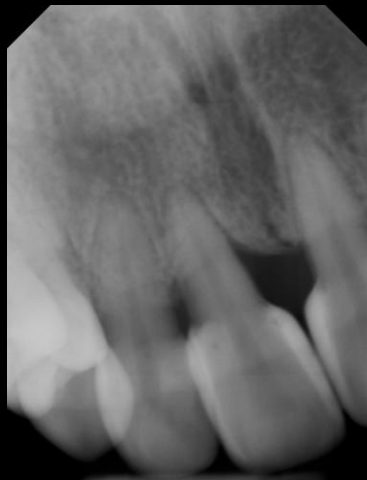
Courtesy Dr. Charles Regalado

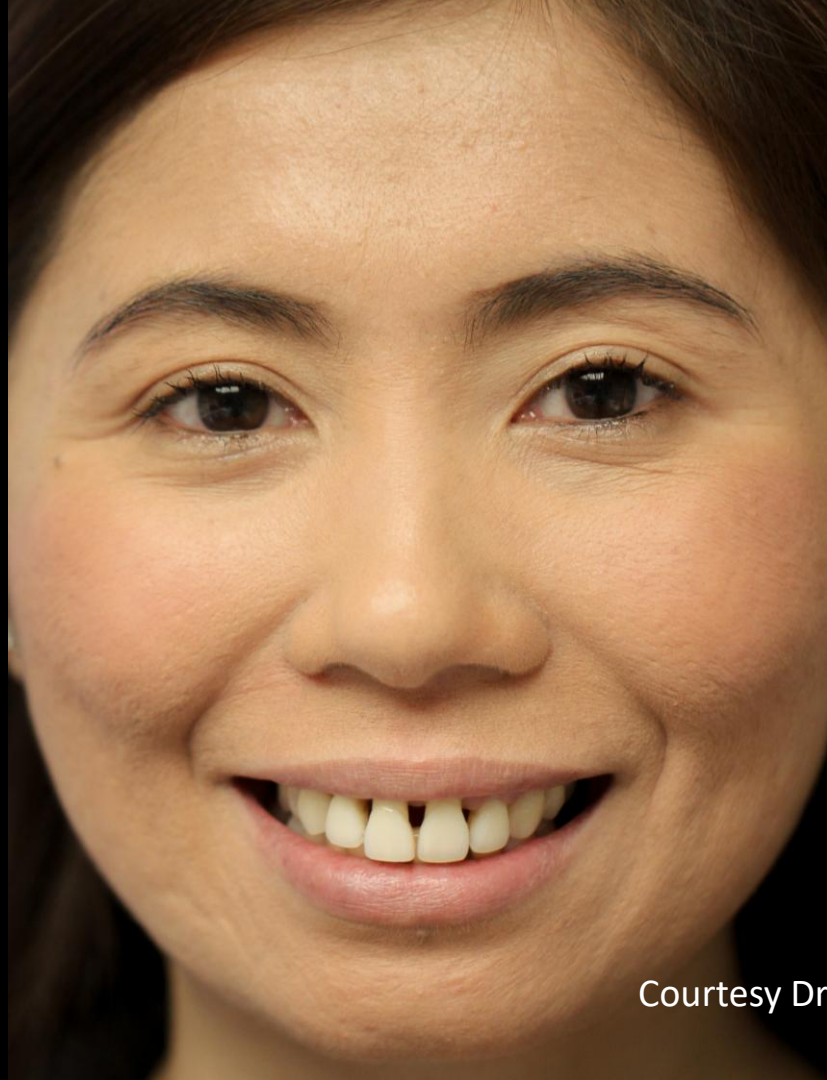


Courtesy Dr. Charles Regalado

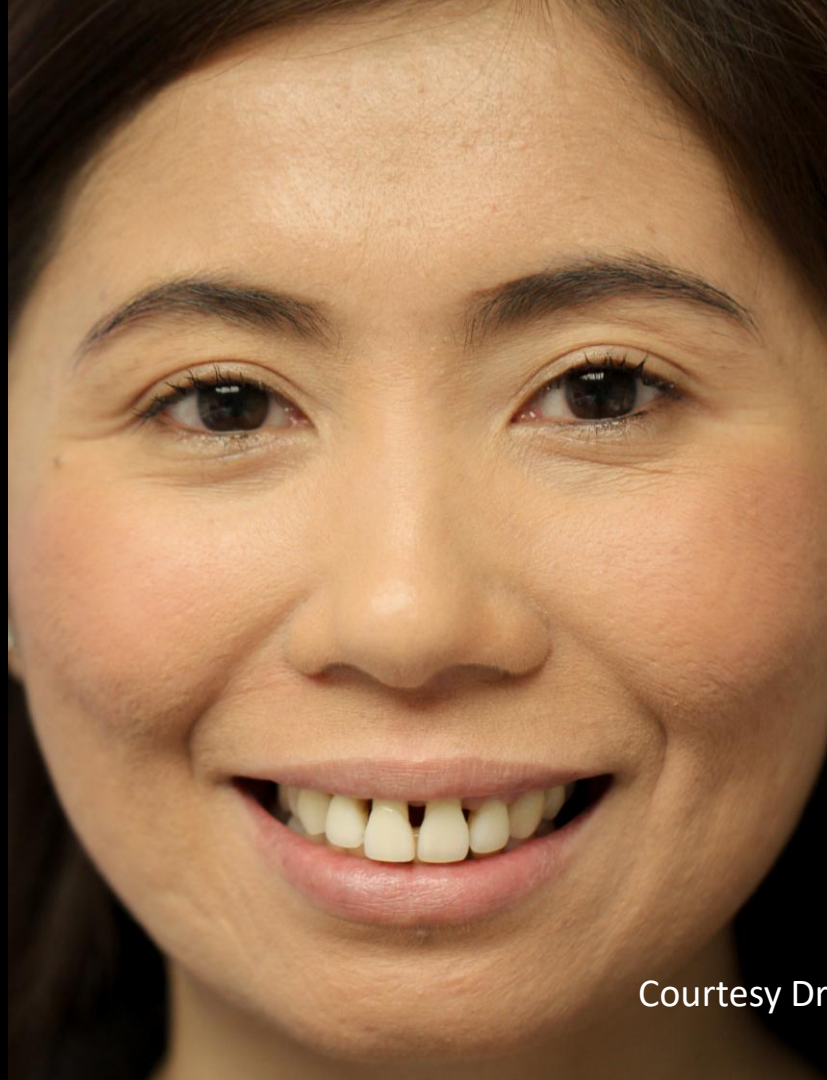


Courtesy Dr. Charles Regalado





Courtesy Dr. Charles Regalado



Courtesy Dr. Charles Regalado



Injection Overmolding: Possibilities and Long-Term Outcomes

Finishing Ortho Cases

A young orthodontist with beautiful teeth...



She HATED Her Black Triangles



Immediate post-operative



6 months post-operative



6 years post-operative





Pre-op



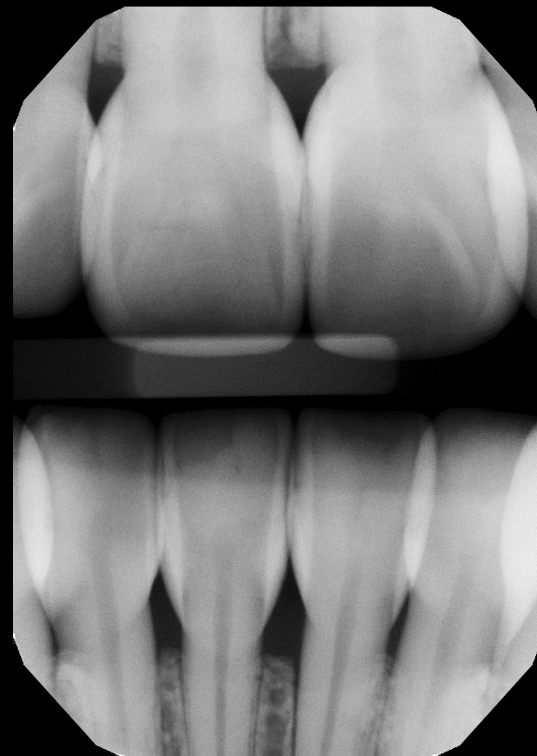
Post-Op



6 Years Post-Op

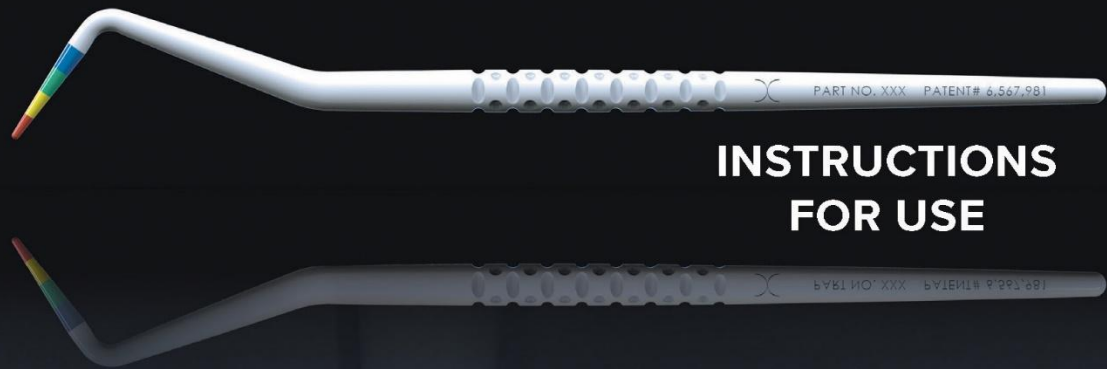


Pre-op



6 Years Post-Op

BT MATRIX

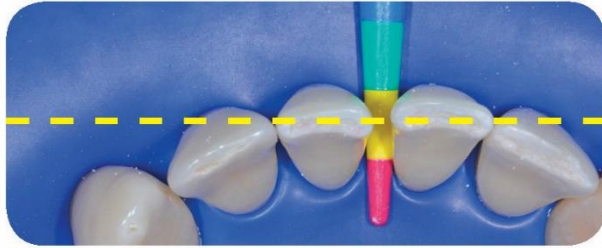


INSTRUCTIONS FOR USE

 BIOCLEAR

BLACK TRIANGLE SYSTEM INSTRUCTIONS FOR USE

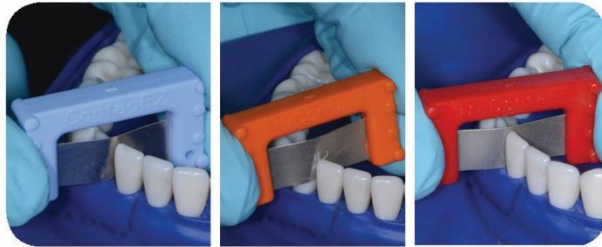
1
GAP
SIZING



2
DISCLOSE
AND CLEAN



3
CONTACT
OPTIMIZATION



4
MATRIX
INSERTION

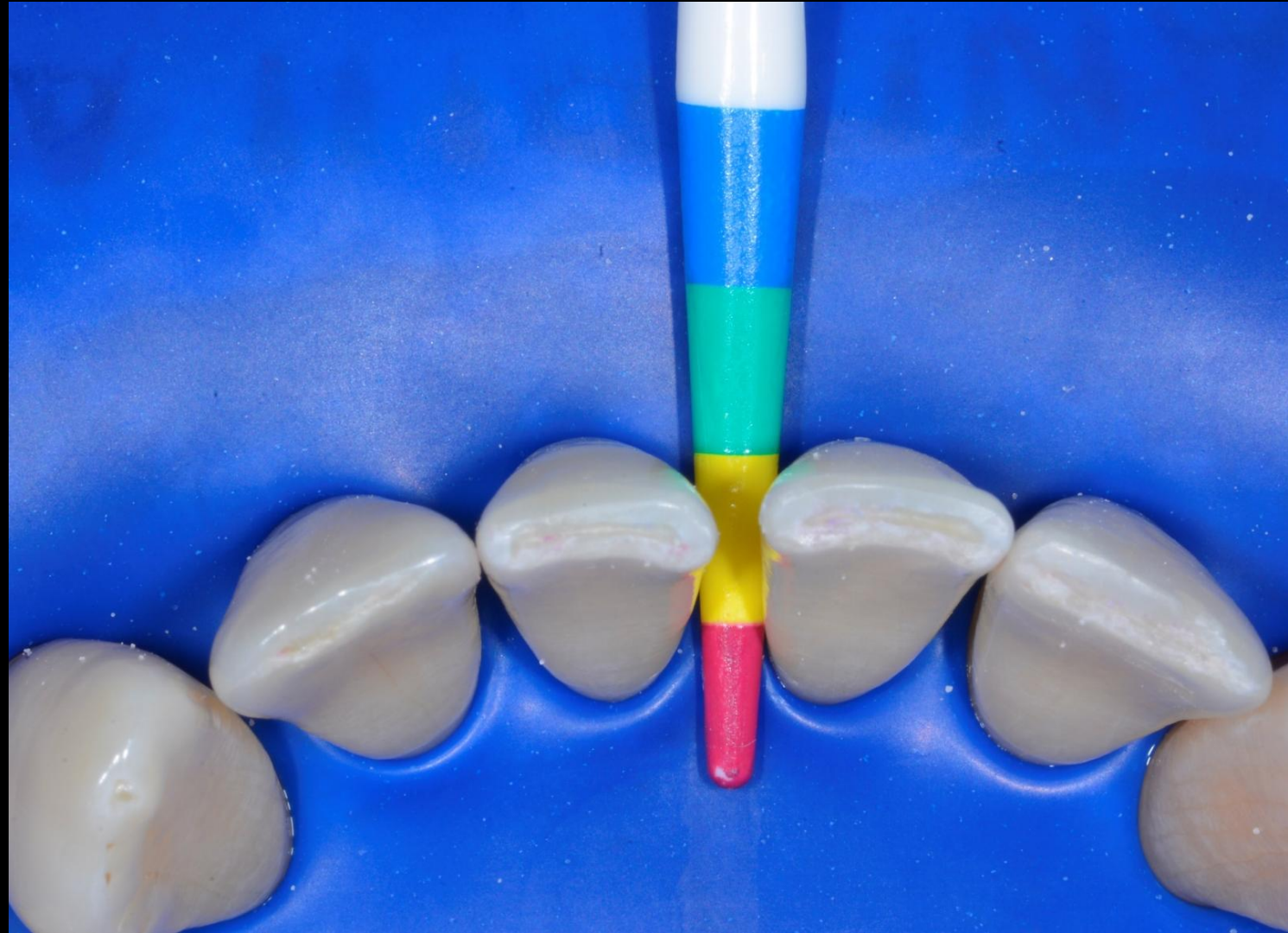


5
ETCH
AND RINSE



6
ADHESION,
INJECTION MOLD,
LIGHT CURE,
RELEASE MATRIX,
FINISH







Bioclear Dual Color Disclosing

















Rock Star Polish

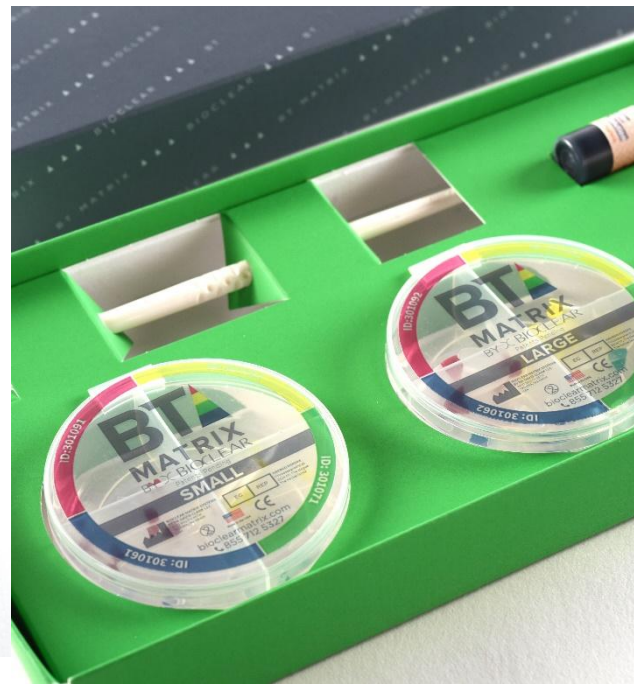
1



2



BT
MATRIX
BY ∞ BIOCLEAR



BT



MATRIX

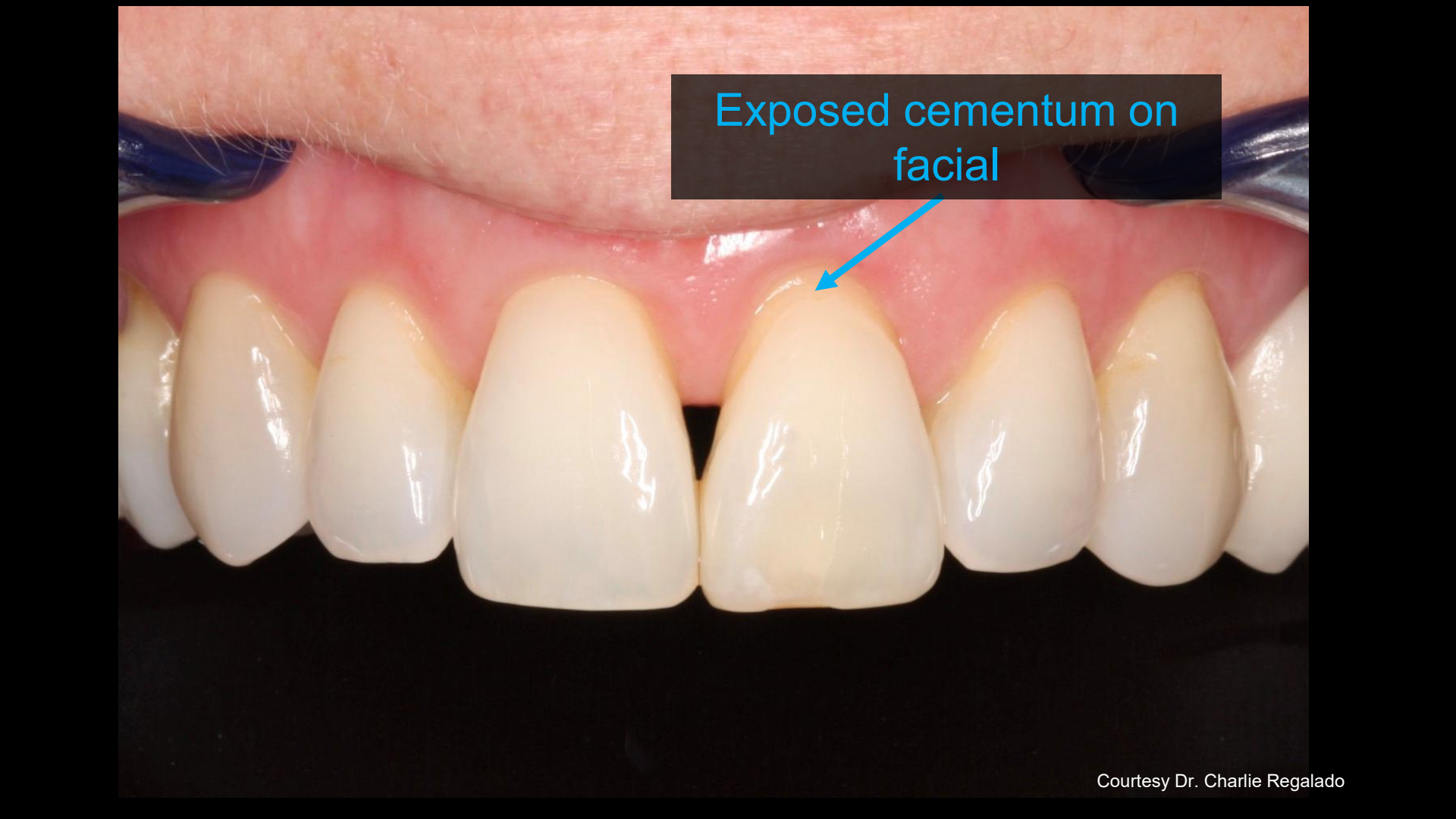
BY  BIOCLEAR



Complex Black Triangle Treatment

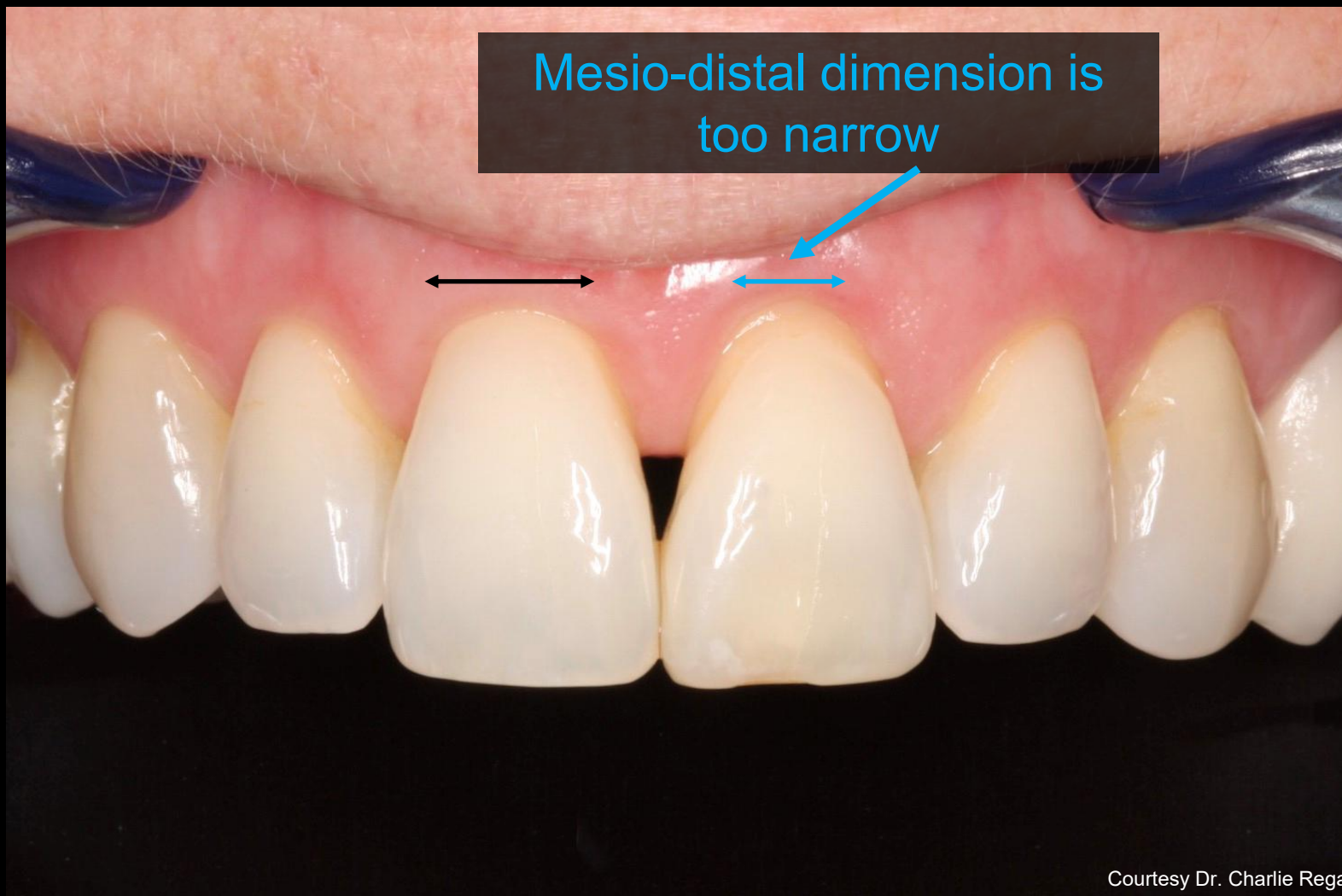
Matrix Selection and Modification for the Root Overlay. When is it necessary to add the root overlay procedure to a Black Triangle treatment?

- Exposed cementum on the facial
- When the mesial-distal dimension of the facial zenith is too narrow



Exposed cementum on
facial

Mesio-distal dimension is too narrow





Before Bioclear



After Bioclear Root Overlay plus
Black Triangle Treatment


Both the black triangle and the root overlay are performed with Bioclear BT matrices



Let's look at a single tooth case next to and implant crown that is in the temporary phase

- Exposed cementum on the facial
- When the mesial-distal dimension of the facial zenith is too narrow

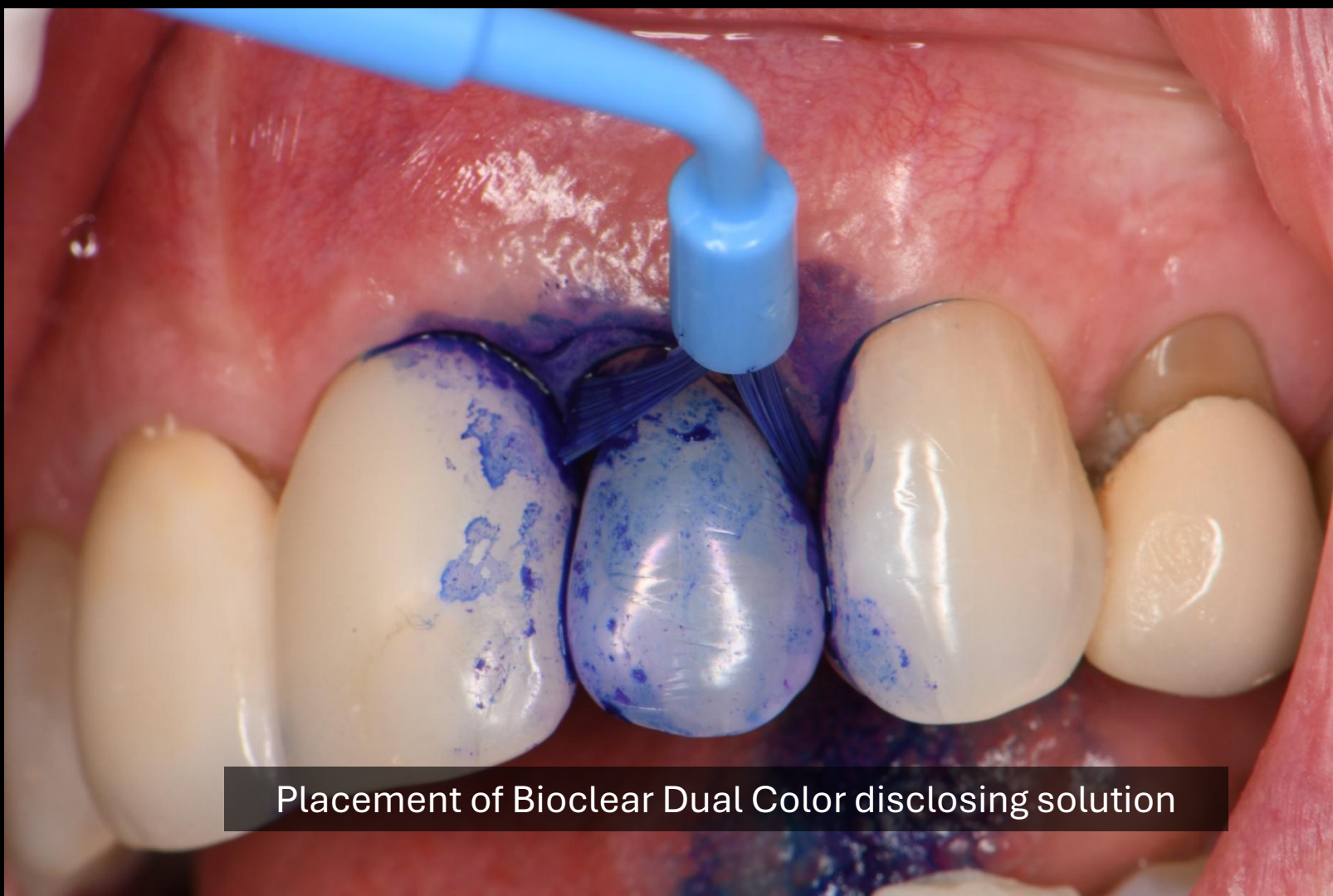




Temporary crown on
recently placed implant
#21 area.

Before the permanent crown on
implant is fabricated, the contour and
color of the root of the lateral incisor #
22 should be enhanced with Bioclear





Placement of Bioclear Dual Color disclosing solution



Blasting with Aluminum Trihydroxide

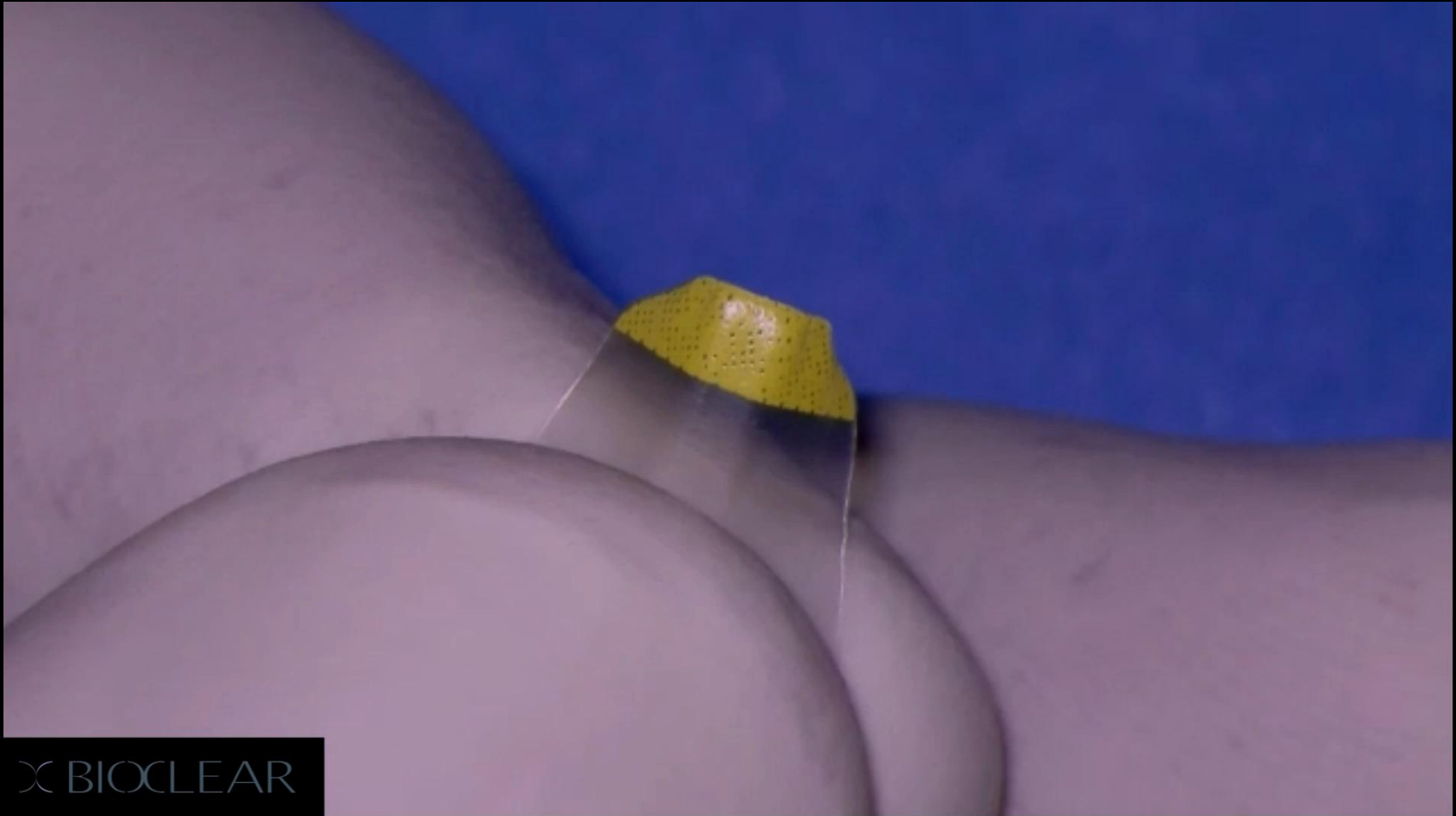


Bleeding is to be expected



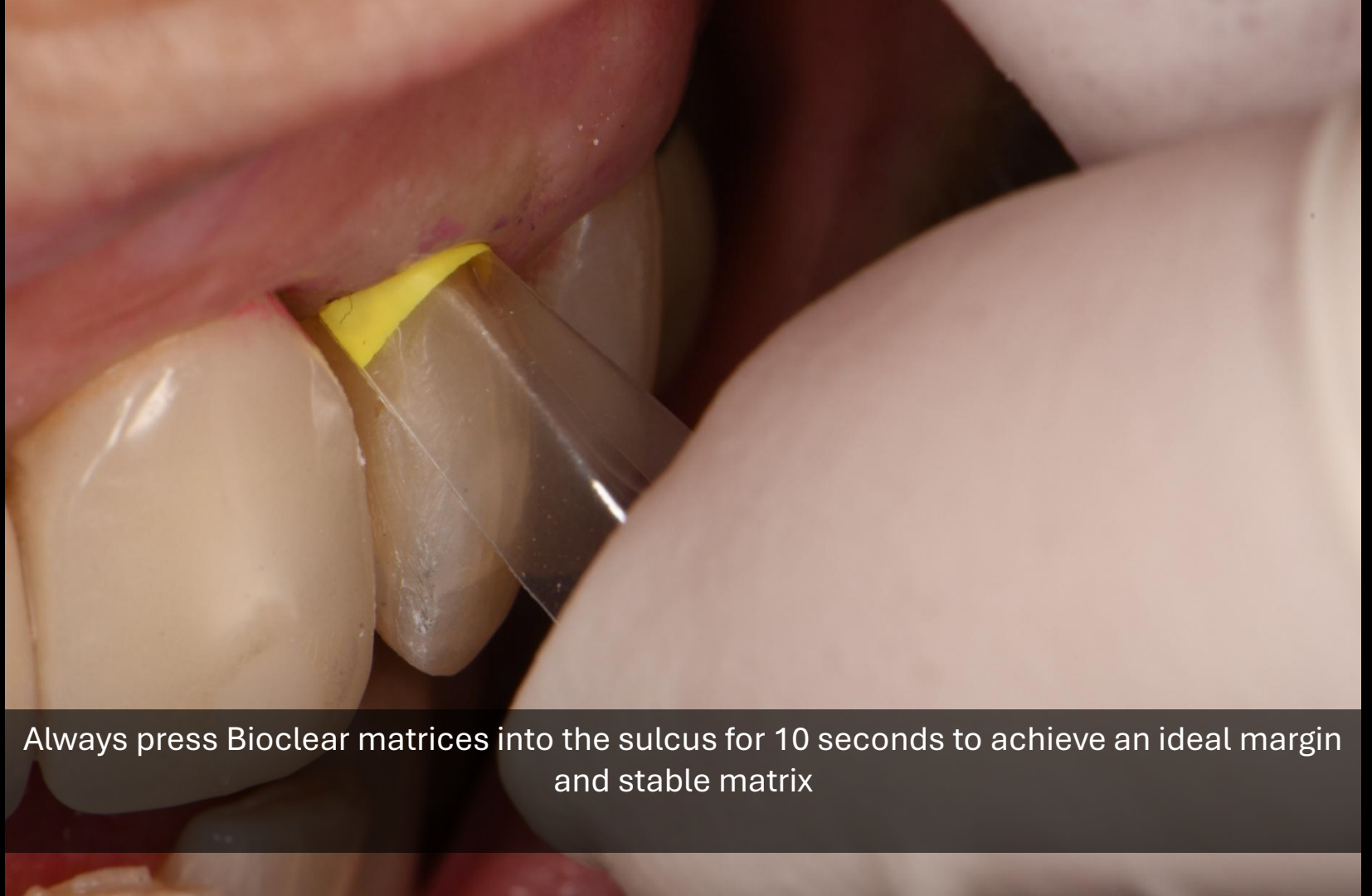
Astringent is applied to control bleeding
Sử dụng Astringent để cầm máu

Trimming and bending the BT matrix to create the ideal root overlay matrix





Trimmed and modified Small Yellow BT matrix is used upside down to create a perfect 45-degree angle and a perfect gingival margin.



Always press Bioclear matrices into the sulcus for 10 seconds to achieve an ideal margin and stable matrix



Trimmed and modified Small Yellow Bioclear BT matrix
additional view



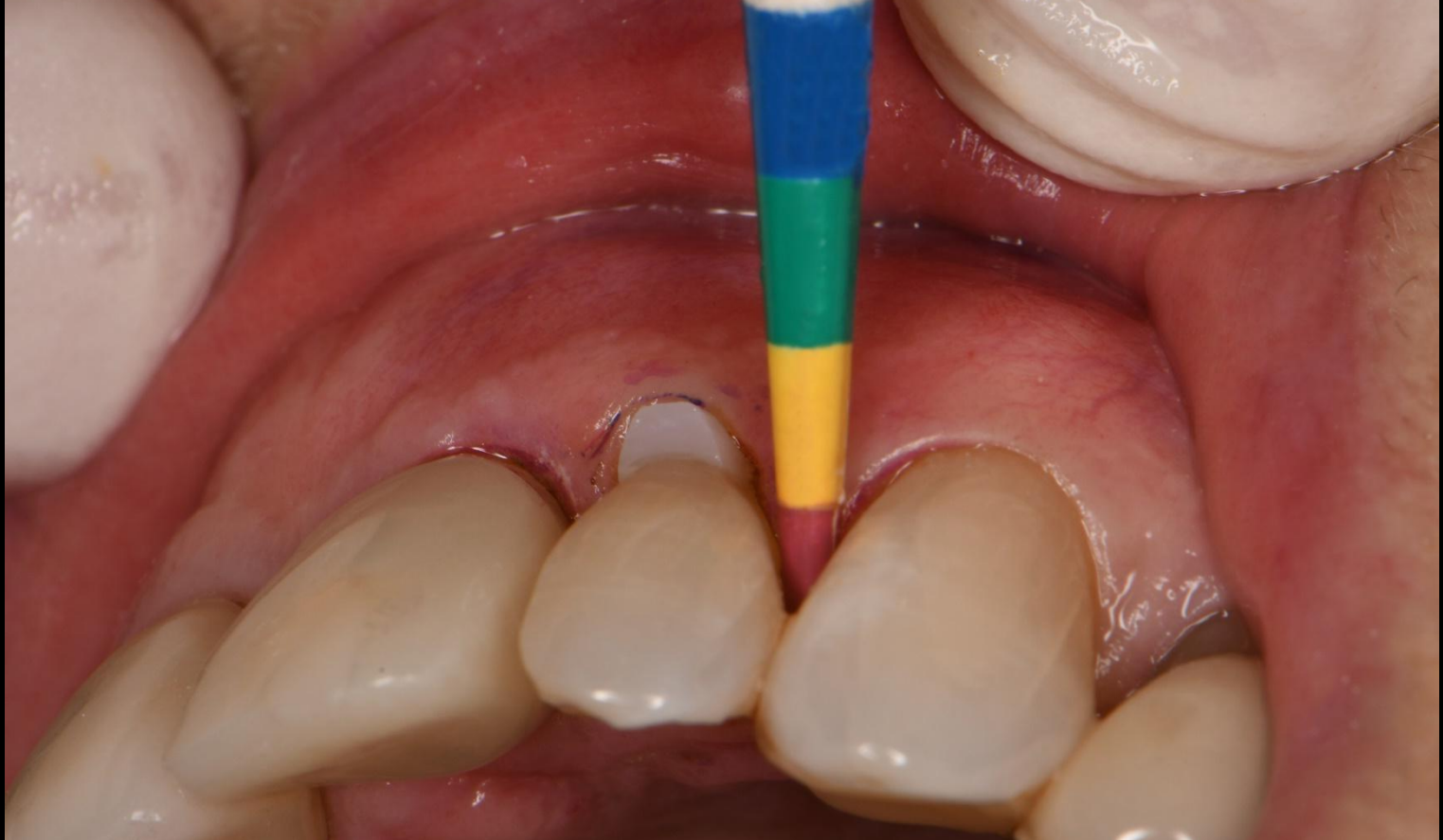
Trimmed and modified Small Yellow Bioclear BT matrix additional view
Góc nhìn khác - Cắt & điều chỉnh khuôn BT Small Yellow .



Lateral view of root overlay. Some trimming of the composite is done with diamond burs which will be shown later.




Once the root overlay is trimmed to ideal shape, use the BT gauge to verify the recommended color matrix to match the amount of space closure: mesial



Once the root overlay is trimmed to ideal shape, use the BT gauge to verify the recommended color matrix to match the amount of space closure: distal.



These are large Bioclear BT matrices that have been trimmed slightly. Emergence profile is verified as appropriate for mesial and distal embrasures

A close-up clinical photograph showing a dental procedure. Two hands, wearing white gloves, are pressing clear plastic matrices onto a patient's teeth. The teeth are visible in the center, and the surrounding gum tissue is being retracted. A blue surgical drape is visible at the top of the frame. The text at the bottom of the image provides instructions on the duration of the pressure application.

Now press the matrices firmly for 10 seconds to achieve deep seating and perfect margins

Magnified view of fully seated matrices. (The tooth was re-blasted after rubber dam placement, before matrix placement-not shown)

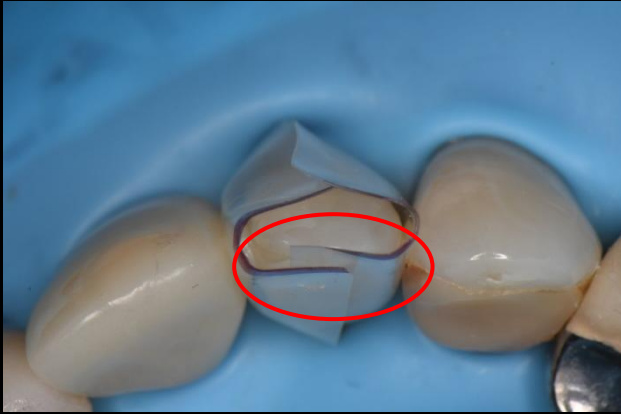




Now we are ready to perform total etch. Any areas of exposed dentin will need to have the adhesive cured before injection molding (pre-curing).



Now we are ready to perform total etch. Any areas of exposed dentin will need to have the adhesive cured before injection molding (pre-curing).



Incisal views of the “Bioclear Aquarium”. In the bottom photograph the matrices are rearranged for a better containment. Always check to see if one arrangement is better than the other. In other words, which matrix should be tucked inside the other matrix ?

Incisal views



Best arrangement





Injection molding is complete with 1-2-3: 1) uncured adhesive as a surfactant, 2) heated flowable composite, 3) heated paste composite

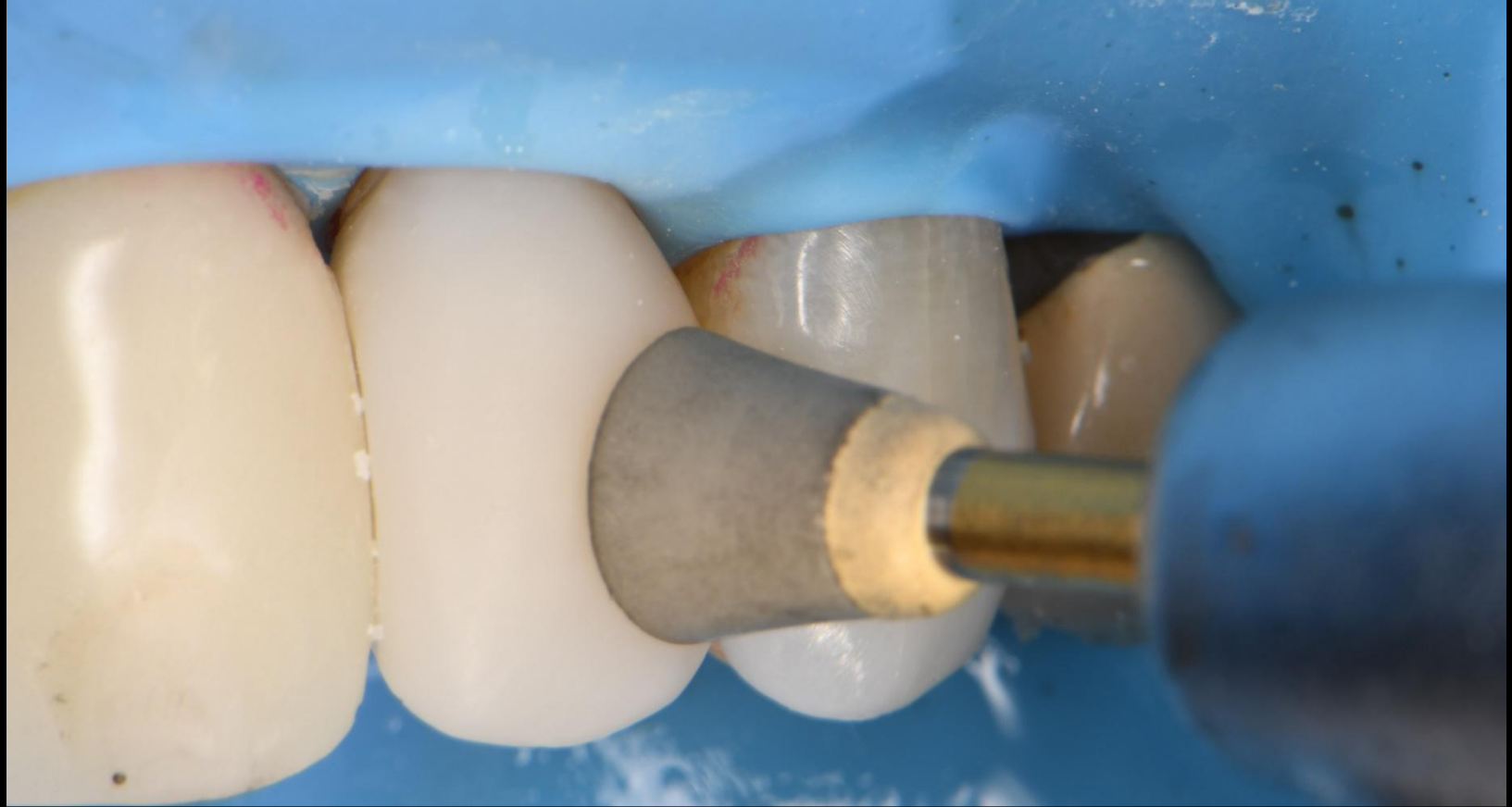
Injection molding với 3 bước: 1) Keo dán không chiếu đèn như chất hoạt động bề mặt. 2) Composite lỏng làm ấm 3) Composite đặc làm ấm.



Cutback and disking complete.



Bioclear Magic Mix applied in a disposable prophy cup



Bioclear Rock Star Polish cup (autoclavable and diamond impregnated) is best used with water spray to cool the tooth







Before and after immediate postoperative views: combined root overlay and black triangle treatment with Bioclear BT matrices.



Courtesy Dr.
Les Miller

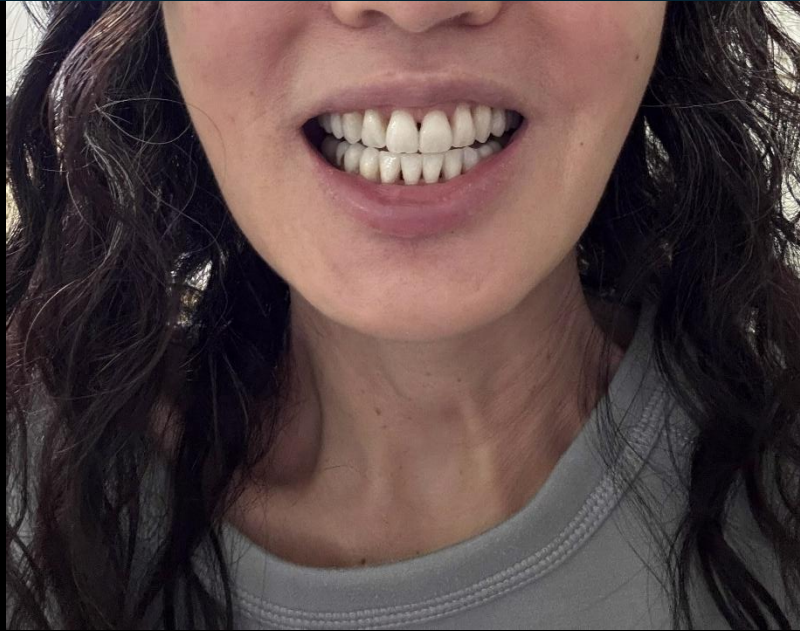
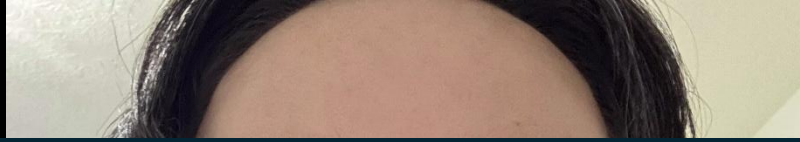






- If you think you will lose your contacts, you need to prep and then take each to 80% shape before you move to the next tooth.
- Bioclear method benefits from leverage and landmarks
- Creation of 3 facial planes is key
- Monolithic composite in the body shade is generally beautiful to the patient. Why?



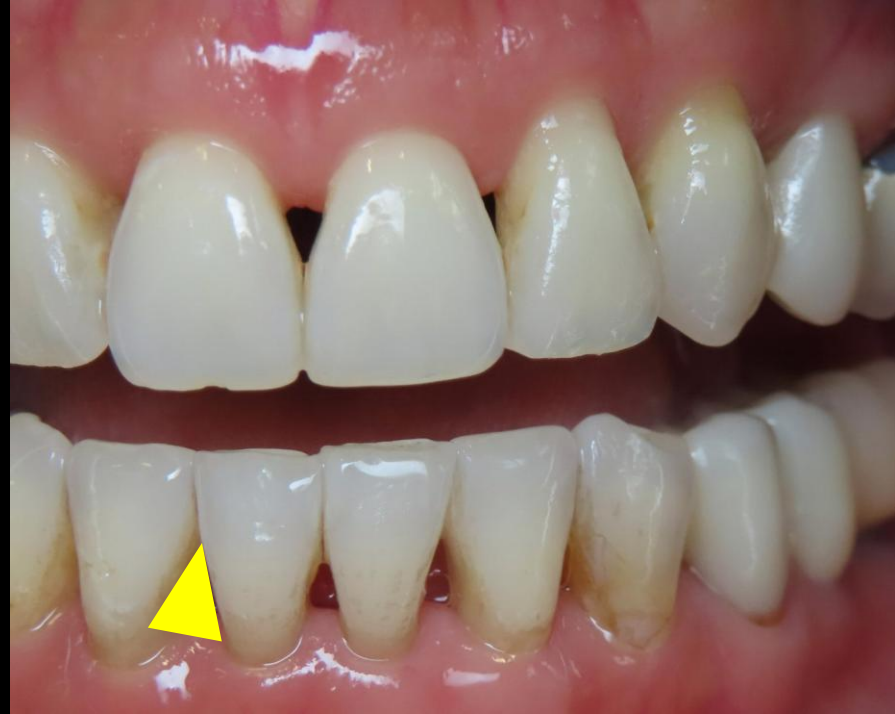








1. Get your tongue out of the way!!!
2. Did you know that you are posturing your tongue to soften Absolute Luminescence?
3. Brown Triangles-BT matrix design



1. Get your tongue out of the way!!!
2. Did you know that you are posturing your tongue to soften Absolute Luminescence?
3. Brown Triangles-BT matrix design



- Patient wants a natural look
- Doesn't want bulky teeth
- I would be uncomfortable adding volume.. teeth are already prominent
- Therefore NO significant color upgrade
- In general I don't want patients bleaching before Bioclear



- 1.The first thing I do after photos is shade selection **before the teeth dehydrate**. I spray the teeth periodically w/ water as we do this to keep teeth hydrated
- 2.You **MUST** Press flat Mylar and cure.
No manipulation with the glove

We are experimenting to find the most color stable composite.

Today we try Majesty by Kuraray. We will know much more in two years

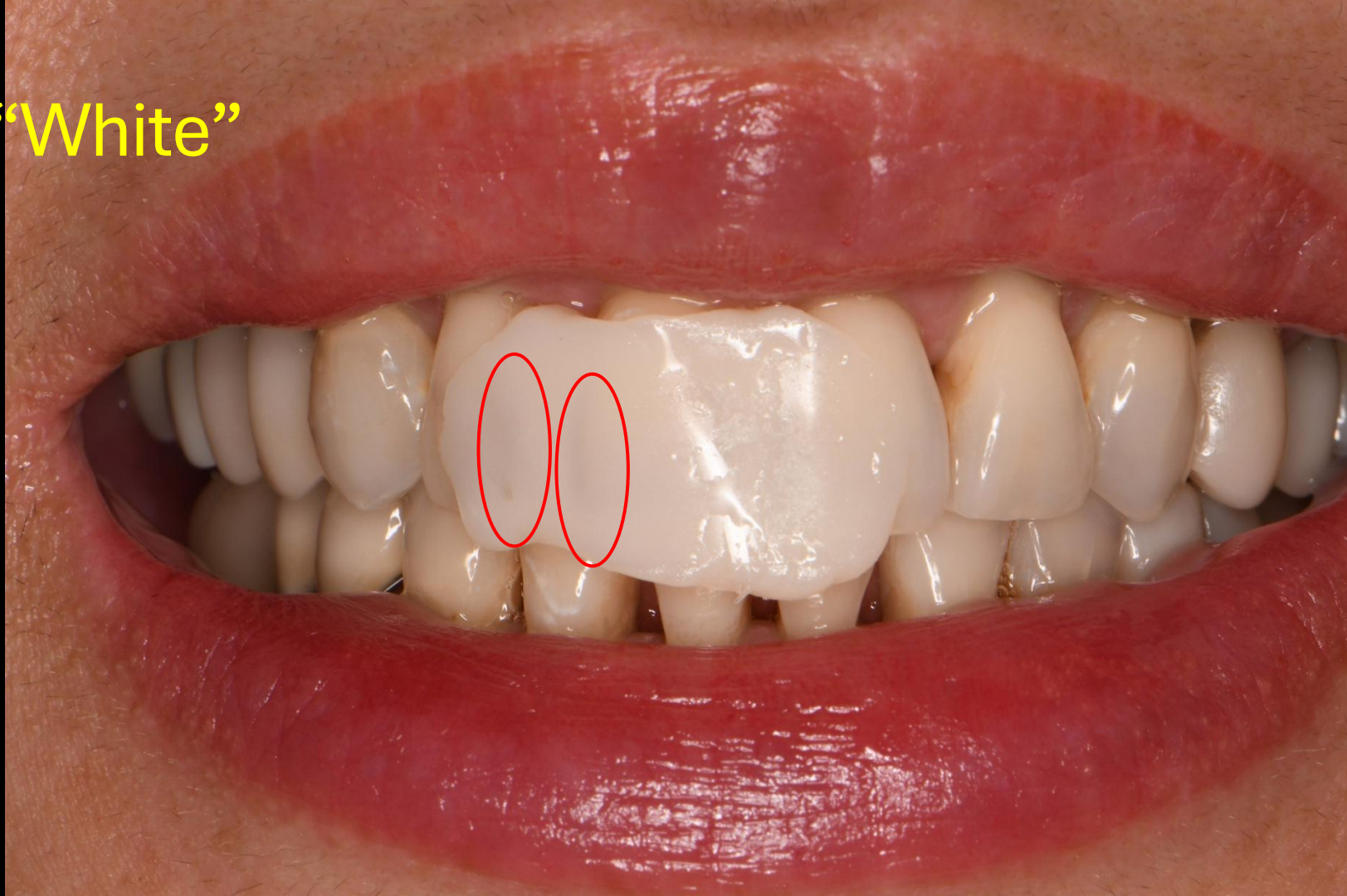
I started with Majesty ES
“Classic” paste (which
is their body shade.

“**White** was tried first...

“White”



“White”



“White”



“White”



Majesty ES “Classic”
paste (which is their
body shade). “B-1” was
tried next

B-1



B-1



B-1



B-1

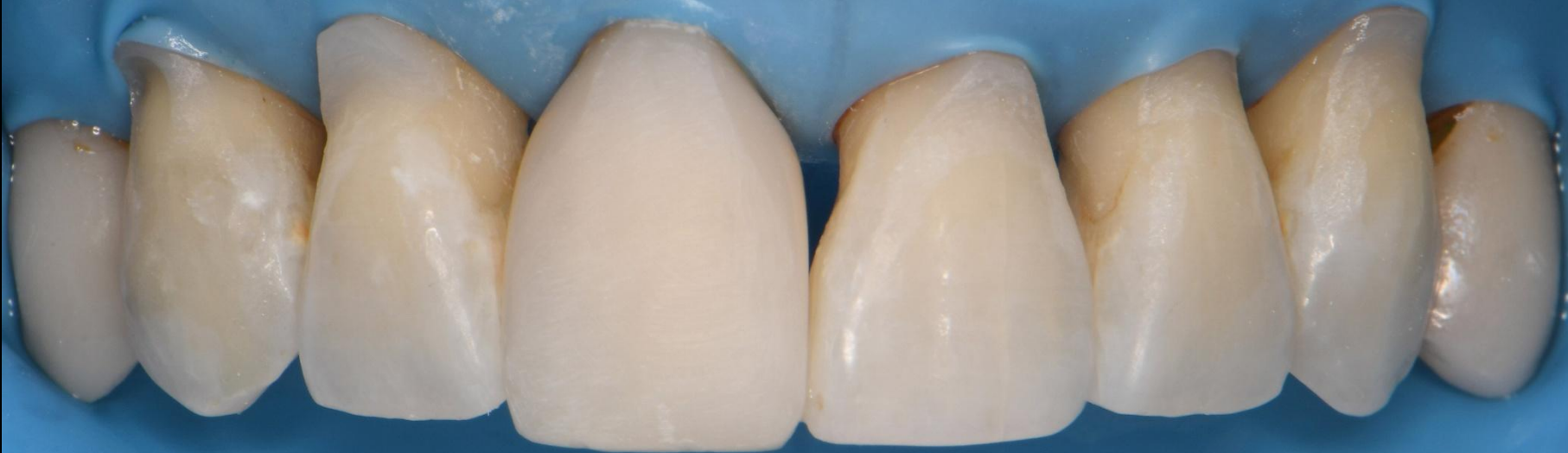


“White”





80% rule



1) 80% rule

2) “Discover” the enamel with Soflex XT
Course disc. Then stop









End of day one:

7:00 am to 2 pm with 45-minute lunch

We spent an hour with initial exam, photos and shade selection

Once I get rolling I can do two BT's per hour



Monolithic Composite

Monolithic
Zirconia



Monolithic Composite

Monolithic
Zirconia







Combining the Dahl Technique with the Bioclear Method

Bioclear Anterior Matrices

Anterior Matrices



Original Bioclear Matrices

- 9 different matrices
- Treat
- Available in regular (50 um) and HD (75 um)



360 Veneer Matrix

- 1 Size
- Pre-trimmed
- Specifically designed for injection over molding anterior teeth (Bioclear veneer)



Black Triangle Matrices

- 8 Matrices
- Specifically designed for black triangle treatment
- Easy to install, small learning curve



Karen - referred discretely by the orthodontist. The original referring dentist planned 3/4 crowns after 3 years of ortho. Patient wanted Bioclear









The Dahl “Light” Technique





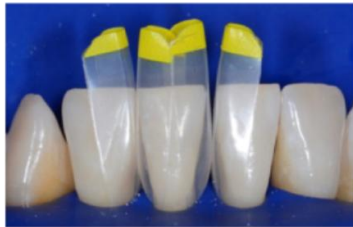
Combining the Dahl Technique with the Bioclear Method:

- Dahl technique is commonplace in Nordics and the UK
- The Baby Dahl (flowable or paste composite “hats”) on premolars and first molars is more palatable to North American dentists

Getting paid to be conservative

BIOCLEAR VS. CROWNS AND VENEERS

Bioclear is an alternative to traditional methods for enhancing a smile. Rather than preparing for a crown or veneer, the Bioclear Method—expanding the possibilities of dentistry—conserves the natural tooth structure, tooth enamel and tooth durability.



BIOCLEAR PREPARATION
Bioclear allows dentists to **conserve** healthy tooth structure



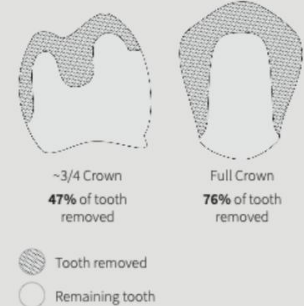
CROWN PREPARATION
Crowns require dentists to **remove an average of 76%** of the tooth structure prior to the procedure



VENEER PREPARATION
Veneers require dentists to **remove an average of 47%** of the tooth structure prior to the procedure

AN HONEST LOOK AT CROWN PREPARATIONS

As illustrated below, crowns, veneers, and onlays require the removal of a significant amount of healthy tooth structure. Bioclear dentists can leave most or all of the tooth structure. Bioclear is a very attractive option to patients.



Don't Miss This Hands-On Experience

Gain hands-on training and practical skills you can bring back to your practice



2 Day Bioclear Program – Lecture & Hands-On

with Dr. David Clark



Scan the QR code or visit
www.crd-ce.com
for full course details and registration
information

Presented by:



NORTH YORK - SEPTEMBER 26 - 27

Bioclear Anterior Matrices



Original Bioclear Matrices

- 9 different matrices
- Treatment of all cases including diastema closure
- Available in regular (50 um) and HD (75 um)



360 Veneer Matrix

- 1 Size
- Pre-trimmed
- Specifically designed for injection over molding anterior teeth (Bioclear veneer)

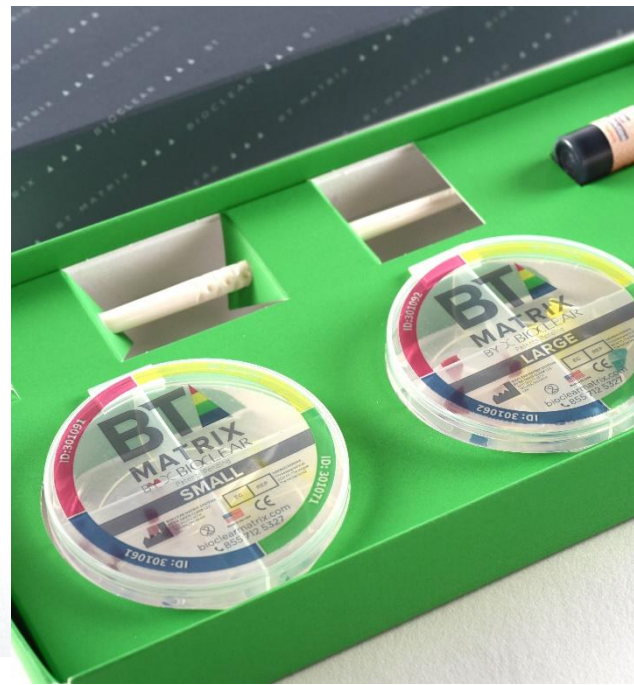


Black Triangle Matrices

- 8 Matrices
- Color coded
- Specifically designed for black triangle treatment
- Easy to install, small learning curve



BT
MATRIX
BY ∞ BIOCLEAR



BT



MATRIX

BY  BIOCLEAR

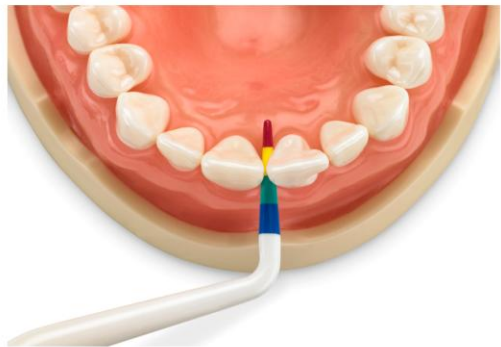


BLACK TRIANGLE

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.



Ontario, Canada
February 27th 2026

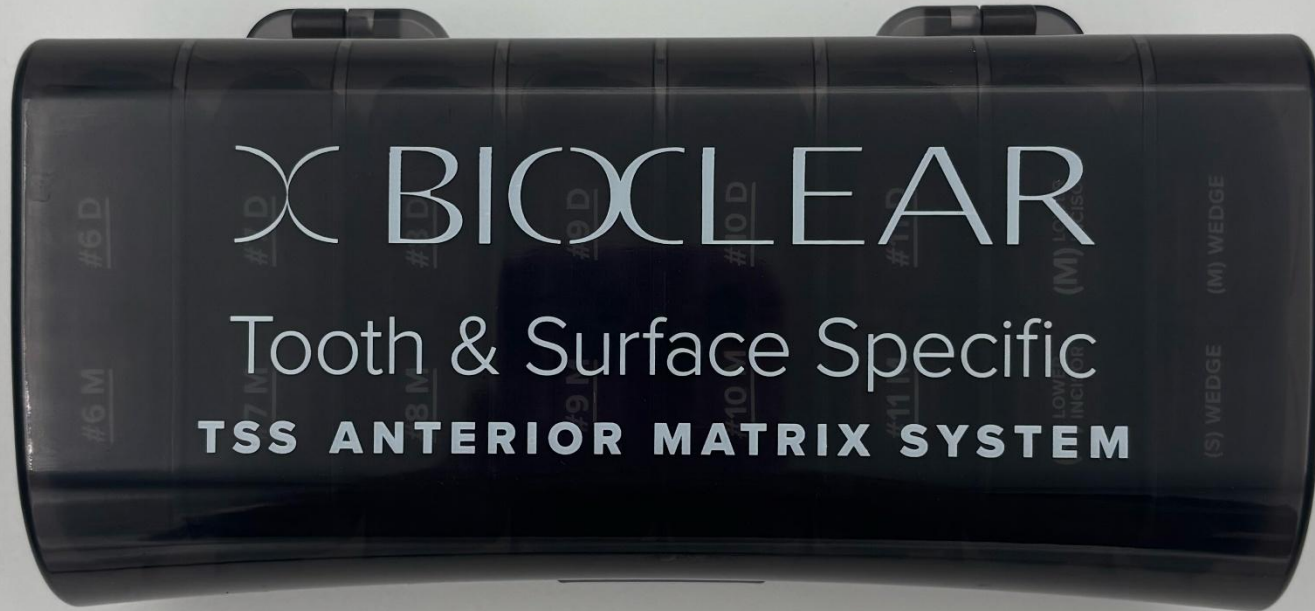


BIOCLEAR
CERTIFIED

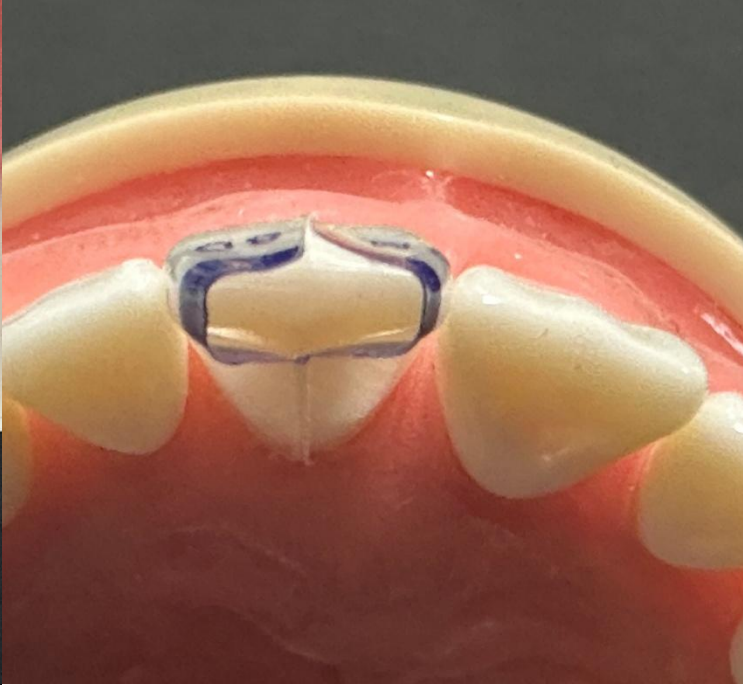
BLACK TRIANGLES



TSS available December 2025. This system is for small and large anterior restorations, broken teeth and anterior esthetic veneering when you DO NOT have a black triangle or diastema











**TOOTH & SURFACE SPECIFIC
MATRIX SYSTEM**
BY  BIOCLEAR



140 Anterior Matrices

#6 through #11 in Mesial & Distal
Small & Medium Lower Incisor

75 Wedges

25 Small Wedges
50 Medium Wedges

**The next generation
of anterior matrices:**

We're taking the
guesswork out of to
matrix selection



Contact your Bioclear Sales Rep to Pre-Order

WWW.BIOCLEARMATRIX.COM

1.855.712.5327



BIOCLEAR

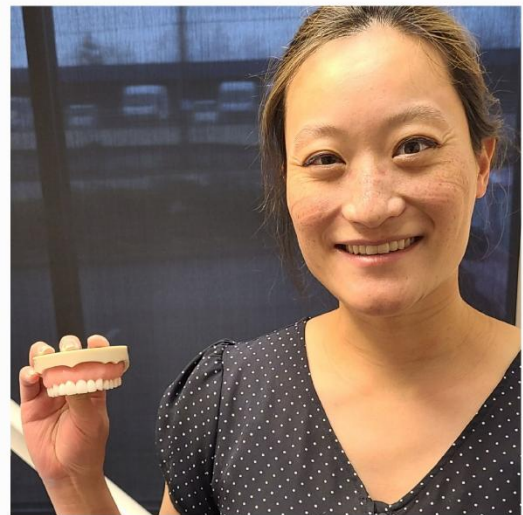
LEARNING CENTER

Tacoma USA · Solihull UK
Varberg Sweden · Cairo Egypt
Syracuse Italy









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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March

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April

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August

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September

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December

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26	27	28	29	30	31	





Eleni Stathatos
Bioclear Representative, CANADA
(514) 806-0082
eleni@bioclearmatrix.com



Bioclear Lexicon

- The Direct Contact Strut
- The Infinity Edge Margin or Tooth Restoration Interface (TRI)
- Progressive Wedging
- Deep Margin Acquisition (Temporarily deepening the sulcus)
- Angle of Incidence (Matrix to tooth)
- Angle of Incidence (composite to enamel rods)
- Driving the matrix to partly displace the gingival attachment to achieve a perfect seal
- Pressurizing the *System*
- The power and importance of a resin surfactant
- Optimizing the neighboring contacts (creating parallel guide planes)
- The dimple contact
- The Clark Pocket in a Class II restoration
- Regional C-Factor
- Maximizing the enamel/dentin surface area ratio
- Creating Compression at the Primary strike point
- Aquarium matrices vs. shield matrices
- Anatomic vs. volume matrices
- Class I lever vs. a Class II lever
- Prescriptive Selective Caries Removal (SCR)
- Taking the tooth shape to 80% in multi tooth cases
- Double Direct Contact Struts (midline diastems)
- Patient centered vs. doctor centered outcomes



The Bioclear Direct Contact Strut

Creating Contacts for Diastemas, Peg Laterals, and Bioclear 360° Veneers

- Abbreviated Version -

Diastema Closure with the Bioclear BT matrix kit



Dr Jose Moura 5/2025 Taubate Brazil















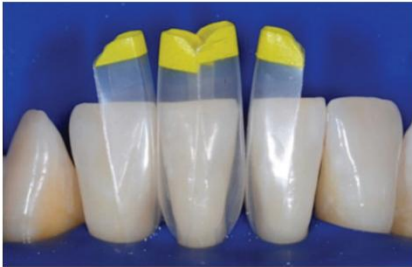




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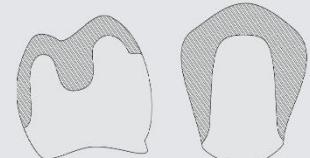


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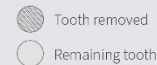


~3/4 Crown

47% of tooth removed

Full Crown

76% of tooth removed

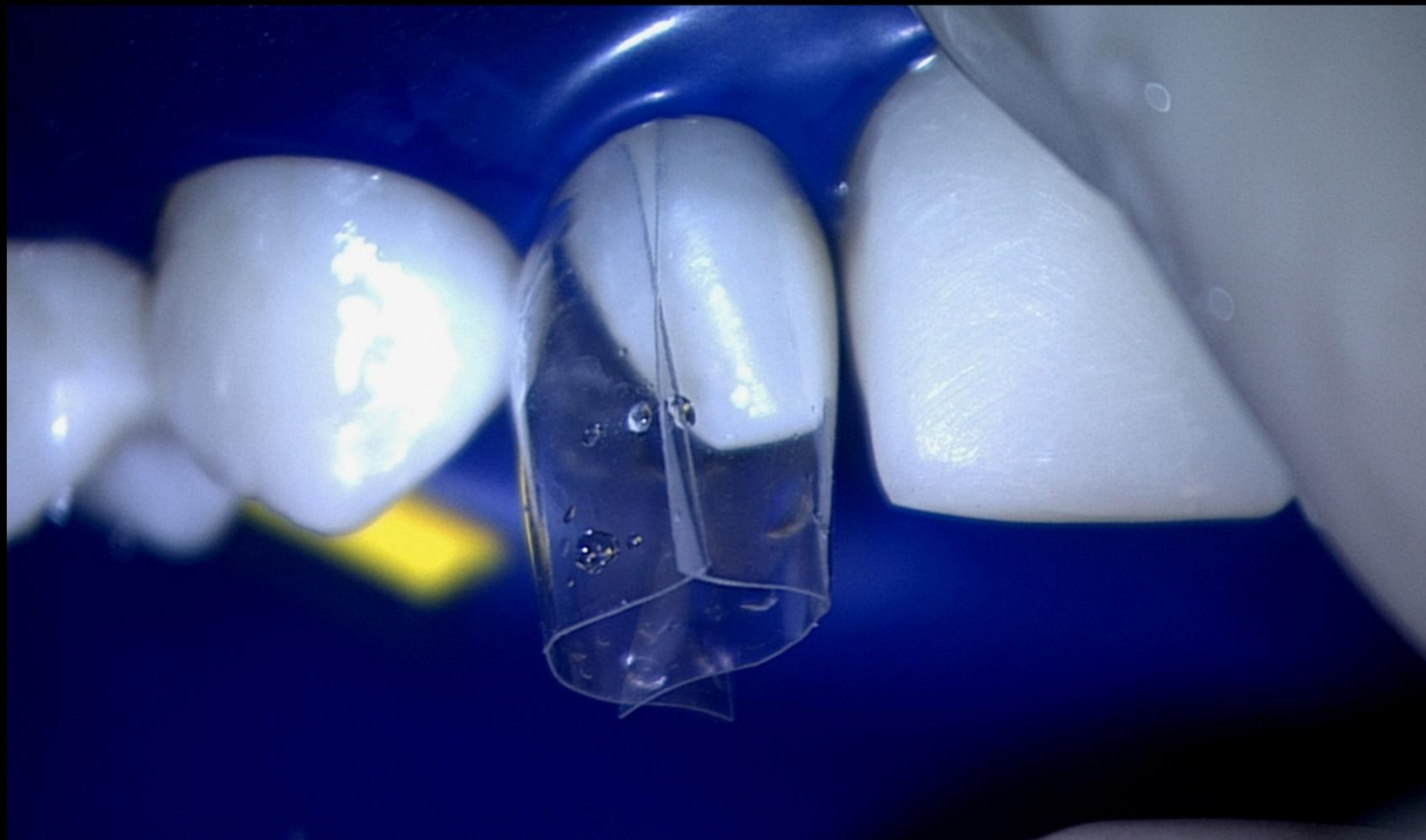


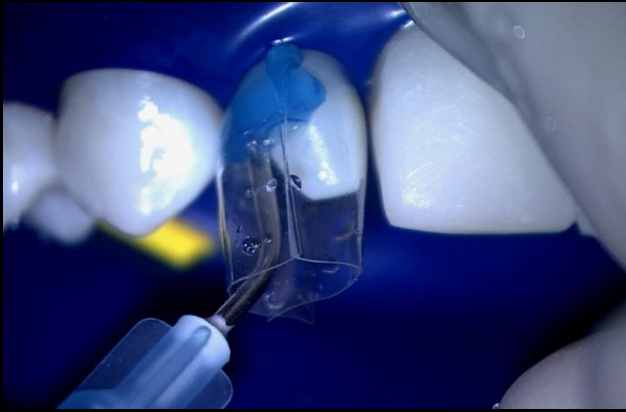




























3 year
follow up



7 year follow up



11 year follow up

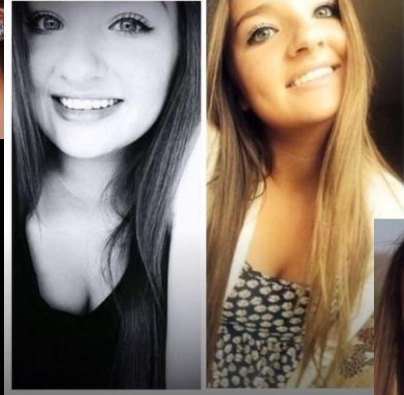




Pre-
op



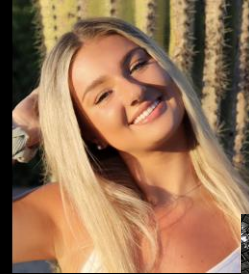
Immediate
post-op



Three-year
post-op



Seven-
year post-
op



Eleven-year
post-op






Pre-
op



Immediate
post-op



Eleven-year
post-op



The Great Tooth Killer: Epidemic of Cracked Teeth, the Science of Strong Teeth

featuring

 **BIOCLEAR**

THE SCIENCE OF STRONG RESTORED TEETH



DR. DAVID CLARK



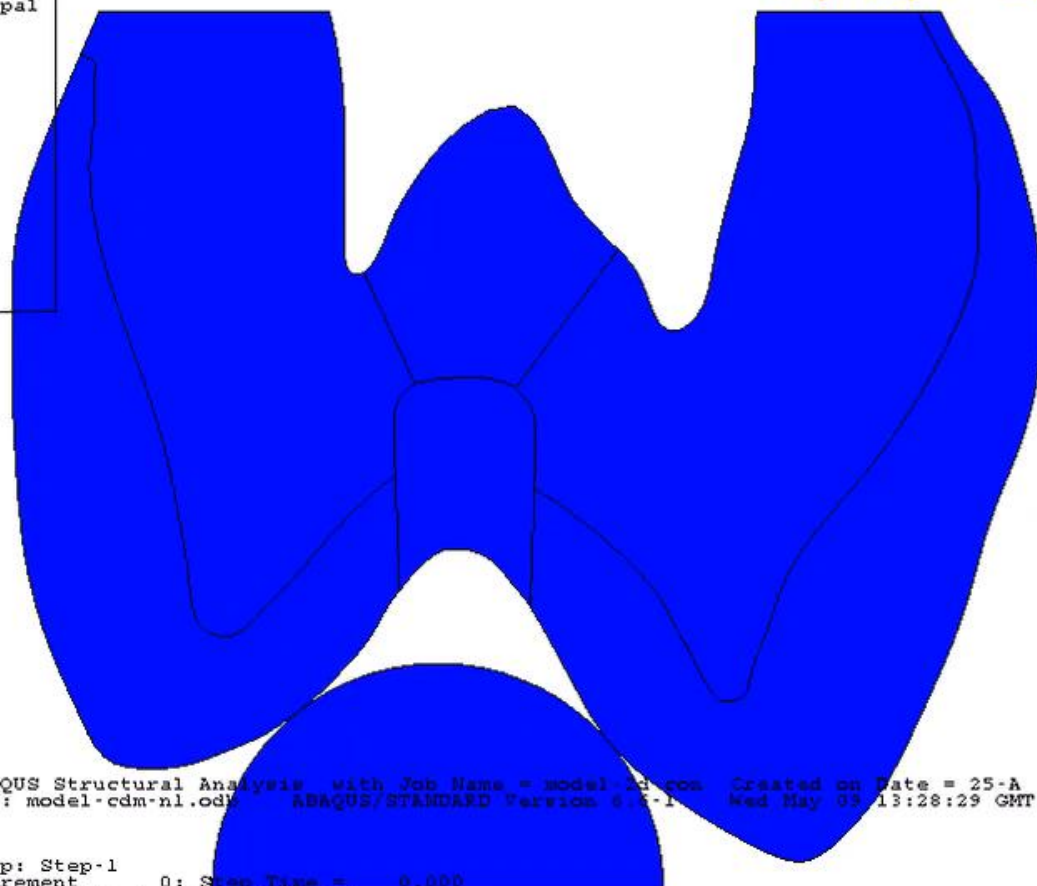
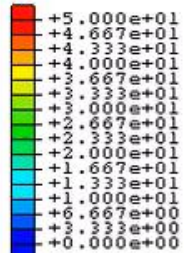
DR. ALEX FOK



Dr Alex Fok is a Mechanical Engineer with expertise in solid mechanics, structural analysis and mathematical modeling. He is currently the Academic Director of the Minnesota Dental Research Center for Biomaterials and Biomechanics (MDRCBB). The MDRCBB is an international leader in the development and application of novel characterization techniques for dental biomaterials, with long-standing collaboration with dental materials manufacturers. Dr Fok's research focuses on the development of techniques for material characterization, nondestructive examination, lifetime prediction and shape optimization of dental restorations. A principal aim of his research is to instill more engineering principles and analytical techniques into the design and assessment of dental restorations and treatments so as to improve their longevity and effectiveness.

Step: Step-1 Frame: 0

S, Max. Principal
(Avg: 75%)



ABAQUS Structural Analysis with Job Name = model-nl.odb Created on Date = 25-A
ODB: model-cdm-nl.odb ABAQUS/STANDARD Version 6.6-1 Wed May 03 13:28:29 GMT Daylight

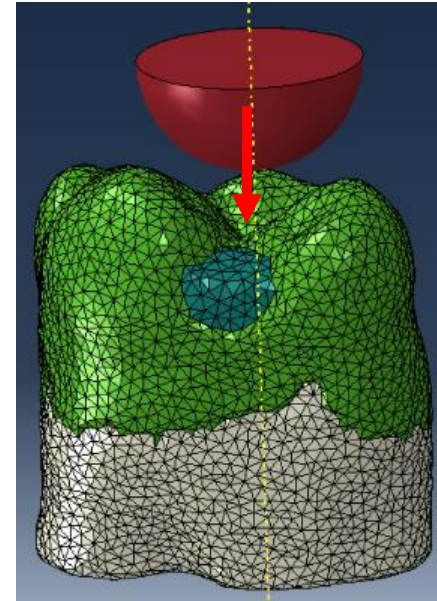
Step: Step-1
Increment 0: Span Time = 0.000
Primary Var: S, Max. Principal
Deformed Var: U Deformation Scale Factor: +1.000e+01



Finite Element Analysis of Stresses in Restorations due to Occlusal Loading

Methods

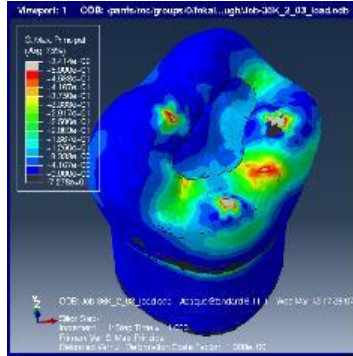
- Occlusal stress simulated by adding a hemisphere as an antagonist to the occlusal surface with downward vertical force (1000N) , resulting in three occlusal areas
- Principal stresses on the restorations and tooth were compared.



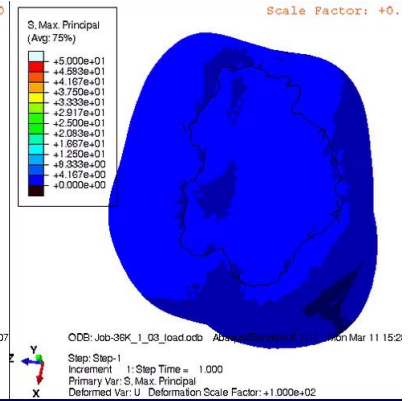
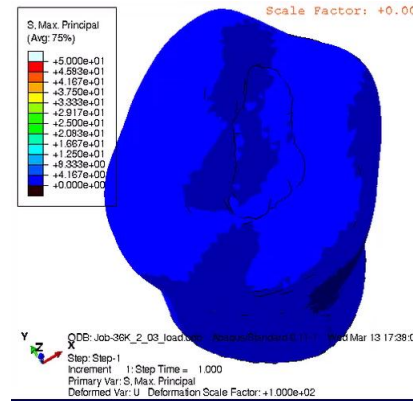
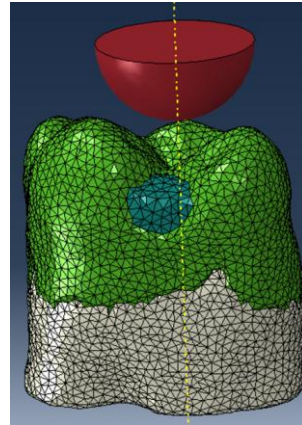
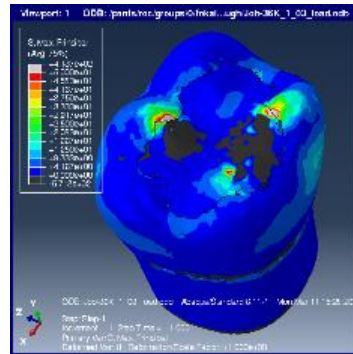
3D Finite Element Analysis of Stresses in Class I Restorations due to Occlusal Loading

Max principal stress contours

Black

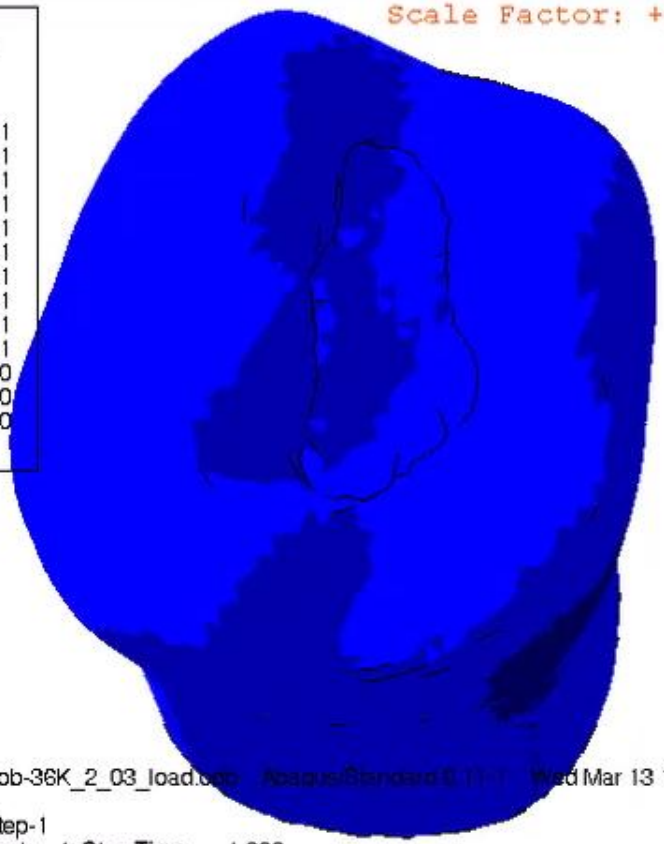
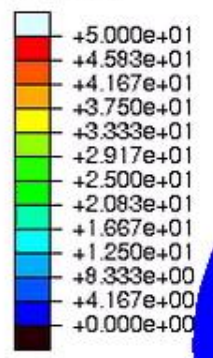


Clark



Scale Factor: +0.00

S. Max. Principal
(Avg: 75%)

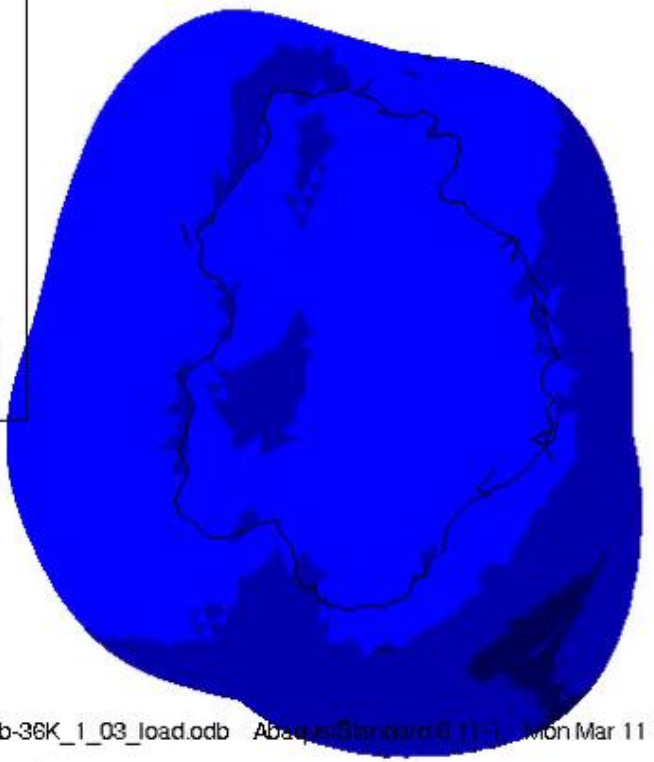
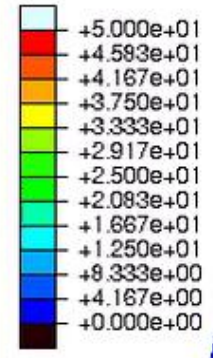


ODB: Job-36K_2_03_load.odb Abaqus/Viewer 6.11-1 Wed Mar 13 17:38:07
 Step: Step-1
 Increment 1: Step Time = 1.000
 Primary Var: S, Max. Principal
 Deformed Var: U Deformation Scale Factor: +1.000e+02

Black

Scale Factor: +0.

S. Max. Principal
(Avg: 75%)



ODB: Job-36K_1_03_load.odb Abaqus/Viewer 6.11-1 Mon Mar 11 15:2
 Step: Step-1
 Increment 1: Step Time = 1.000
 Primary Var: S, Max. Principal
 Deformed Var: U Deformation Scale Factor: +1.000e+02

Clark

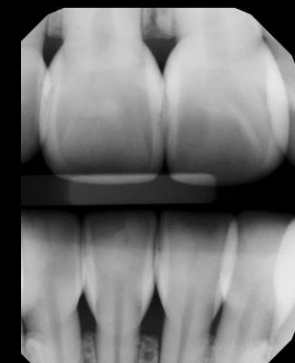


Modern Approach to Composite Restorations

Posterior Restoration



Black Triangle



Modern Method for Composite Restorations

Bioclear Anatomic Matrices

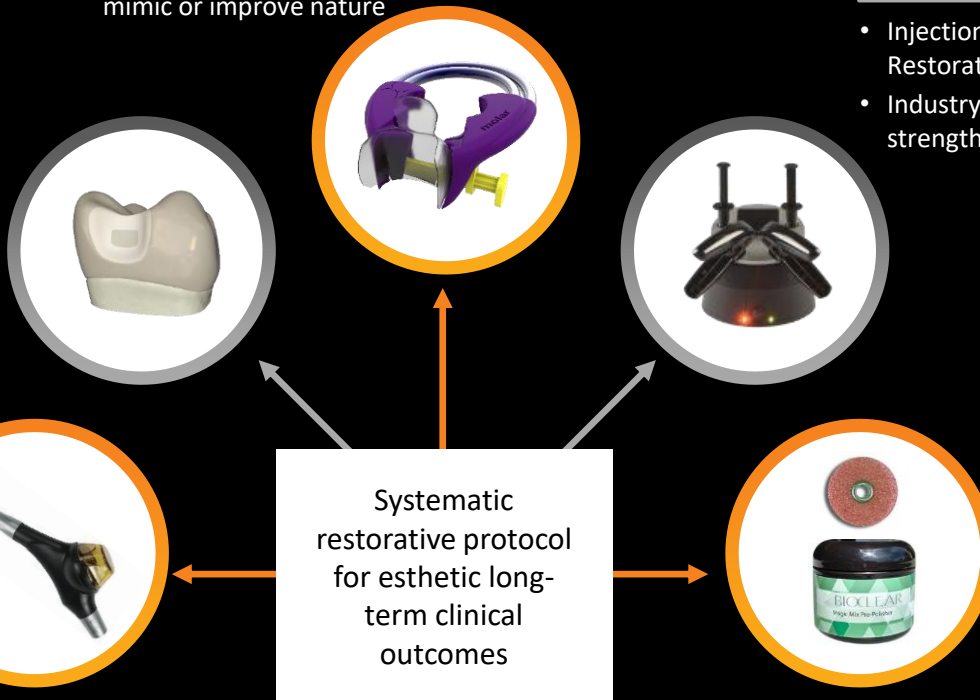
- Anterior & Posterior Matrices designed to mimic or improve nature

Preparation Design

- I.C.E. Infinity edge, Compression based, Enamel driven
- Maximizes enamel involvement by going "around the tooth"

Biofilm Removal

- Bioclear Blaster removes biofilm before bonding
- Allows bonding to uncut enamel
- Allows infinity edge margins



Injection Mold Composite

- Injection mold warmed Solventum Restorative materials
- Industry leading polish, esthetic, strength & wear

Rock Star Polish

- 3M™ Sof-Lex™ XT coarse discs for reduction
- "Rock Star" polish with Bioclear Magic Mix & RS Polisher

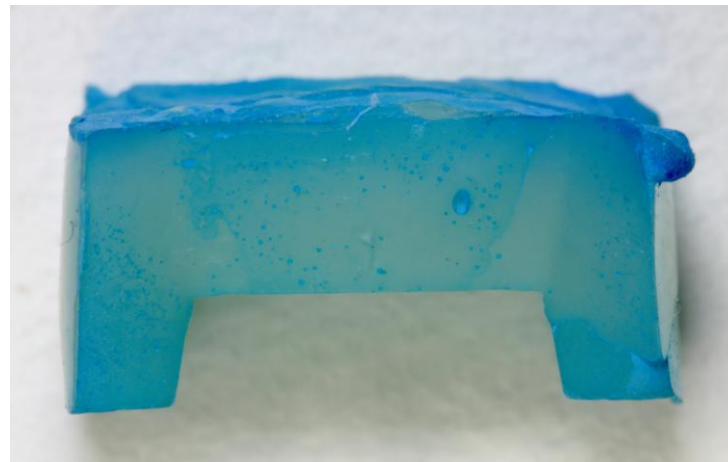
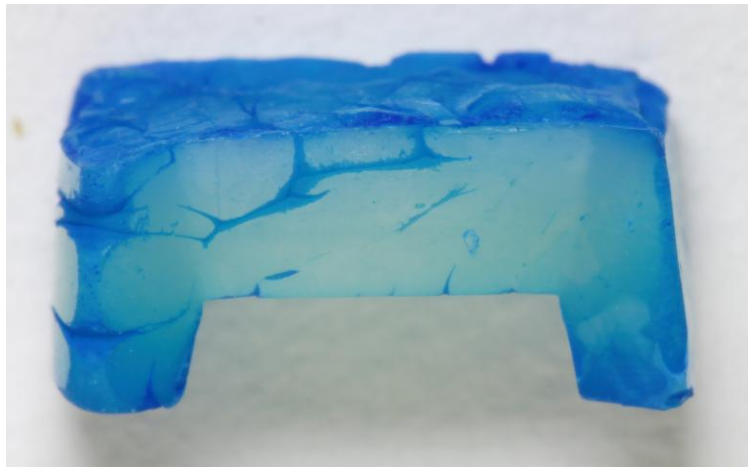
Let's go back to 2007...

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

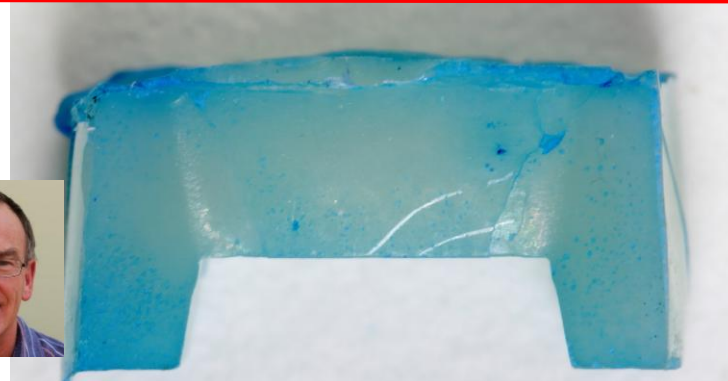
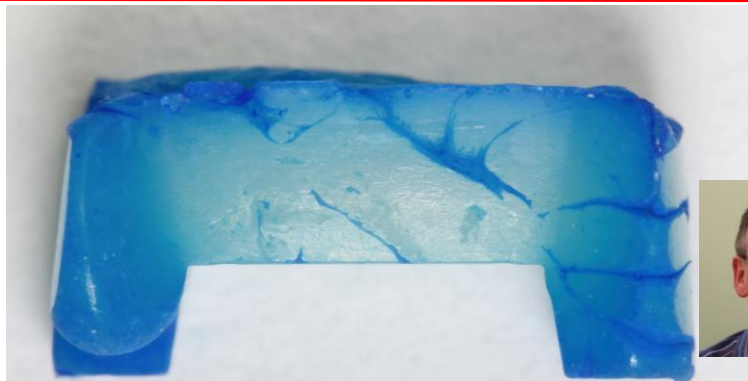
Hand-Packed and Layered

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?

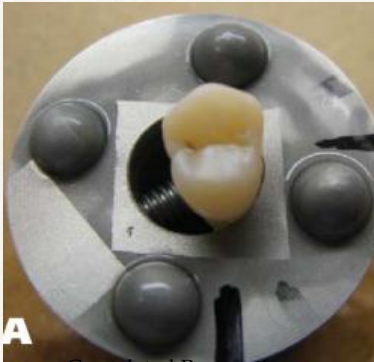
Does layering relieve stress and reduce microleakage? **NO**

Studies do not support layering to mitigate polymerization stress

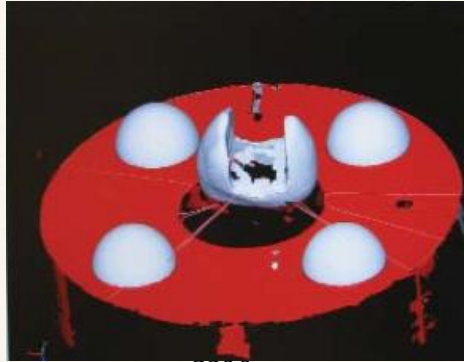
- ◆ Does Incremental Filling Technique Reduce Polymerization Shrinkage Stresses?
Versluis A, et.al., J Dent Res March 1996; 75(3): 871-878
- ◆ An In Vitro Study of the Effect of Restorative Technique on Marginal Leakage in Posterior Composites
Neiva IF, et.al.; Oper Dent 1998, 23:282-289
- ◆ Microleakage 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

October 2011 JADA

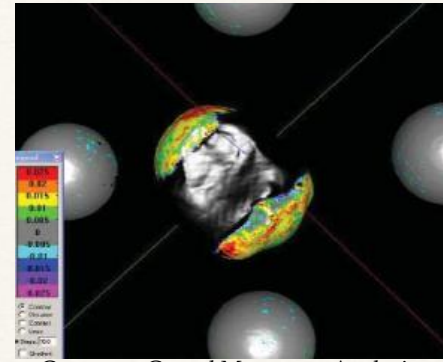
Cuspal deflection and depth of cure in resin-based composite restorations filled by using bulk, incremental and transtooth-illumination techniques



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."

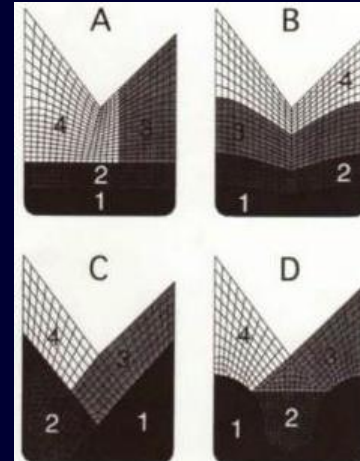
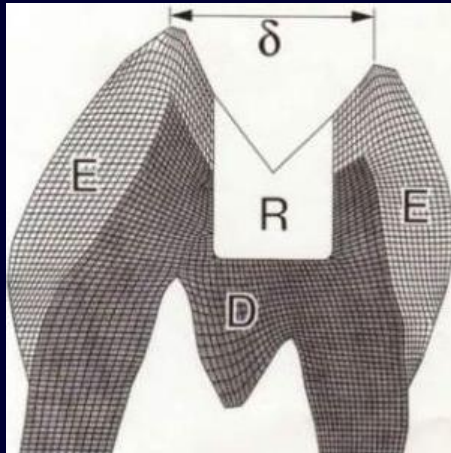
Does an incremental filling technique reduce polymerization shrinkage stresses?

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.

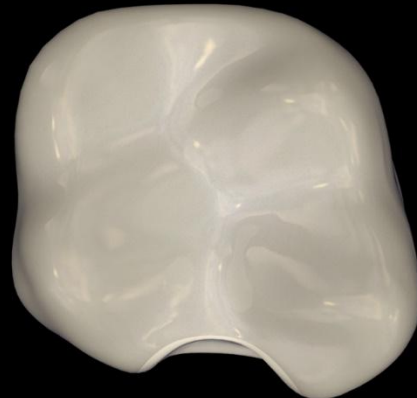


Epidemic of Failing Composites

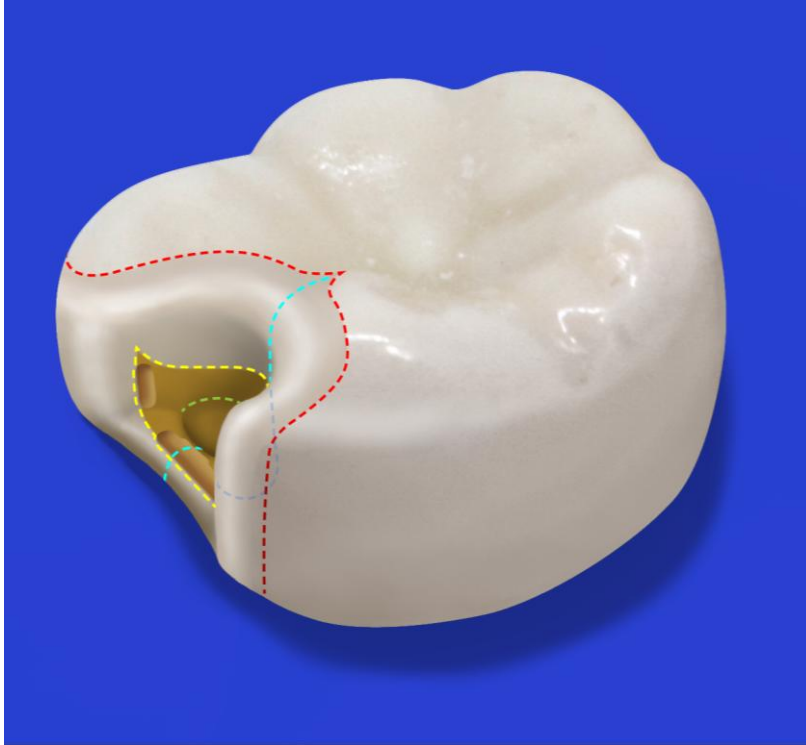


Modern Class II Cavity Preparation Design

The Prep?



Final views of completed Bioclear Class II Preparation.





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



Richard V Tucker, DDS

Ferndale, WA

Population: 11,415

Slides and Case Courtesy
Dr. Tim Hess

Courtesy Dr. Tim Hess











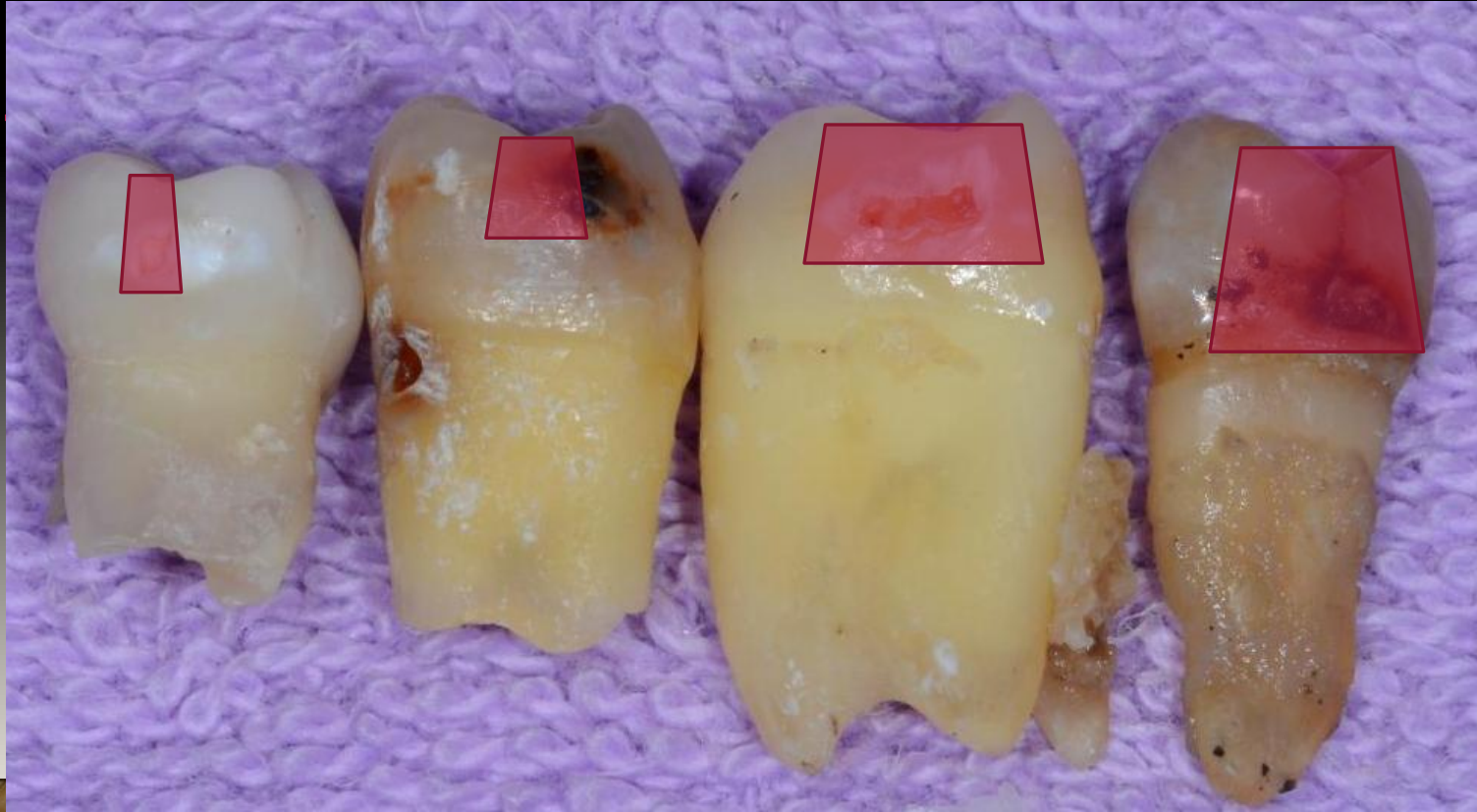
CAVITATION VS APRISMATIC ENAMEL



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

















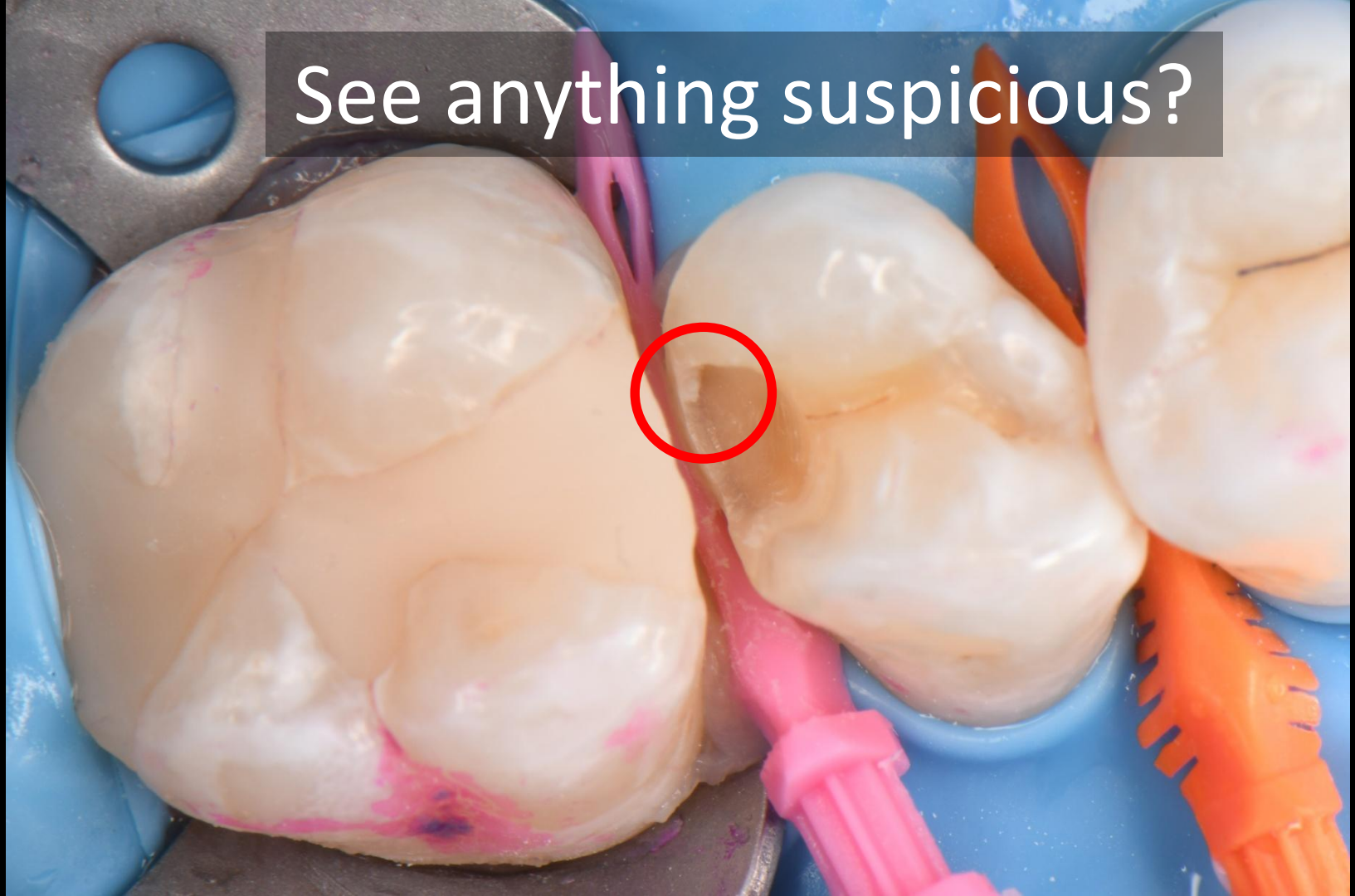








See anything suspicious?







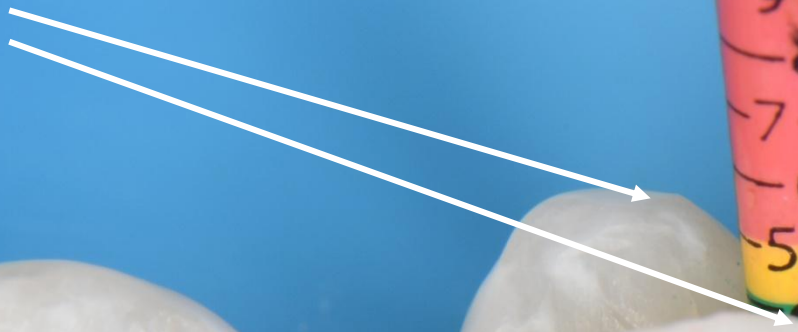








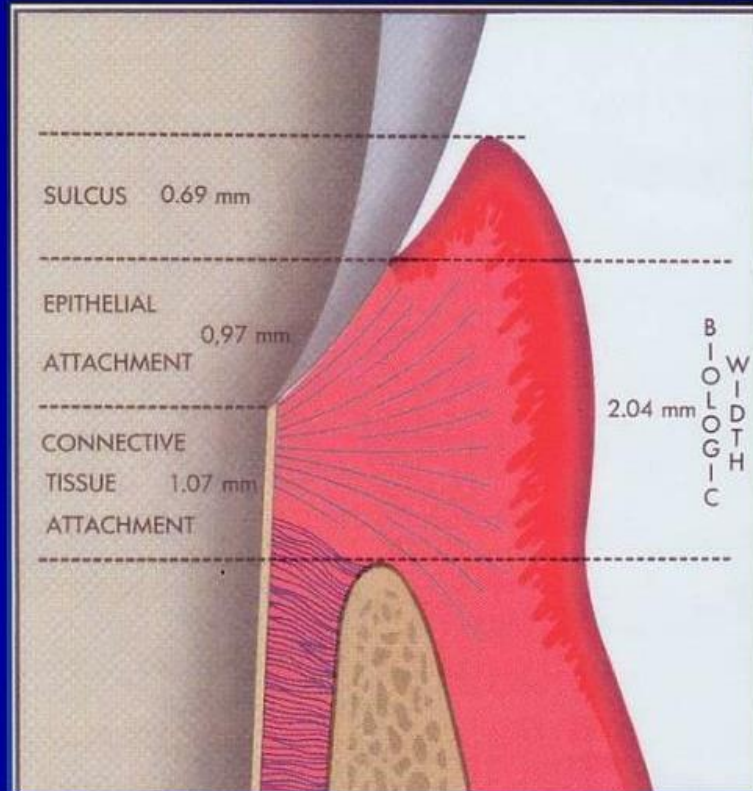
What's my
reference?

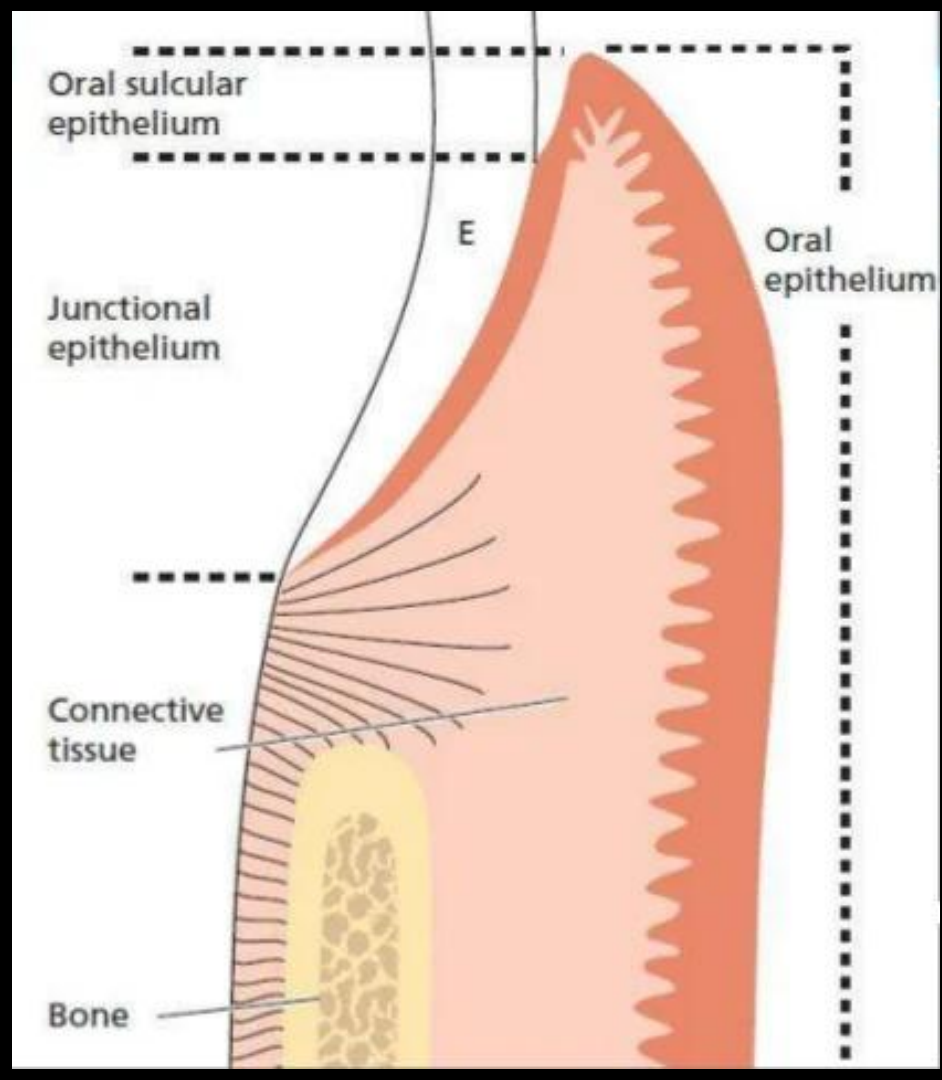
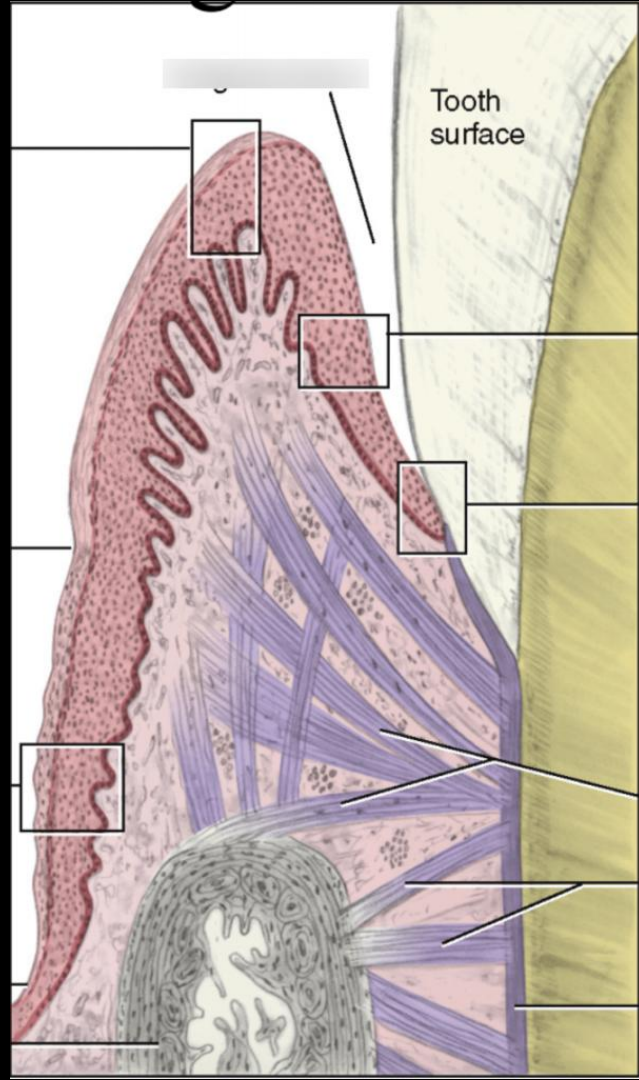


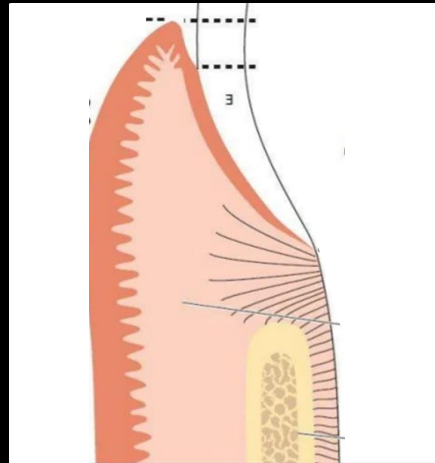
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reference?

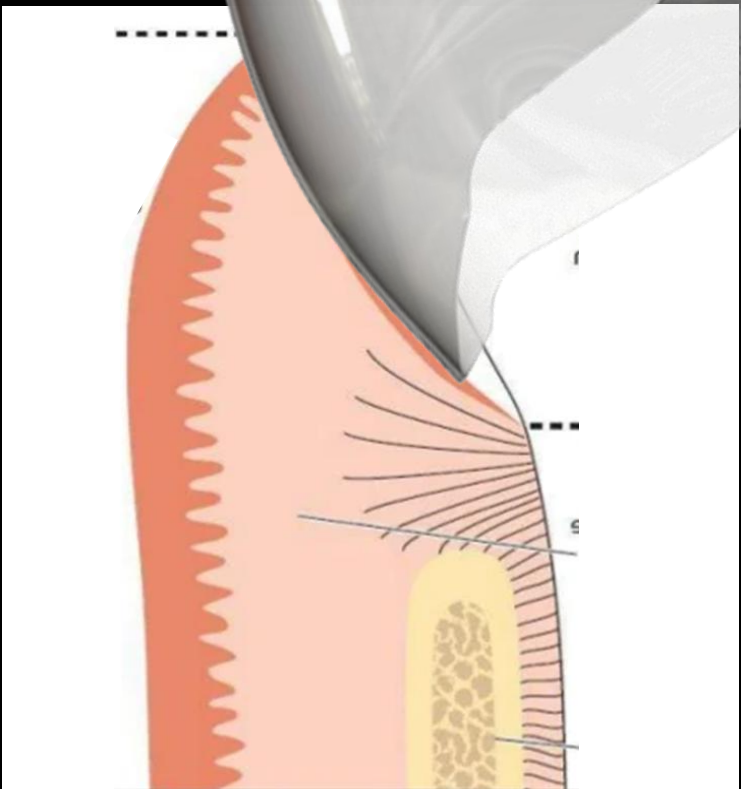


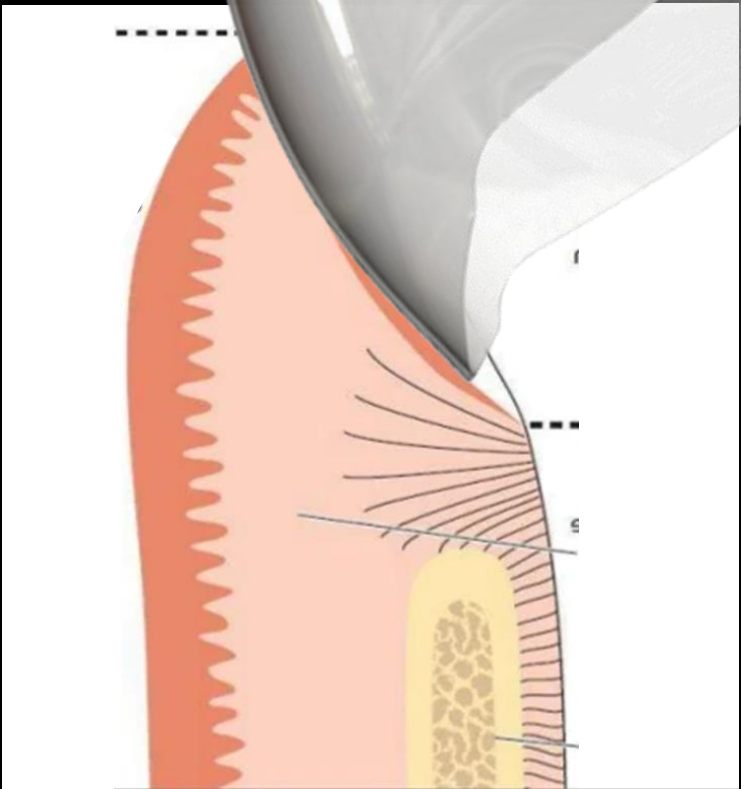












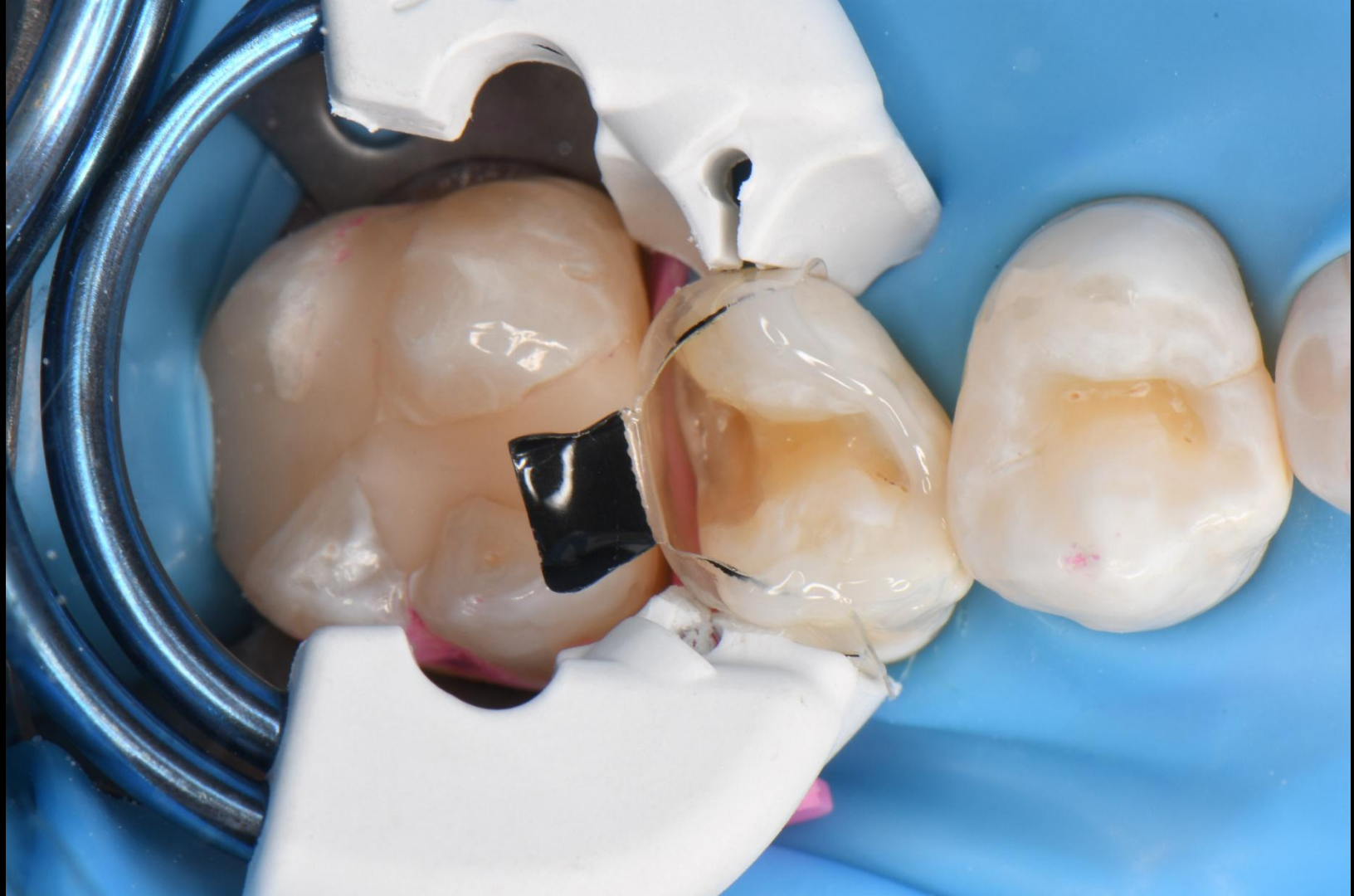


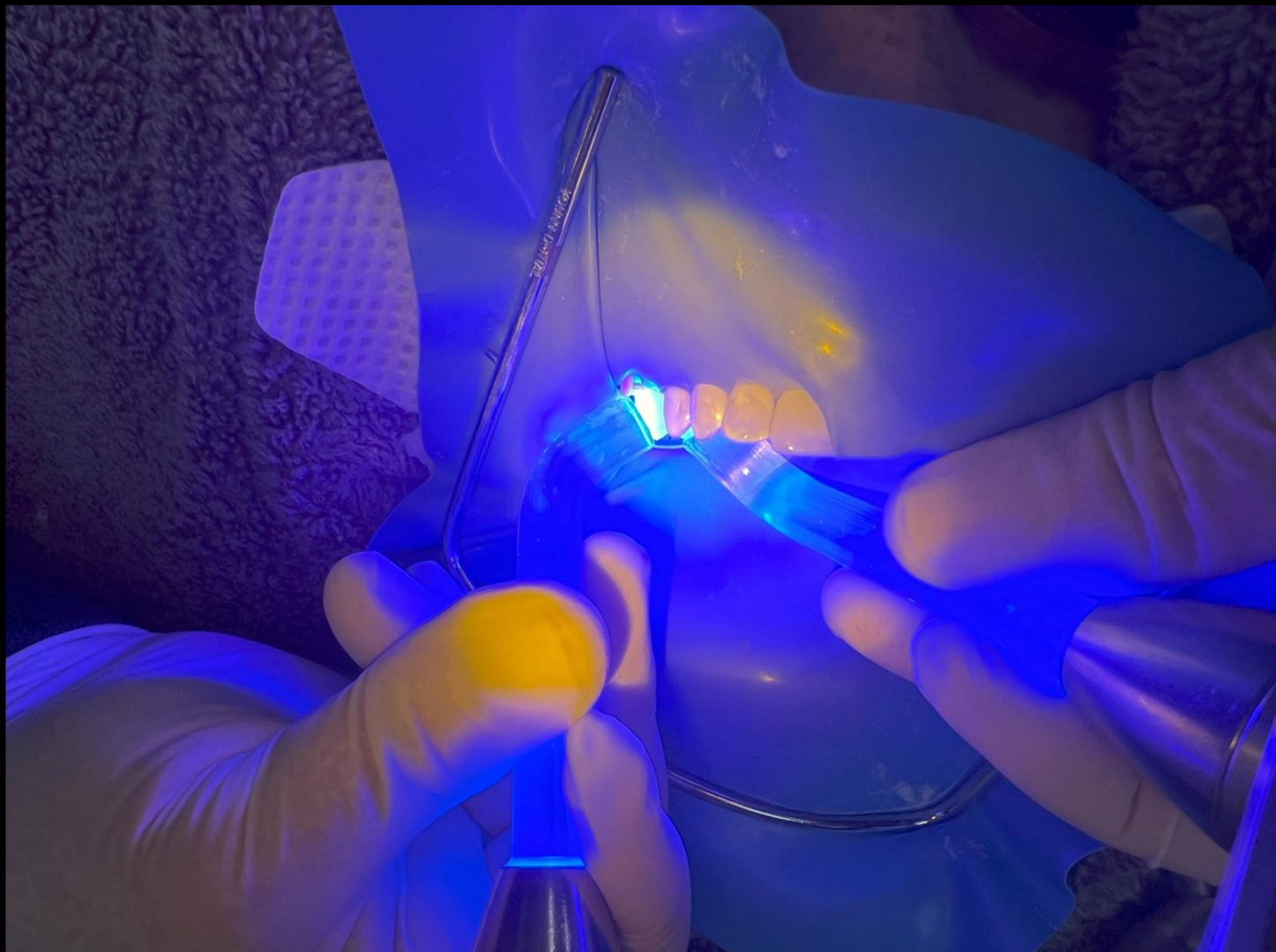














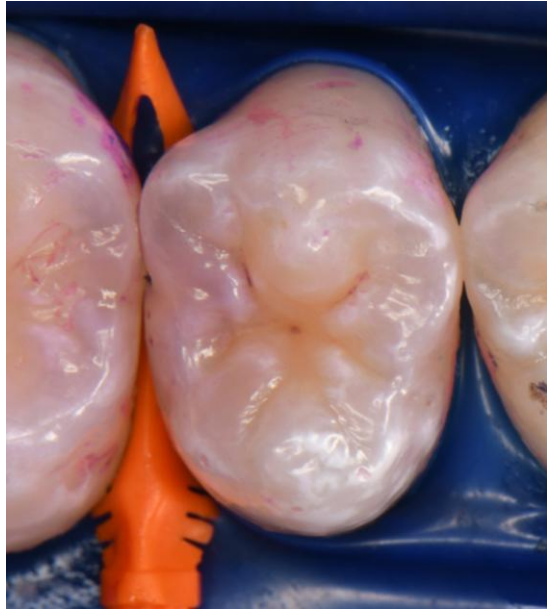








Similar Case: Pre-op, post op, and 3 year follow up





Step by Step Guide for Injection Molded Class II

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

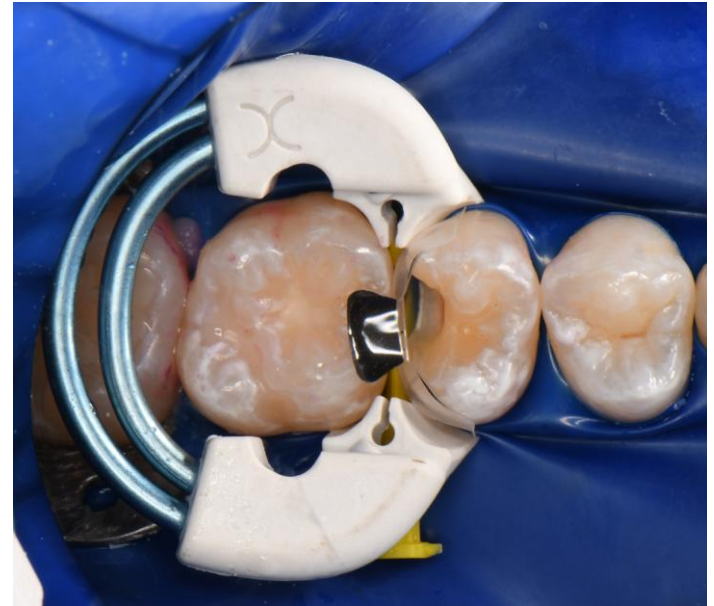
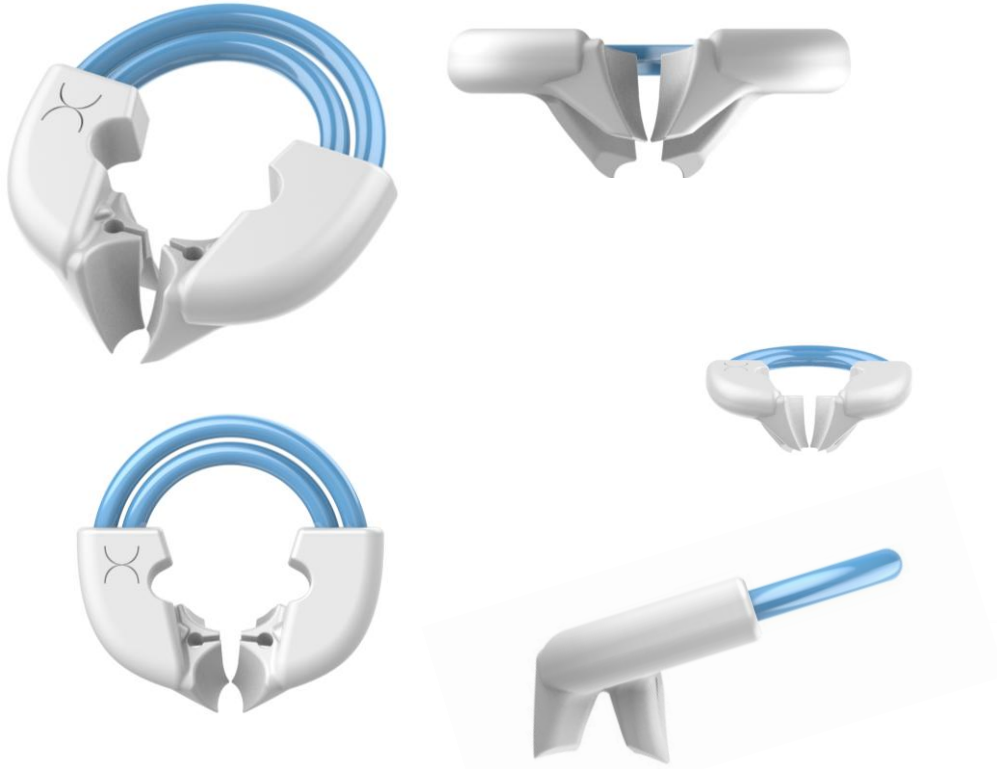


Stretched to 20mm Twenty Times



TwinRing Universal

∞ BIOCLEAR





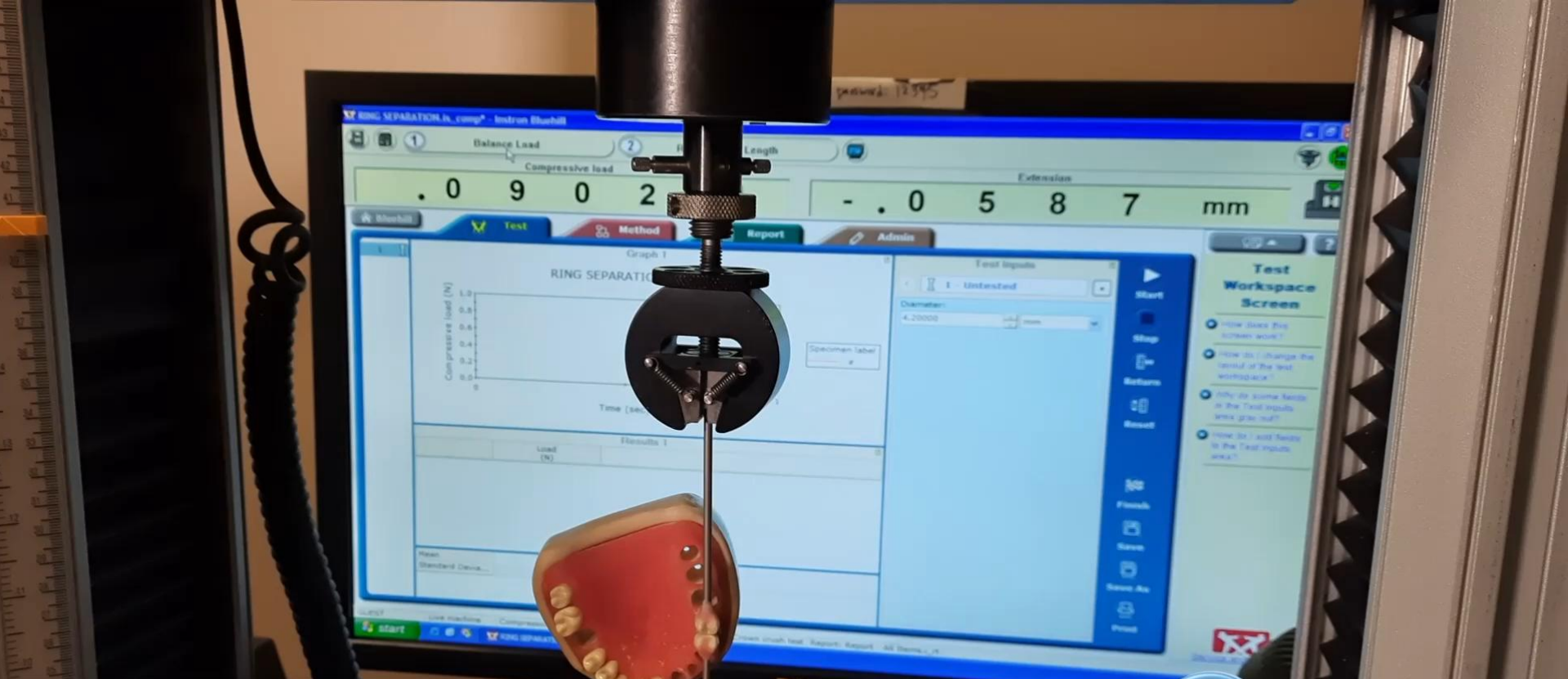
How do we win the *Snug Contact Game?*

- Power
- Strategy
- Technique



How do we win the *Snug Contact Game?*

- Power
- Strategy
- Technique



Nate Lawson DMD PhD

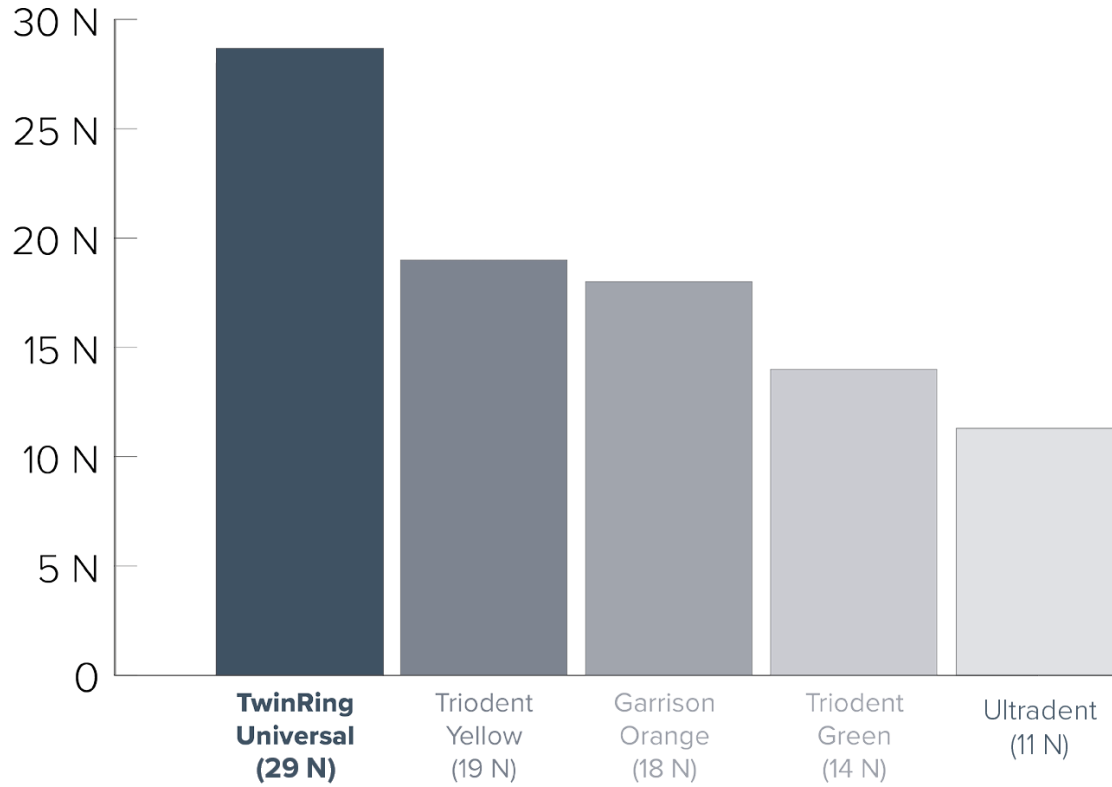
Director of the Division of Biomaterials and Pranita Bora. BDS, MDS.

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)



EVOLVE --- MATRIX

Premolar



Molar



EVOLVE
MATRIX

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



3 Sizes

6mm

7mm

9mm

- Curved/straight profile
- Wider width

∞ BIOCLEAR

The Adjustable Push-Pull Instrument

for Ideal Contacts

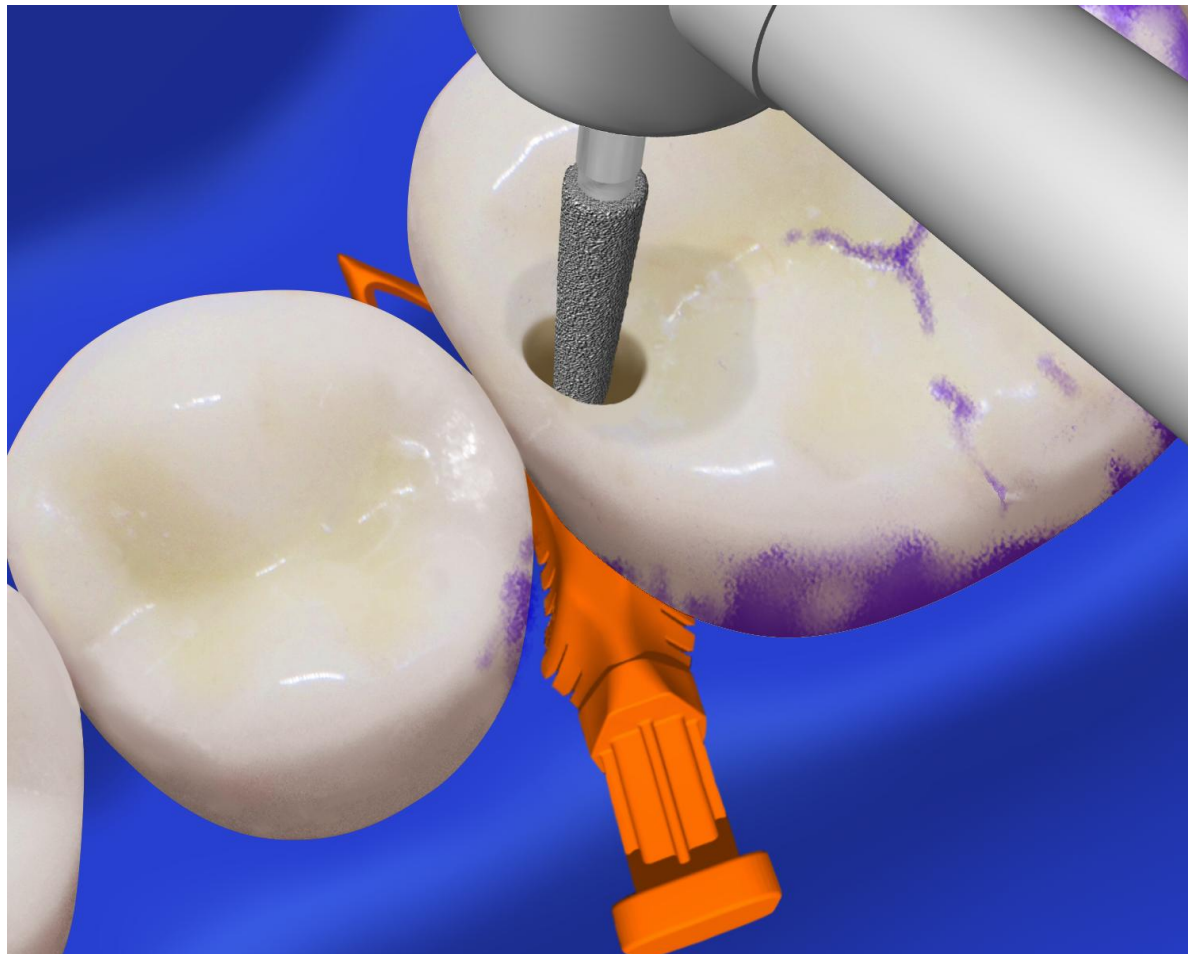


EVOLVE MATRIX SYSTEM

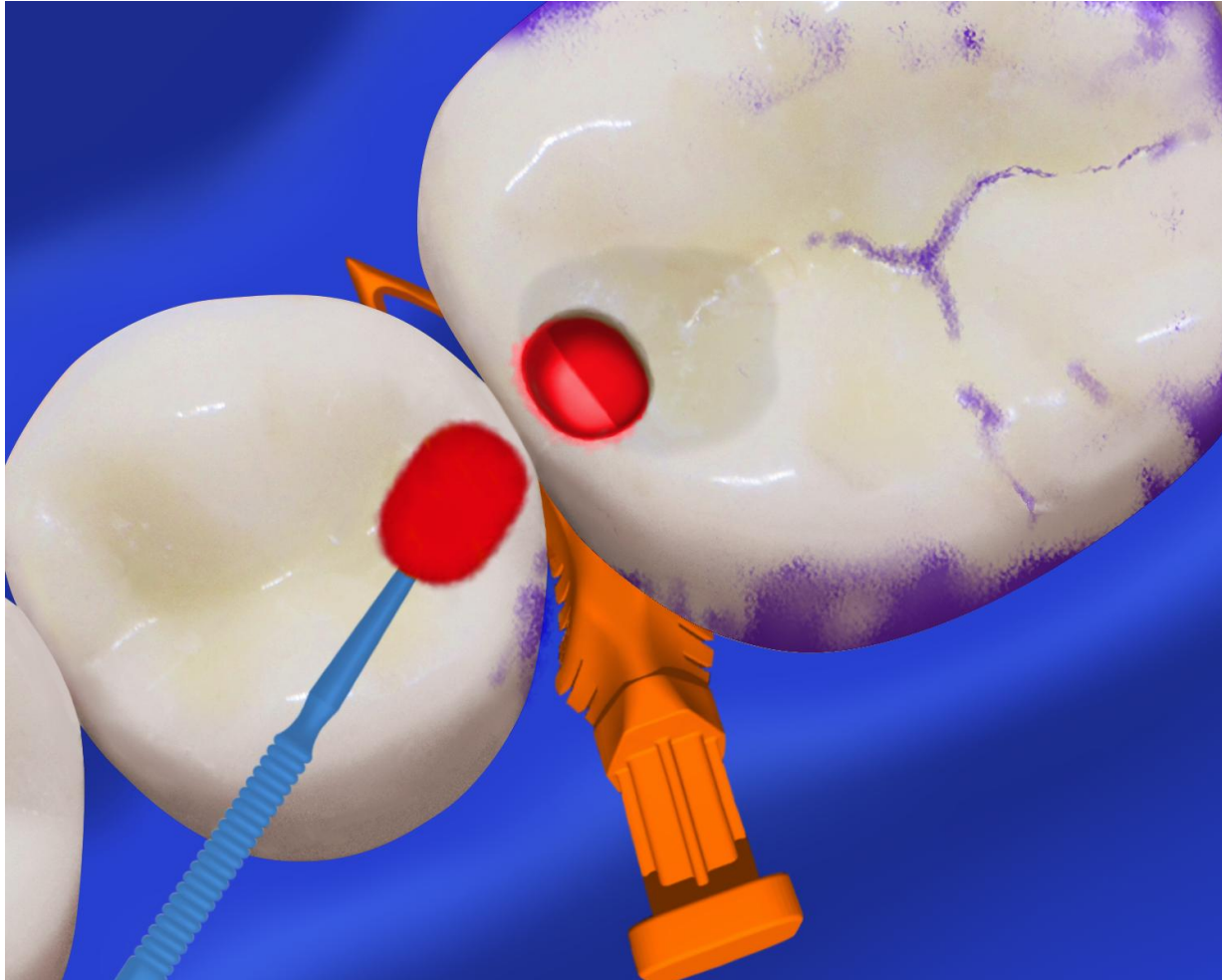
The slip-off test



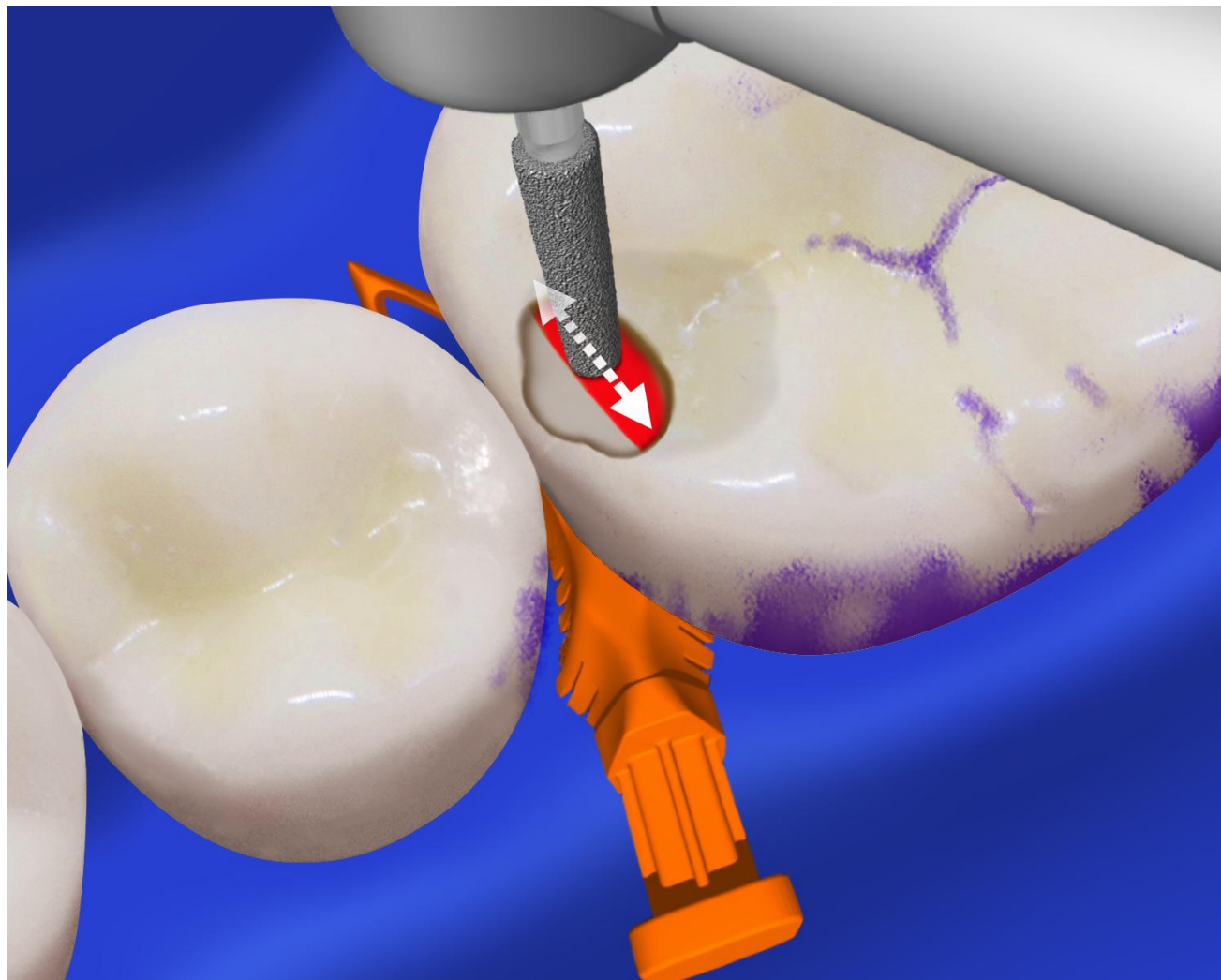
3) Bur #3 is
dropped into the
at the suspected
cavitation area.
(Bur is used with
water coolant)



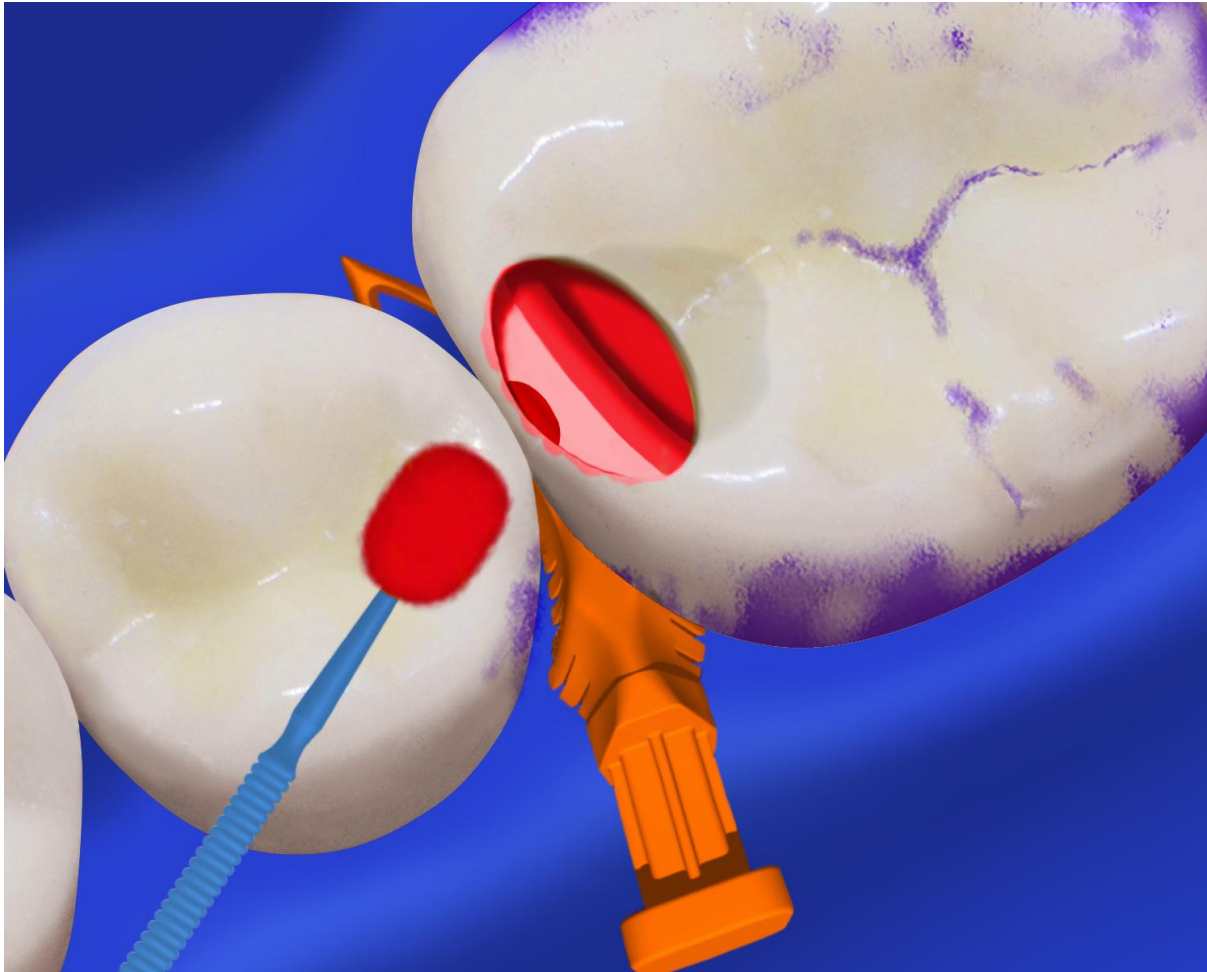
4) Caries indicator identifies dentin caries. Assessment of cavitation and caries to adjust bur movements. Axial dentin caries and healthy DEJ tissue should not be removed.



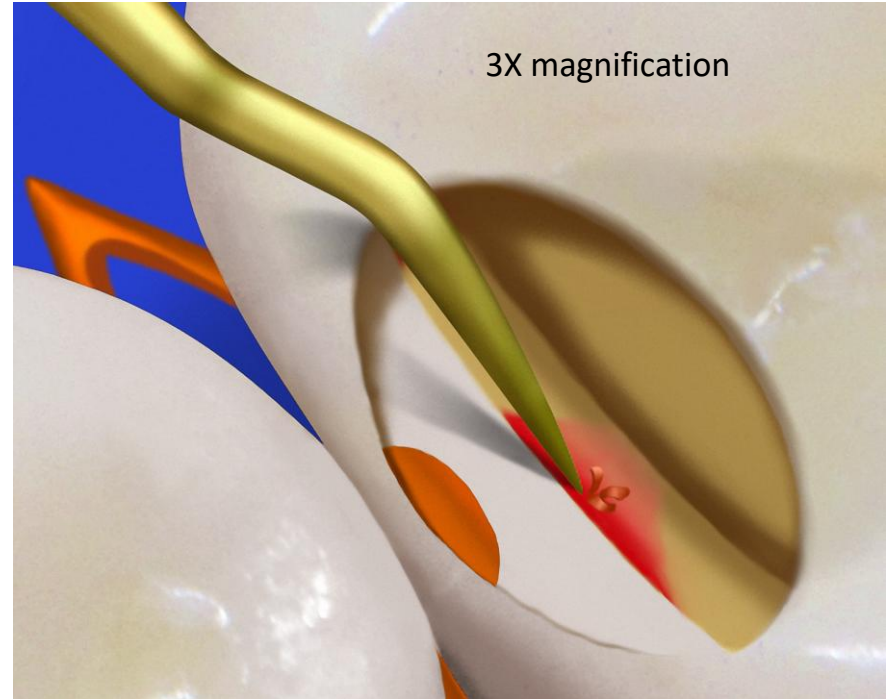
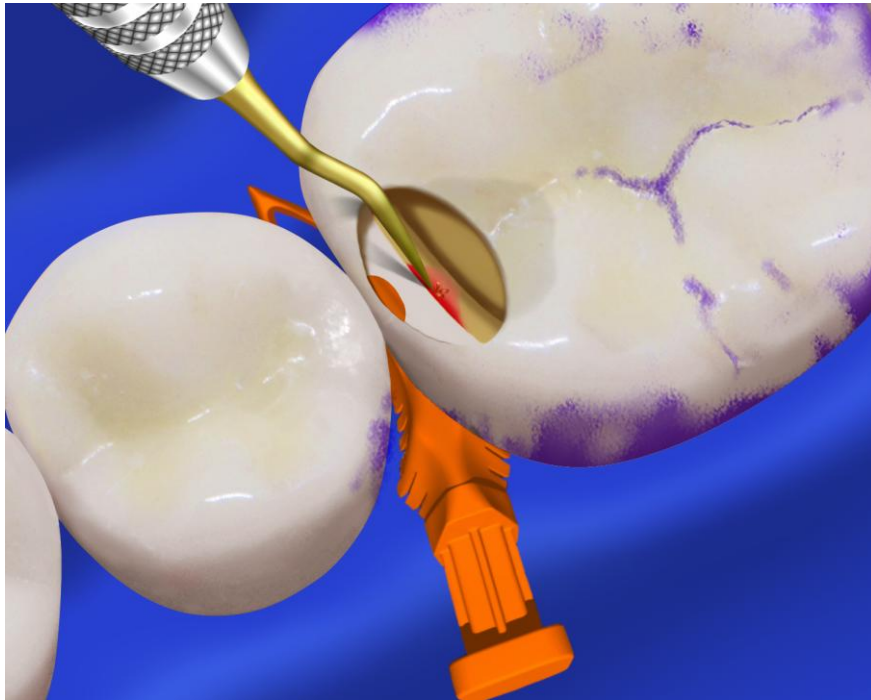
5) Bur #3 is kept **inside** of the cavity prep as DEJ caries removal proceeds.



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

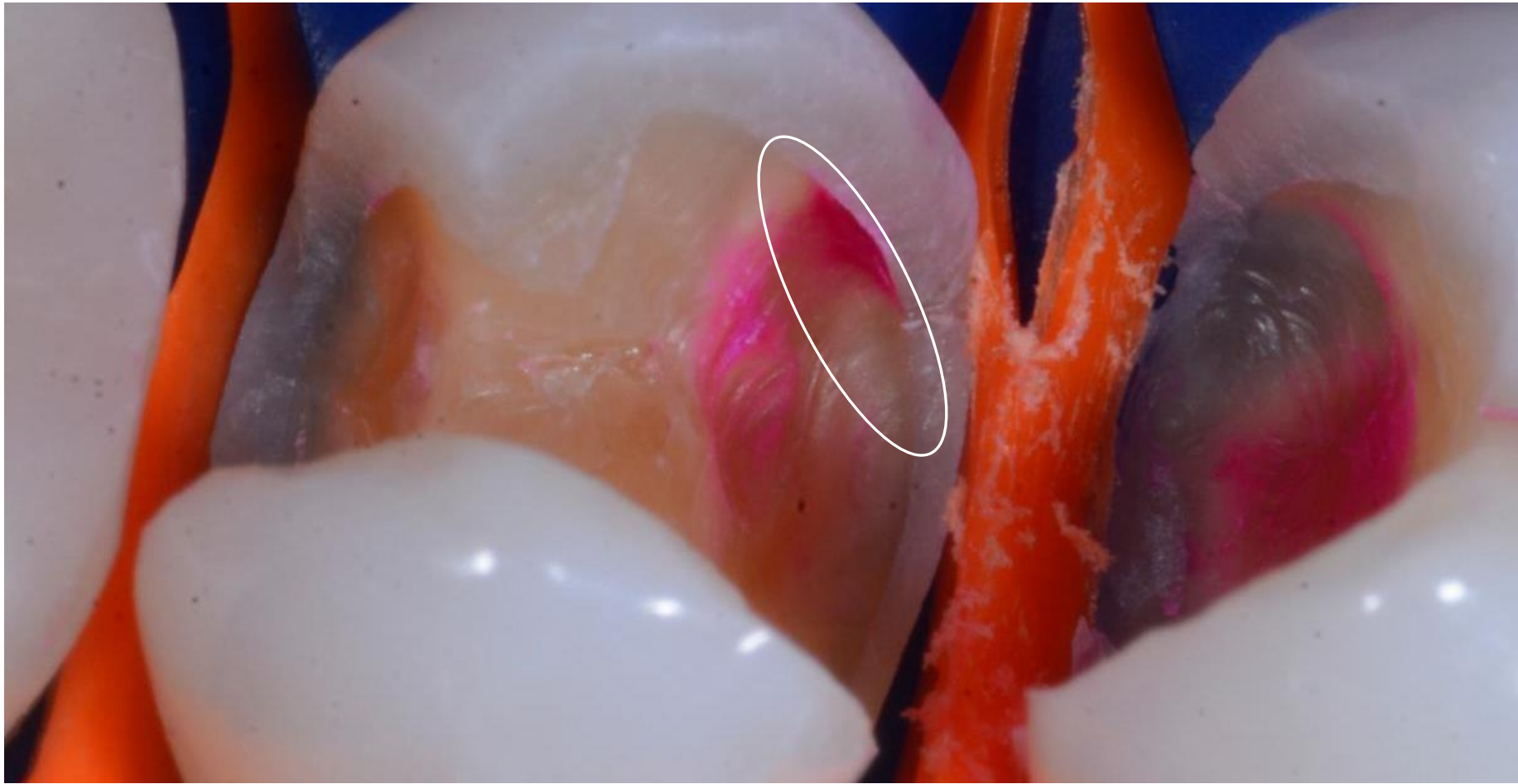


7) Clark explorer is used to achieve tactile test of healthy vs. carious DEJ dentin. Cumulative diagnosis with hardness test and caries indicator is recommended.

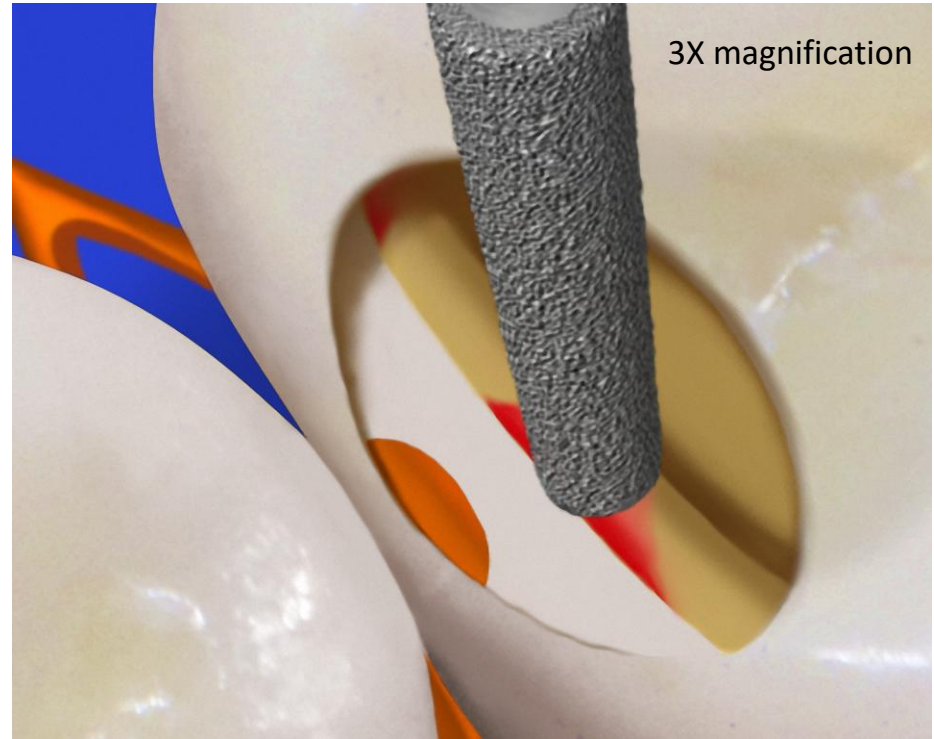
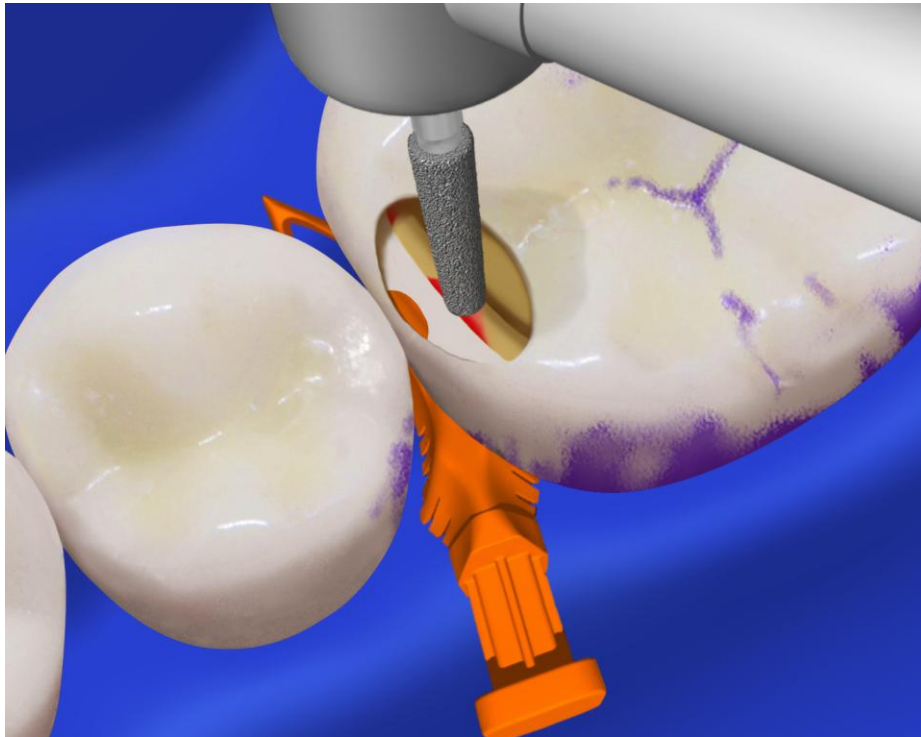




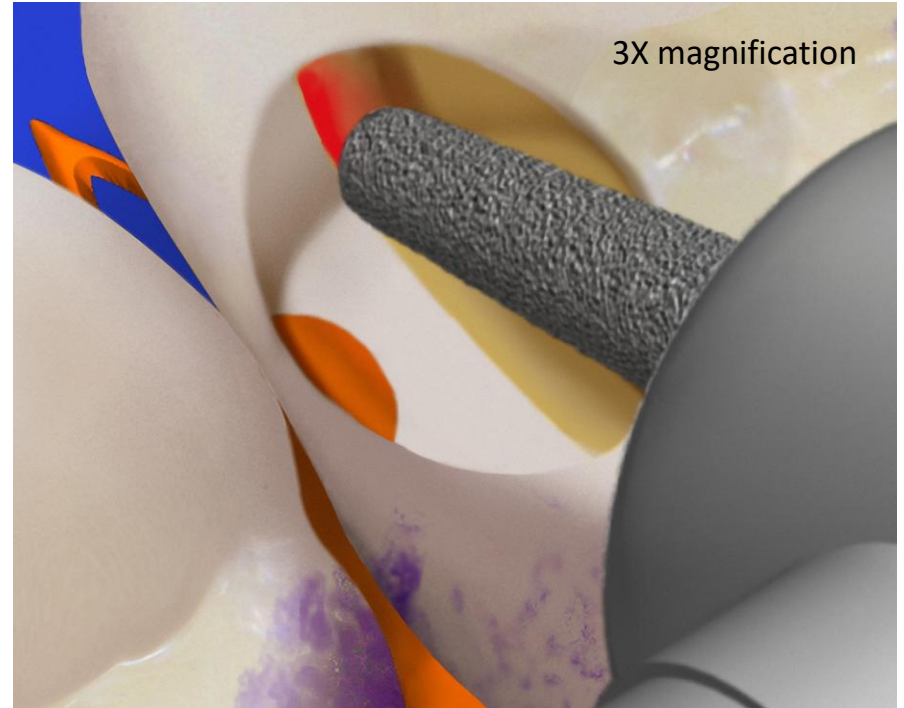
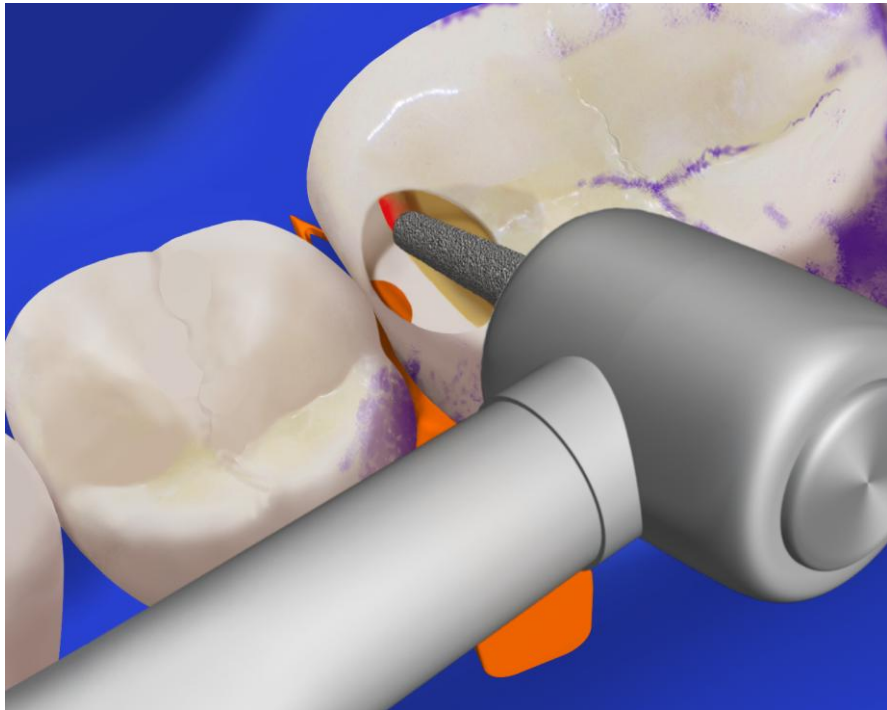




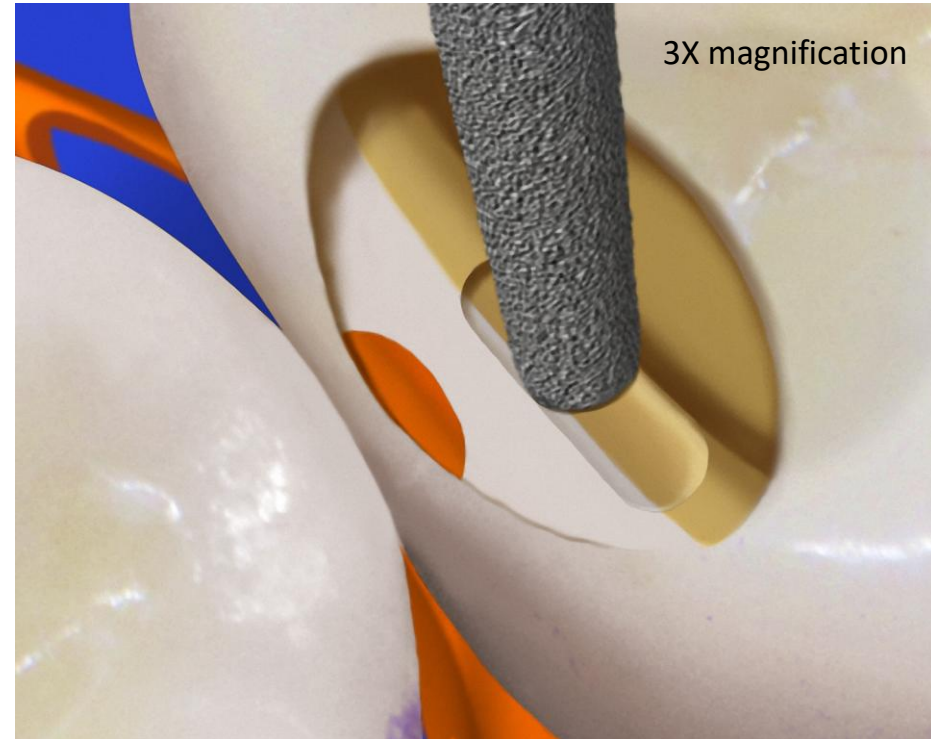
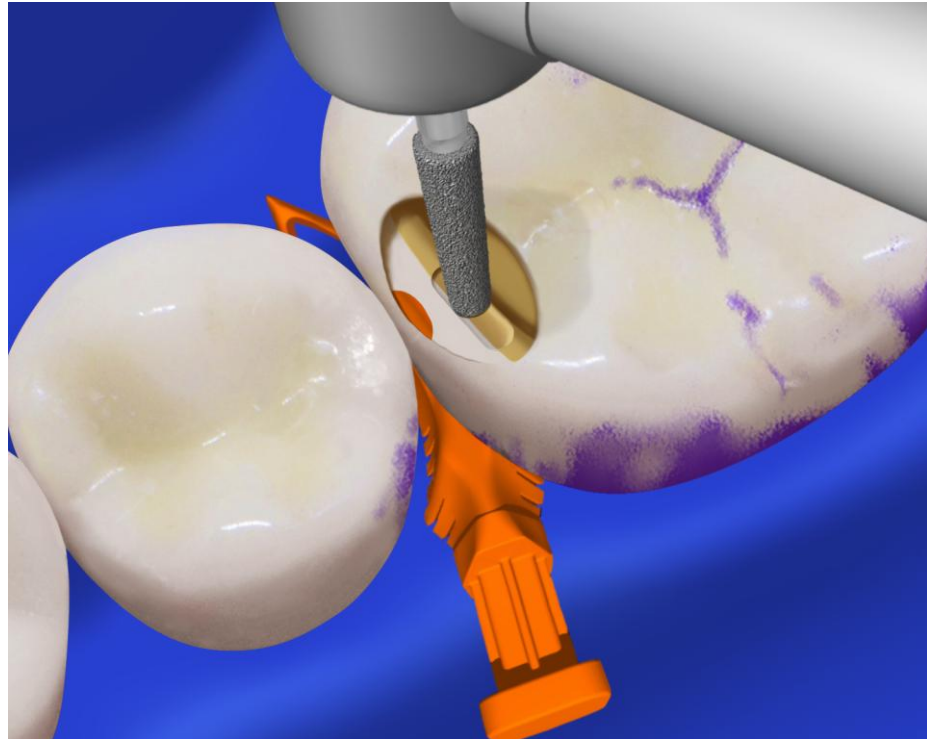
8) Final DEJ caries removal on gingival zone with #3 bur



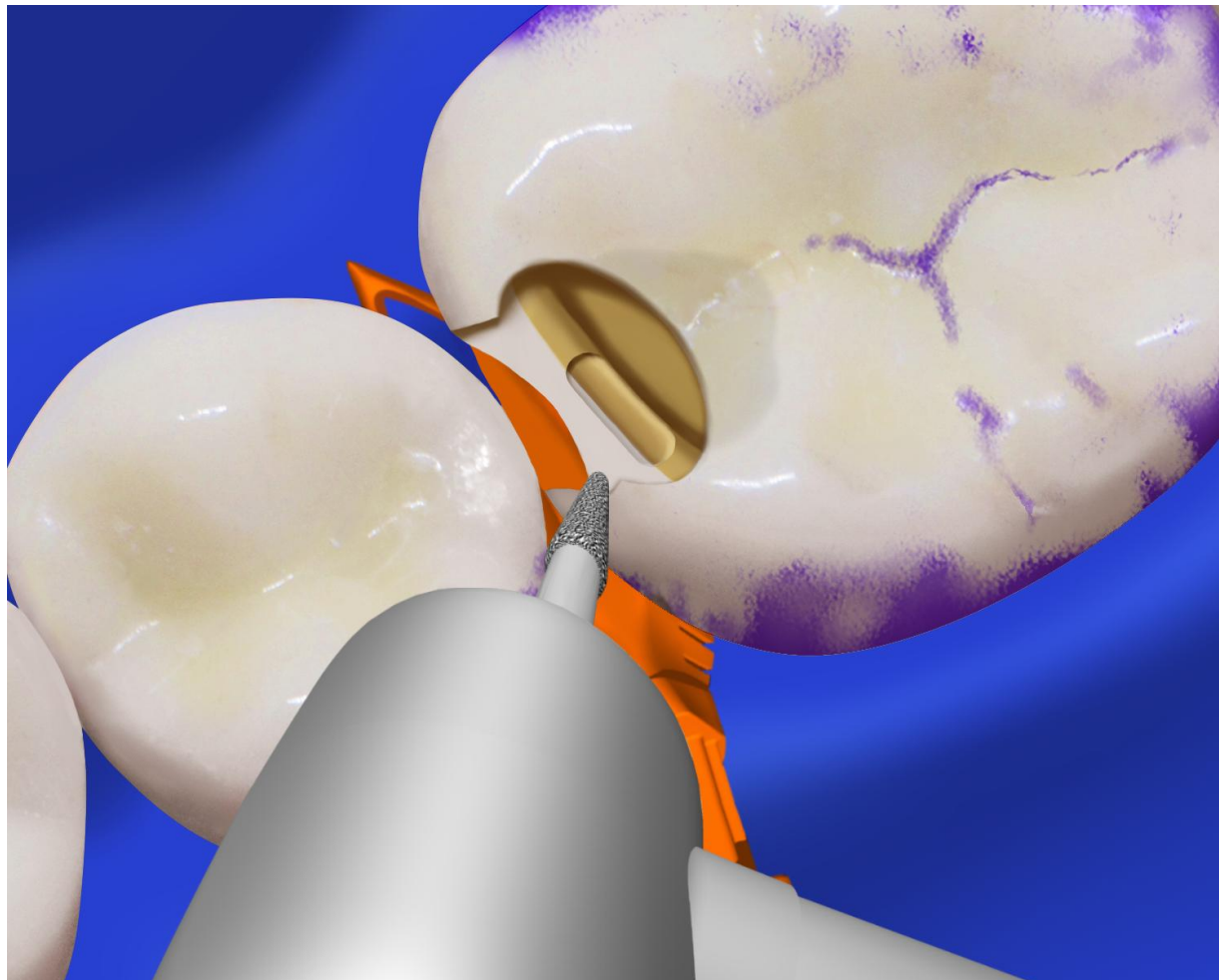
9) Buccal and caries at DEJ is also performed. Angle of bur can be changed for conservative access.



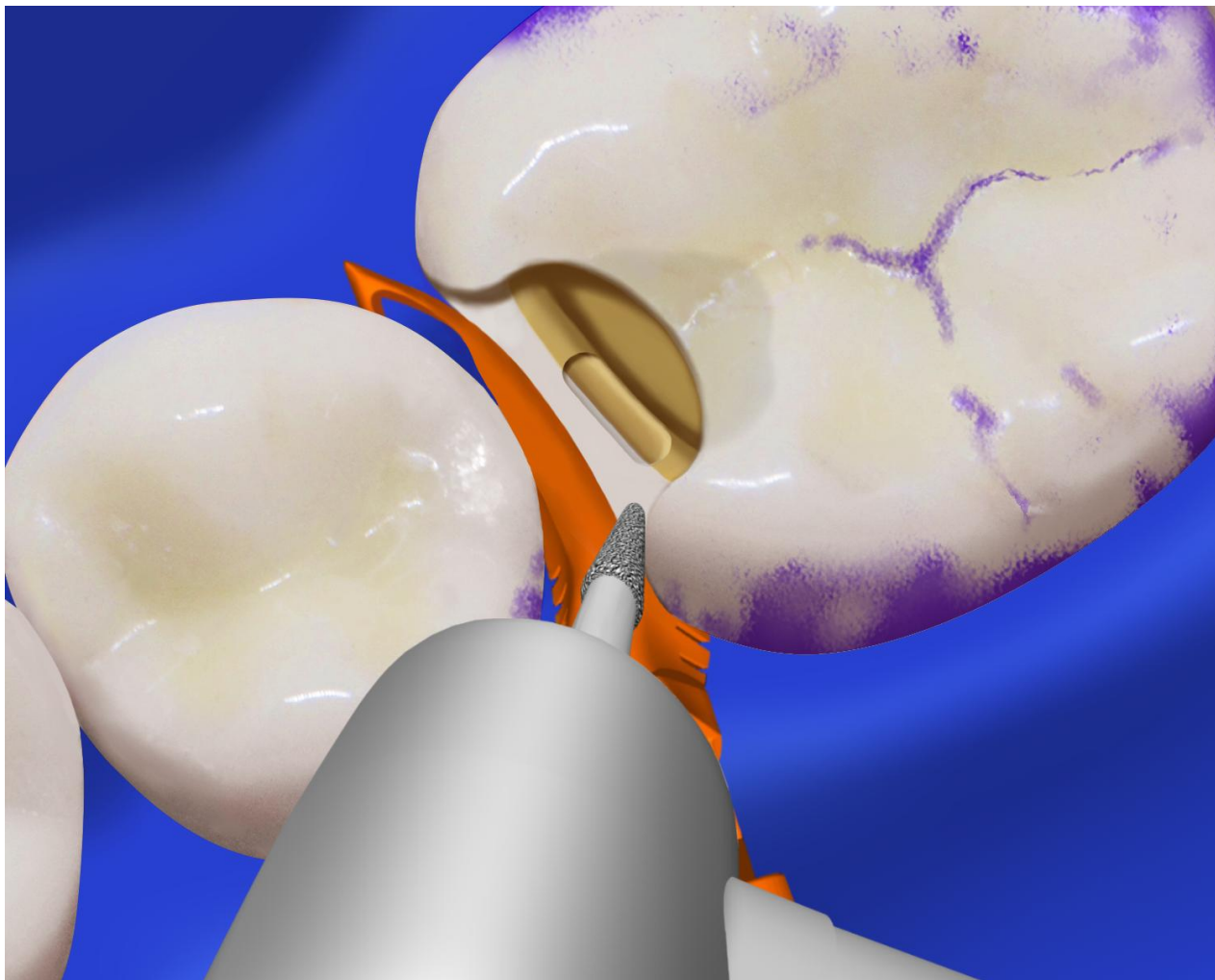
10) Final caries removal at DEJ is shown and natural cavitation area is shown.



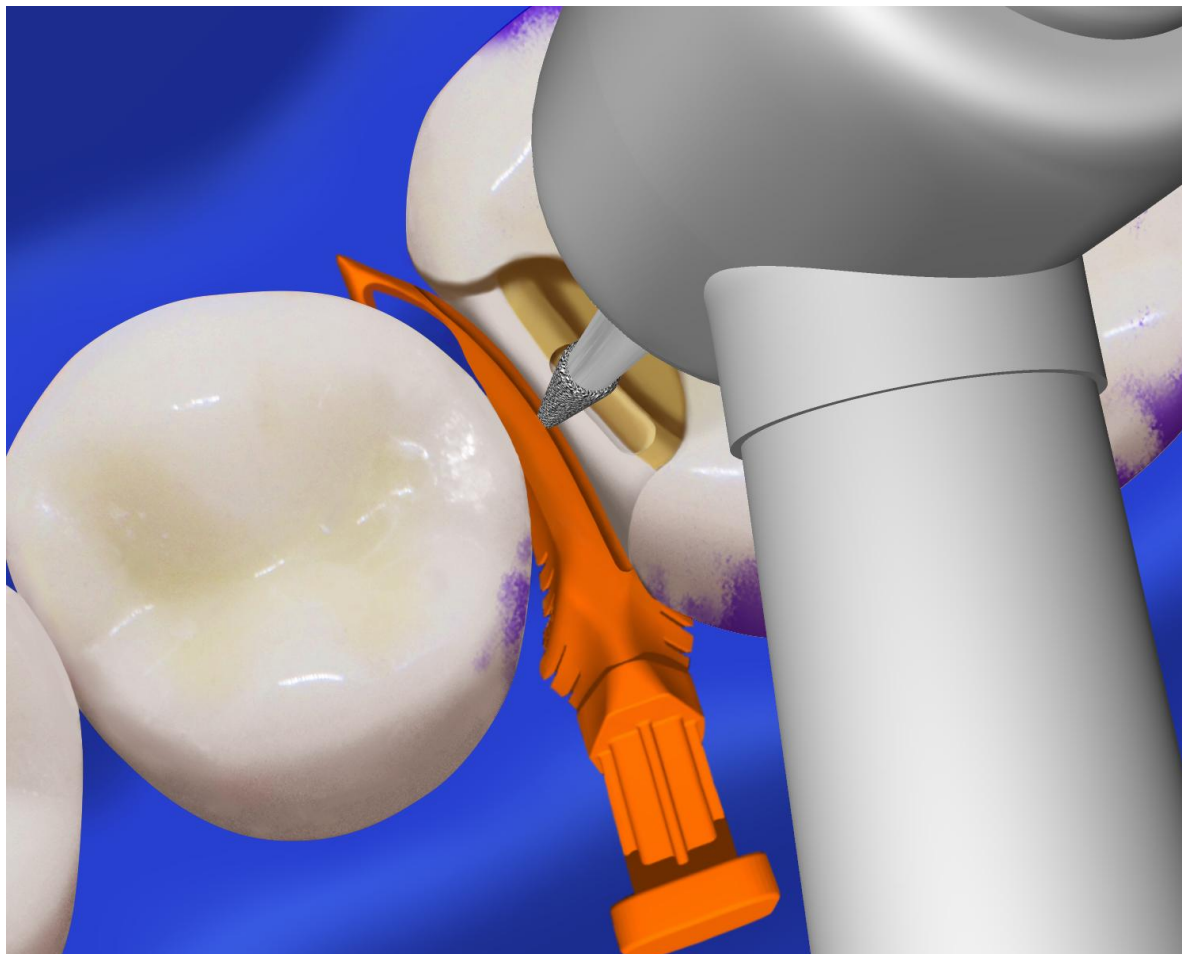
11) Komet Bur #6
is used to break
all contacts. Bur
can be used
either wet or
dry)

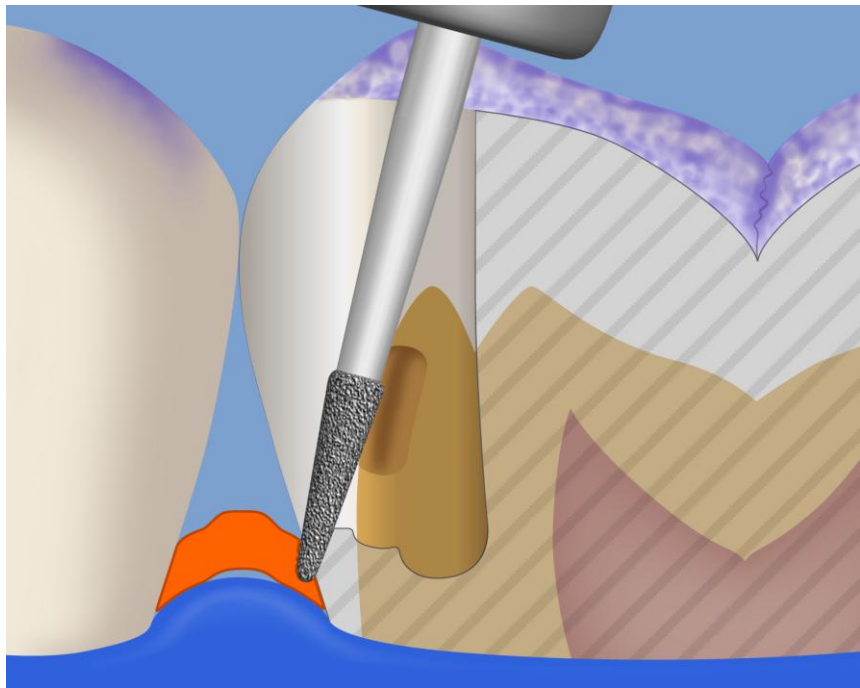


12) #6 Bur is used to create the radius bevel.

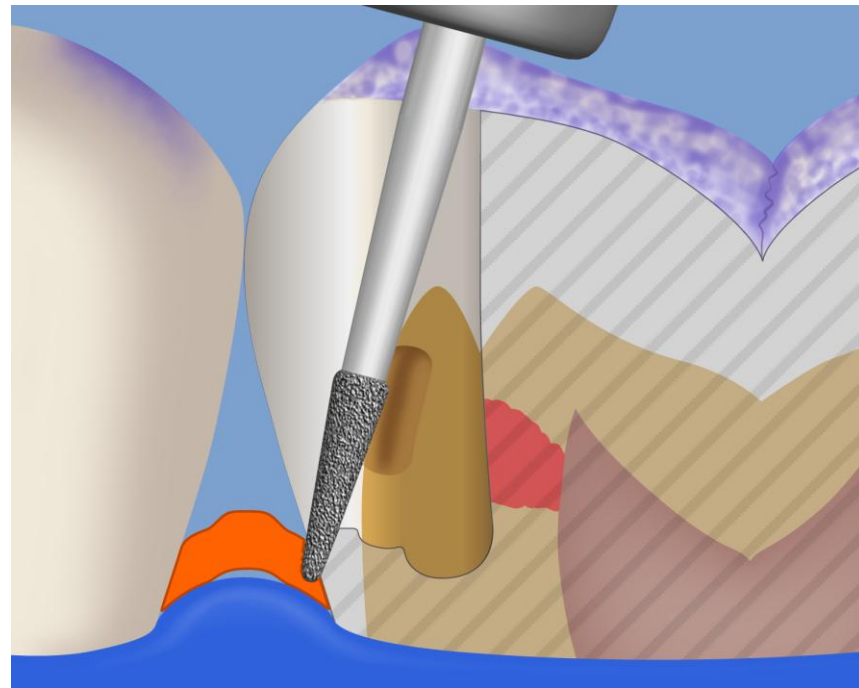


13) Create the gingival bevel.
Diamond wedge can be removed if wedge is an encumbrance to bur.



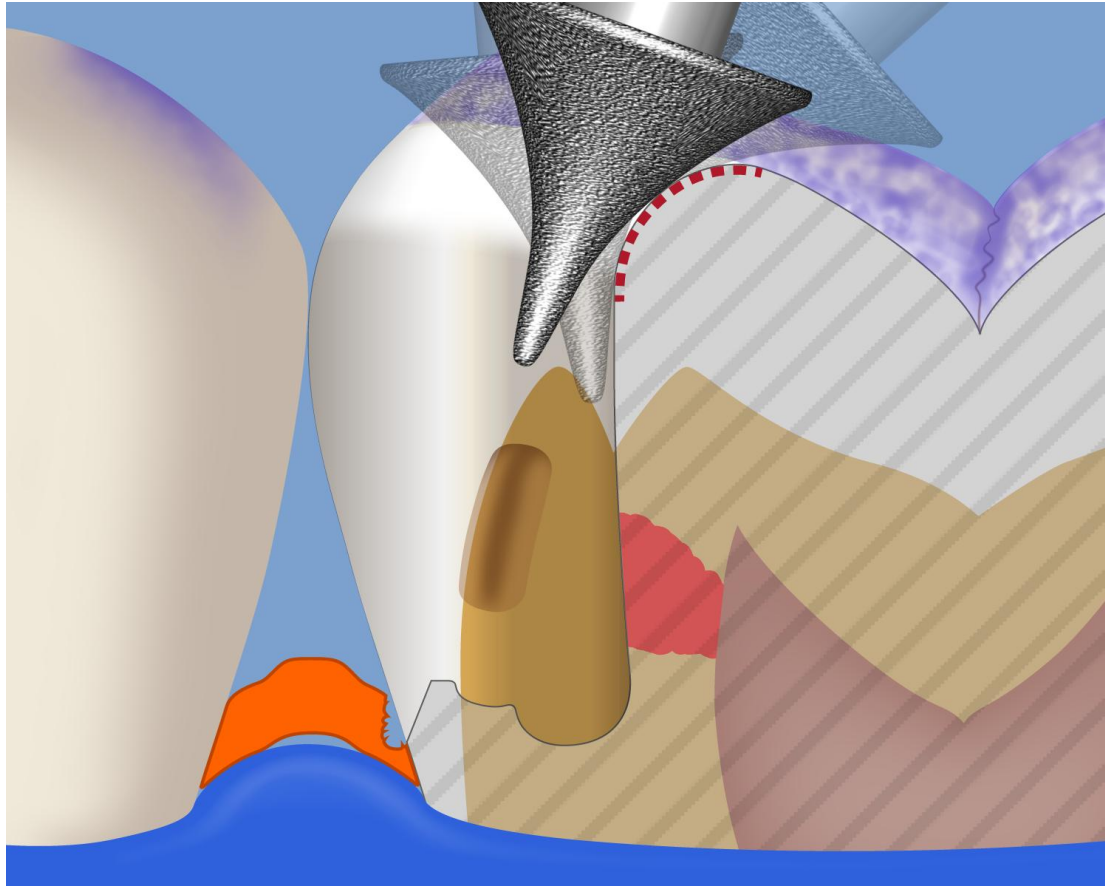


Cross section view of step 13

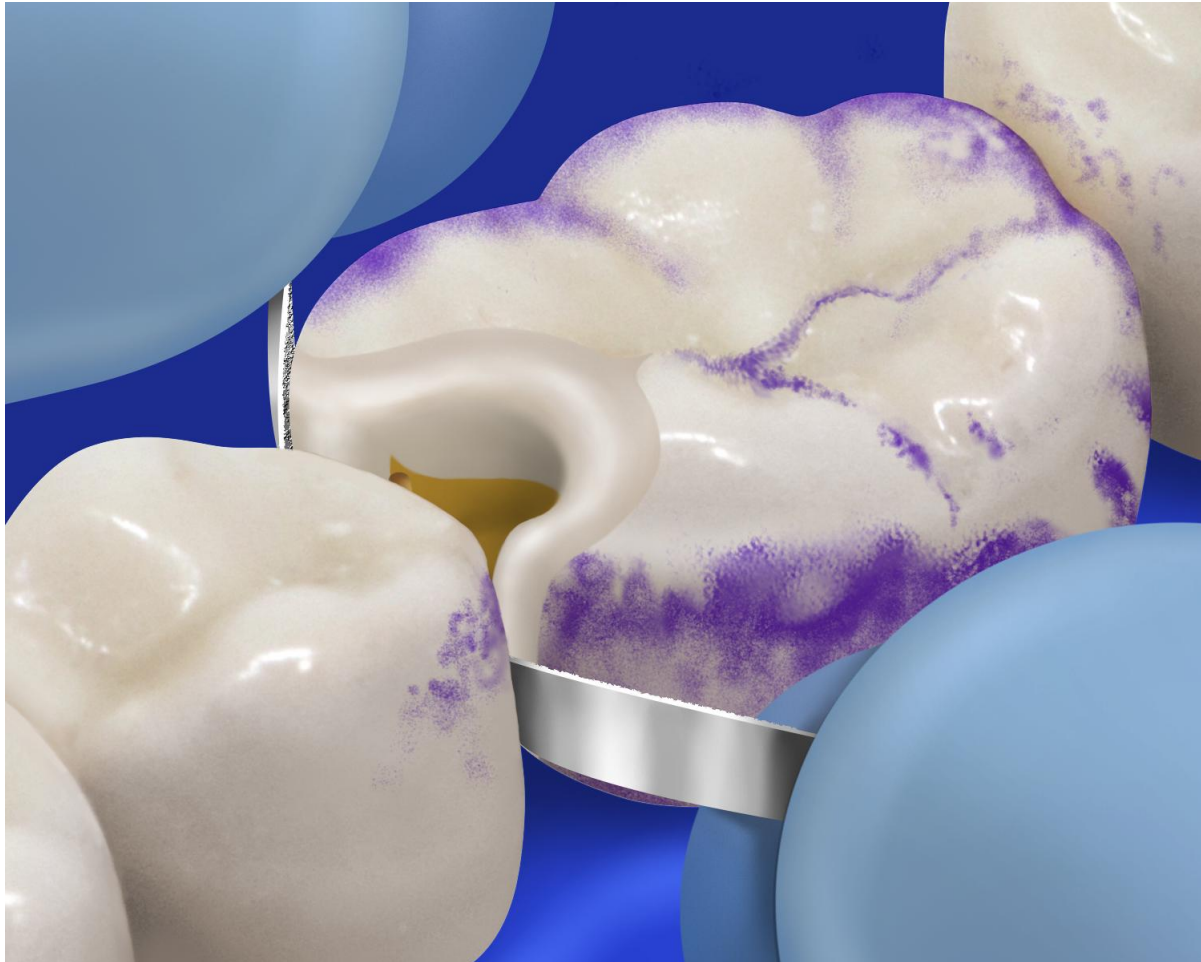


Cross section view of step 13 with
Selective Caries Removal

14) Calla Lilly bur is used to create radius bevel/compression joint on occlusal enamel.



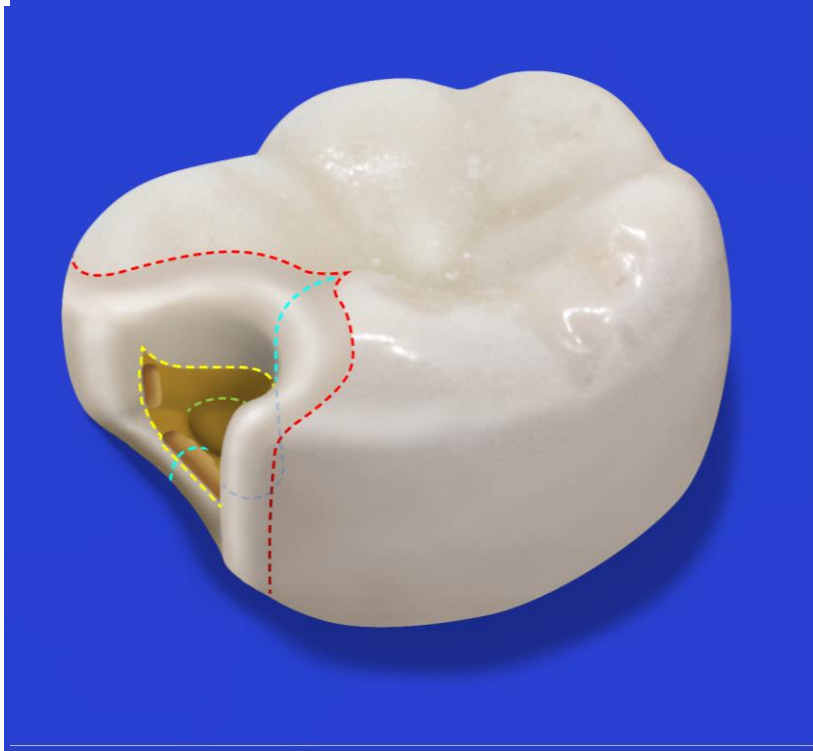
15) Diamond strip removes loose enamel rods on entire preparation and hard deposits in the infinity edge area apical to the gingival bevel.



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



Final views of completed Bioclear Class II Preparation.



Natural Contacts



Traditional Composite Contacts

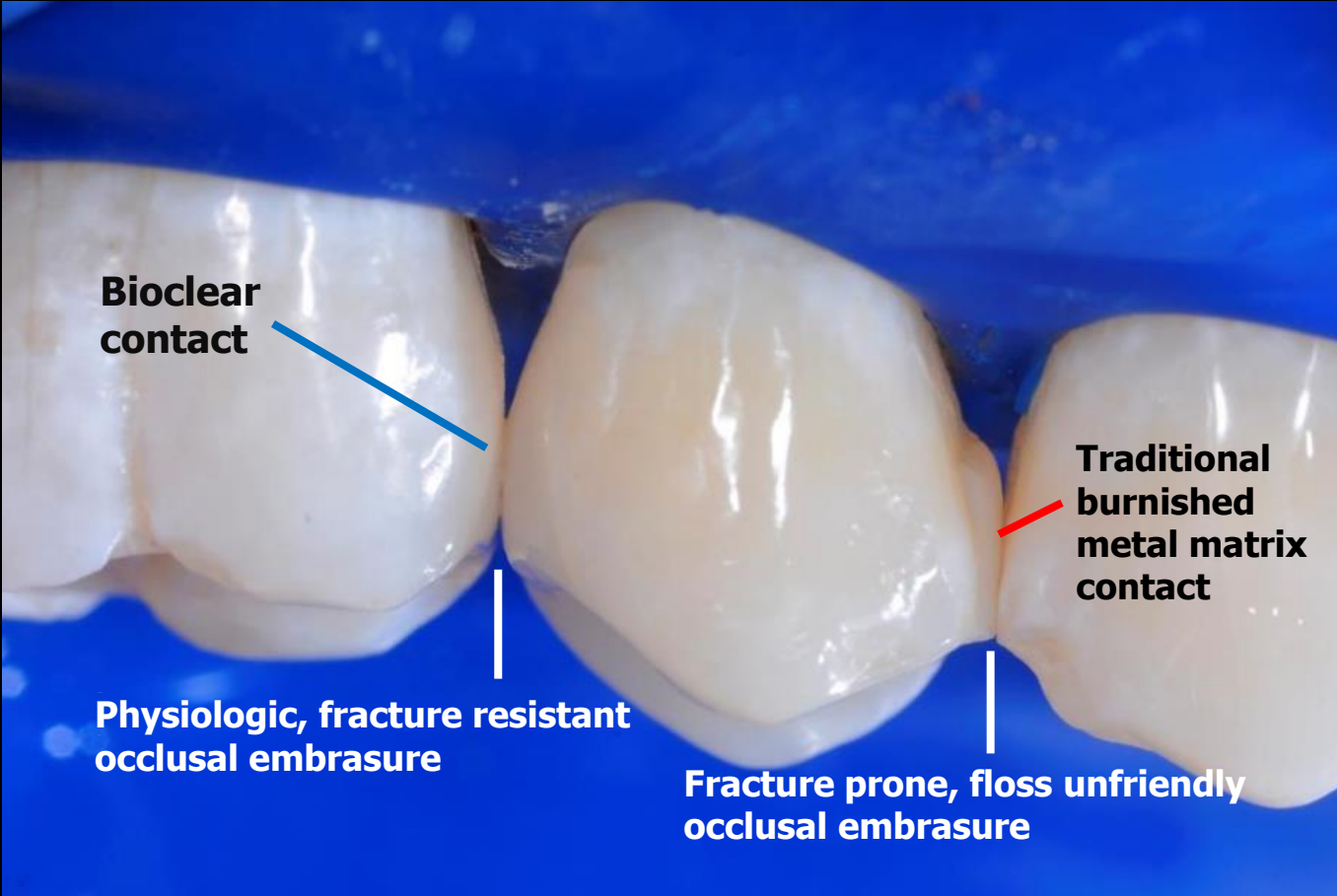


Let's compare old vs. new

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.



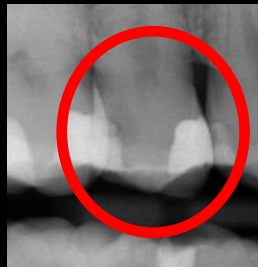
**Bioclear
contact**

**Physiologic, fracture resistant
occlusal embrasure**

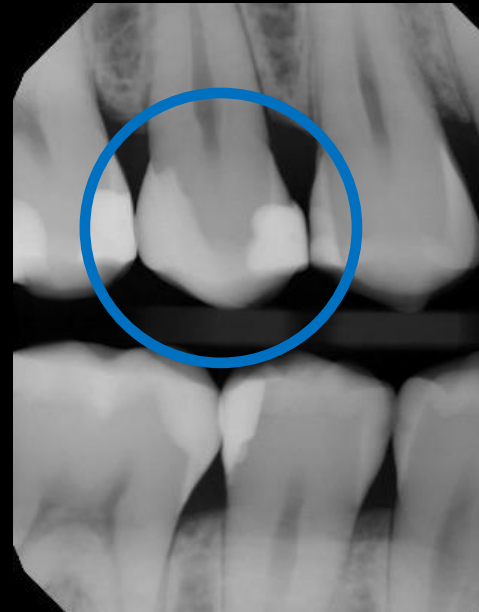
**Fracture prone, floss unfriendly
occlusal embrasure**

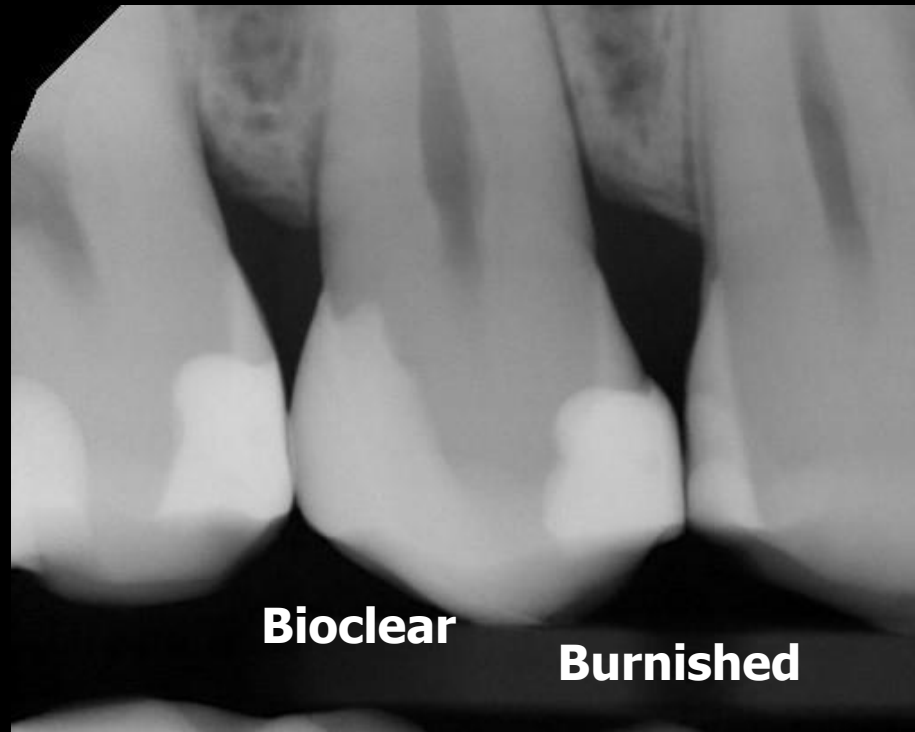
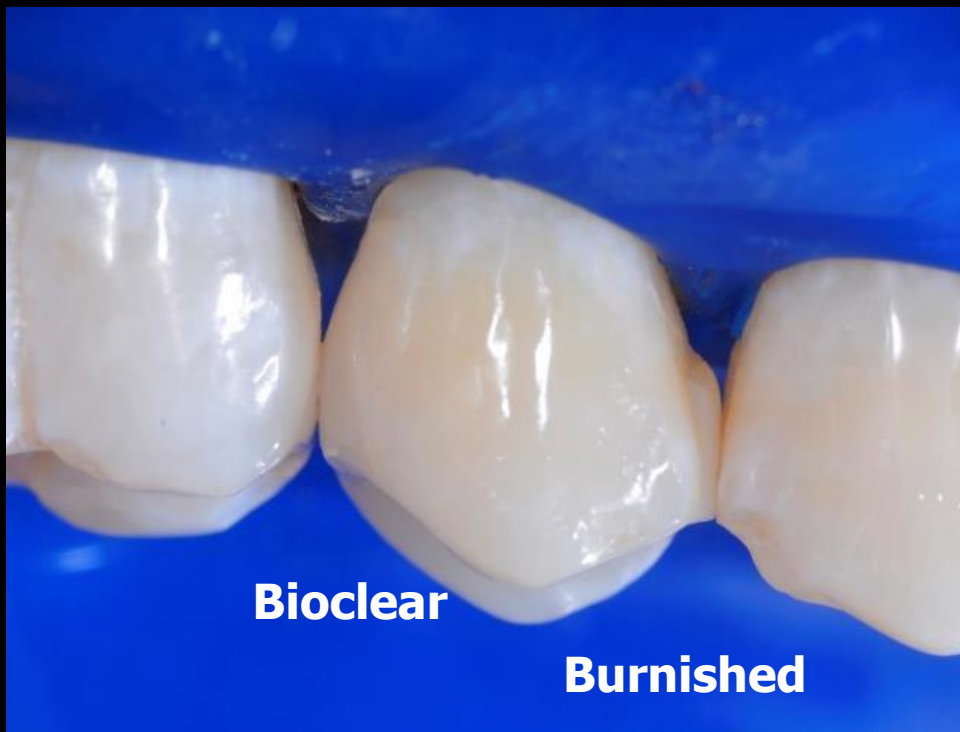
**Traditional
burnished
metal matrix
contact**

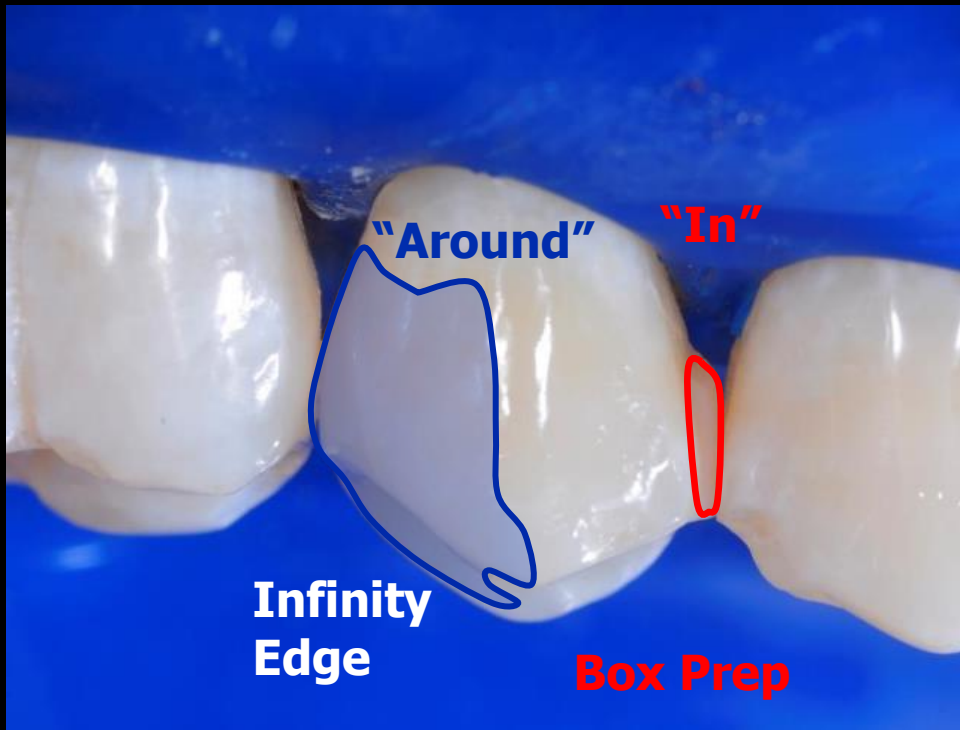
Pre-Operative Radiographs

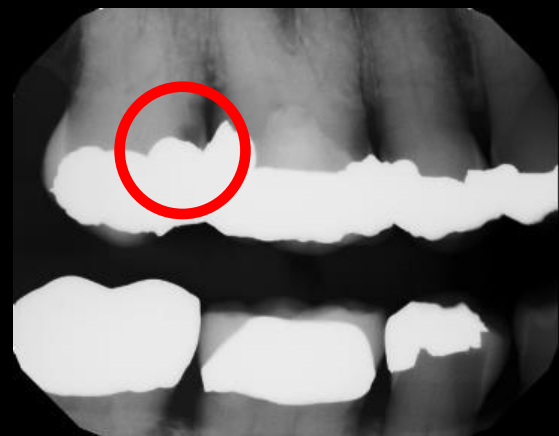


1 Year Post-Operative









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?









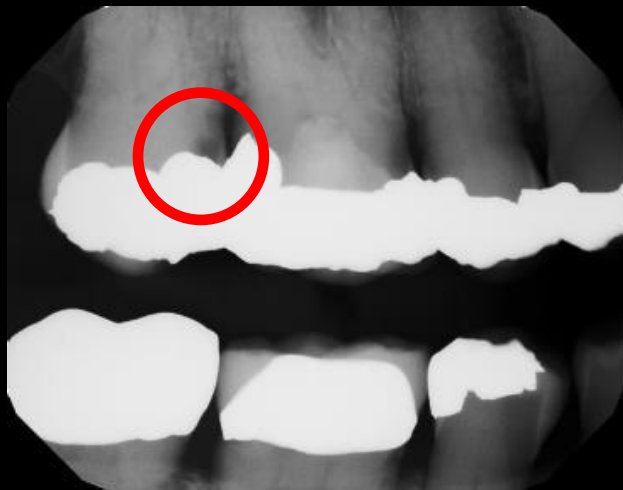




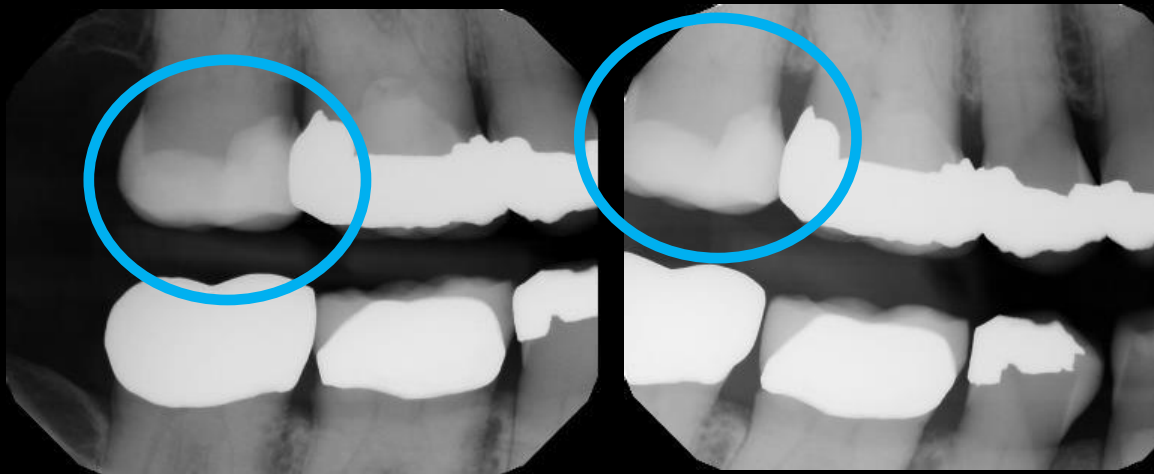




Pre-op



Post-op (two views)



∞ 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

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



5 Sizes

5mm
6mm
7mm
8mm
9mm

- Curved profile
- Normal width



3 Sizes

6mm

7mm

9mm

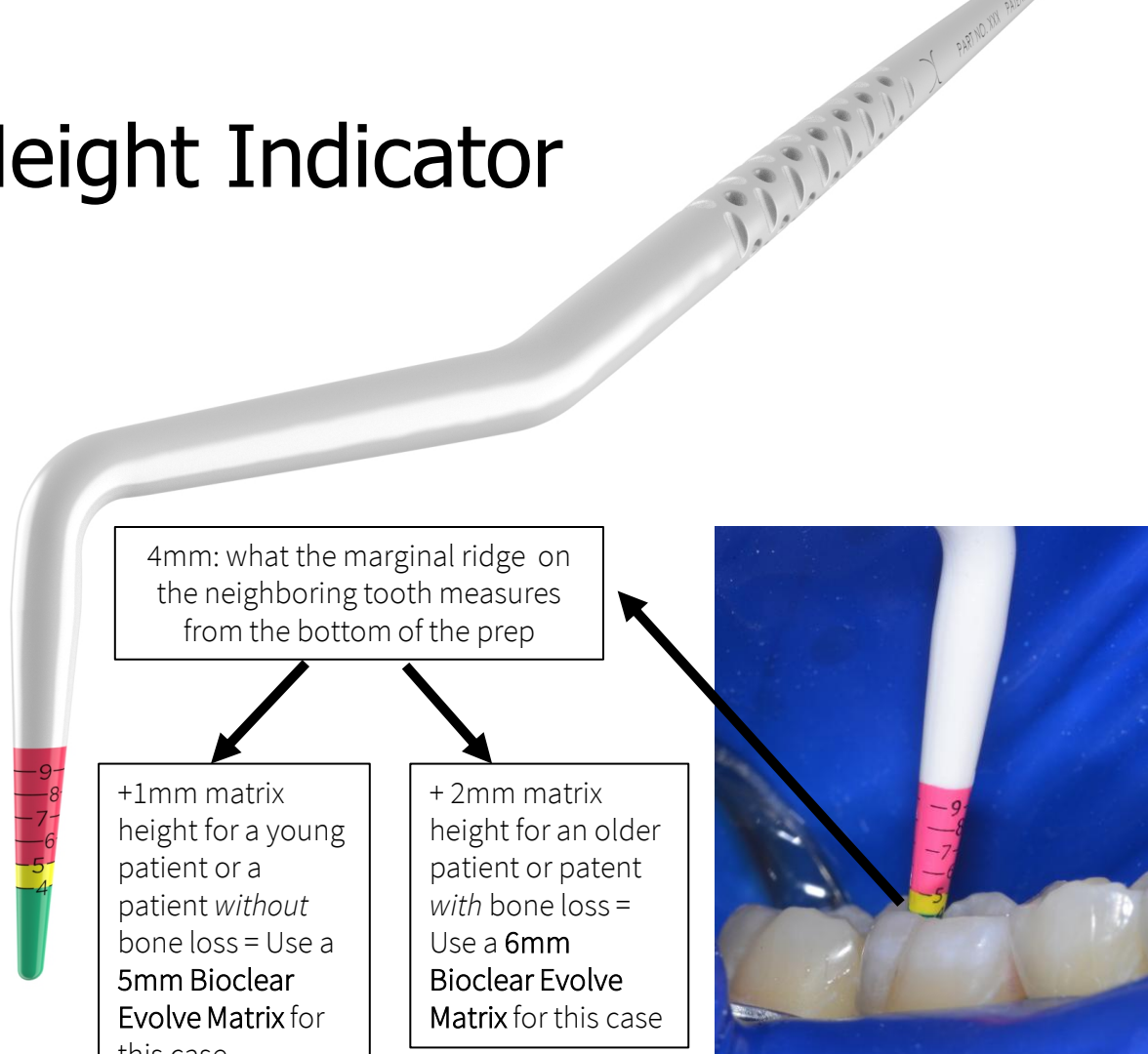
- Curved/straight profile
- Wider width

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

9 keys to ideal contacts with Bioclear

- ✓ 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 and confirm your setup!★
- ✓ Quadrant Strategy
- ✓ Study nature: How natural contacts change over time

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

Composite Heater pre-set
to 155° F



Conclusions

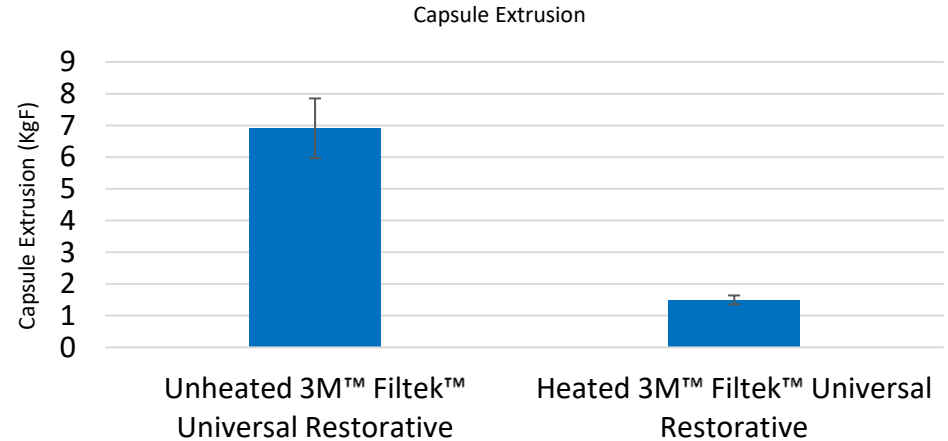
- Preheating a syringe of Filtek™ Bulk Fill Posterior to 60 °C for twenty 1 hour increments does
 - NOT harm mechanical properties such as
 - Diametral tensile strength
 - Flexural strength
 - NOT harm cure properties such as
 - Depth of cure
 - Cusp deflection (polymerization shrinkage stress)
 - NOT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

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)

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

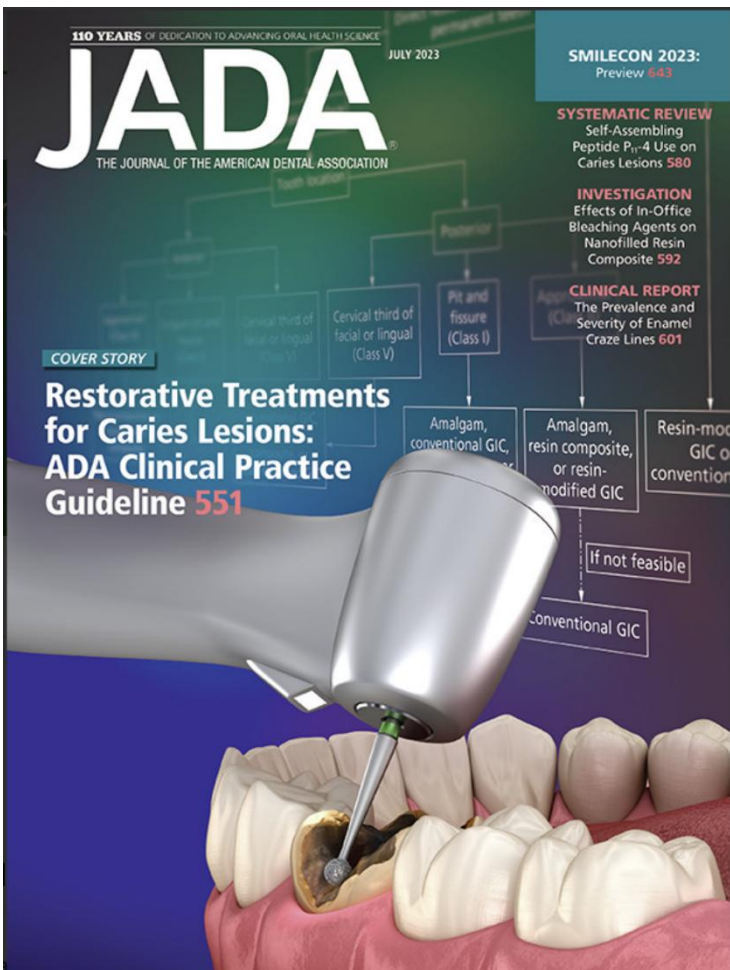


Table 1. Definitions of carious tissue removal approaches and clinical presentation of caries lesion.

CARIOUS TISSUE REMOVAL APPROACHES (THAT IS, THE EXTENT OF CARIOUS TISSUE REMOVED)

Nonselective Caries Removal	Carious tissue is removed until hard dentin is reached. Also known as complete caries removal.
Selective Caries Removal	Carious tissue is removed until soft or firm dentin is reached. Also known as partial or incomplete caries removal.
Stepwise Caries Removal	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.
No Carious Tissue Removal	No carious tissue is removed prior to the placement of a definitive restoration.

CLINICAL PRESENTATION OF CARIES LESIONS

Moderate Caries Lesion	International Caries Detection and Assessment System codes 3 and 4
Advanced Caries Lesion	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

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, DDPH; 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>

Restorative dentistry is integral to managing caries.¹ 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.^{2,3} 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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JADA 154(7) • <http://jada.ada.org> • July 2023

551

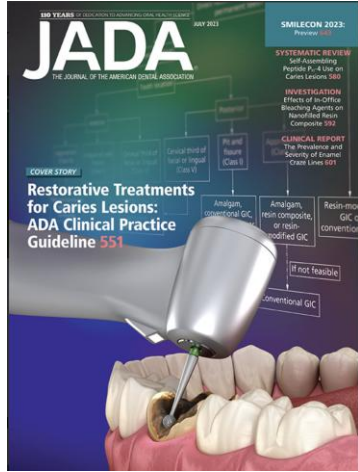


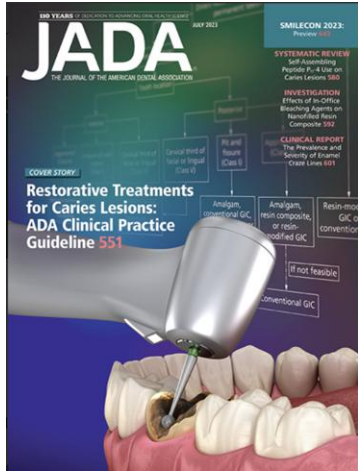
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CLINICAL PRESENTATION OF CARIES LESIONS	
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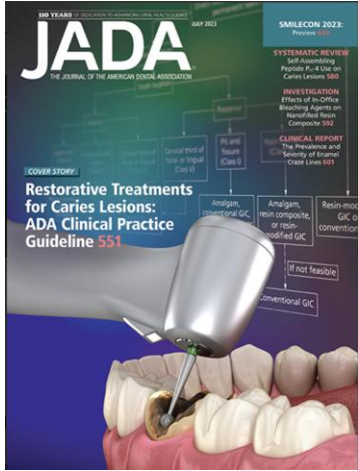
“To treat **moderate caries lesions** of vital permanent teeth, the panel suggests prioritizing the use of SCR over nonselective i.e., complete caries removal.”

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

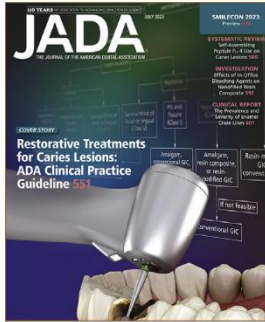
JCDA article the next month (August 2023)

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 *



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

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

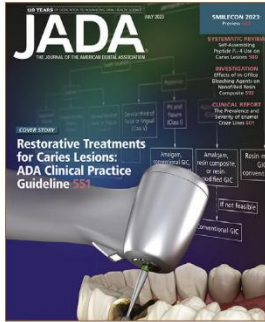
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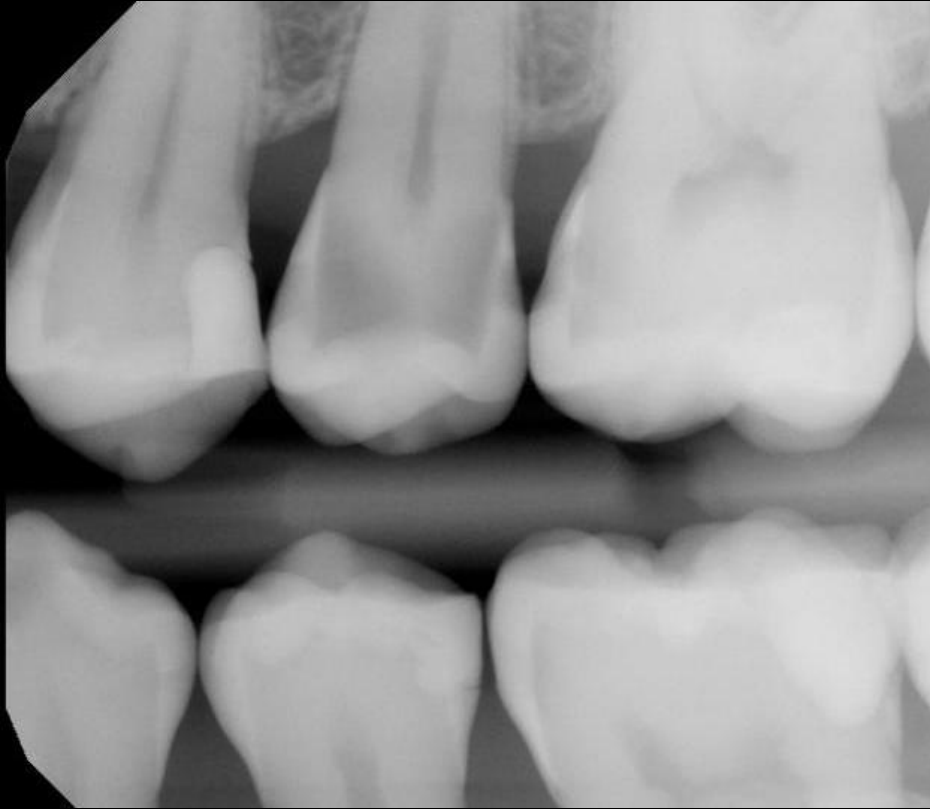
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This is the ADA's second clinical practice guideline in a series on caries treatment. The new restoration guideline, and existing recommendations on non-restorative treatment for tooth decay, are available at: ada.org/cariesguidelines *



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





“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”



\$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**



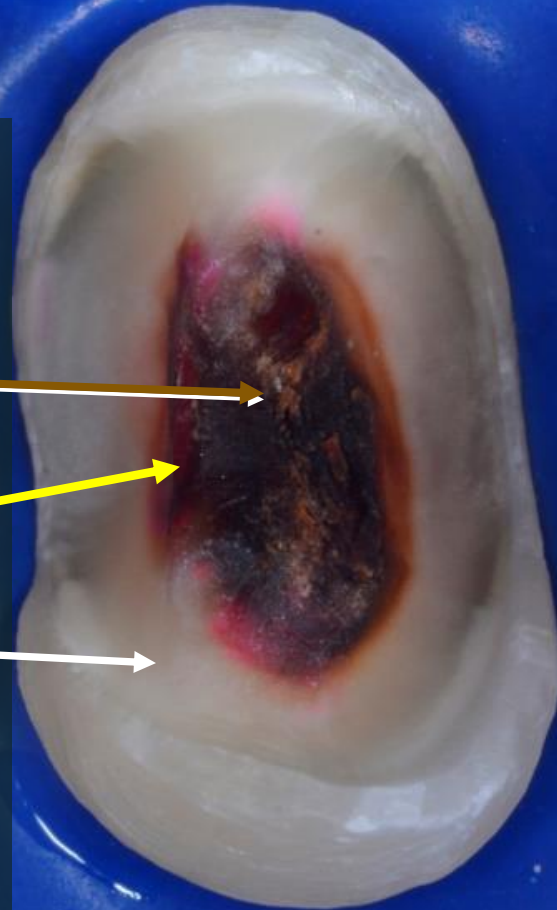
Simplification of dentin zones for restorative dentist:

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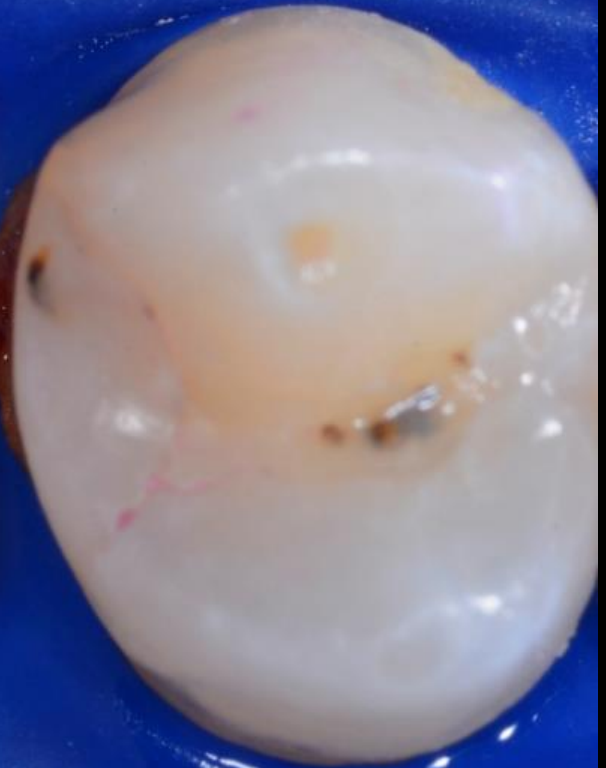
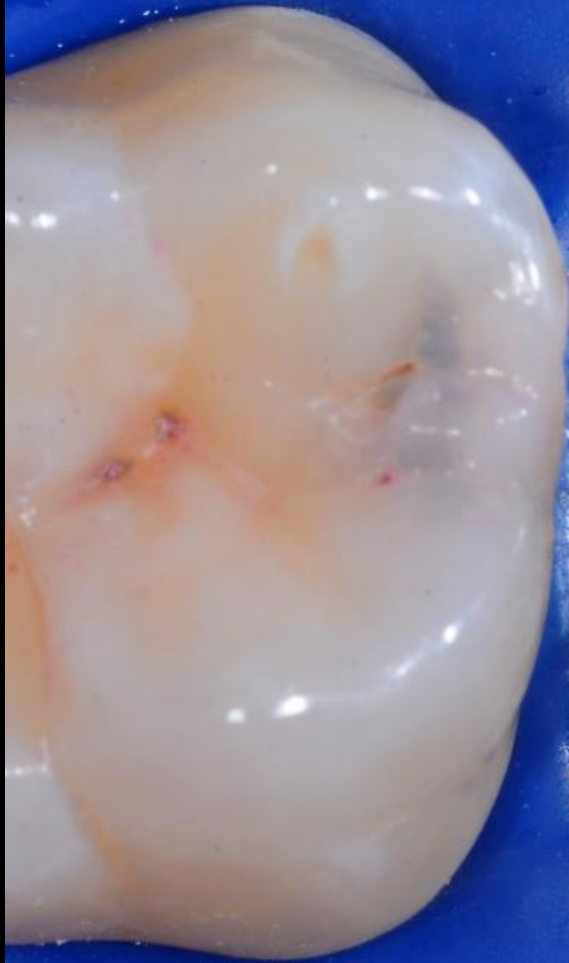
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3) **Affected Dentin:
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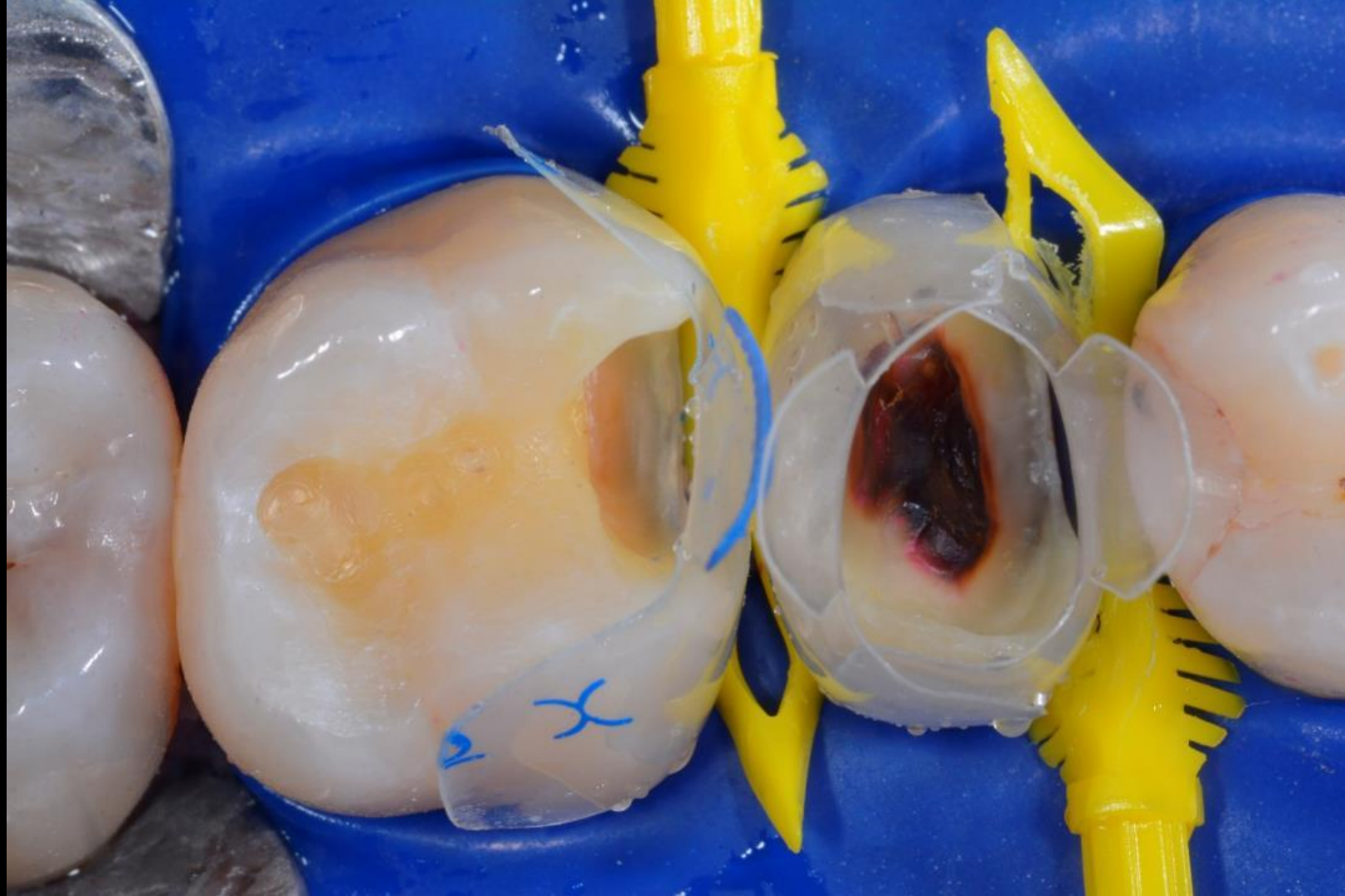










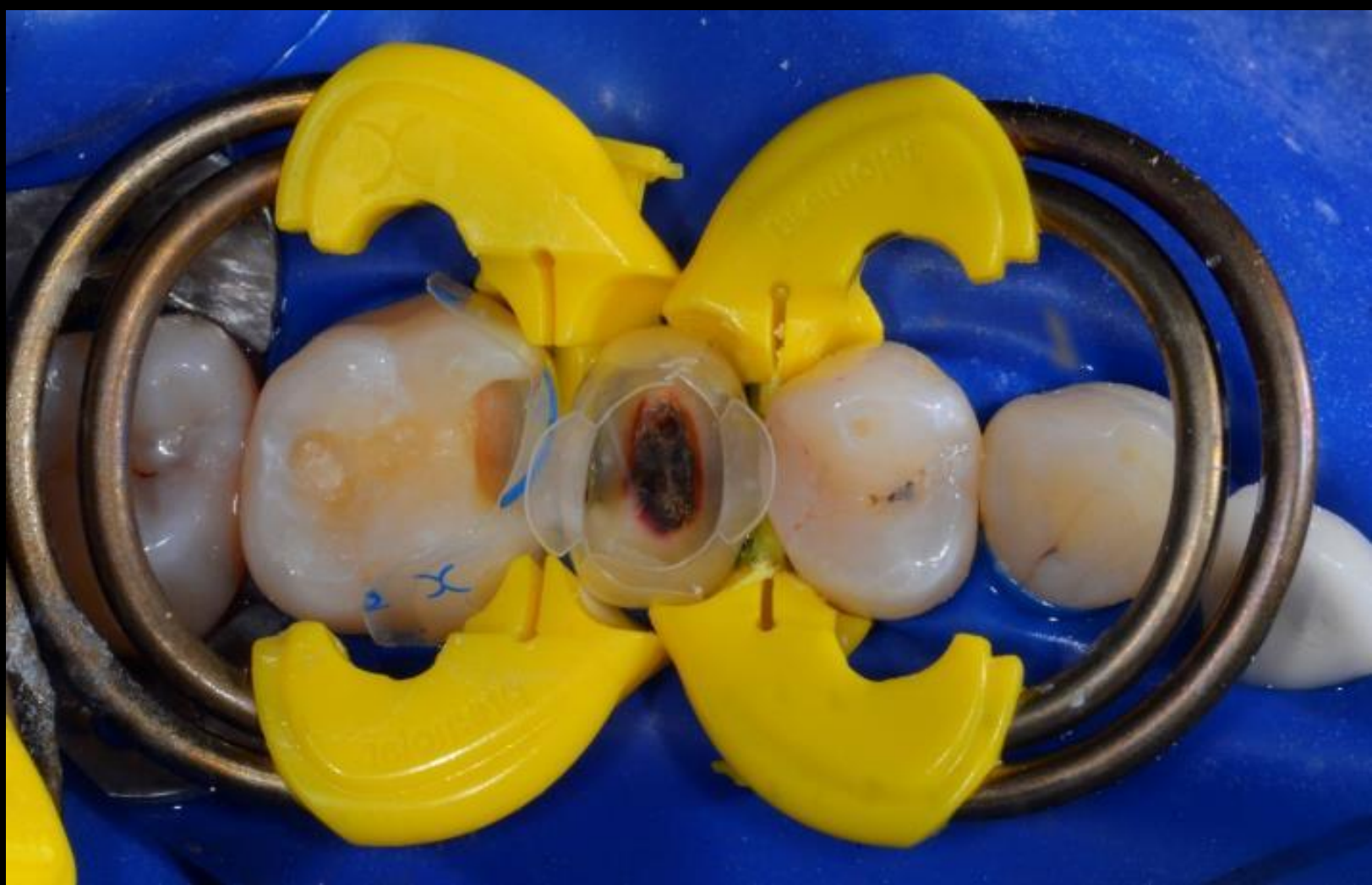






8 keys to ideal contacts with Injection Molding

- ✓ 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



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

Max Planck *Nobel Prize, 1918*



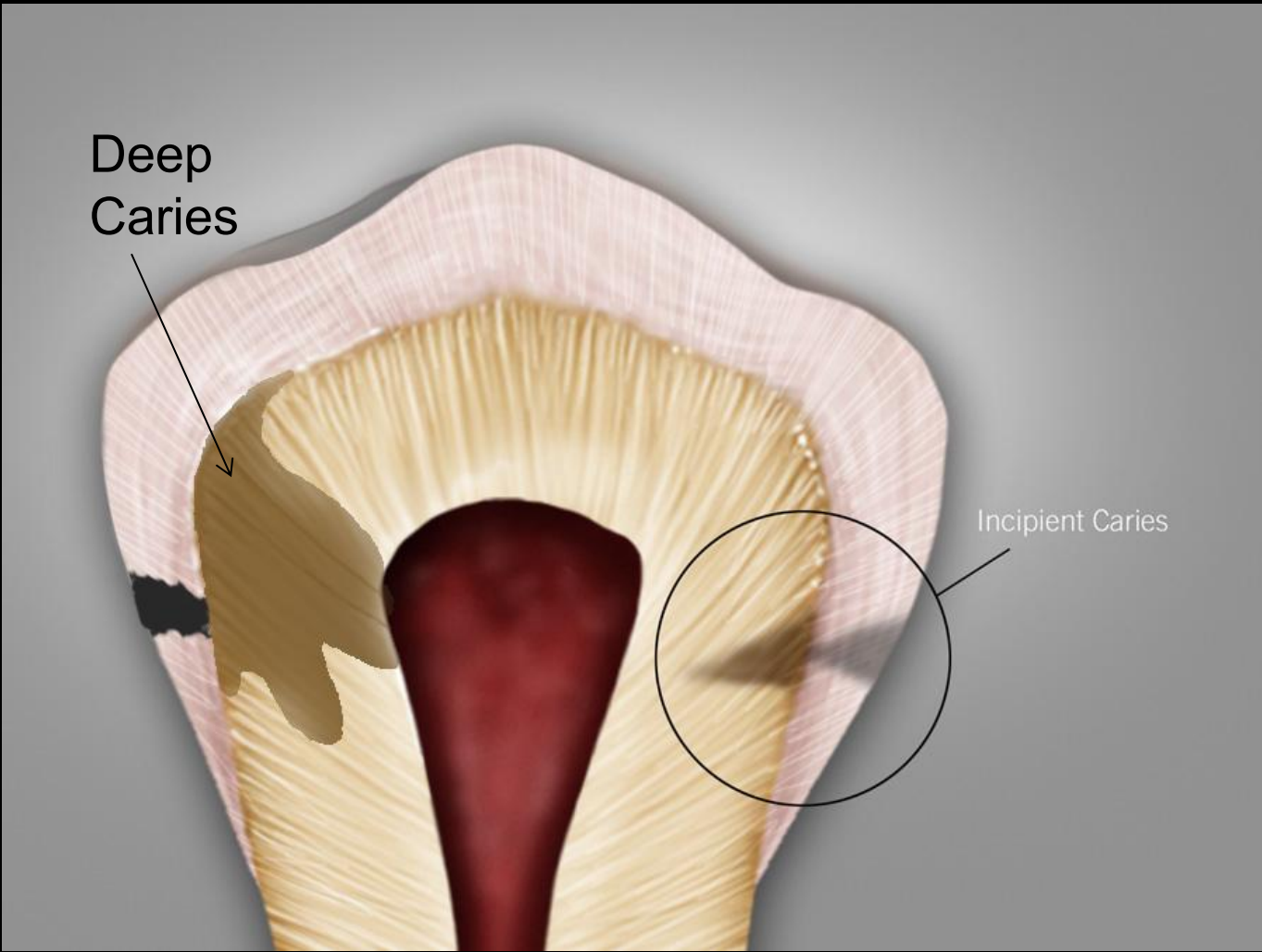
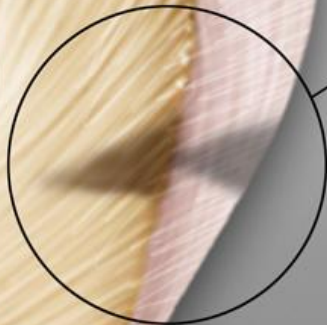
“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.”



Deep
Caries



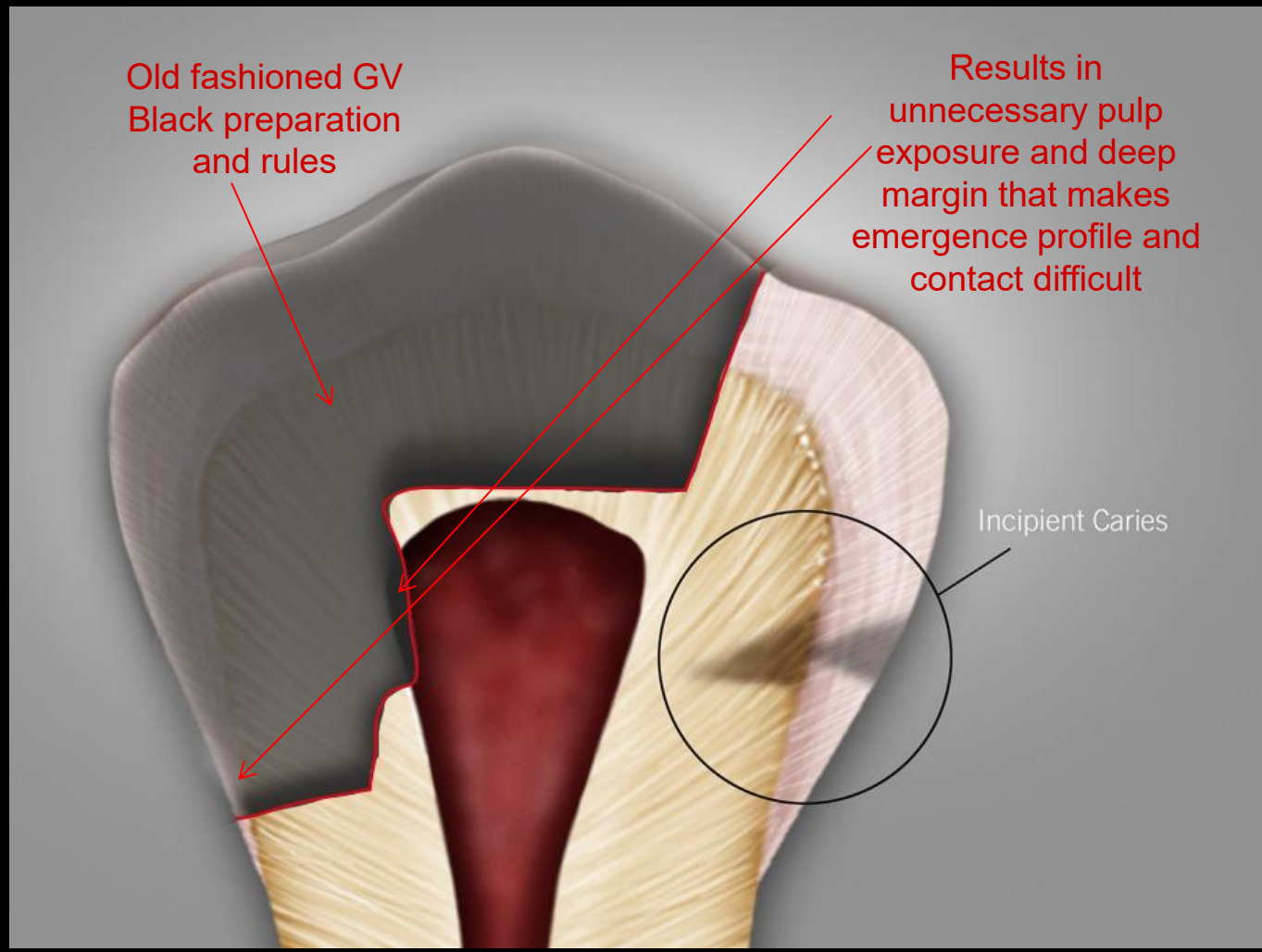
Incipient Caries



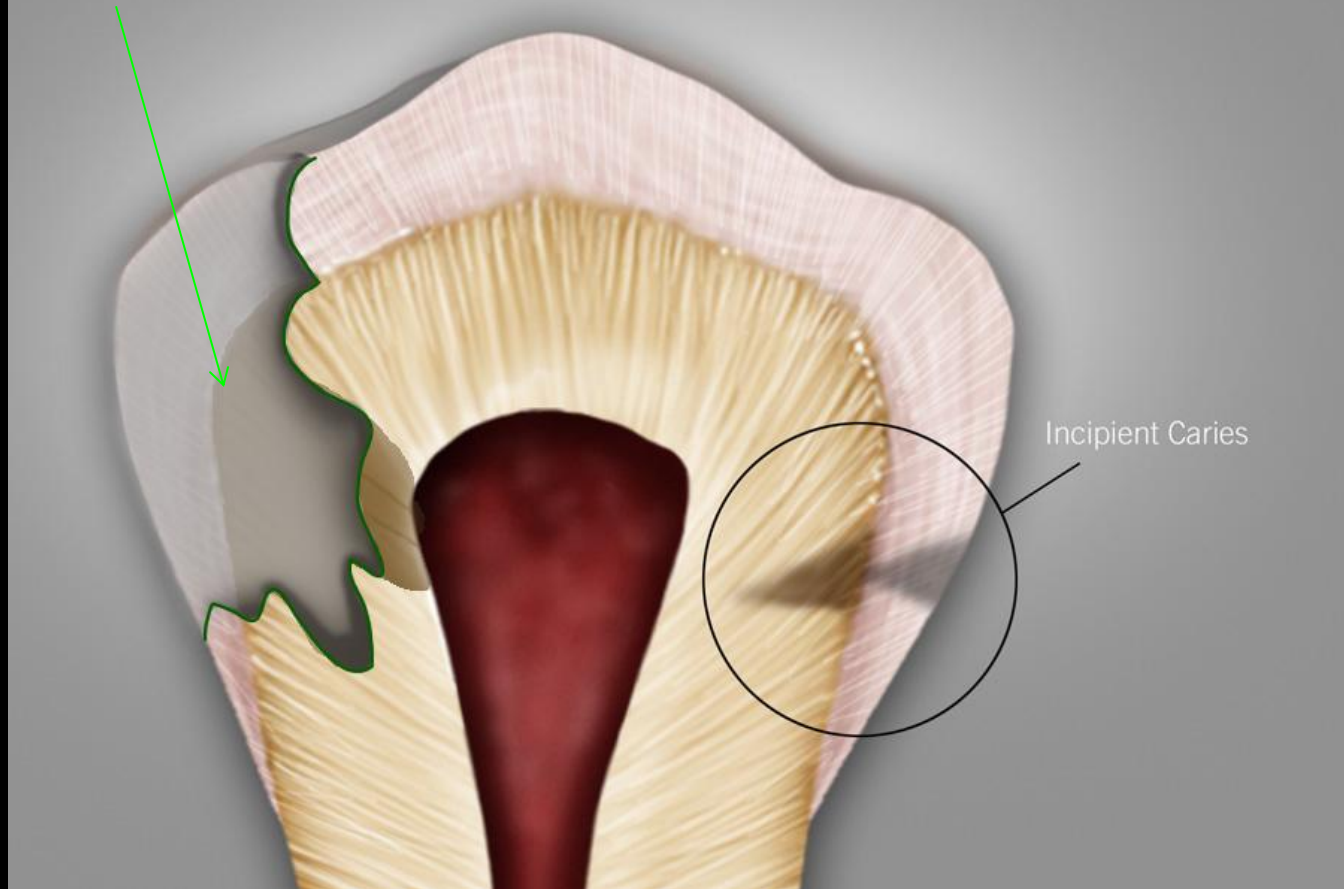
Old fashioned GV
Black preparation
and rules

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

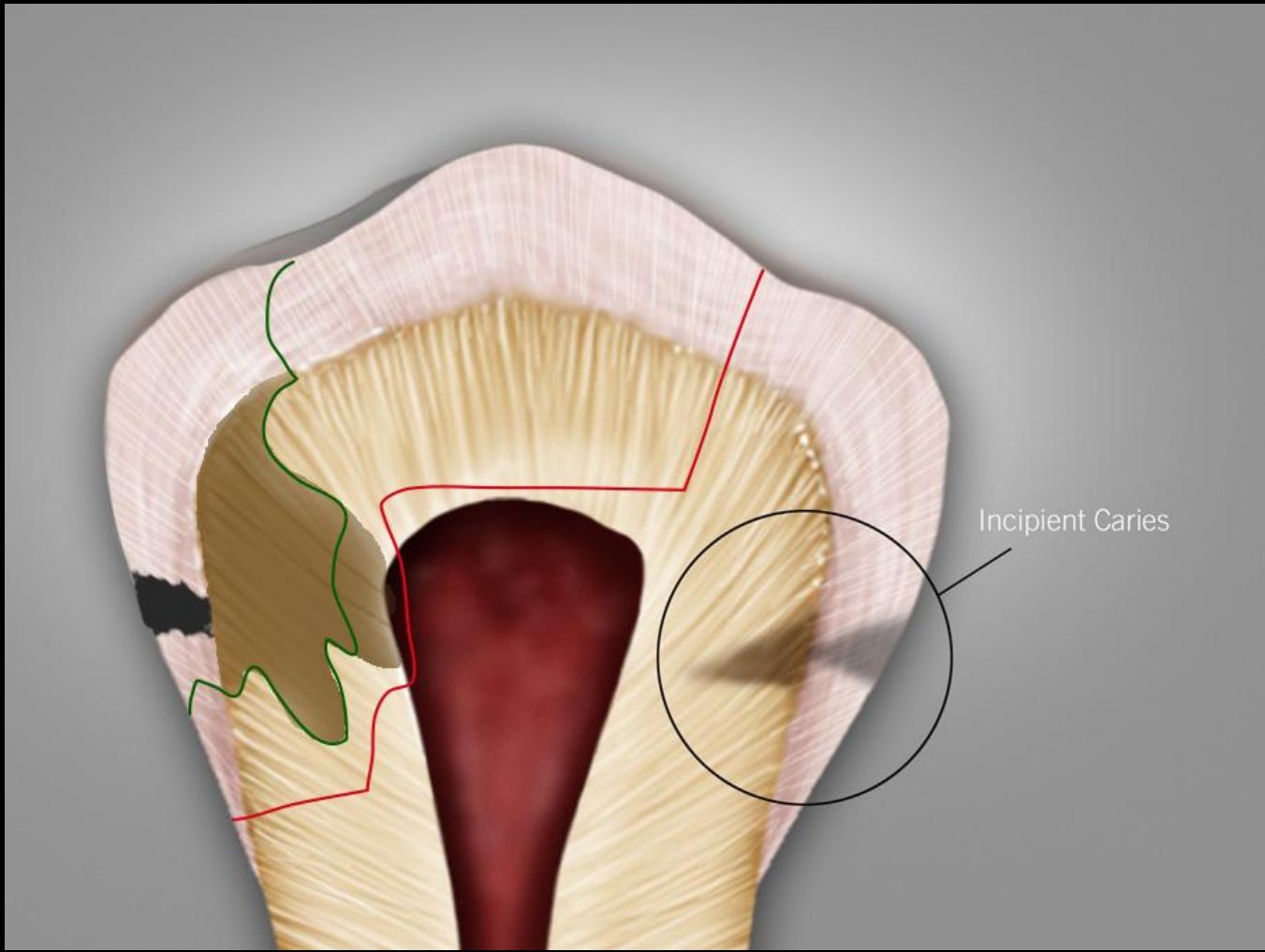
Incipient Caries



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.

Selective Caries Removal or the Modified Hall Technique

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



Caries zones – Image courtesy of Prof. Leandro Hilgert and Prof. Soraya Leal, University of Brasilia (UnB), Brazil

Saving Natural Tooth Substance – With Confidence

Preparation guidelines have changed considerably over time. Over 100 years ago, G.V. Black promoted “extension for prevention”, today, the philosophy is “prevention of extension” (F.J.T. Burke, Dent. Update 2003, 30, 492-502), supported by guidelines for minimally invasive dentistry.

Minimally invasive preparations have meaningful benefits for patients:

- Increased tooth longevity
- Lower risk of pulpal exposure
- Reduced need for painful root canal treatments



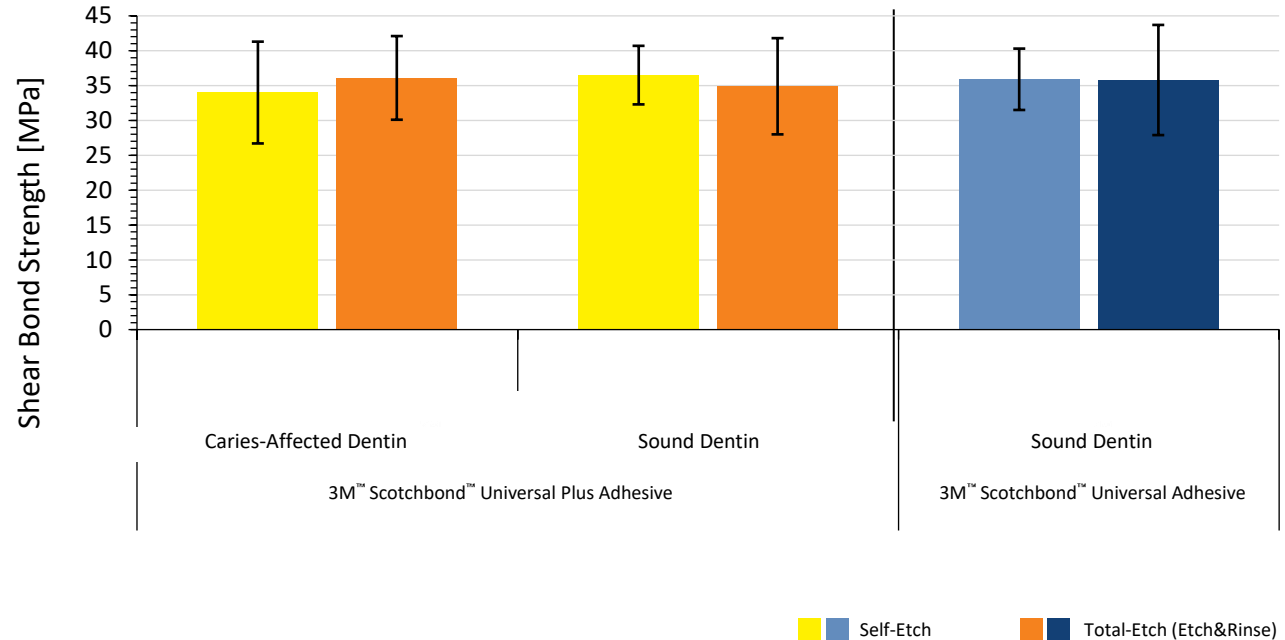
Long term survival of restorations depends on a stable bond to enamel and dentin. With minimally invasive dentistry, caries-affected dentin is preserved during excavation.

3M™ Scotchbond™ Universal Plus Adhesive bonds to firm caries-affected dentin with similar strength as to sound dentin, so you can have confidence in your minimally invasive preparations.

Strong Bonding to Caries-Affected Dentin

Strong bonding to caries-affected dentin helps preserve tooth structure

Cariou human molars were prepared with a polymer bur (SmartBur™ II, SS White) to expose caries-affected dentin. In both etching modes, 3M™ Scotchbond™ Universal Plus Adhesive achieved similar shear bond strength to caries-affected dentin and sound dentin as the control 3M™ Scotchbond™ Universal Adhesive. This high bond strength makes it well suited for MID procedures.



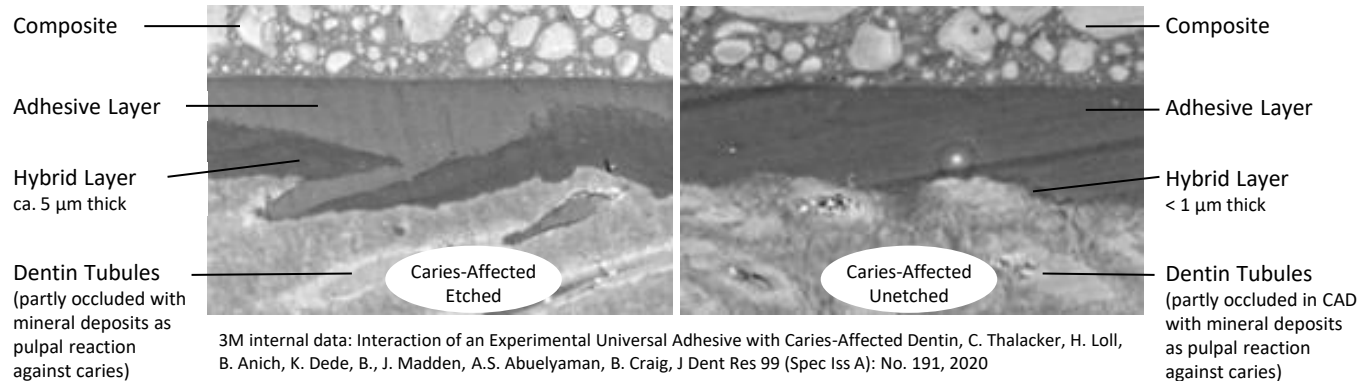
3M internal data: Interaction of an Experimental Universal Adhesive with Caries-Affected Dentin, C. Thalacker, H. Loll, B. Anich, K. Dede, B., J. Madden, A.S. Abuelyaman, B. Craig, J Dent Res 99 (Spec Iss A): No. 191, 2020

Well-Defined Hybrid Layer on Caries-Affected Dentin

Supports minimally invasive dentistry to preserve natural tooth substance

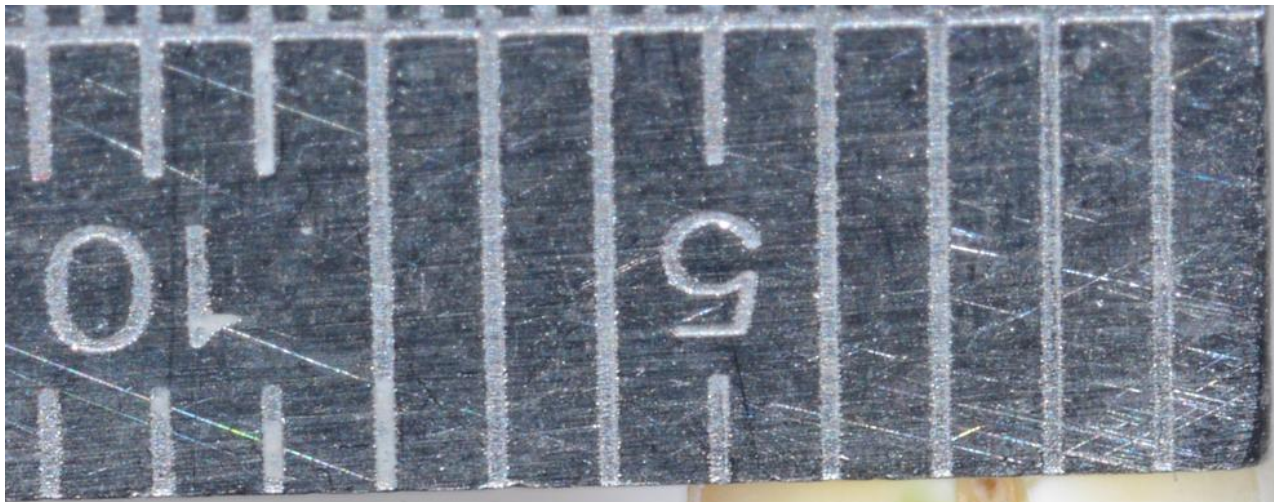
3M™ Scotchbond™ Universal Plus Adhesive helps preserve natural tooth structure in MID procedures and when preparing near the pulp by forming a continuous hybrid layer without voids or gaps on both caries-affected and sound dentin. A well-defined hybrid layer effectively seals caries-affected dentin areas.

SEM study – hybrid layer on caries-affected dentin (etched and unetched)



SCR: We have a lot to talk about...

- 1) How much clean dentin do I need on the periphery to seal in decay?
- 2) Better question: How much clean dentin can I afford?



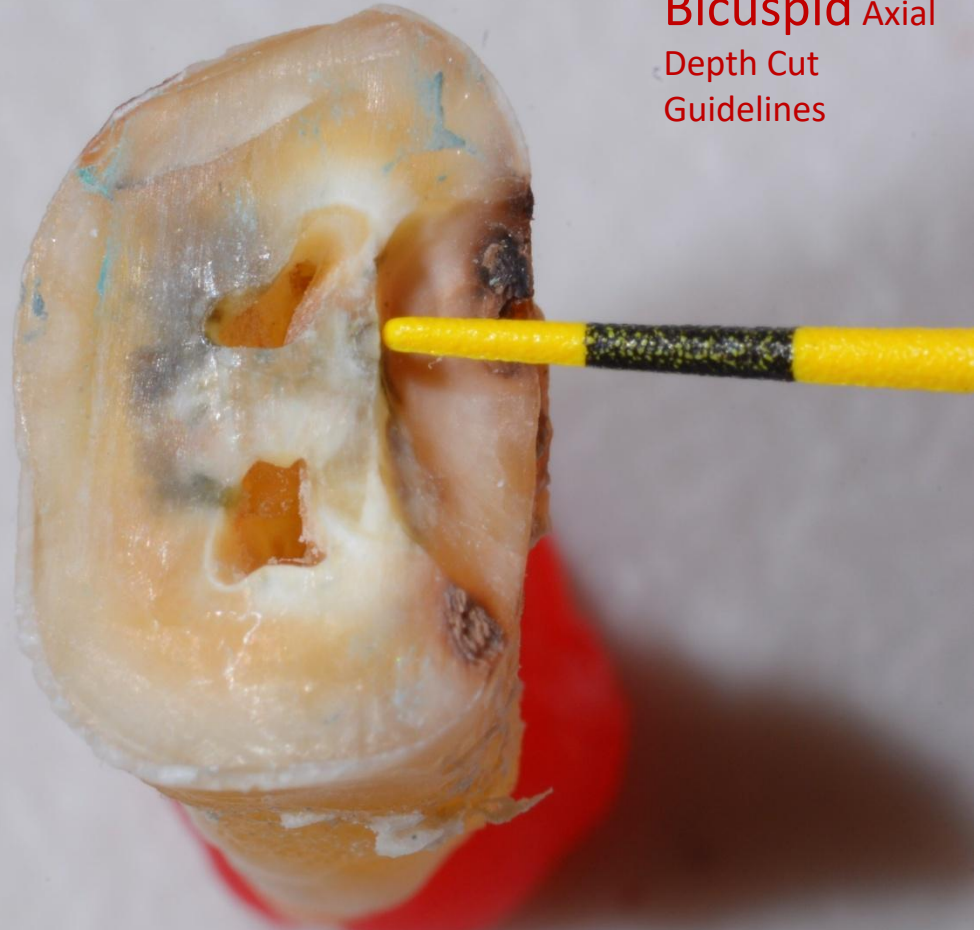
Bicuspid Axial
Depth Cut
Guidelines



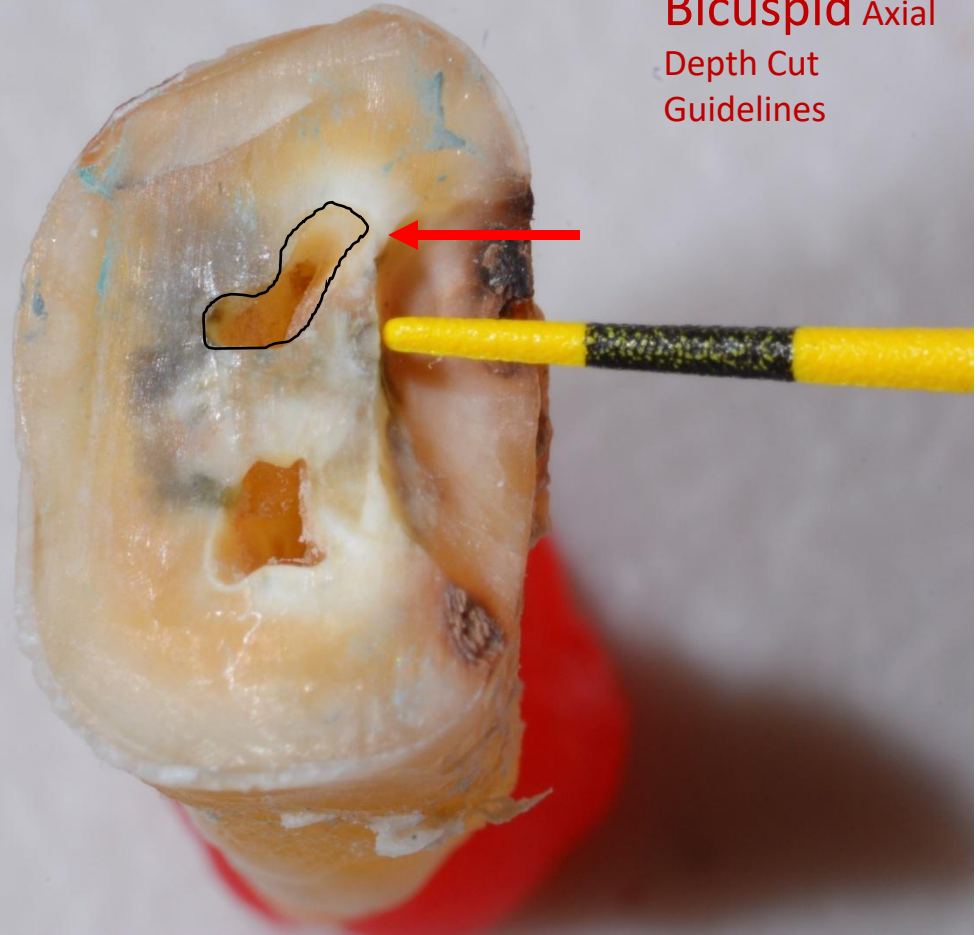


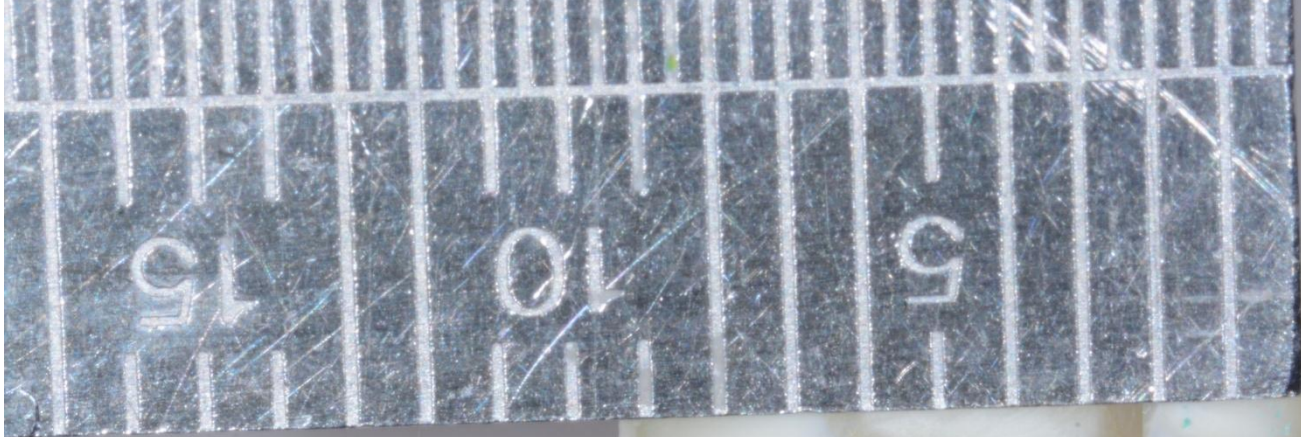
Bicuspid Axial
Depth Cut
Guidelines

Bicuspid Axial
Depth Cut
Guidelines



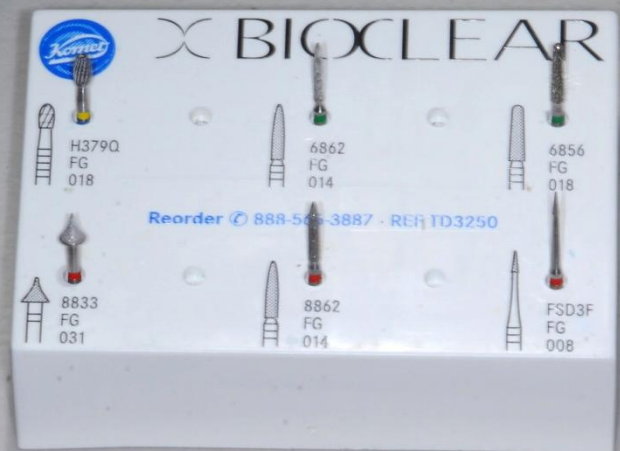
Bicuspid Axial
Depth Cut
Guidelines

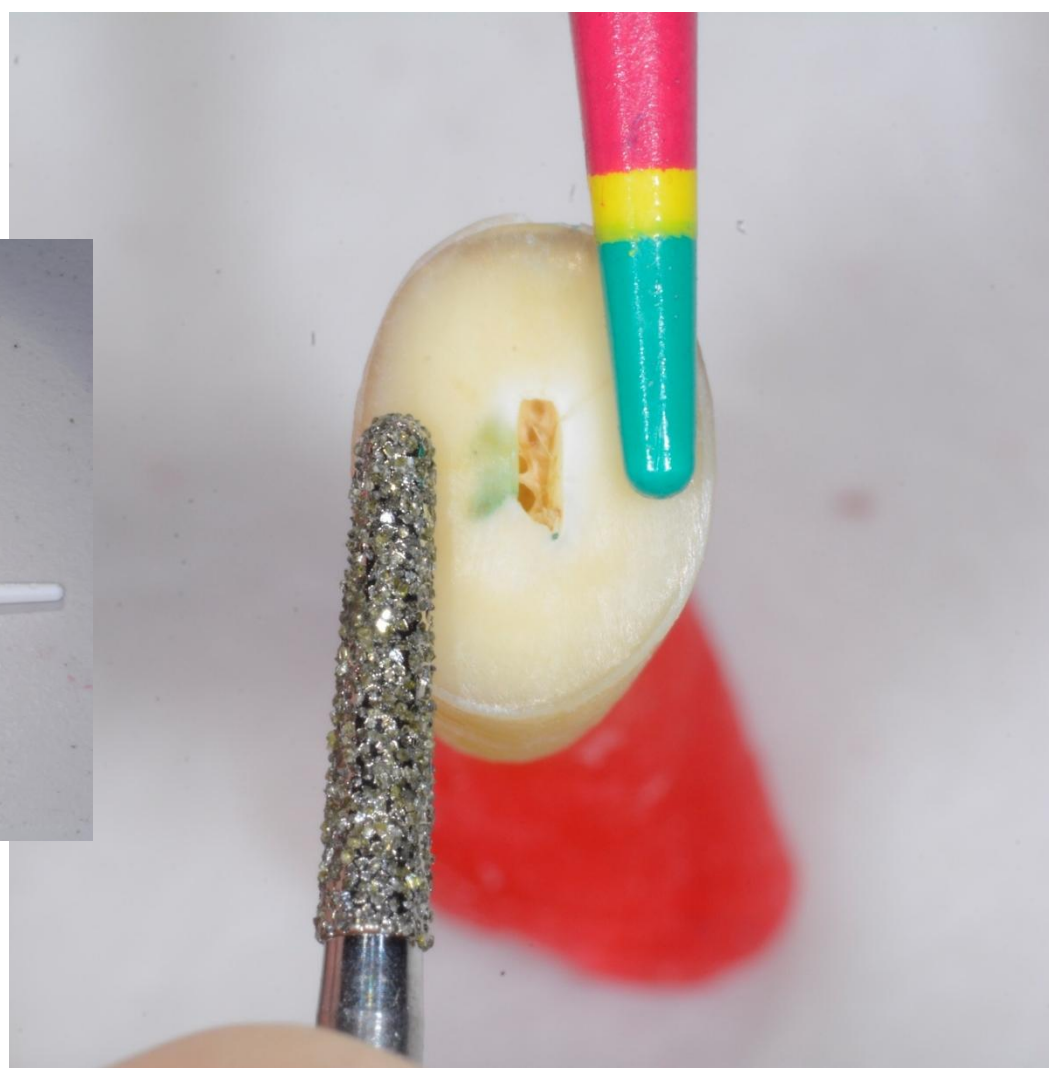
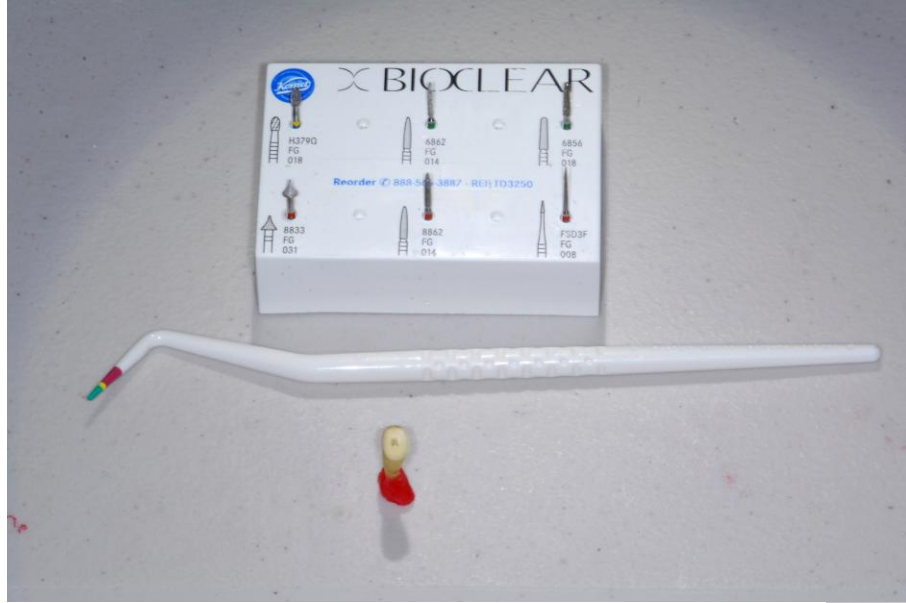


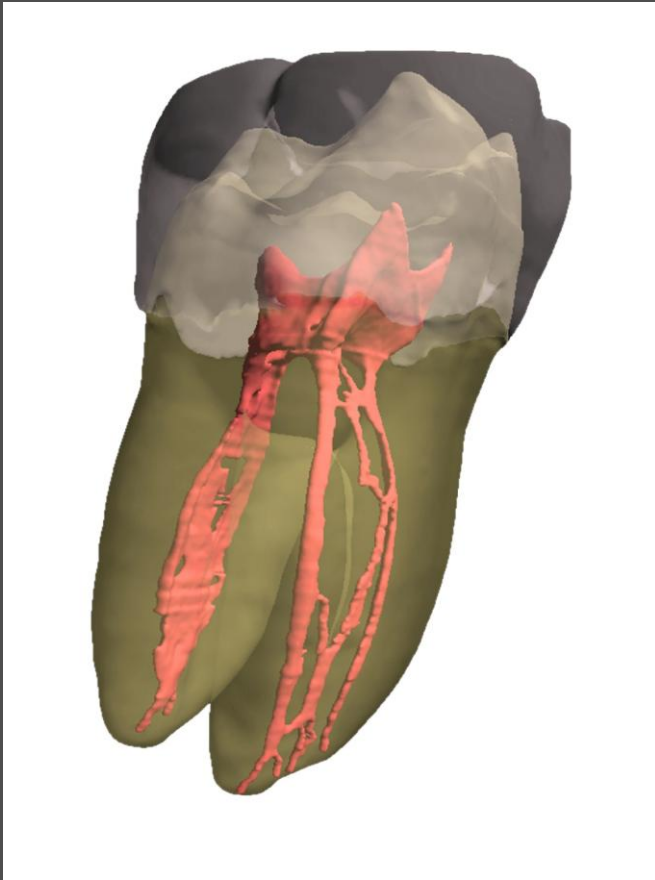


Molar Axial
Depth Cut
Guidelines









3D TOOTH ATLAS 8

Interactive Dental Education Software

Interactive Dental
Anatomy Course

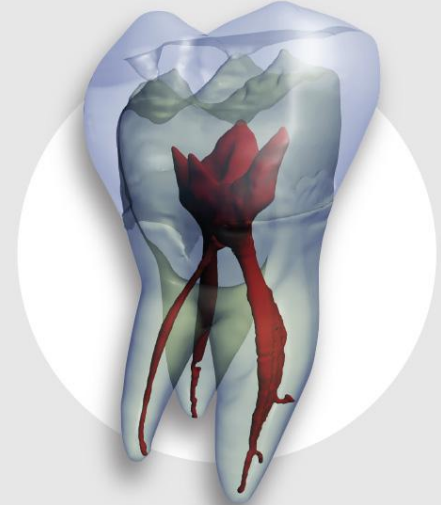
.....
Tooth Morphology

.....
Synopsis of
Human Dentition

.....
Additional
Specialized Resources

.....
Complete Redesign

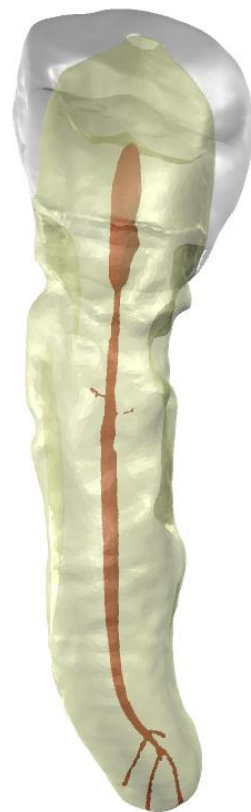
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Newly Remastered Assets

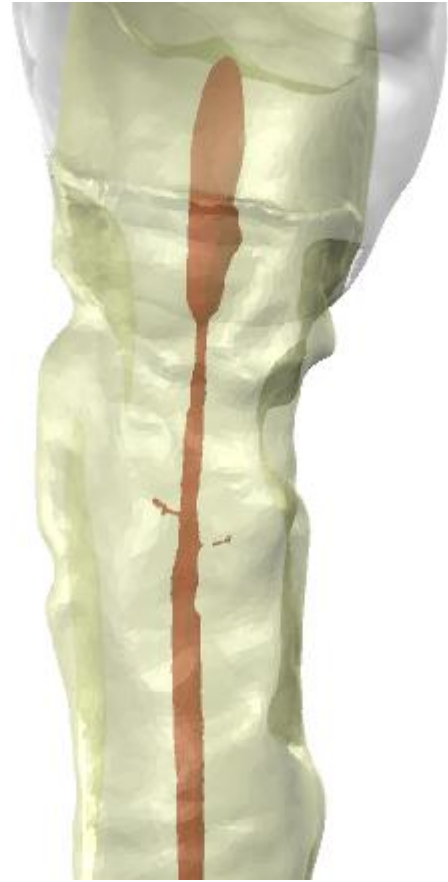
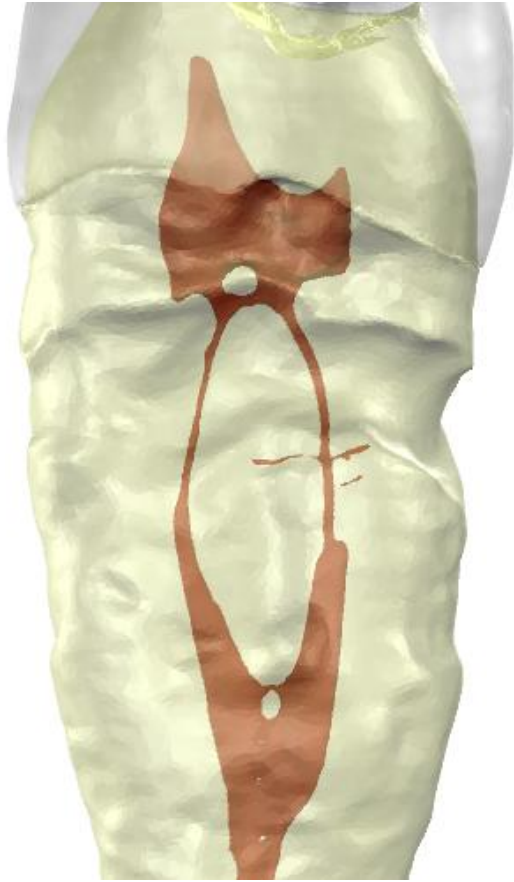


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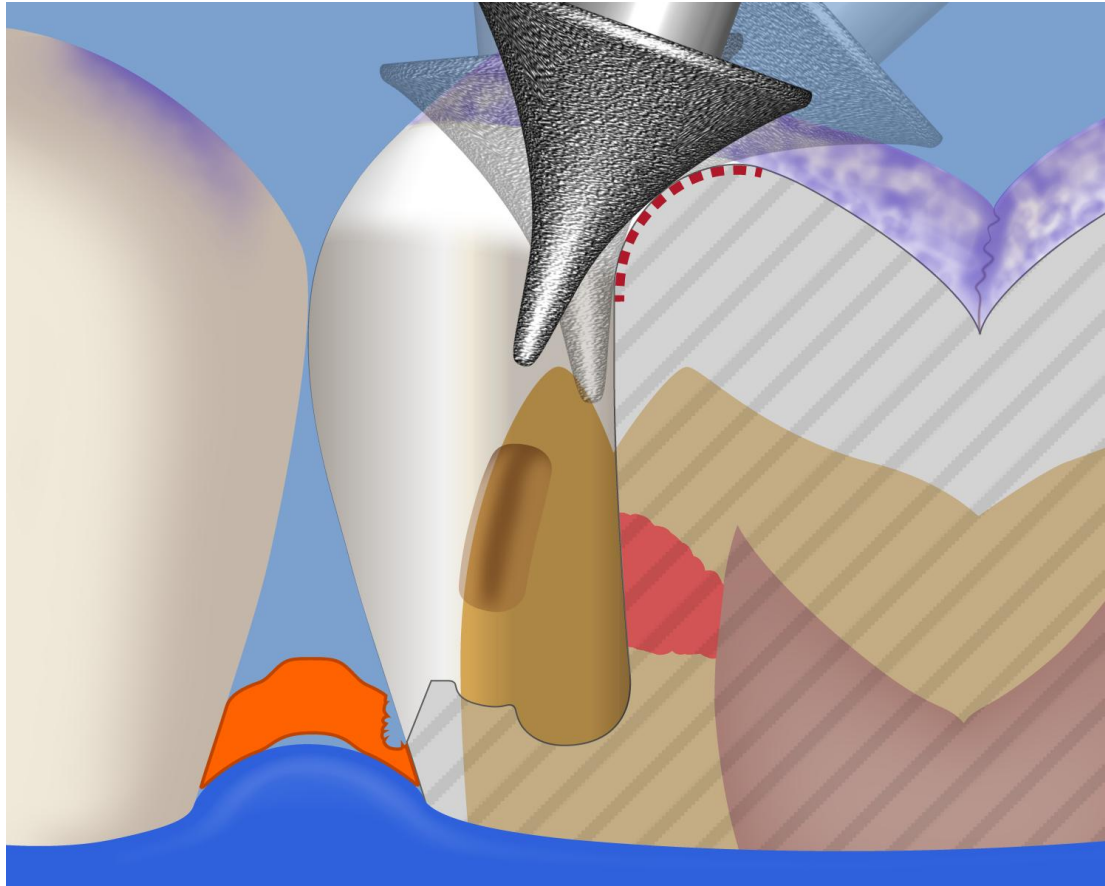


SCR:

We have a lot to talk about...

- 1) Better question: How much clean dentin can I afford? 1mm in the x axis
- 2) The Clark Class II allows 2 mm of surface area (pocket plus bevel plus additive dentistry)
- 3) 1mm in x axis and 1 mm in y axis = 2 mm surface area total for peripheral seal

14) Calla Lilly bur is used to create radius bevel/compression joint on occlusal enamel.





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