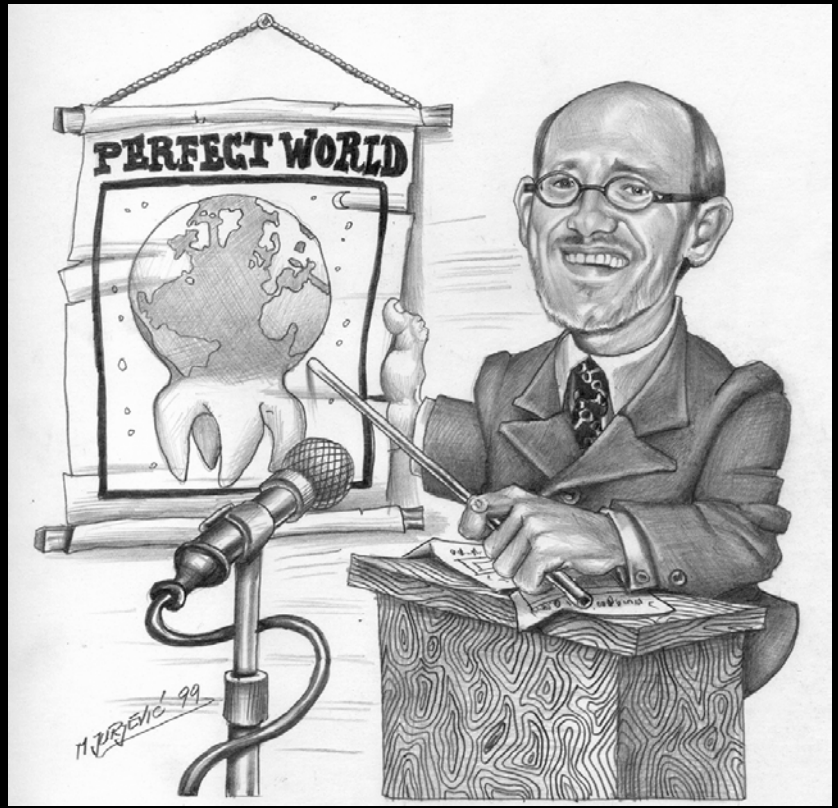
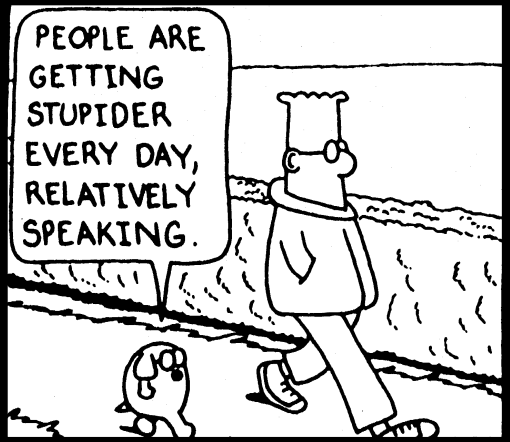
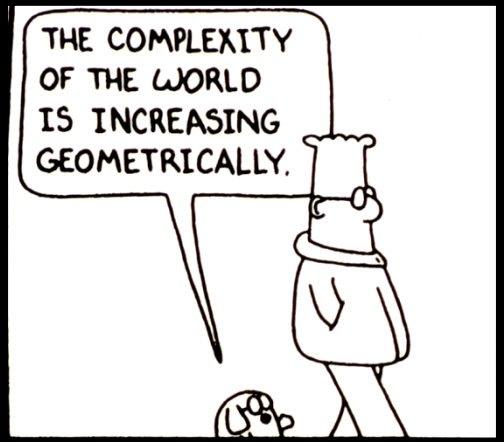
You probably already know 98% of what I will say,

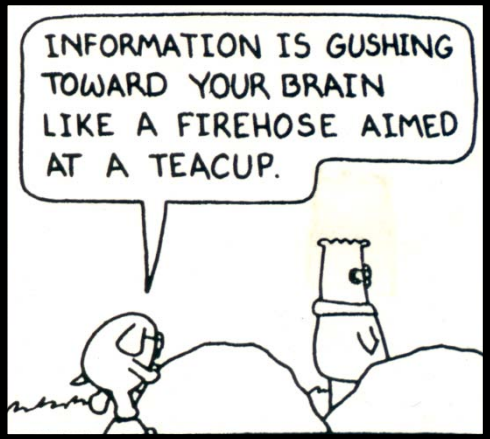
but I hope some of it will be from a different perspective.



We live in the "Age of Information".

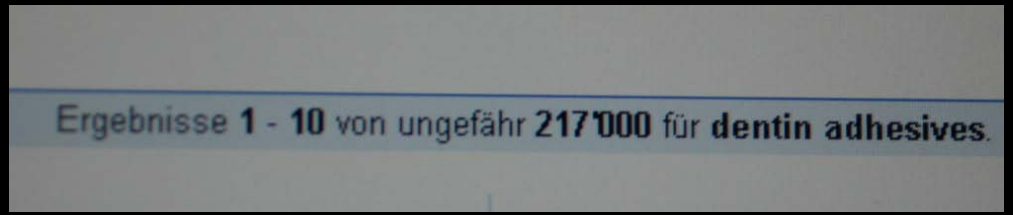






The internet is democratic.

Idiots have equal rights.



"An echo chamber of half-truths and complete lies."

David Carr Editor, New York Times 2011

Decisions about materials and techniques

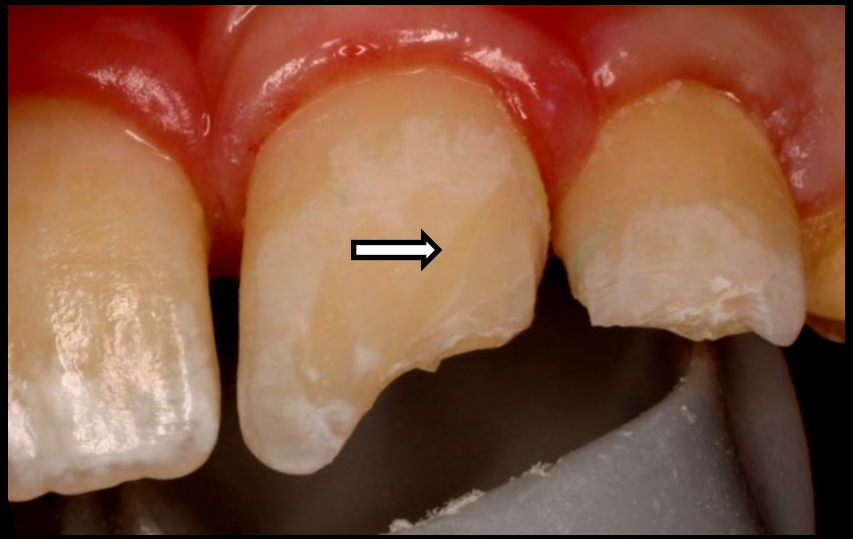
Anterior Restorations

Transilluminate

9 year old boy

Anterior Restorations

Preparation must prevent crack propagation to avoid endodontics or an unrestorable fracture

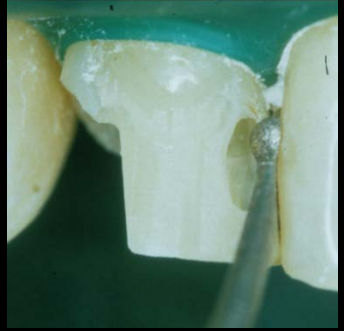


The fracture extends into dentin

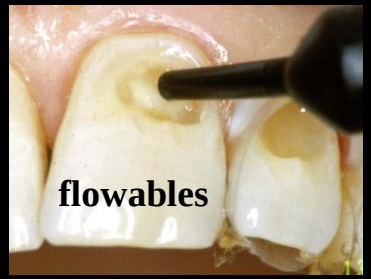
9 year old boy

Composites have improved dramatically, but before I talk about new materials, a quick look back

Wave Bevels



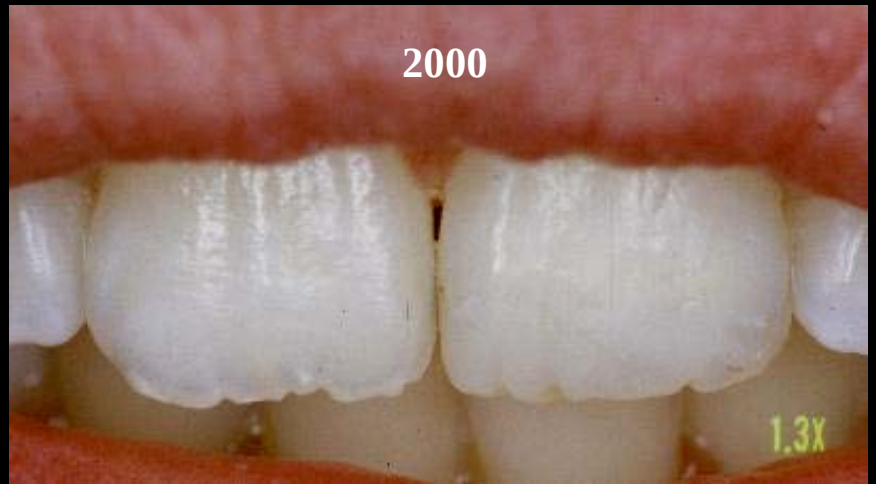




Cases done > 20 years ago

My daughter: age 8
After midnight, and several beers ... (me, not her)



1992

2011

1992

After 19 years: incisal wear, small marginal defects, rough surface, too opaque

1992

2011

1992

2012: decided to let this "obsolete composite" celebrate another birthday

20 years

refinished

New composites: the chemists can make them very transparent

It's not just transparency, the refractive index should also match the enamel

"Filtek Supreme Plus failed to produce acceptable integration."

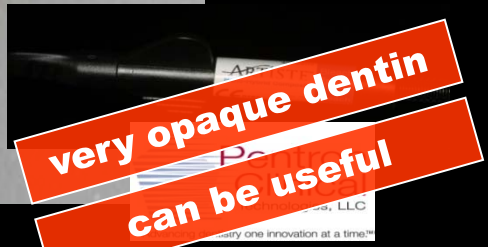
Magne P, So WS. Quintessence Int 2008

"Dyract extra was superior to Filtek Supreme in color stability"

Turkun LS, et.al. J Dent Res 2007

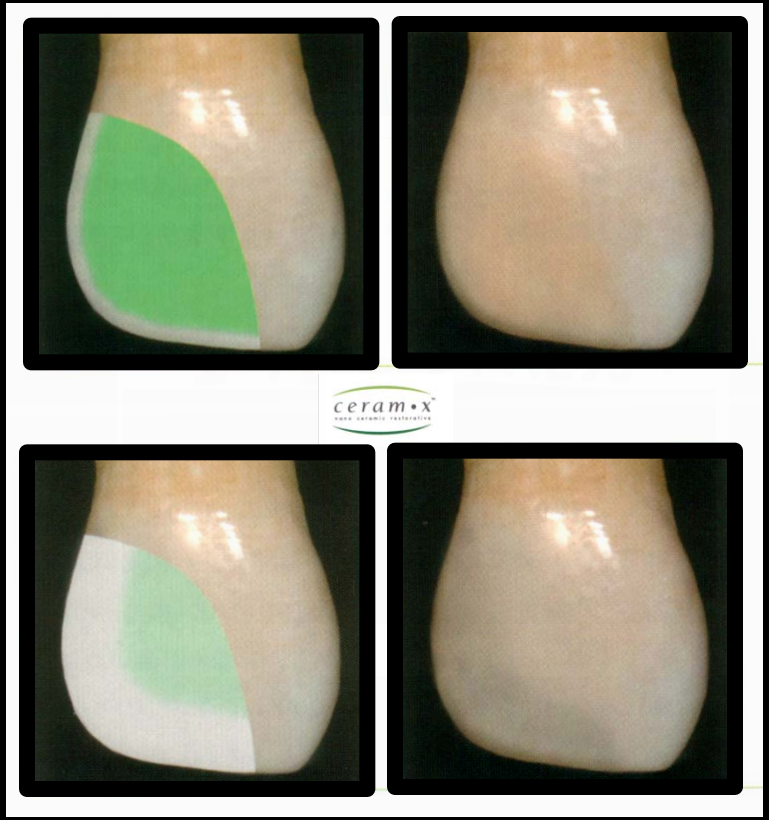
enamel less transparent

totally useless



very opaque dentin

can be useful



I don't have their hands or eyes.

More time means a higher fee.
How much is a composite worth?

Opaque dentins and transparent enamels

Layer like the technicians with ceramic?

If you have not heard these lecturers, you should

Jackson

Fahl

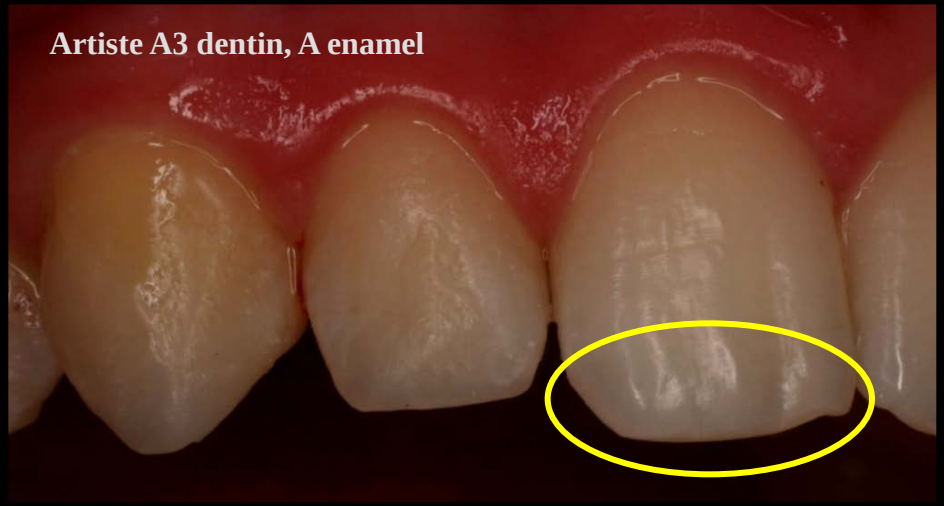
Vaninni

Lenhard

Spreafico

Dietsche

Marcos Vargos



Difficulties with Transparency

Note enamel opacity from drying

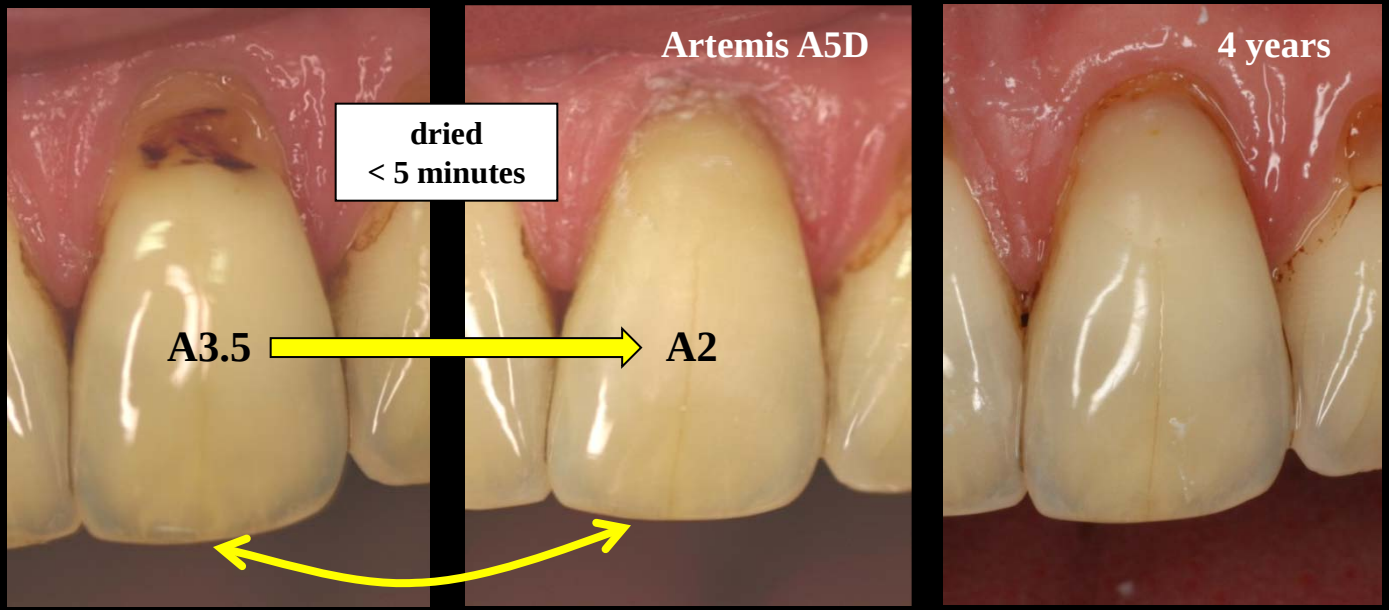
The extent of change is extremely variable

It will take about three hours to return to normal

If it looks good immediately after placement, it is probably wrong

Enamel dries quickly and becomes more opaque

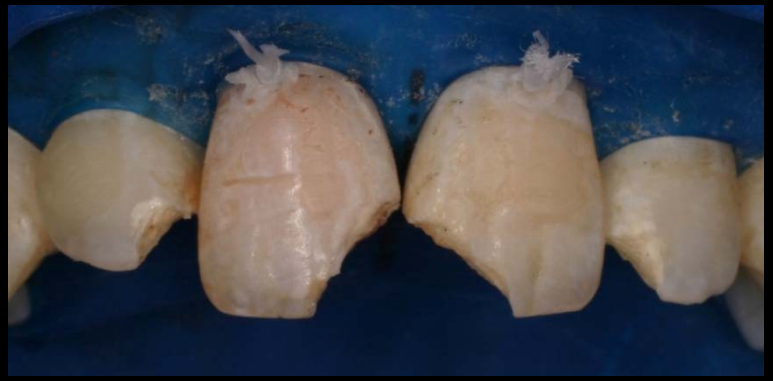
Select shades and transparencies before any drying



It is only easy if you always use shade AACD and restore all visible teeth

Shade would be easy, except that transparency changes the shade

How do we determine transparency? We guess!



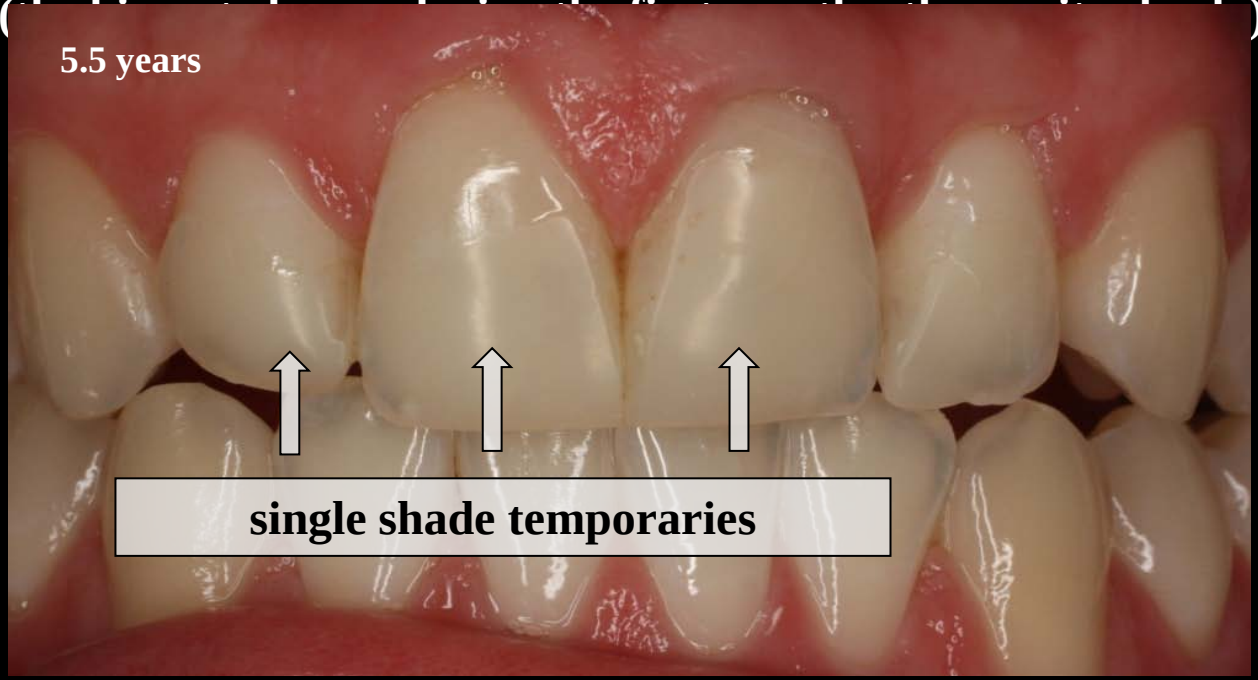
16 years old

Endo both centrals
Temporary restorations 12, 11, 21

22 restored "properly"

22: Artemis: A2 dentin, A2 enamel, clear

Transparency loss occurs with every composite



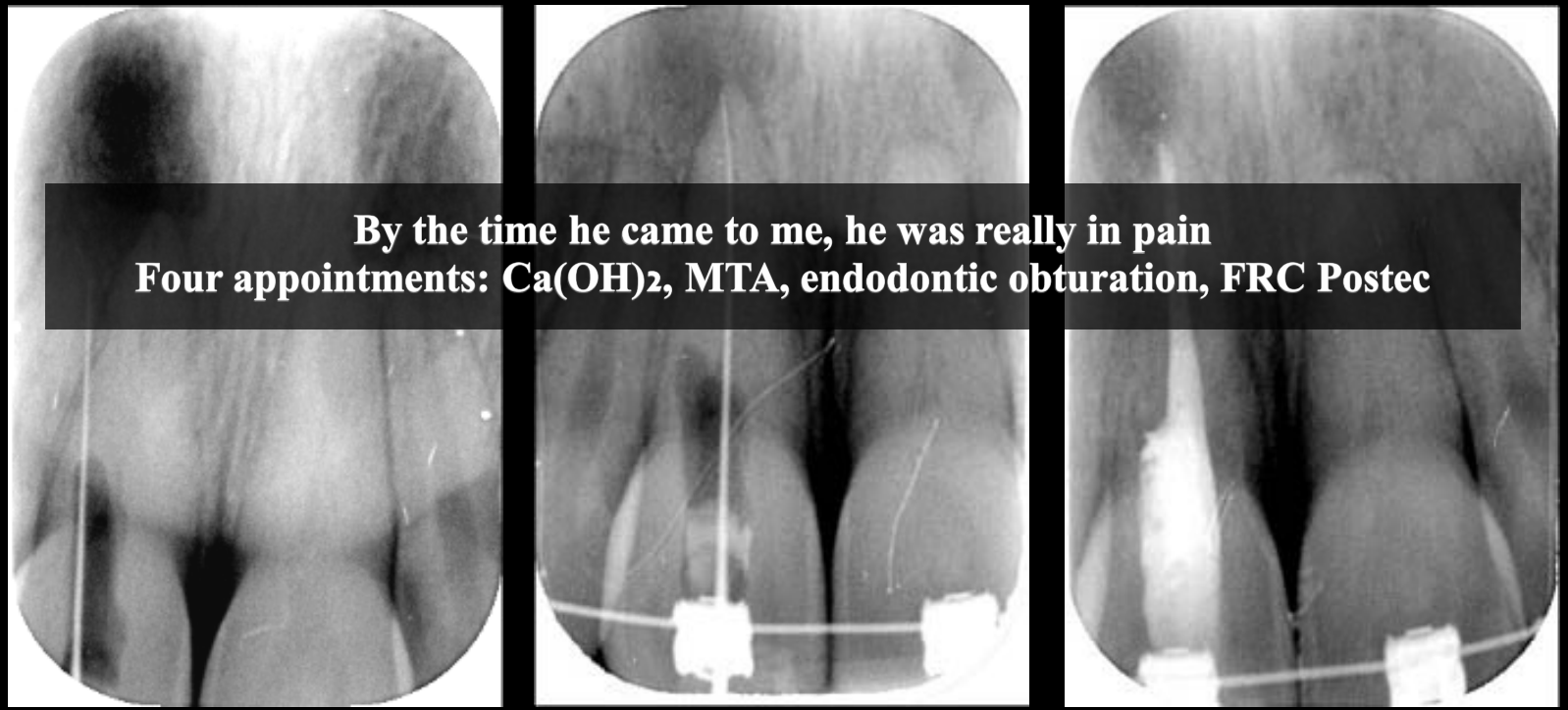
Opacity with water storage increased during the entire five years of this study.

Hosoya Y. Dent Materials 1999:15(1):268-274

I did not guess high enough

14 year old boy: treated twice as emergency in Berlin

Perforated both times, distal and labial: never found the canal



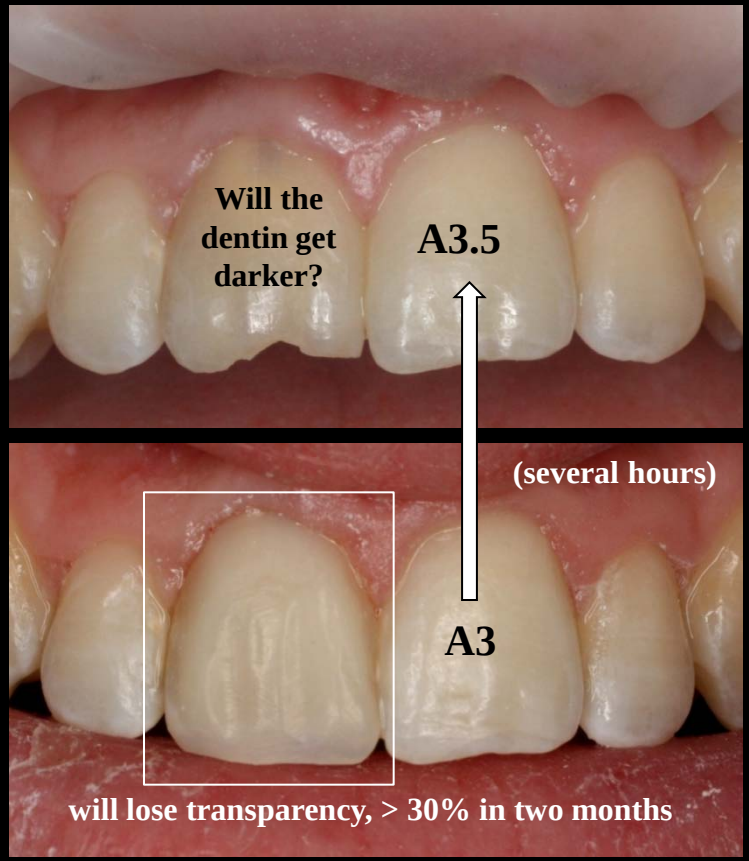
By the time he came to me, he was really in pain
Four appointments: Ca(OH)2, MTA, endodontic obturation, FRC Postec

How can a dentist start endo on an unrestored tooth four weeks after the beginning of orthodontic treatment?

Two years later, orthodontics completed

Empress direct - A3 Dentin, A2 Enamel, Opal

Are the shades and transparencies correct?
You won't know until the next appointment.

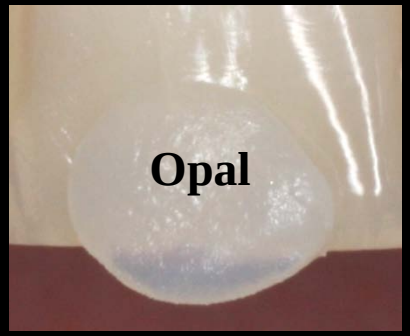


My guess for incisal transparency was fairly good
(should have brought the dentin closer to the incisal edge)

The cervical one third is gray
(deeper preparation and an opaquer or perhaps A4D?)

Halo effect

The halo effect is not created with a different shade.



White composite on the incisal edge?

No halo?
The incisal edge is too thick, not transparent enough, or at the wrong angle.

Patient did not want to spend the money for ceramic, and did not want the diastema closed.

before bleaching A3.5
bleached to A2

2002: restored with Artemis
A2 dentin and enamel

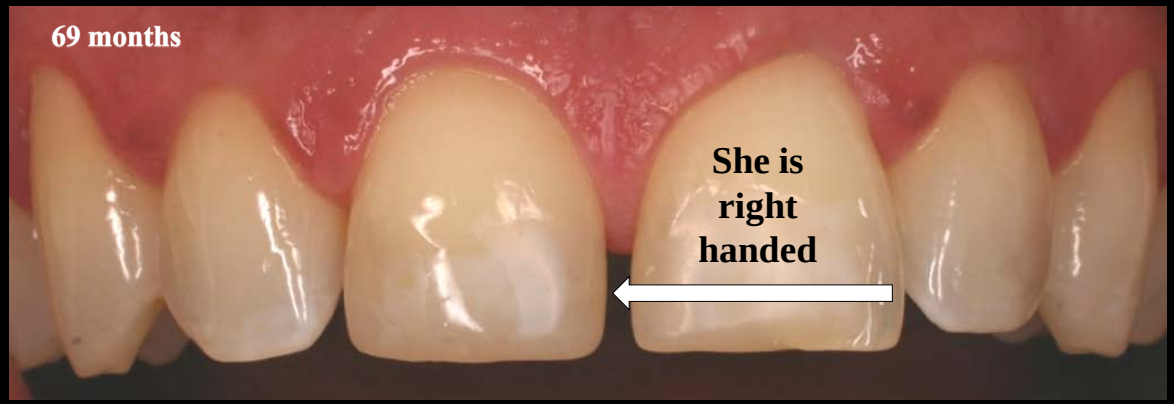
Modern composites have less wear and less transparency shift

"Major" problem is loss of surface characterization.

In this case the surface wear is unusual.

Modern composites have less wear and less transparency shift

More wear on the proximal than on the incisal edge?



22: trauma, failed endo, no labial bone = extraction

Empress FPD 21-23
Heliomolar veneer 11

opened a bottle with her teeth

new veneer
Empress direct
(after two months)

Empty pockets

22: trauma, failed endo, no labial bone = extraction

Empress FPD 21-23
Heliomolar veneer 11

one year

new veneer
Empress direct
(after two months)

Empty pockets

"Orthodontic Crown"
traumatic occlusion
in centric and protrusive
Periodontal complications

Direct composite crown
A3.5 Dentin, A2 Enamel, I-Bleach

Widen the cervical with angled matrix

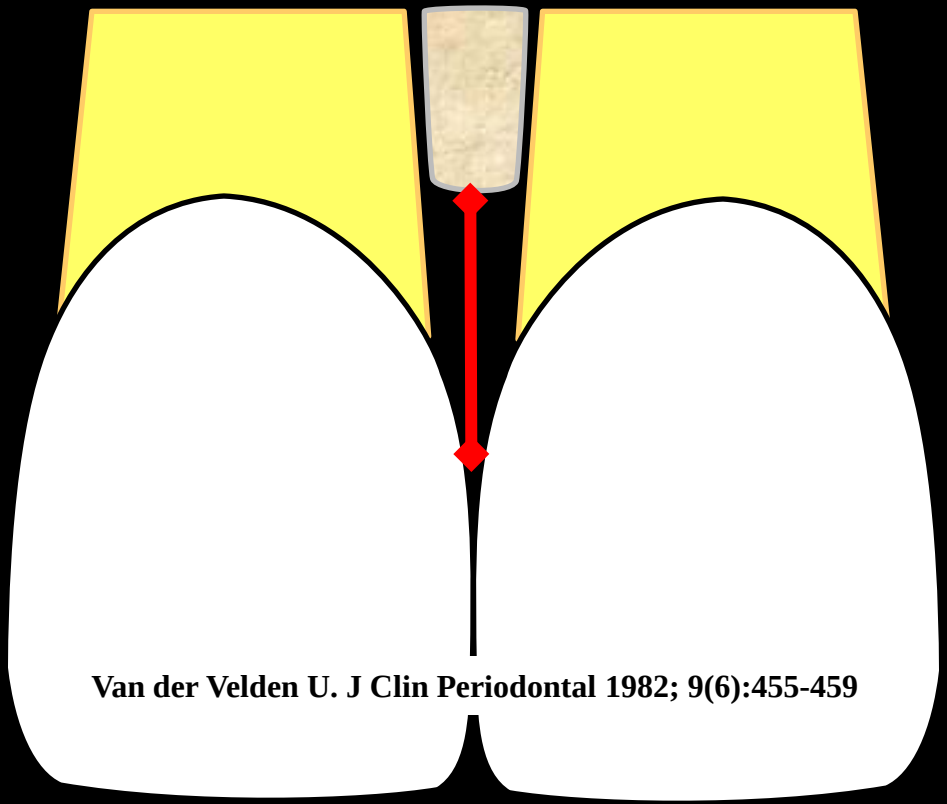
Bioclear Diastema Matrix
bioclearmatrix.com

Dr. David Clark

Closing black triangles with direct composite

Establish new contour
and "compress" papilla

Open gingival embrasures (black triangles)
level of crestal bone to proximal contact



Van der Velden U. J Clin Periodontal 1982; 9(6):455-459

5 mm = none

6 mm = 44%

7 mm = 73%

If sulcus depth < 4 mm papilla will generally remain stable,

> 4 mm expect recession

You can compare a papilla to a balloon.

It gets longer when you squeeze it.

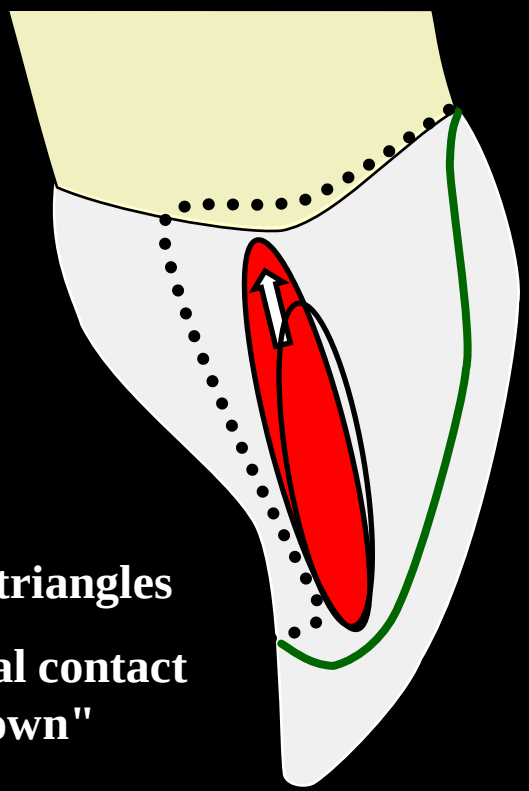
If I had been smarter earlier, then I might have done this case correctly.

1992

Priest G. Proximal margin modifications for all-ceramic veneers.
Prac Proced Aesthet Dent 2004; 16: 265-72

Diastemas and black triangles require a subgingival margin

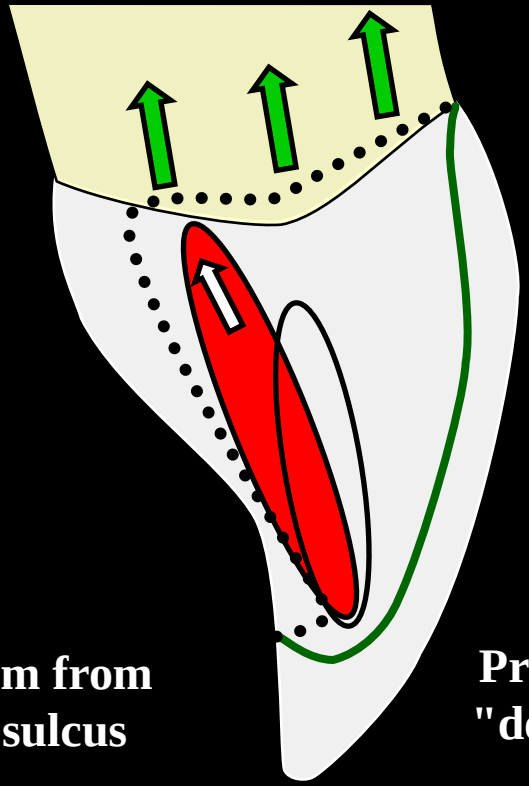
0.5 mm per millimeter of width increase



Black triangles

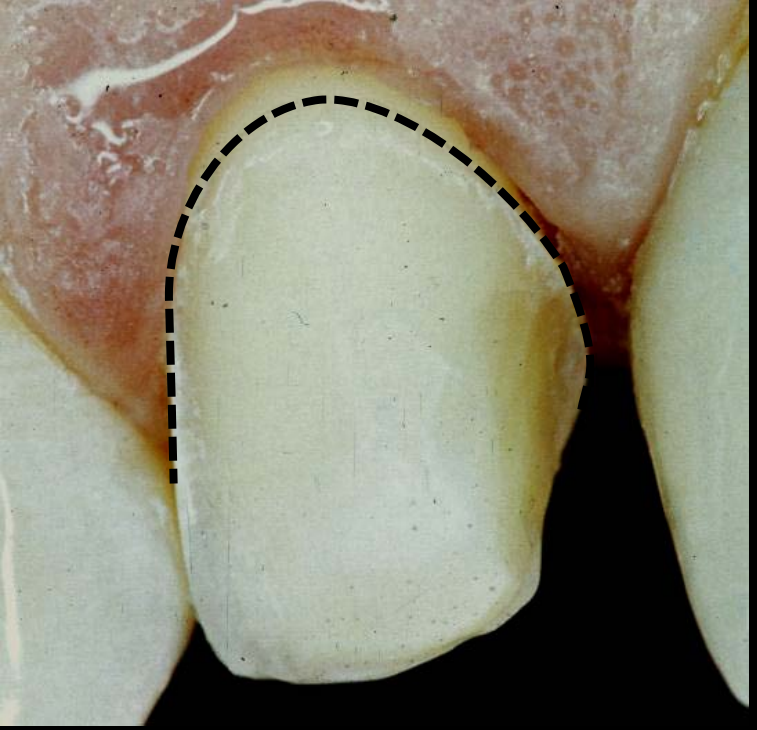
Proximal contact "down"

Stay ±1 mm from depth of sulcus

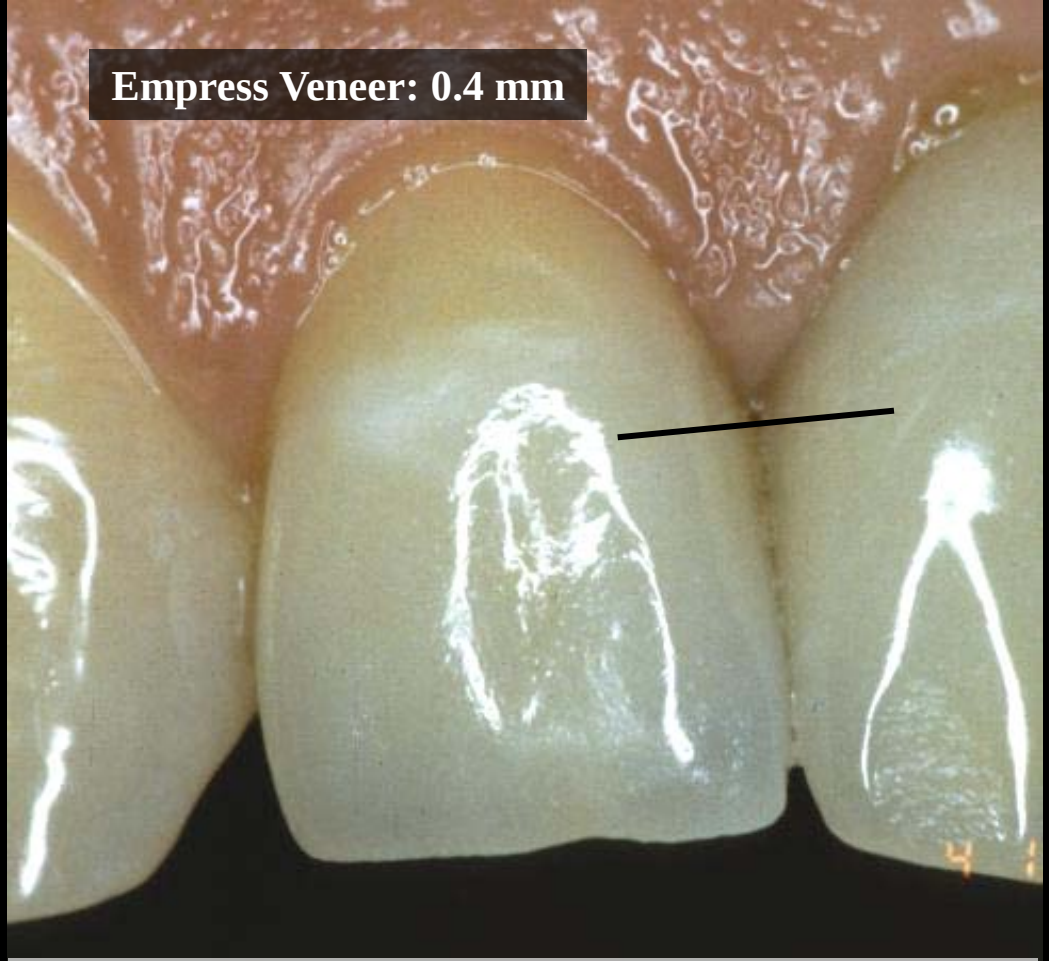


Diastemas

Proximal contact "down and back"



Technician
Gerald Ubassy



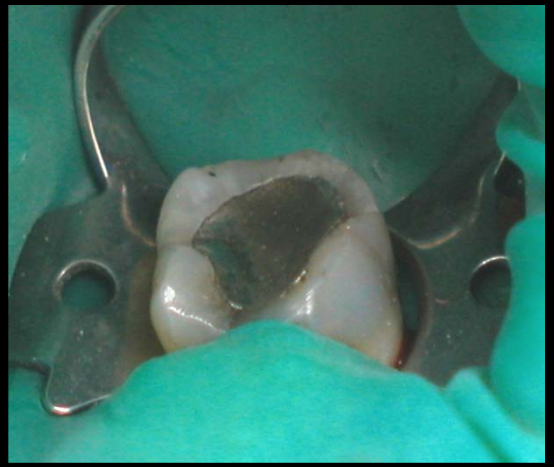
Proximal contact moved palatally and gingivally

RUBBER

DAMN

Rubber Dam: Clinical Literature

- No differences with fissure sealants or Class 3's.
- Trend toward better results when placing direct Class 2's.
- Trend toward worse results when placing direct Class 5's.
- No clinical studies concerning indirect restorations.



Anyone who tells you that you cannot do adhesive dentistry without rubber dam is an idiot

Class 5: I almost never use a rubber dam or a matrix or a retraction cord

Avoid trauma during preparation

Some finishing trauma is unavoidable

If no discolouration, a standard opacity composite to replace dentin has little effect on aesthetics and reduces technique sensitivity.

Tetric Ceram A1

Artemis A2E

You need A-Enamels and highly transparent incisals.

It's nice to have the A-Dentins to mask discolouration.

B and D shades are unnecessary.
C shades are only useful to match bad crowns.

Buccal composite: Empress direct A5D
(and it is still too light, I should have used A6D)

2nd premolar restored with Evetric A2

This patient had begun to chew tobacco, helped him reduce to < 60 cigarettes per day.

90 minutes later

Restored with
Empress direct: A4D, Opal

Putting the midline
in the middle is difficult
without orthodontics

90 minutes later

Restored with
Empress direct: A4D, Opal

Putting the midline
in the middle is difficult
without orthodontics

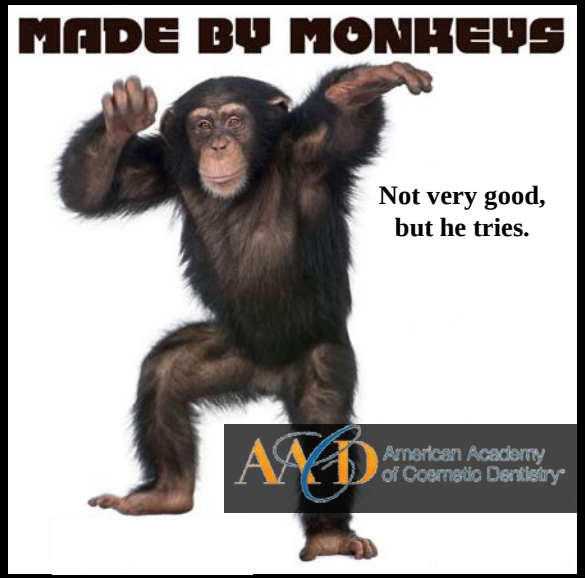
Closing a 5 mm diastema
with a 3 mm sulcus depth
on the mesial of the centrals
is basically impossible

I admit, the contour on the mesial
of the right central incisor
is not very good

I made her less symmetric because it was

faster, cheaper and easier

My AACD certificate



Before I die, I want to fulfill all criteria for automatic membership exclusion

A seamstress who bites off threads

Endodontics

FRC Postec / Variolink 2

Tetric Ceram

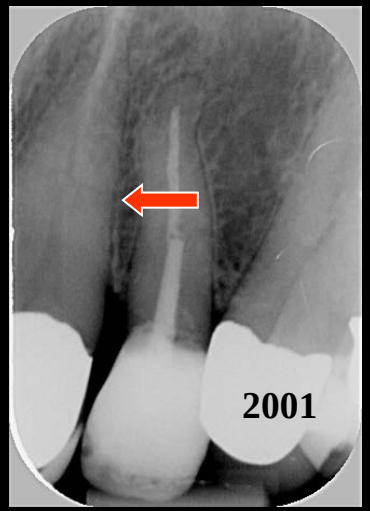
Artemis

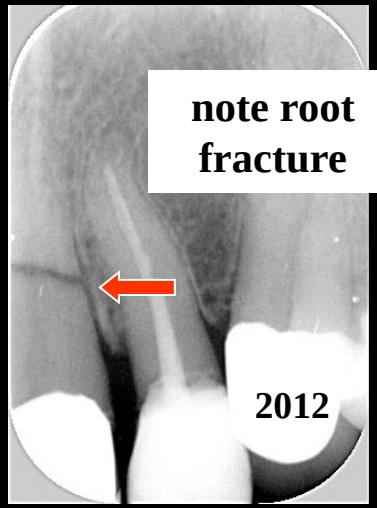
One Year

Two Years

Five Years

Nine Years

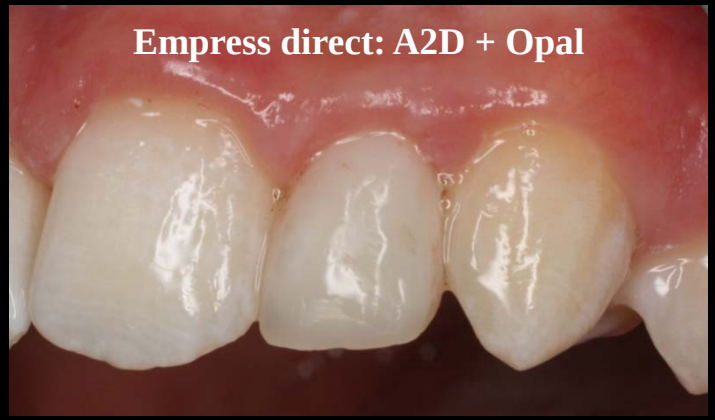




Direct composite crown with FRC post after 11 years

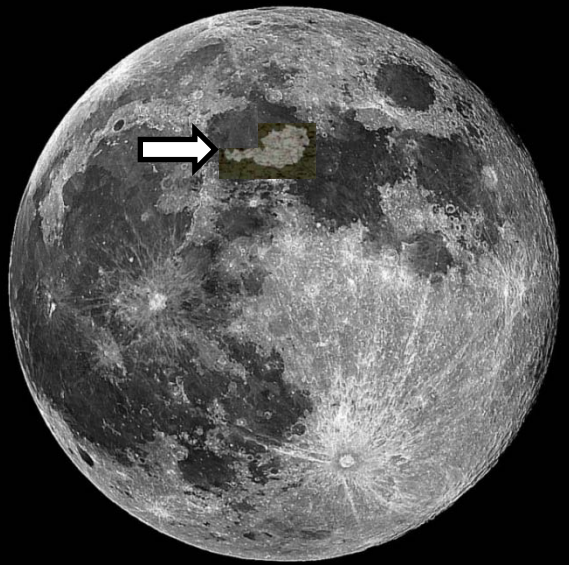
2010: fracture 12
endo, FRC Postec, crown "recemented"

"Recemented" crown with FRC post after 2 years



15 minutes. Fee: < 20% of a crown
(my earnings per hour are the same)

His dentist recommended a crown
(and said a "filling" was impossible)



The dentist lives on the moon
(and probably would have used metal-ceramic)

Fractured lateral three days before his daughter's wedding

Using a standard composite instead of an opaque dentin reduces technique sensitivity

Of course you can sell him a crown,
but considering his periodontal situation it would not be ethical.

If the gingiva was healthy, would a crown be better?

I see a lot of anterior crowns

and most of them look like shit.

Metal-ceramic can function for a long time: a fifteen year old case!

Life would be easy if every patient wanted this kind of smile.

Maxillary Incisors

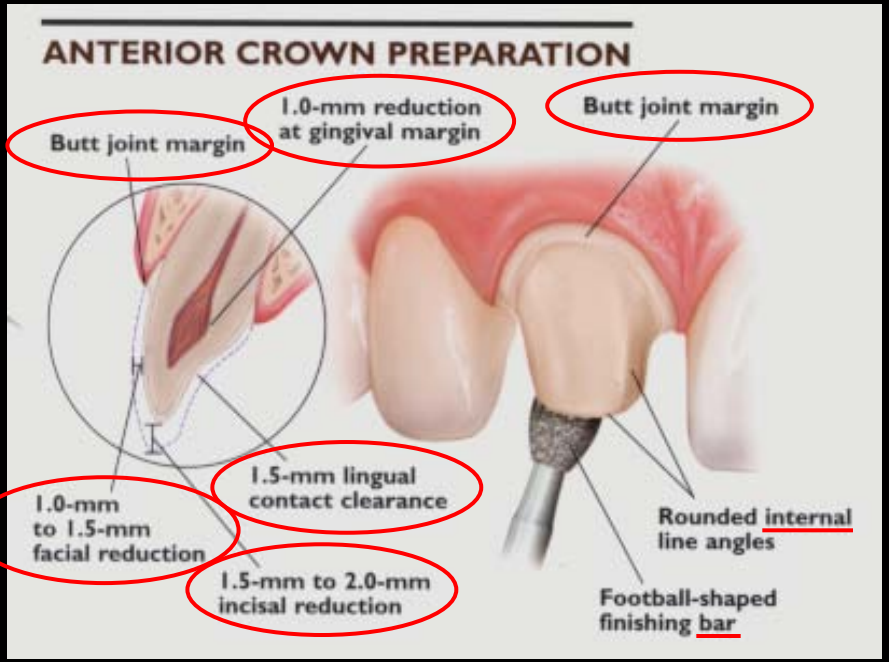
Minimal reduction
for metal-ceramic or zirconium

1.0 mm labial, 0.5 mm palatinal

and I think everyone can agree that this is really the absolute minimum

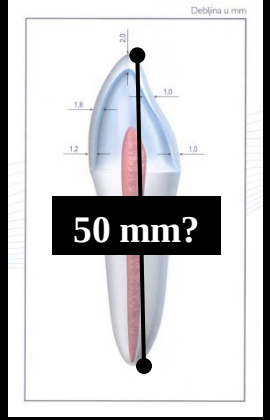
Every crown preparation must be ANATOMIC

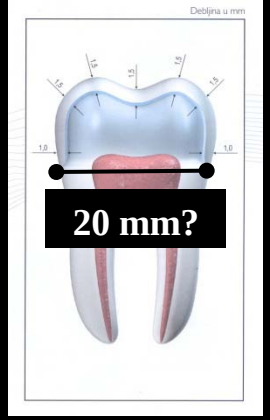
Company guidelines
for bovine dentistry



The only things that are wrong are circled or underlined in red

You can follow these recommendations for the patient in the middle





Maxillary Incisors

Minimal reduction
for metal-ceramic or zirconium

a more typical recommendation for zirconium

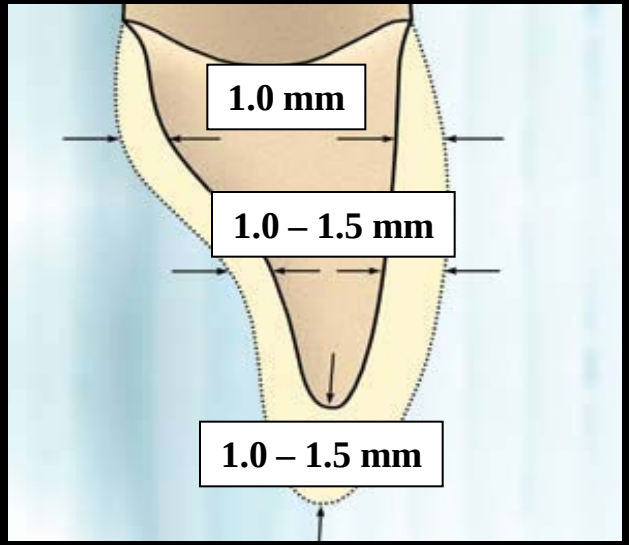
Lava Prep Guide
3M-Espe

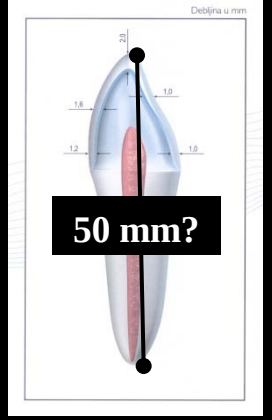
Table 1: Design Criteria for Tooth Preparation for Zirconia Restorations

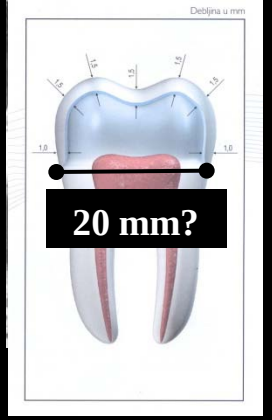
- Uniform, circumferential, tooth reduction of 1.0 mm to 1.5 mm
- Circumferential chamfer
- Occlusal reduction of 2 mm
- Rounded line angles
- Reduce linguals of anteriors with football diamond–create a concave lingual

Adapted from Farah JW, Powers JM, eds. Preparation guidelines for zirconia-based restorations. *The Dental Advisor Clinician Technique Guide*. 2009;(3):1-2.

other companies
use similar graphics







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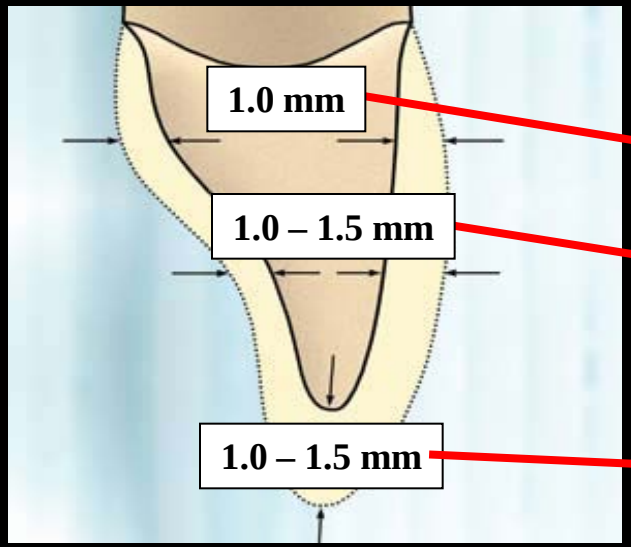

What is
the probable
cause of death?

. . . and I thought dogs resembled their owners!

Lava Prep Guide
3M-Espe

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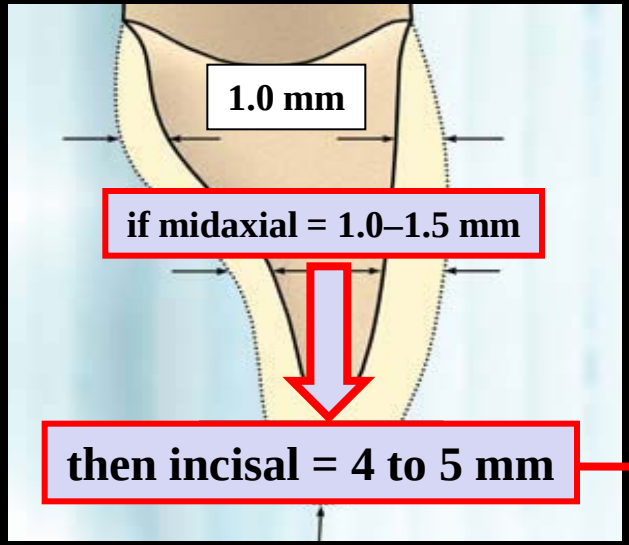
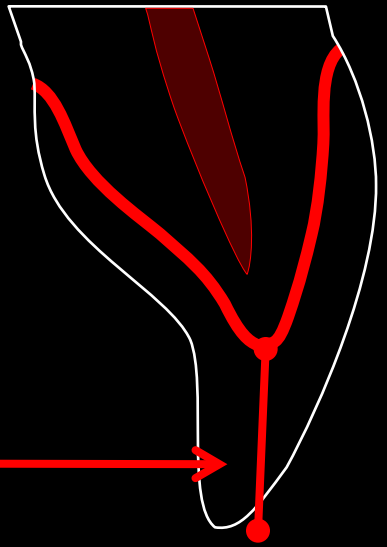
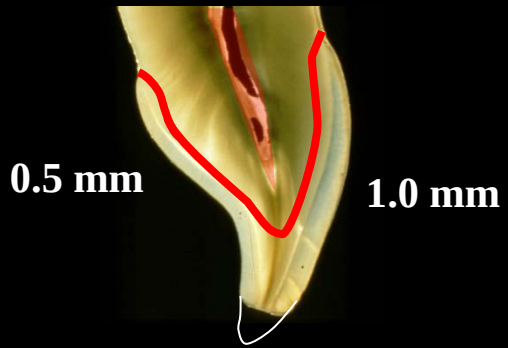




< 0.6 mm anatomic reduction

Dr. U. Brodbeck (CH) / J. Seger (FL)



Even the minimal preparation leads to an incisal reduction of 3 - 4 mm.

Incisal reduction cannot be defined.
"You get what you get"

We don't want to kill the pulp or have the teeth break

and conventional crowns need retention form, but we don't want to destroy the gingiva

The aesthetic, biological, and mechanical requirements are in conflict

Incisors should only be restored with conventionally cemented crowns when all other options are impossible

Basically, this is NEVER

It's time to put anterior metal-ceramic crowns into the history books instead of patient's mouths

In my opinion, zirconia is NOT a sensible alternative

One month previously, this patient paid 3000 Euros for teeth that do not look like teeth

e-max LT, 1.2 mm, Multilink automix
M. Burgmeier, Liechtenstein

Endodontically treated lateral with metal post / amalgam
(post could not be removed)

Trough technique
with opaquer
Fiber post
cervîcal "overcontour"

Another overcontoured crown in traumatic occlusion

Preparation

Labial
0.8 - 1.0 mm

Proximal and palatal
0.6 - 0.8 mm

Note the attrition of the antagonists in approximately three years

Did inadequate palatal reduction precipitate bruxism?

Five unit metal ceramic FPD in situ less than one year

The fee for this FPD was > $6000. Seems like an expensive way to get ugly.

How can any dentist still use metal ceramic for anterior teeth?

How can a patient look in a mirror and then pay for this?

What will this look like in five to ten years?

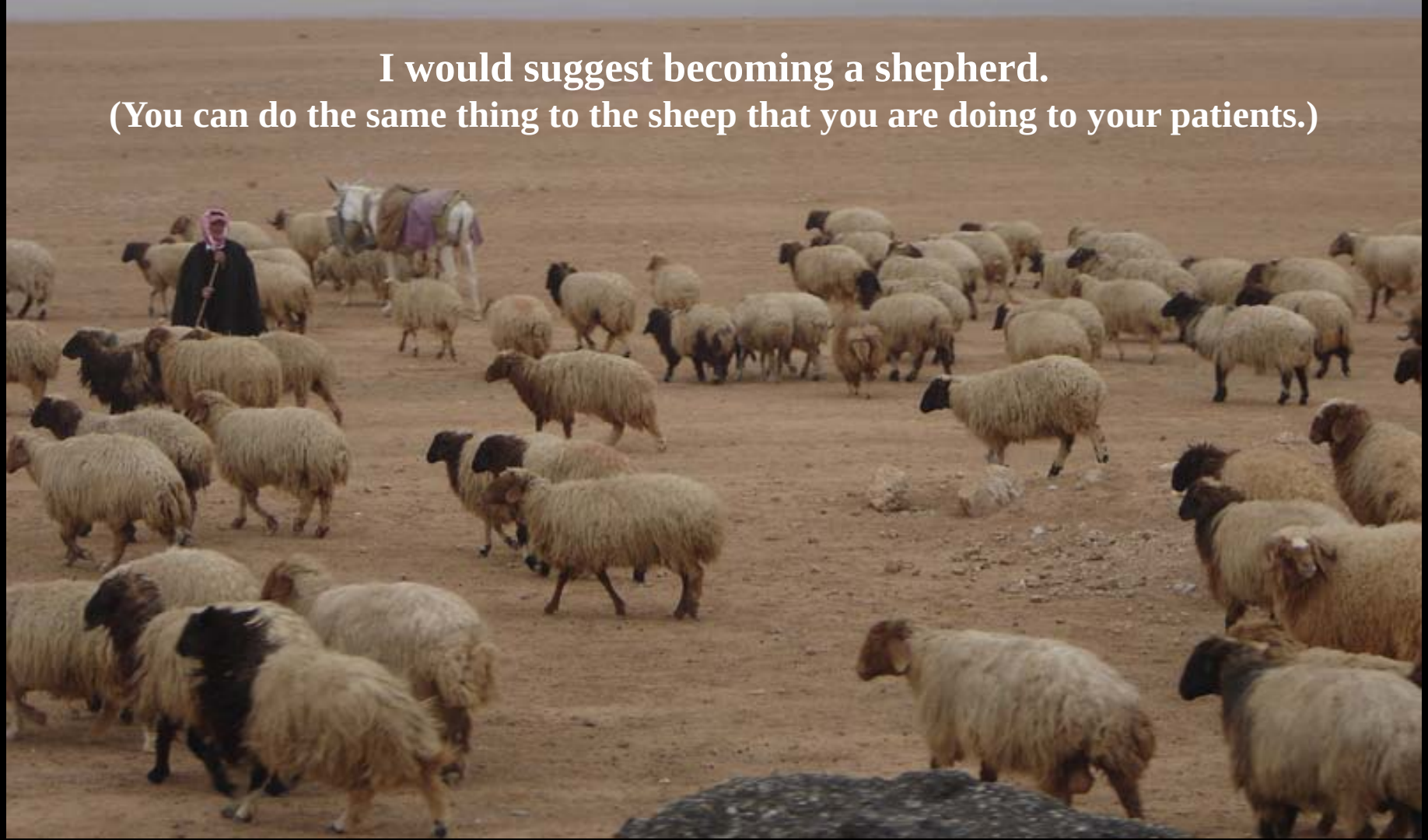
Countless hours of continuing education and years of practice guarantee a successful outcome

Am I the only one who finds this frightening?

Dentists doing metal-ceramic or zirconium crowns on incisors should find a job with fewer intellectual challenges

I would suggest becoming a shepherd.

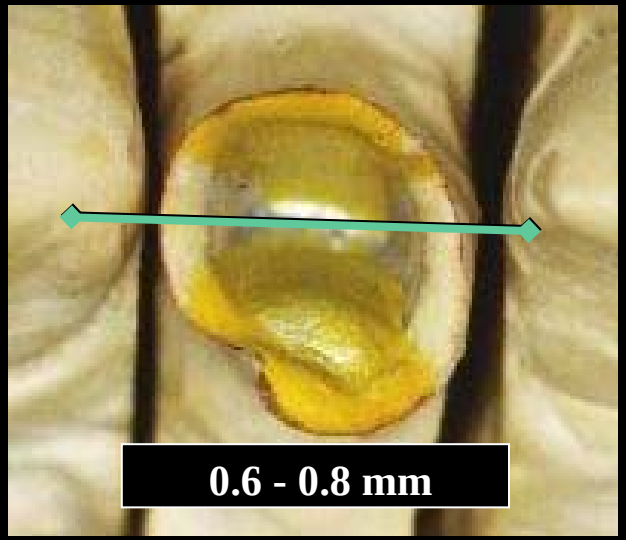
(You can do the same thing to the sheep that you are doing to your patients.)



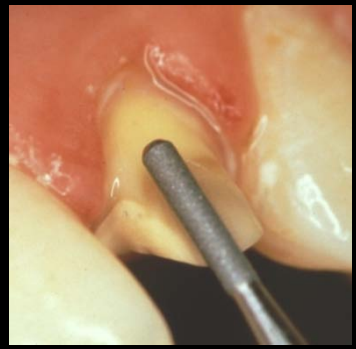
ADHESIVE Full Ceramic

requires LESS preparation than metal-ceramic or conventionally cemented full ceramic!

Ceramic conventional
Ceramic adhesive
Metal-ceramic



Meier A, et.al. DZZ 1996
Burke FJT. Dental Materials 1999
Kelly JR. J Prosthet Dent 1999
Fenske C, et.al. DZZ 1999



I did this case in 1988, still thinking too conventionally.
Today I would prepare even less, and also completely differently.

original Empress: 22 year recall

Root has discoloured

Change in surface texture
(but less than most metal-ceramics)

Show me a 22 year old metal-ceramic crown that is better!

22 year recall: dry

24 year recall: wet

Clinical study with Empress crowns (adhesive cementation)

Survival rate after 11 years

Anterior: 98.9%, Posterior 84.4%

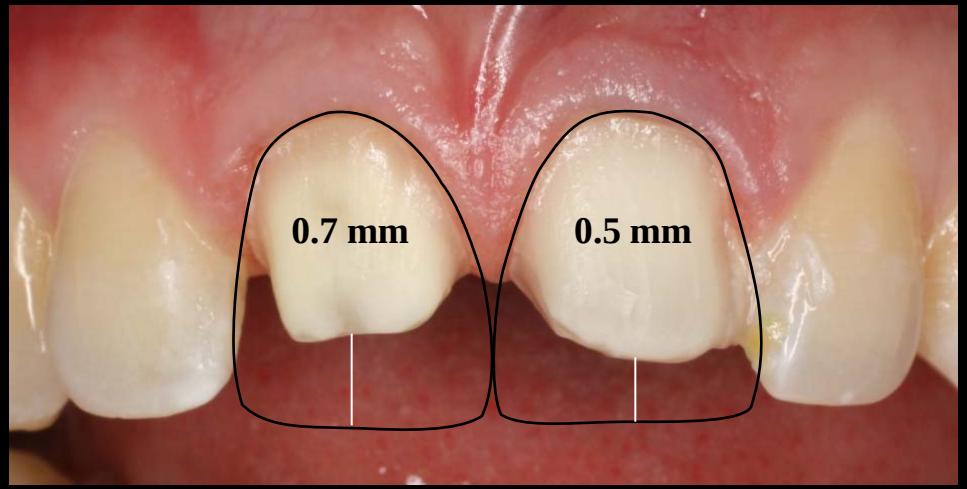
M. Fradeani and M. Redemagni. Quintessenz 2003; 54:379-386

Clinical studies with E-max (anterior and posterior)

Boening (2006)	3 years	97%	(conventional)
Fasbinder (2010)	3 years	100%	(CAD, adhesive)
Nathanson (2008)	3 years	97%	(adhesive or self-adhesive)
Dental Advisor (2010)	4 years	99%	(self-adhesive)
Beuer (2011)	4 years	100%	(CAD, adhesive or self-adhesive)
Gehrt (2010)	8 years	92%*	(conventional and adhesive)

* includes failures after endodontics, 2º caries, and marginal staining (3.3%)

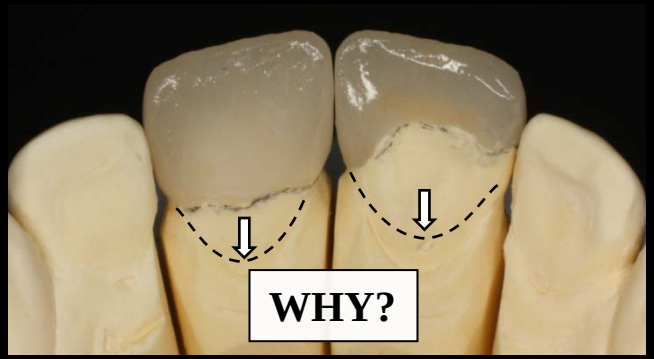
Trauma 11: endodontics and FRC Postec. 21: remained vital



Preparation for adhesive full ceramic (equigingival on labial and proximal)

note"automatic" incisal reduction

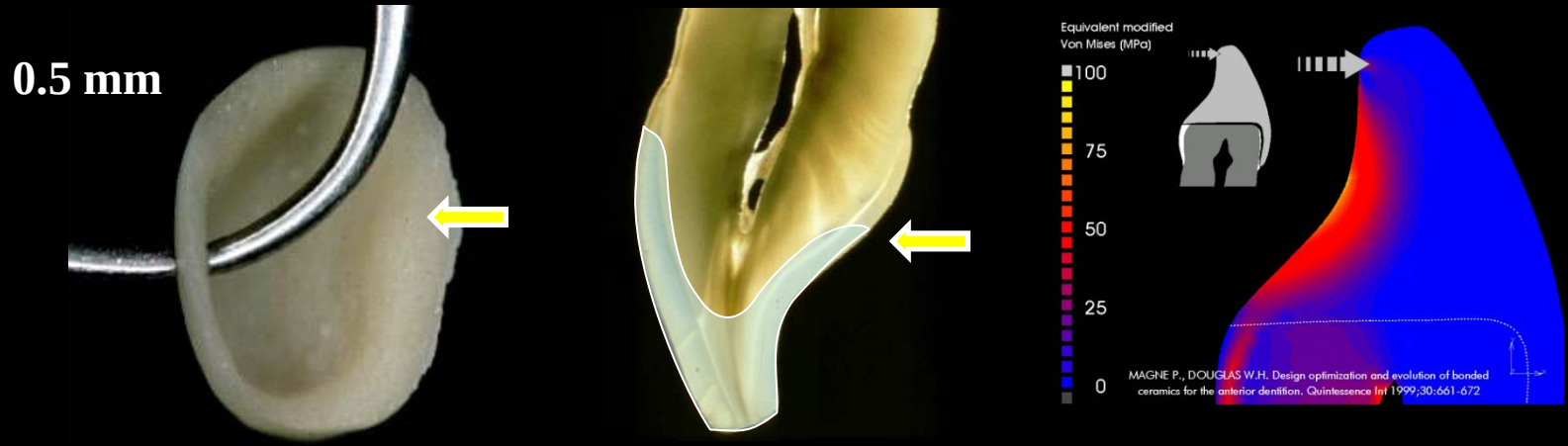
Preparing the palatal margin down to the gingiva is traditional stupidity



e-max Press, cementation with Syntac and Variolink-II

If the patient can afford it, this is optimal treatment,
but direct composites would be better than conventional crowns.

Adhesive techniques require a different preparation, and permit significantly less reduction than conventional techniques.



This is not new information!

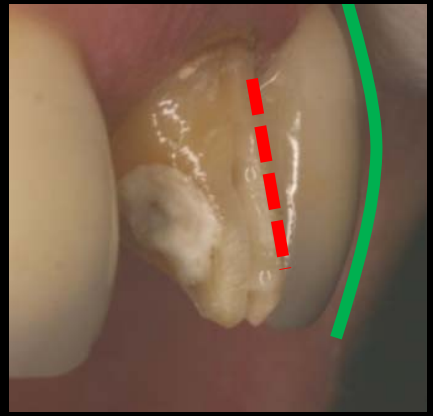
Original Empress placed in 1993

Technician: J. Seger



Under ugly crowns you almost always find terrible preparations





A labial preparation in a single plane

will either compromise the pulp or turn your patient into a rabbit

A palatal preparation in a single plane

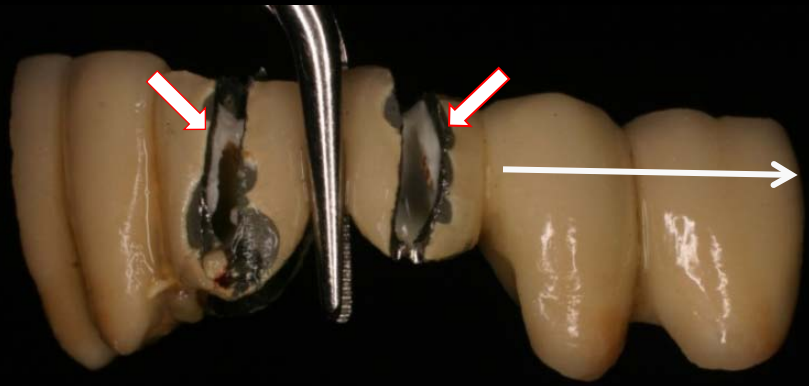
will either compromise the pulp or create protrusive interferences

No dentist would ever prepare this way?

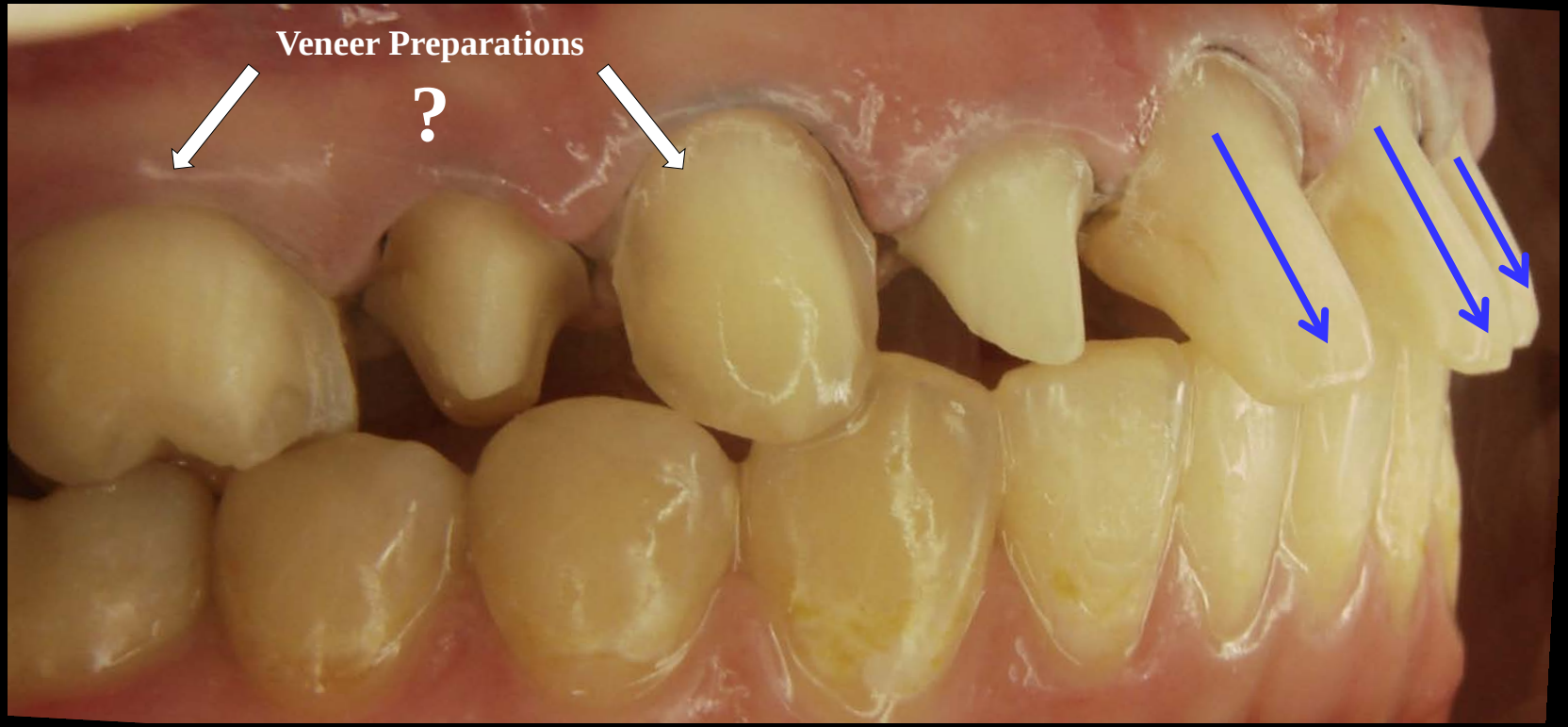
Tooth murder by preparation

FDP < 3 years old

All three abutments mobile and nonvital



not to mention 16 mm distal cantilever and poor accuracy



Where is the pathology that required this?

Another minor point: Has the patient signed the "Bugs Bunny consent form"?

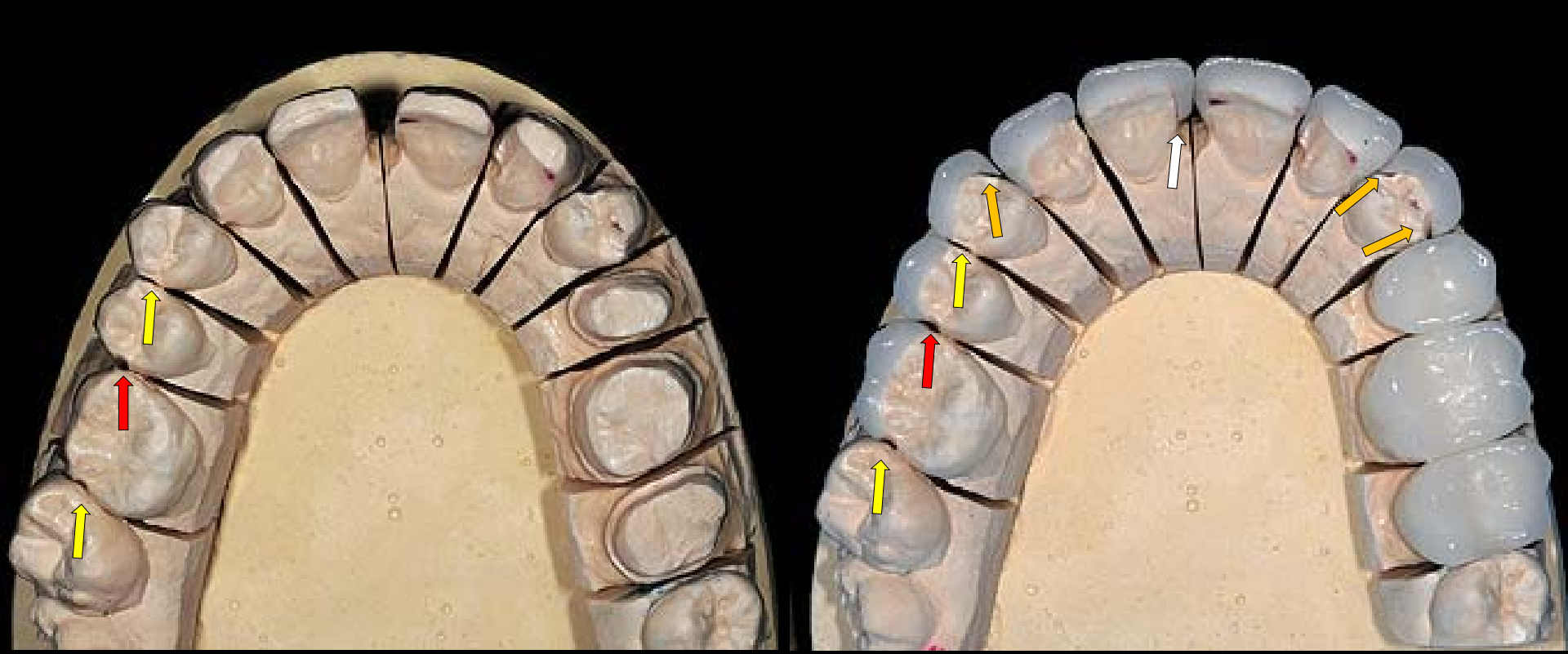
If surgeons did diagnosis and treatment like dentists

the solution for this

smashed thumb

might be this

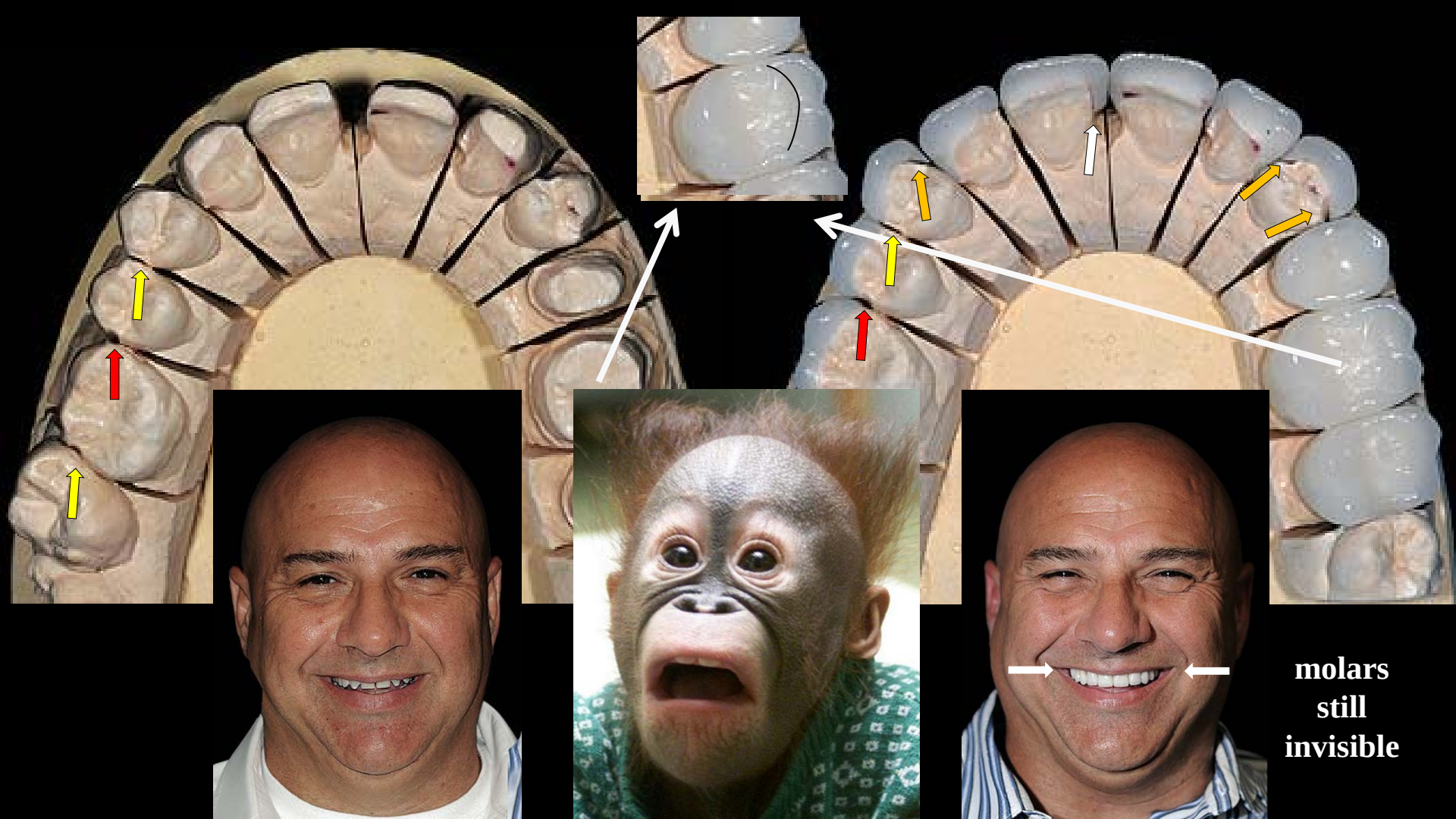
a robot arm



Proximal defects ignored, another defect created

Incorrect preparation for closing the diastema, proximal shelf

Accuracy questionable


molars
still
invisible

Overcontoured, opaque metal-ceramic bridge
(< 3 years in situ)

Treatment suggestion:

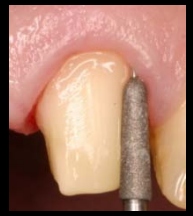
Soft tissue graft 11
gingival recontouring 12
orthodontics 22

Patient decided against this plan

but for a new bridge

Only bondable and translucent ceramics give us real advantages

Technician: M. Burgmeier, FL



FPD: e-max Press with Multilink automix. Veneer: e-max Esthetic with Syntac and Tetric EvoFlow

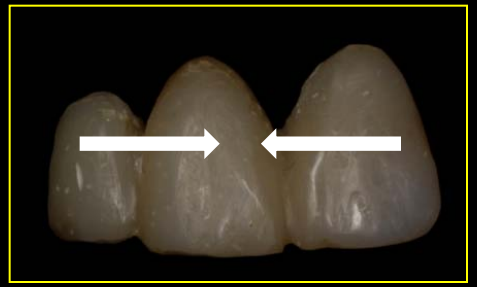
Cementation time: ca. 45 minutes

A "Minor" Complication

Temporary C+B materials shrink slowly and can cause "orthodontic" tooth movement

post cure temporary bridges
for 60 seconds in hot water

readjust before cementation



22mm. 1% residual shrinkage = 0.22 mm

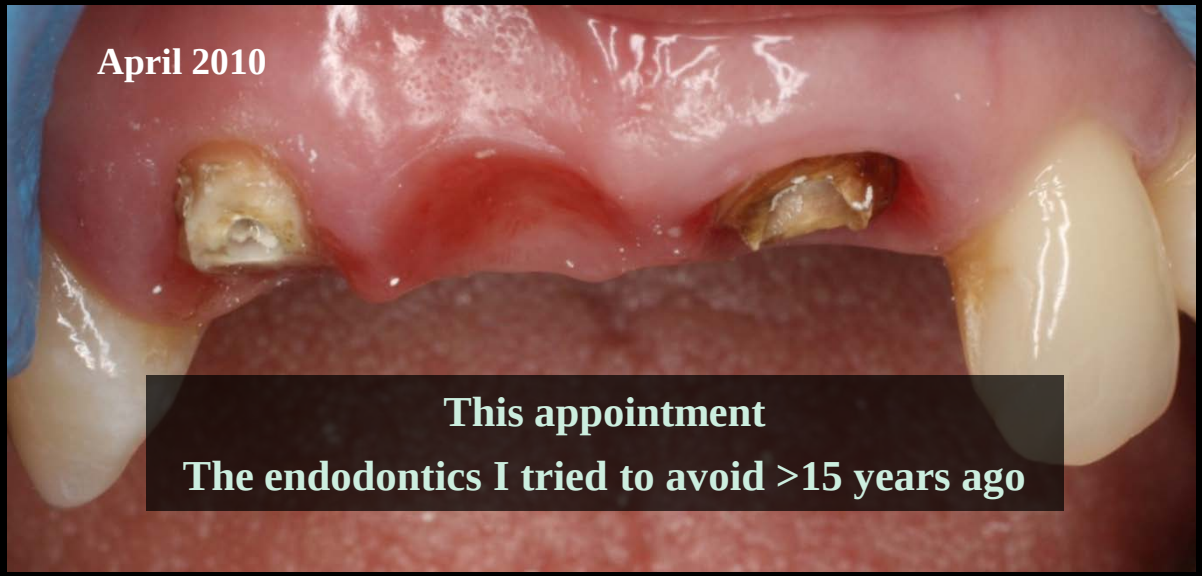
Metal-ceramic 12-21, placed (by me) in the mid-90's

The classic compromises: 12 overcontoured, opaque at the cervical margin

E-max adhesive bridge placed in 2007

Failure three years later: plastic deformation of post despite ferrule?

(almost every time I have not removed a metal post, I have regretted it later)



New FPD on these two teeth?
(21 with thin walls after removal of caries in canal space)

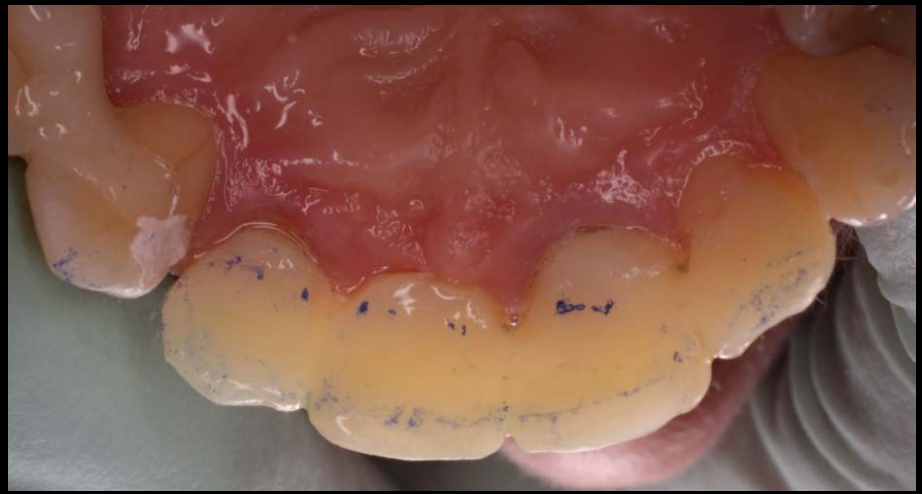
59 year old female: refused implant

Three days later

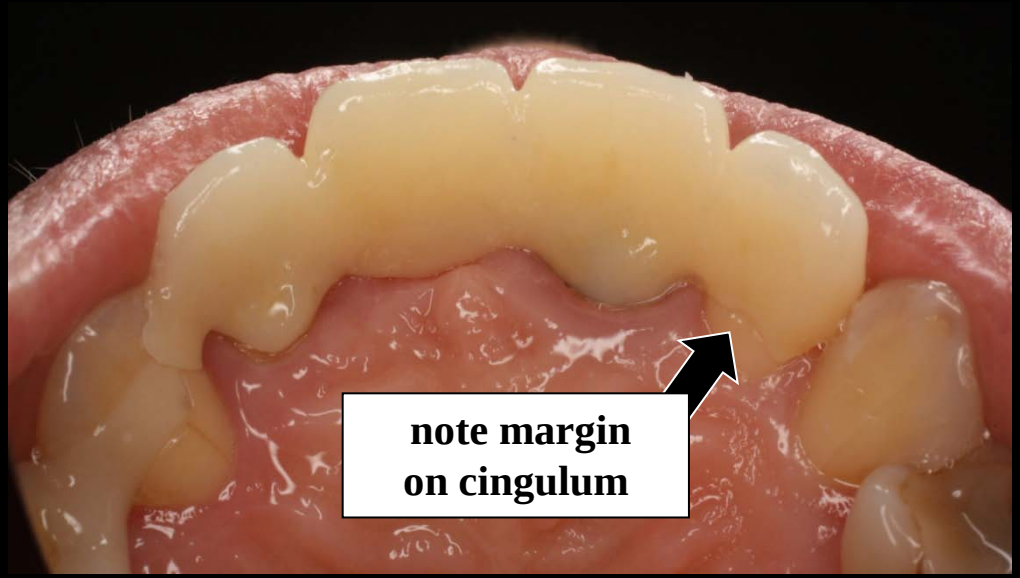
FRC Postec 12 and 21

Preparation of
"Veneer Crown" 22
(previous mp and dp composites)
and
Class III Inlay 13

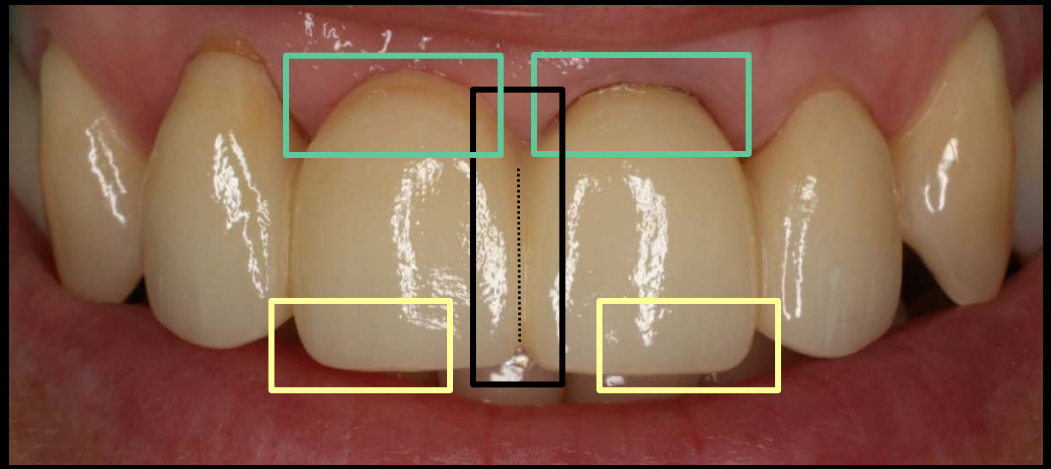
Temporary bridge
(not including 13)



E-max adhesive bridge, try-in
(the canine is now an abutment for two bridges)



An implant and three individual crowns would cost about the same as this FPD, and the patient would have needed a temporary for at least three months.



Try-in
Instructions for technician

Correct emergence angle of 21, reduce cervical 11

Labial embrasure 11/21 slightly deeper (mesial 11) and stain to A4

Recontour distal incisal edges of centrals

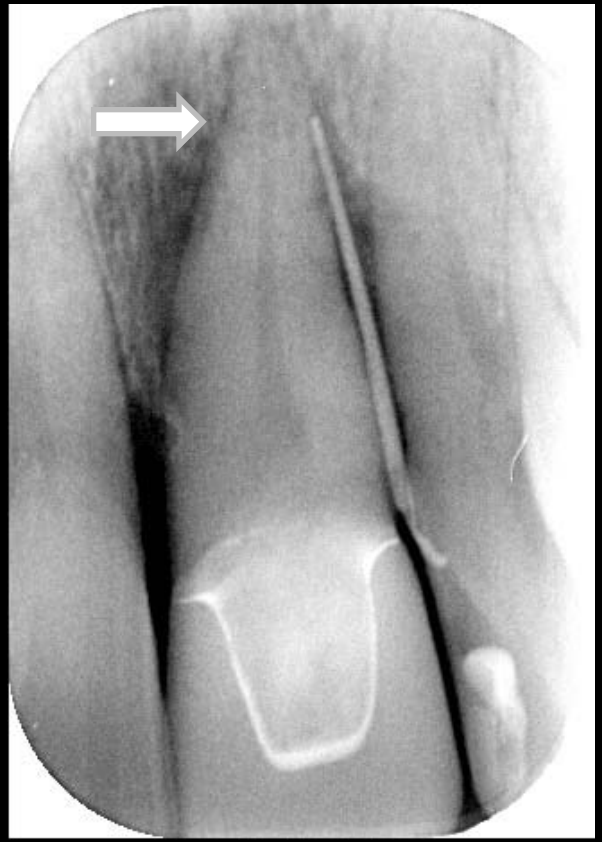
Characterized with the patient in the laboratory

(I did not really like it, but they are not my teeth)

13 is now an abutment for two FPD's

Trauma

horizontal root tip fracture
(several months earlier)



Class III inlays, e-max FPD

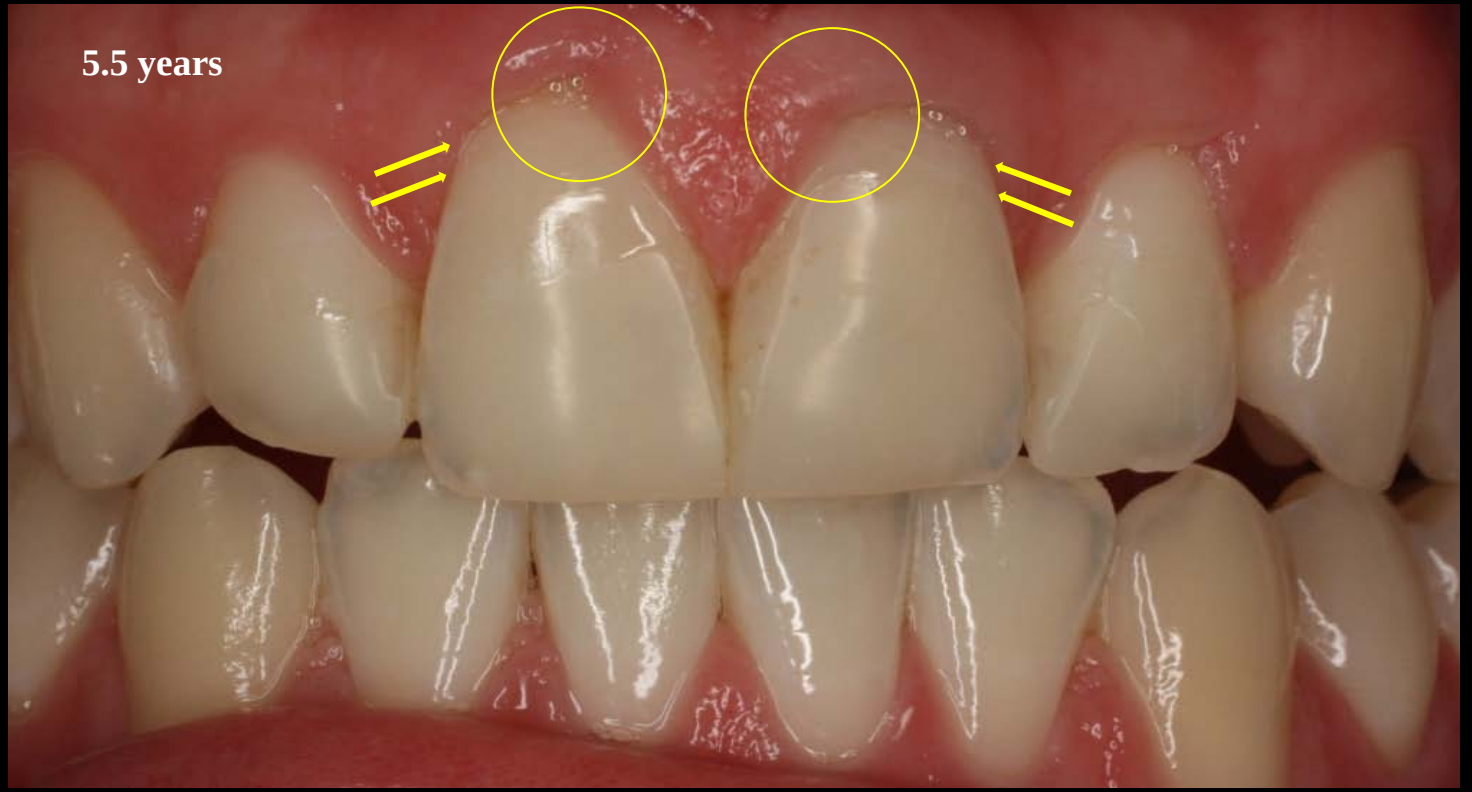
bonded with
Syntac + Evo-Flow

minimally invasive

no periodontal or pulpal complications

and easy…

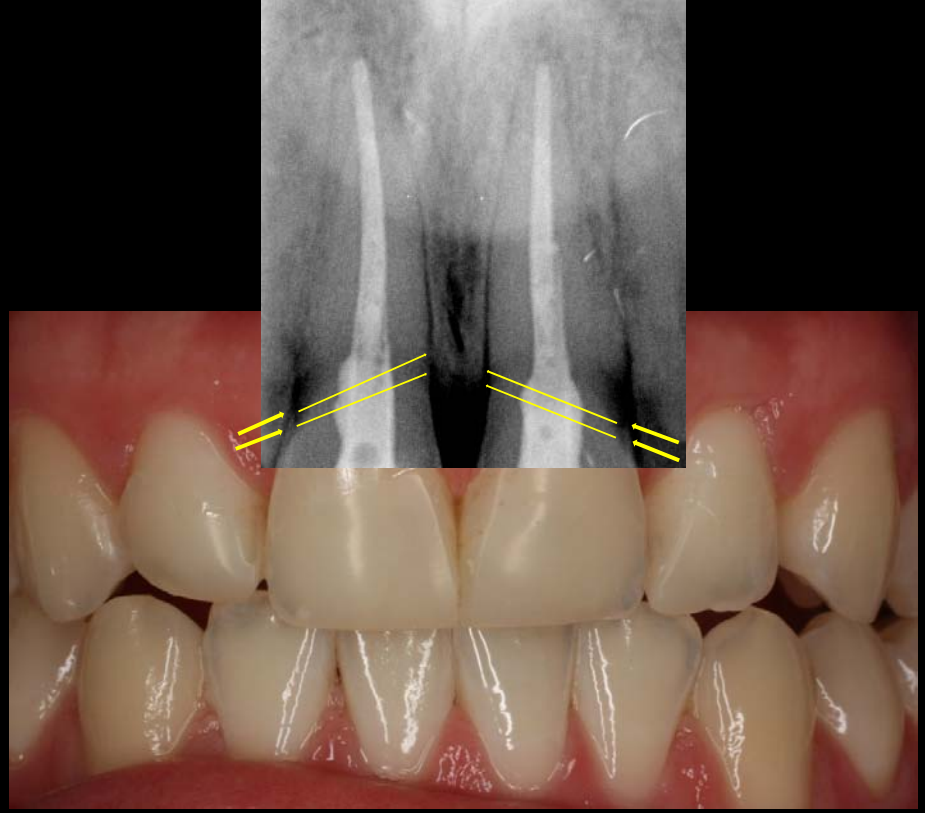
> 5 years

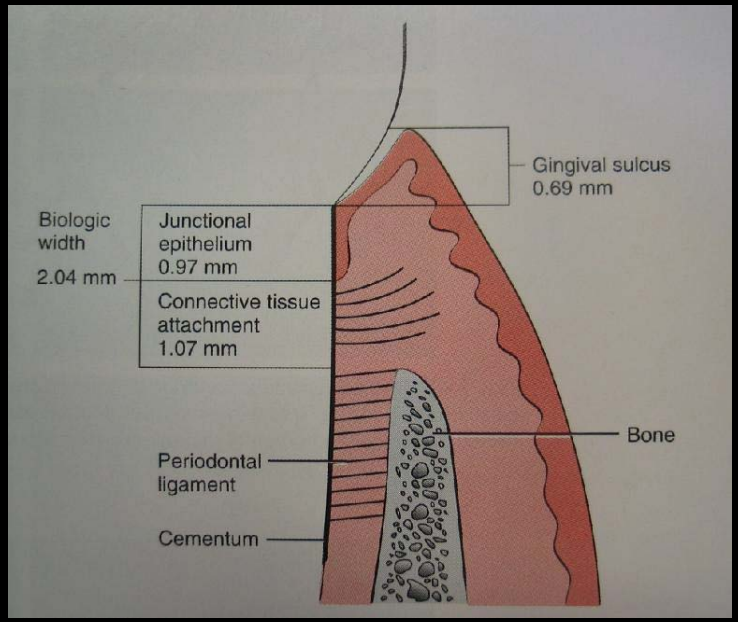


Both centrals have two angular cervical fracture lines

(In 2006 I could see them on 21 but not 11)

Biological width and black triangles





If these fractures progress,

(and pocket depth increases on the mesial of the centrals)

I will need to change my preparation

Gargiuol AW, et al. J Periodontal. 1961;32:261-7

Kois J. J Esthet Dent 1994:6:3-9

Van der Velden U. J Clin Periodontal 1982;9(6):455-9

Tarnow D, et.al. J Periodontal 1992;63:995-6

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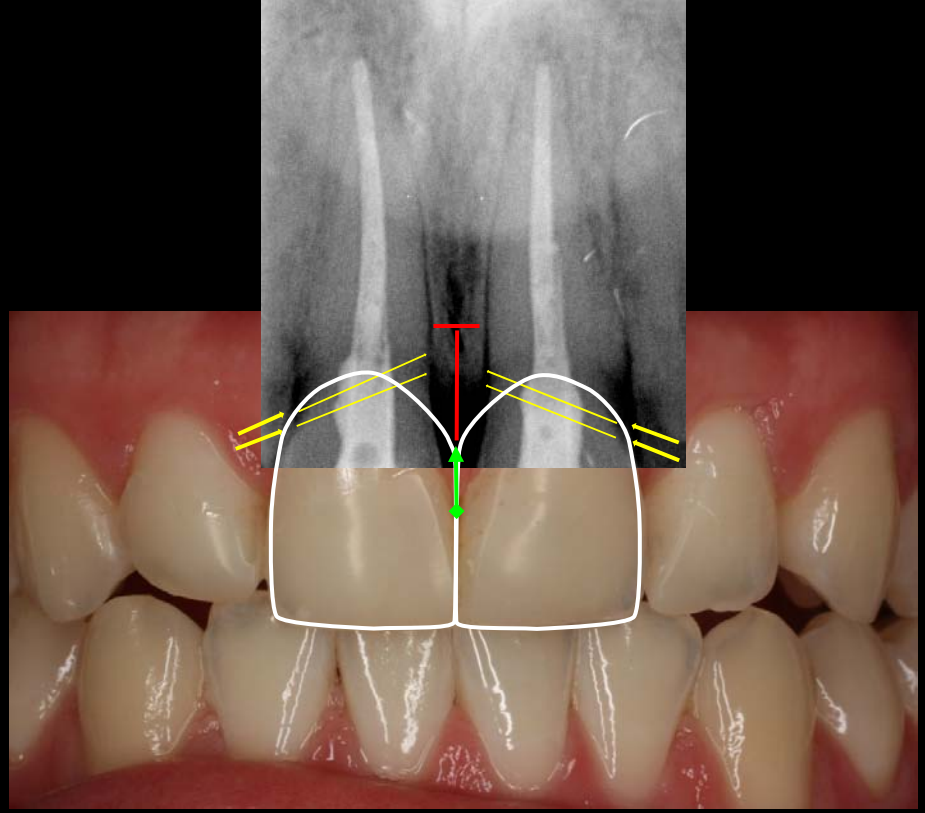

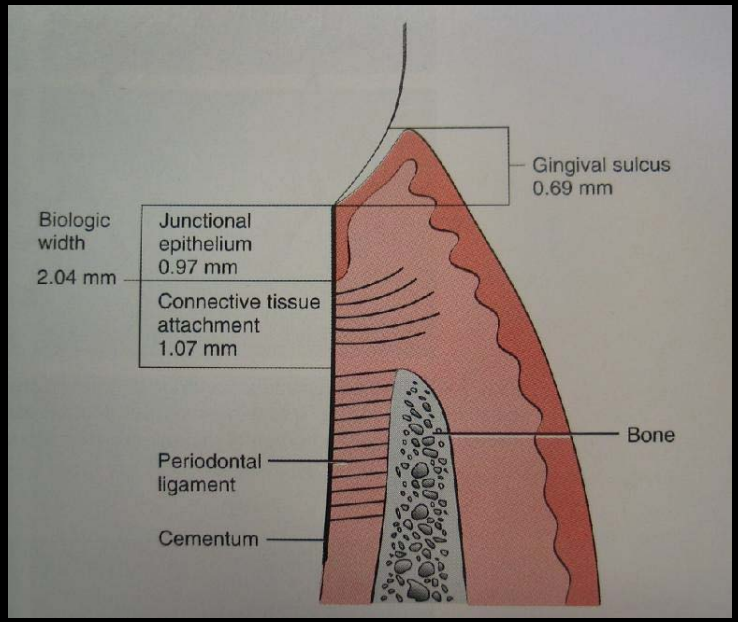

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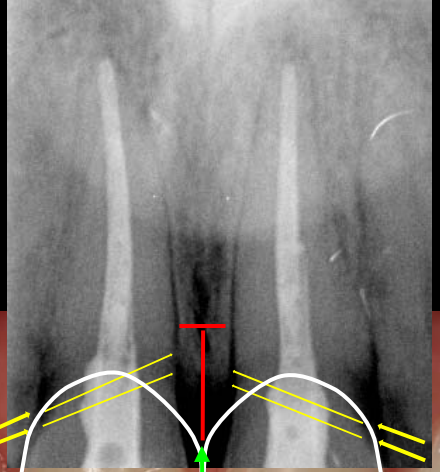
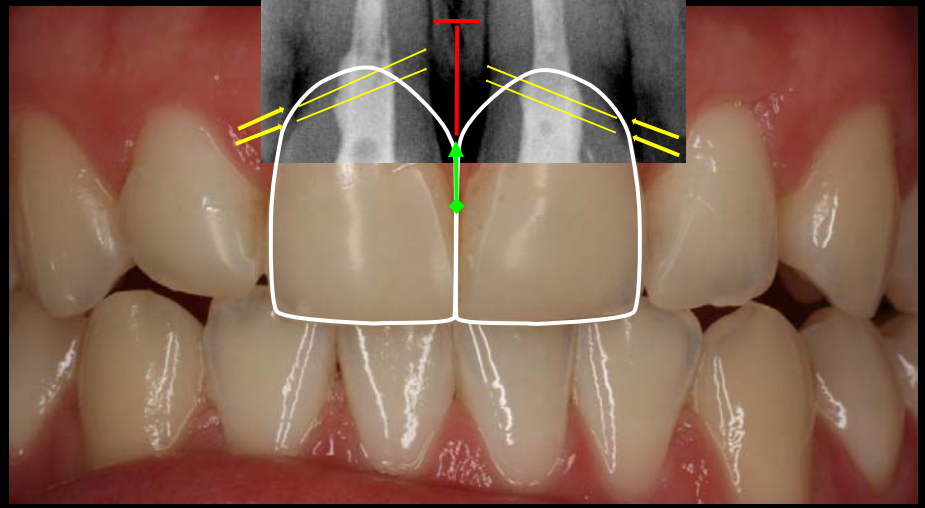


Gingival assymetry centrals,
form assymetry laterals



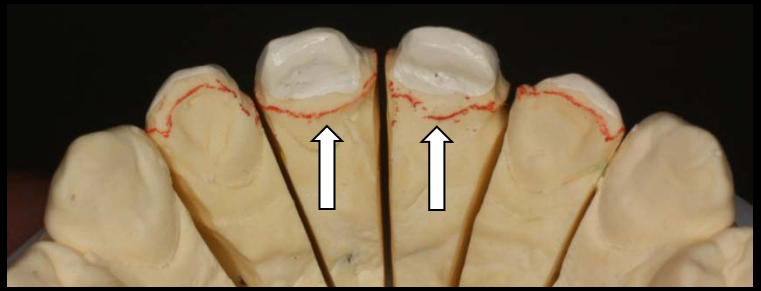
If these fractures progress,
(and pocket depth increases on the mesial of the centrals)

I will need to change my preparation

I decided to leave the margins supragingival and simulate the CEJ

Cementation with Syntac EvoFlow A1

Palatal preparation to endodontic access opening



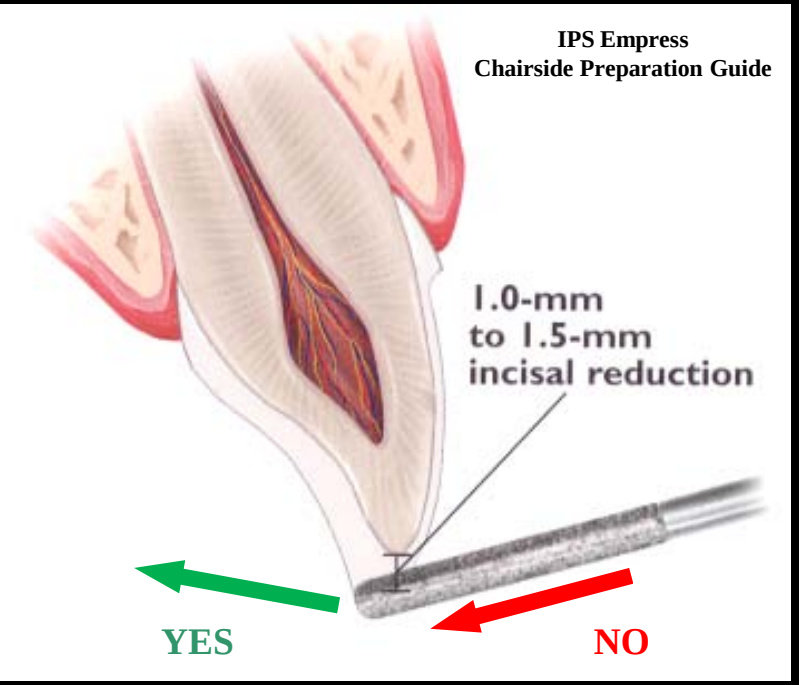
Two days later

Headlight dentistry

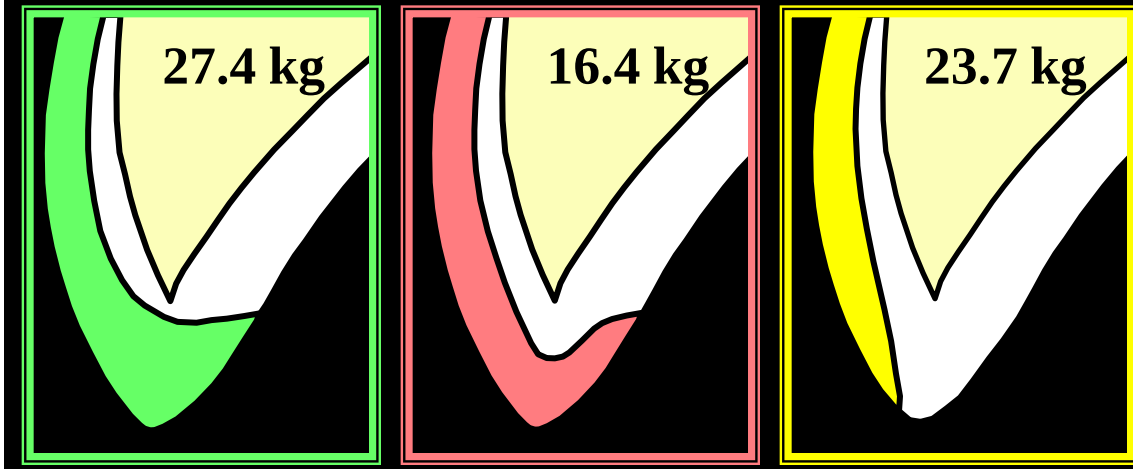
Instant recognition by opposing traffic

This graphic is almost correct,

except you cannot define incisal reduction and the bur angle is not optimal.



Castelnuovo J, et.al. J Dent Res 1998; Abst 1373

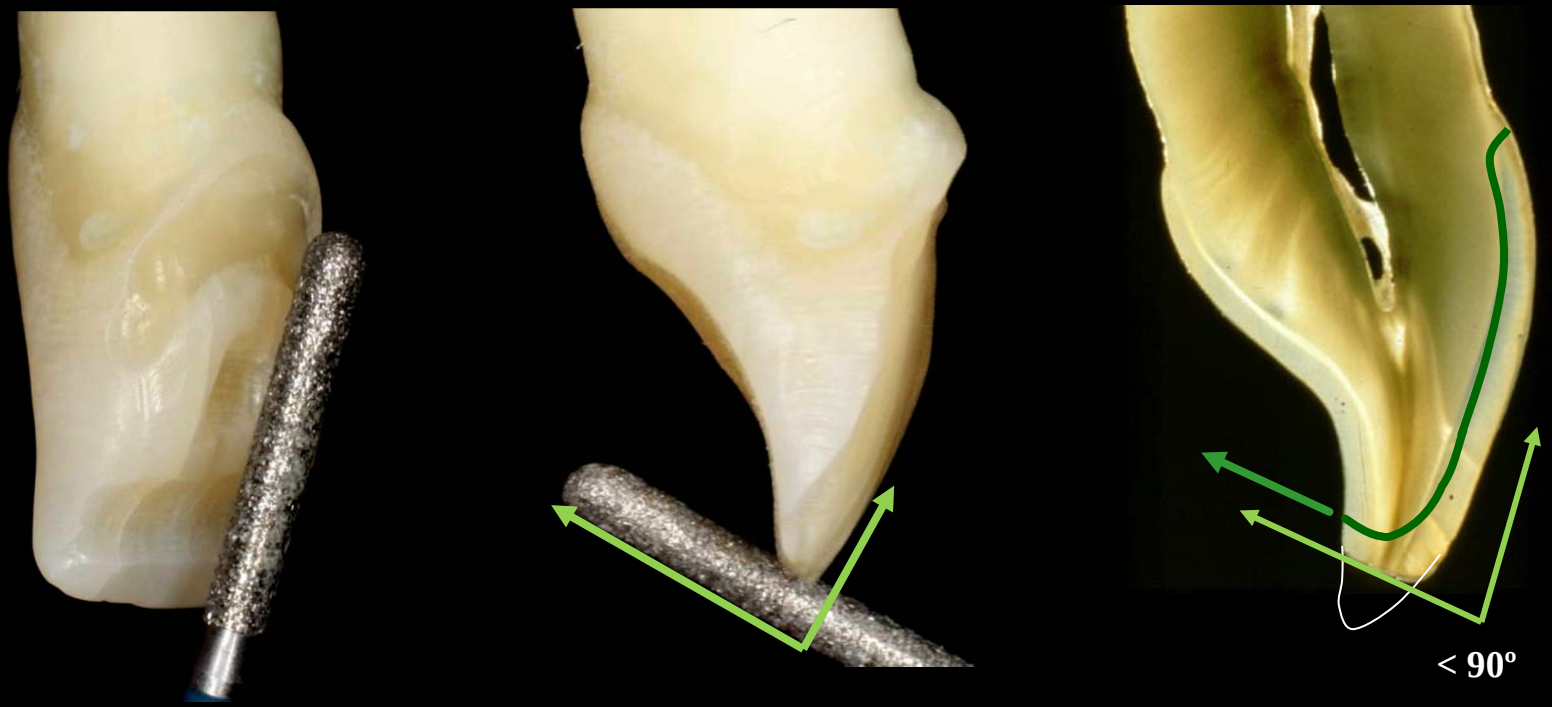


With incisors, a labial reduction of 0.7 mm = ca. 2-3 mm incisal reduction

With incisors, a labial reduction of 0.7 mm = ca. 2-3 mm incisal reduction

Prepare a palatal chamfer and round the edge again?

The easy way to get a positive incisal stop

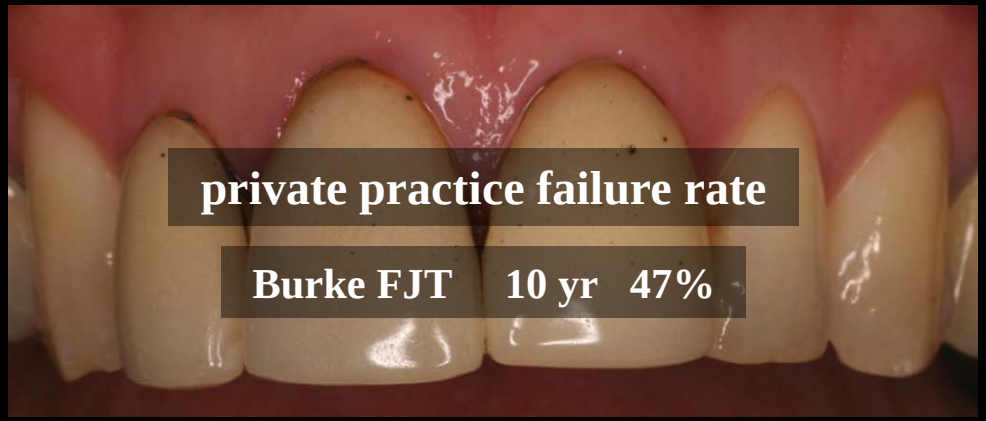


Smales RJ, Etemadi S. Long-term survival of porcelain veneers using two preparation designs.
Int J Prosthodont 2004; 17: 324-6

I do not do many veneers, this one is from 1996.

She only wanted to look better, not perfect.

Veneers ca. 3 years old



Failure rates: veneers

Fradeani	6 yr	6%
Probster	4 yr	6%
Wiedhahn	10 yr	6%
Kern	10 yr	10%
Dumfahrt	5 yr	3%
Groten	7.5 yr	3%

< 1%/year

margin repair

Technician: C. Seger

Anterior Restorations

Composites have technical limits, but modern materials are extremely good

Conventionally cemented crowns are malpractice

Indirect anterior restorations can always be done with adhesive techniques

Posterior Restorations

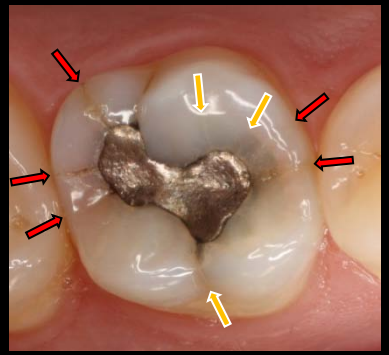
Direct or indirect?

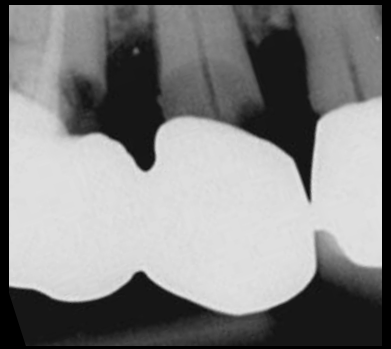
Failure rates per year of posterior restorations

Amalgam	3.3%
Direct Composites	2.2%
Gold Inlay/Onlay	1.2%
Ceramic Inlay/Onlay	1.1%
- Onlays fewer failures than inlays	
Metal-ceramic crowns	1.1%

> 300 clinical studies (> 3 years)

Hickel R, Malament S.
J Adh Dent 2001





If composites are done correctly, they are better than amalgam
A poorly placed composite is a catastrophe

Problems with posterior composites?

Margin quality, sensitivity, proximal contacts, efficiency

Blow the adhesive as thin as possible,
apply a layer of flowable composite on dentin, then cure

Restorative Dentistry

Flowable resin composites as "filled adhesives": Literature review and clinical recommendations

Gary L. Unterbrink, DDS*/William H. Liebenberg, BSC, BDS**

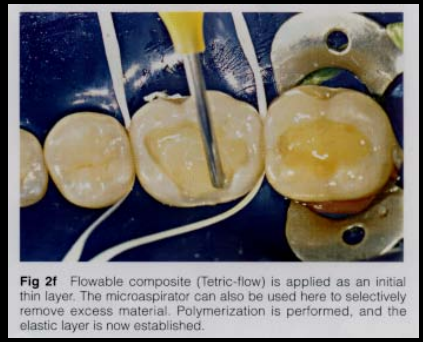


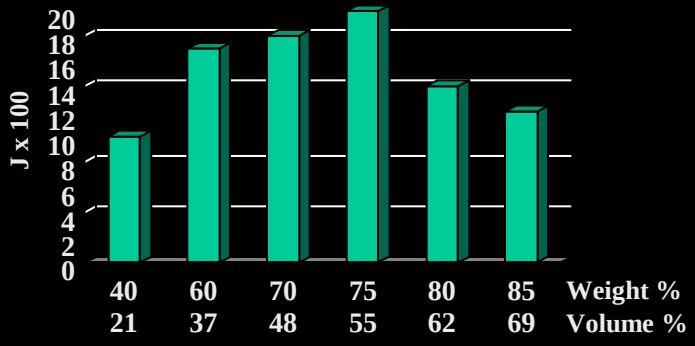
Fig 2f Flowable composite (Tetric-flow) is applied as an initial thin layer. The microaspirator can also be used here to selectively remove excess material. Polymerization is performed, and the elastic layer is now established.

Quintessence International
1999; 30:249-257

Those who criticized this technique because of volumetric shrinkage or (assumed) poor wear resistance only proved they do not understand clinical dentistry or material science

Clinical Study: Class 2 Restorations
Gradia or Gradia flow only
No differences in any category at 2 years
Waldo B, et.al. J Dent Res 2010, Abstract 450

Impact Fatigue Resistance



Htang A, Ohsawa M, Matsumoto H.
Dental Mat 1995: 7-13

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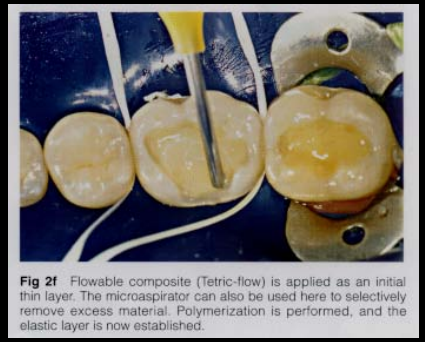
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No differences in any category at 2 years
Waldo B, et.al. J Dent Res 2010, Abstract 450

The critics need

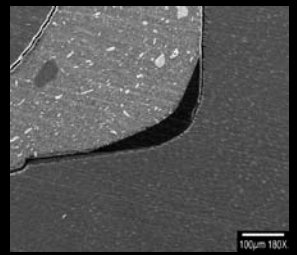
Adhesive: blow thin

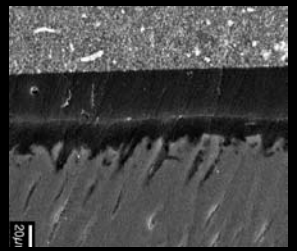
to look like this

Layer thicknesses (in µm) with "gentle" air dispersion

SE-Bond, S. Heintze 2002

MOD preparation		Crown preparation	
Axial	10-40	Axial	0-40
Gingival	100-350	Gingival	60-190
Occlusal	0-15	Occlusal	10-20





Thick layers

- increased gaps if > 100 µm -
-weaker interface at enamel margins -
- wrong refractive index for aesthetic margins -
- radiographic diagnosis -

Only on dentin
Thin layer

Adhesive: blow thin

Adhesive + Flow

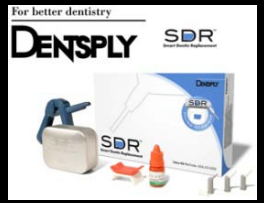
20 s. with < 500 mW/cm²
10 s. with > 500 mW/cm²

If you blow the adhesive very thin, you MUST use the flowable.

Only on dentin
Thin layer

Adhesive: blow thin

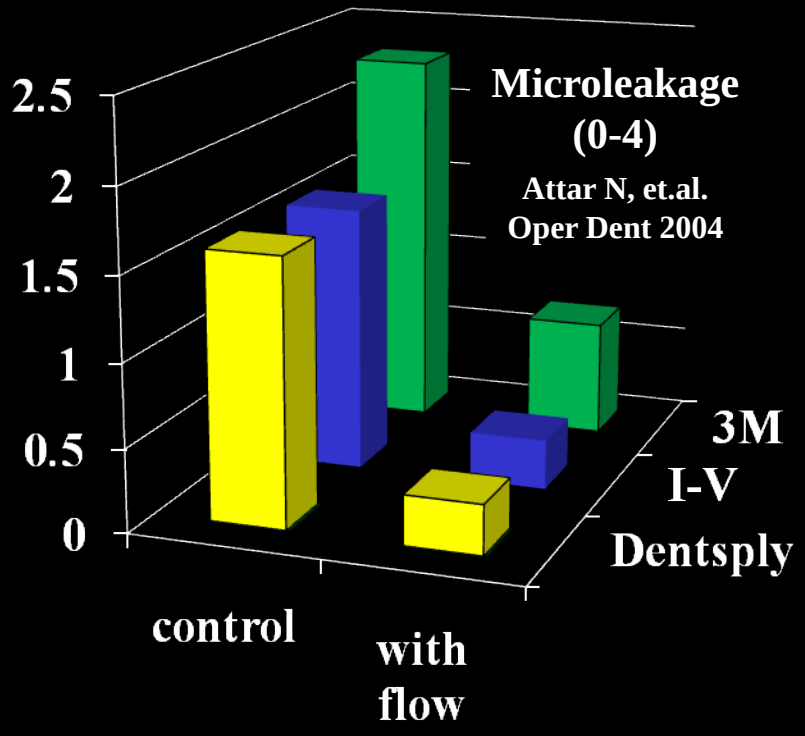
Adhesive + Flow



Bulk fill flowables?

A thick adhesive layer must be polymerized to establish a bond!
Radiographic diagnosis and other problems remain.

If you live in a public toilet, you are happy when it stinks less

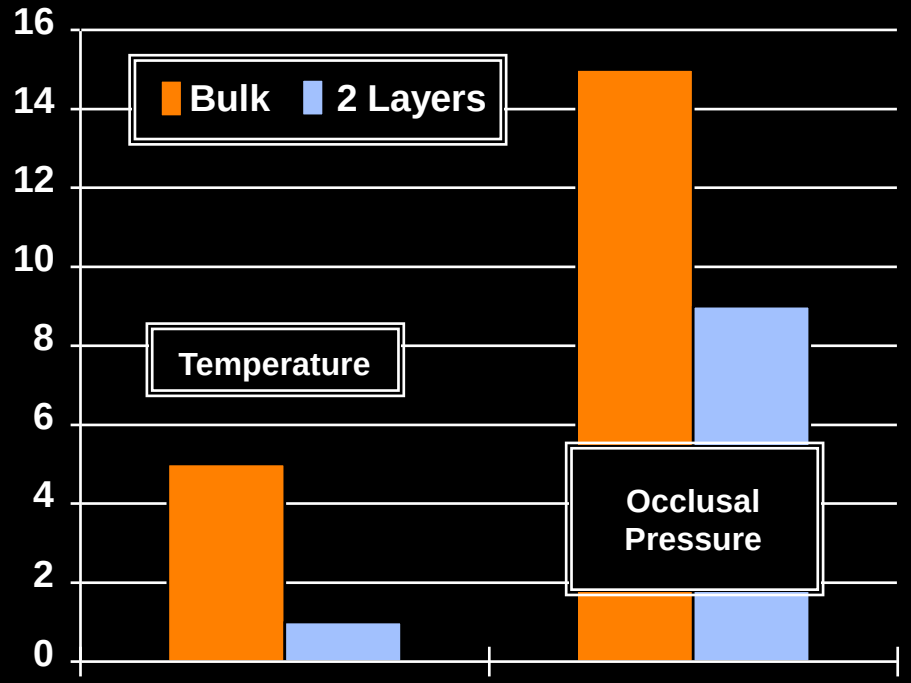


Reduced microleakage with flowable

Tung FF, Hsieh WW, Estafan D. Gen Dent 2000;48(6):711-5. Belli T, et.al., Oper Dent 2001;26(1):70-5. Fabianelli A, Goracci C, Ferrari M. J Adhesive Dent 2003;5(3):217-23. many others

Post-operative Sensitivity

Class I Restorations, SB-MP and P50, n = 16



Opdam, et.al. J Dent Res 1997, Abst 1193

What contributes to efficiency?

Rubber dam can help

Fuji IX fast set: conventional GIC!

A light-curing GIC is no help

and glass ionomer as well


Look at construction sites
Matrix Technique

The matrix is also critical for proximal contacts and contours

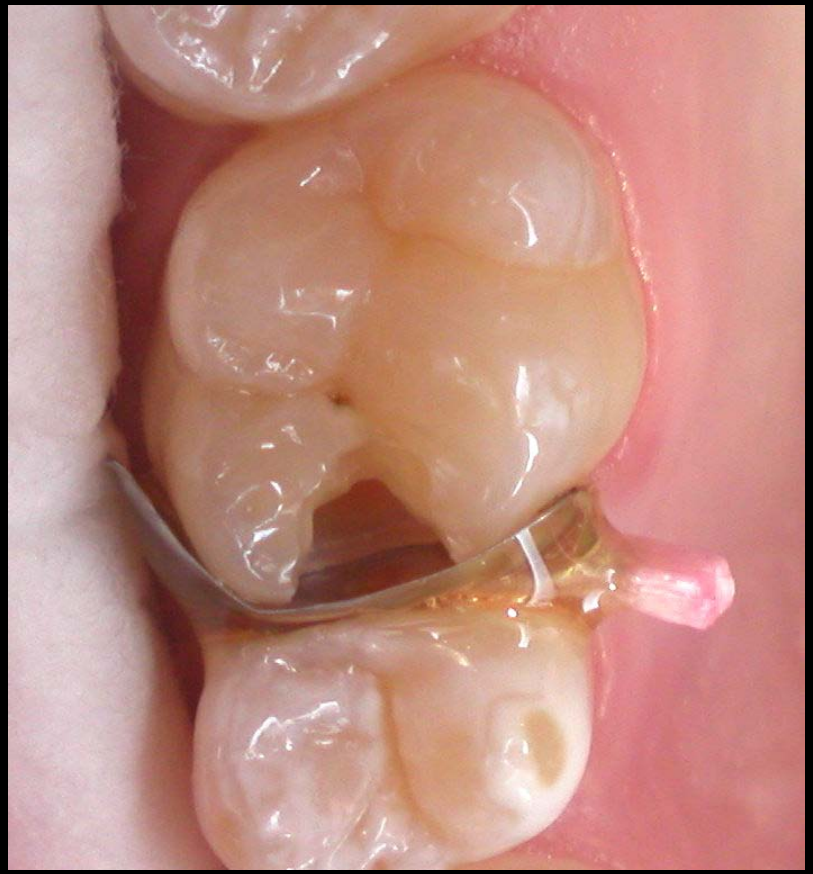
Wedging hard produces some separation, but only temporarily

O-rings produce separation which is stable but unpredictable (depends on tensile force and contact angles)

Therefore, normally I use both

Thin sectional matrix, wedge, O-ring

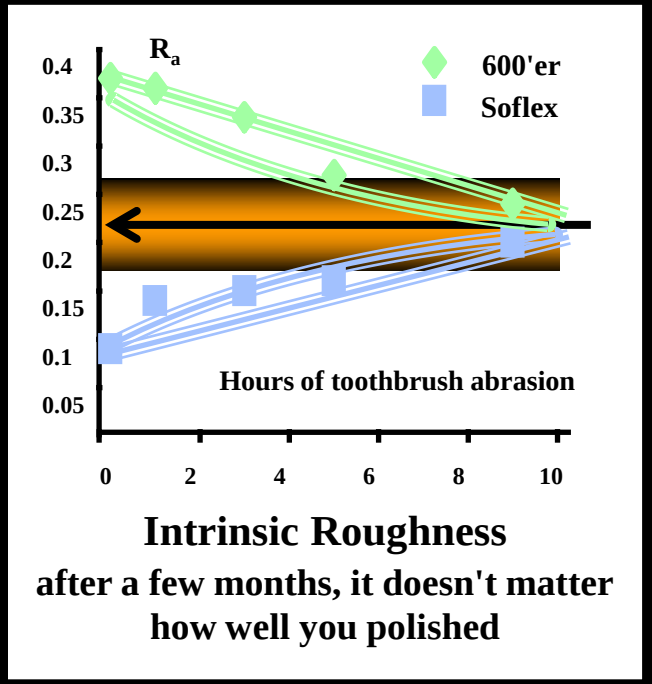
A loose wedge = insufficient separation + proximal excess



Bonded Wedge / Matrix
stabilizes separation
and adaptation

Finishing and polishing is where we lose time with direct composites

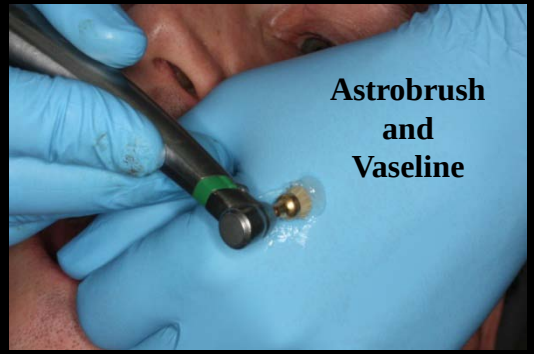
(i.e. waste time)



Intrinsic Roughness

after a few months, it doesn't matter how well you polished

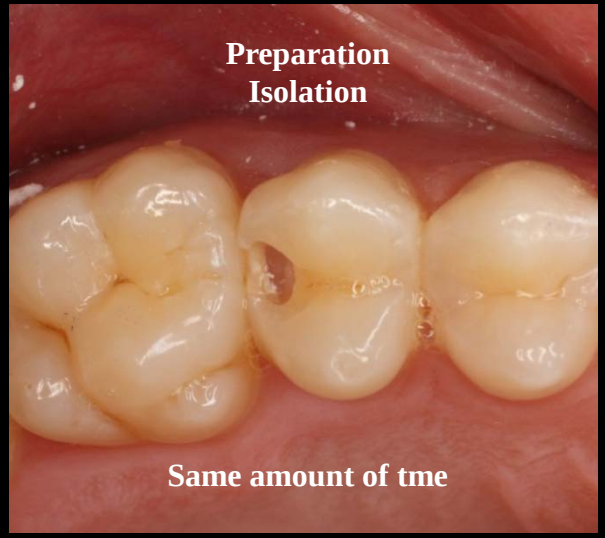
When you remove the matrix, it is almost time to send the patient home



I cheat

Check / adjust occlusion, make it reasonably smooth.
The patient completes the polishing at home.

How can anyone still claim that amalgam is faster than composite?



Application and polymerization takes less time than condensation and carving.
Matrix technique reduces finishing time.

No risk of fracture during matrix band removal, low risk during occlusal adjustment.

Small to medium class II's (at least for me) require less time than amalgam!

After curing the adhesive/flowable

bulk fill is acceptable for restorations of this size (or a bit larger)

Bulk fill?

No

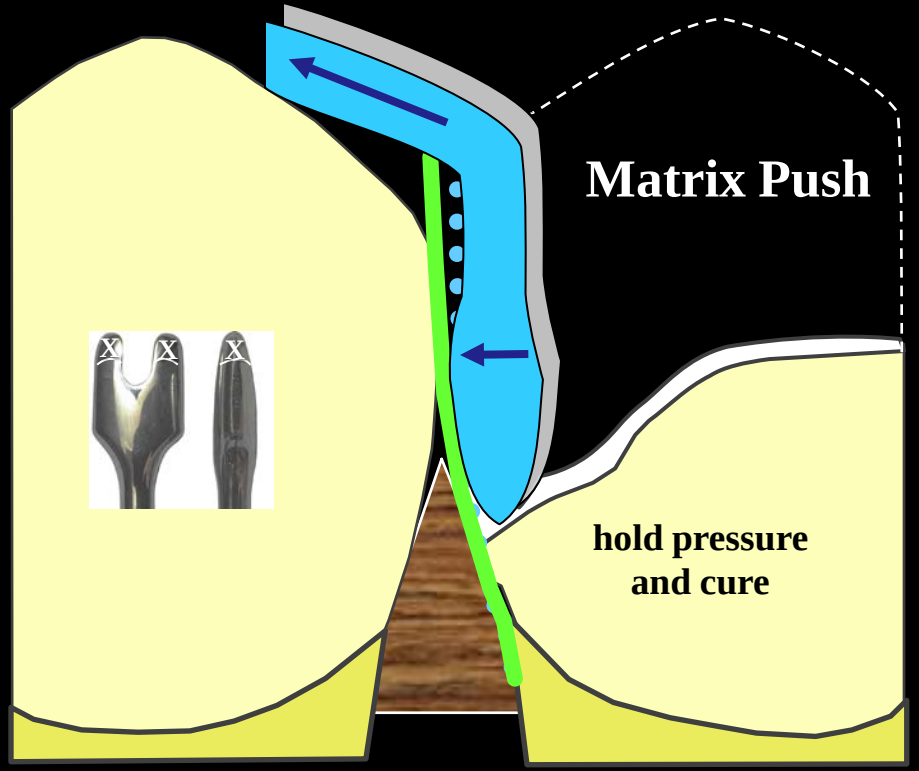
Yes No

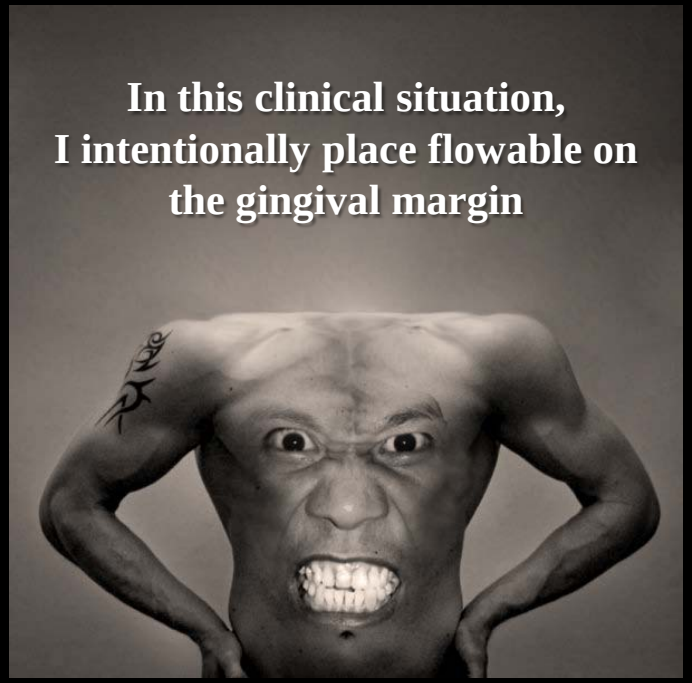
Yes No Yes

Ivoclar-Vivadent
Bulk Fill

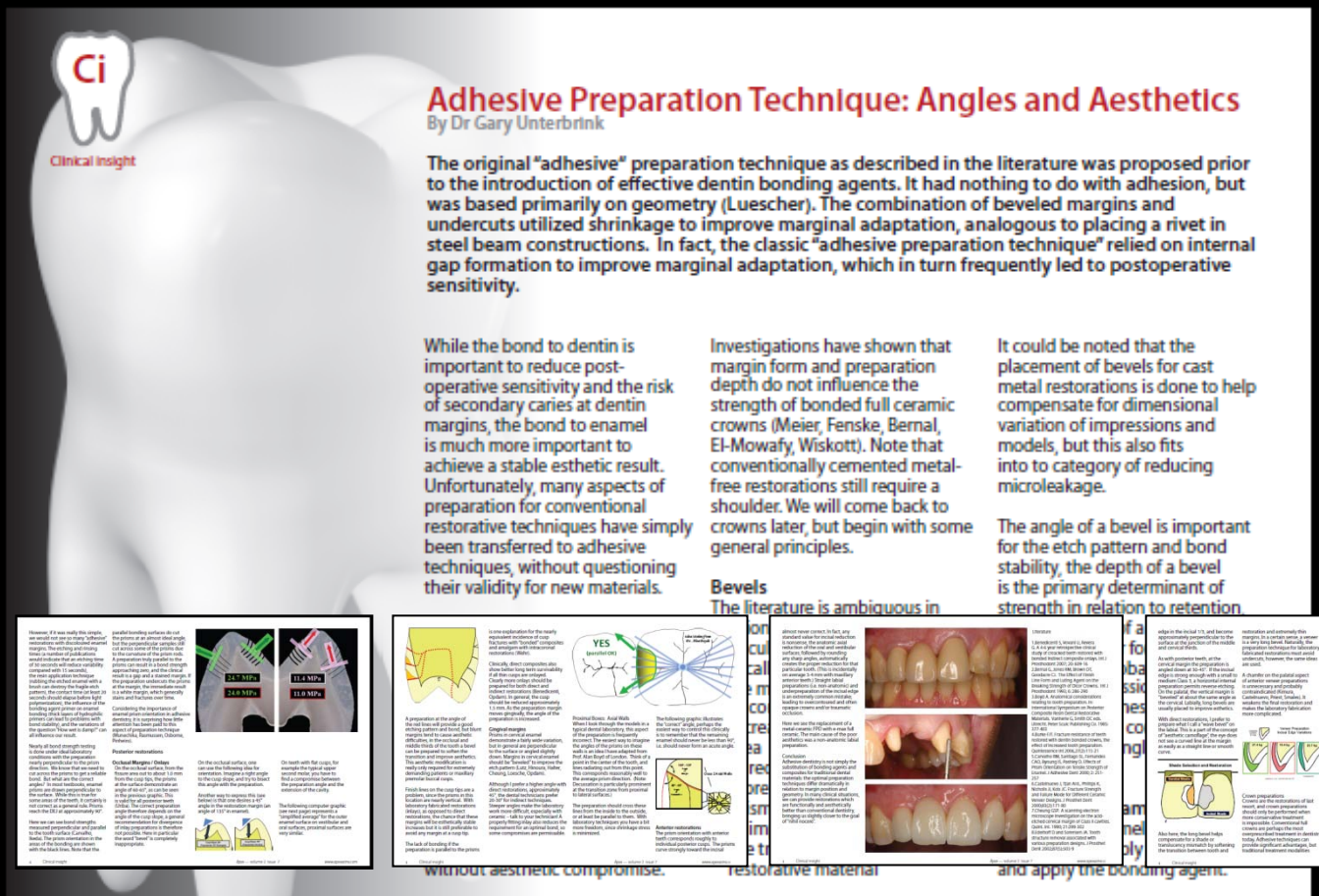
and only after polymerizing the adhesive/flowable layer!

Shrinkage stress is low enough today to reduce the requirement for layering, but layering can still be useful to reposition the matrix!

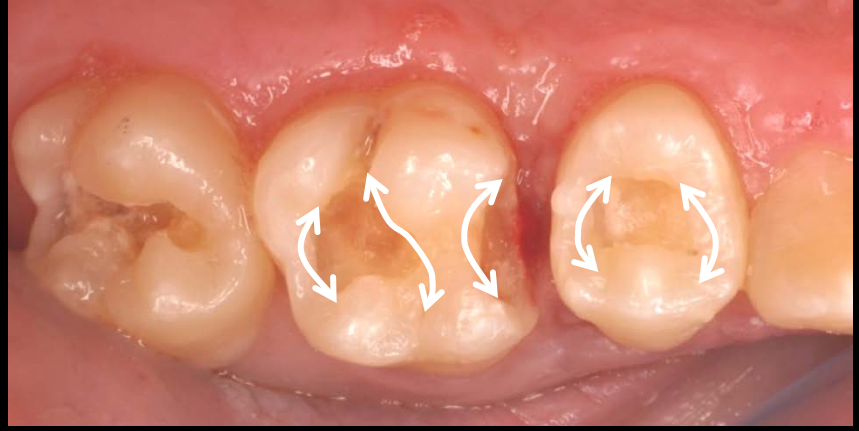




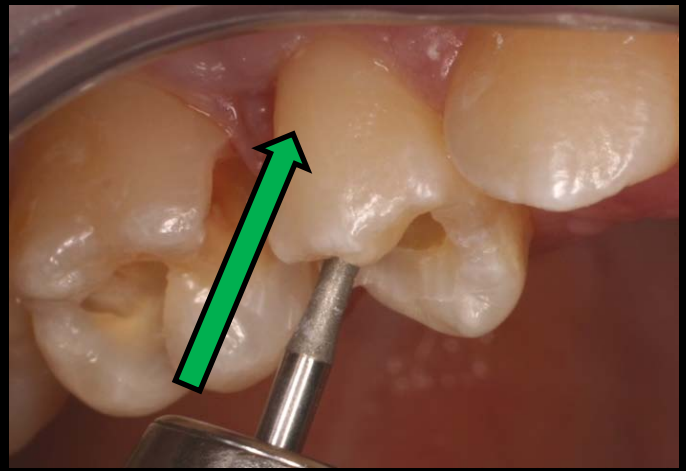
Optimizing bond strength to enamel is still a priority

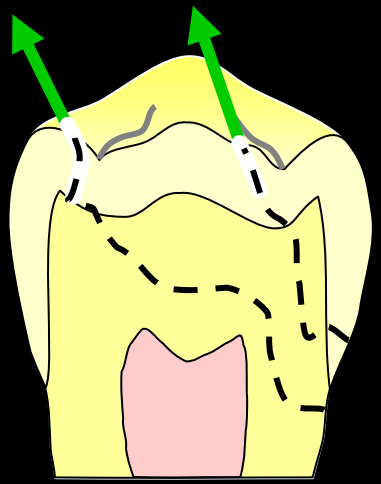


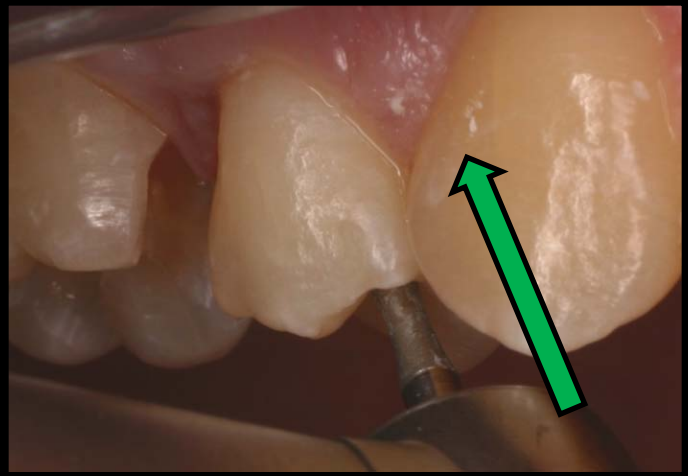
Black margins make aesthetic dentistry a bad joke



Note angle of bur when finishing oral to vestibular margins

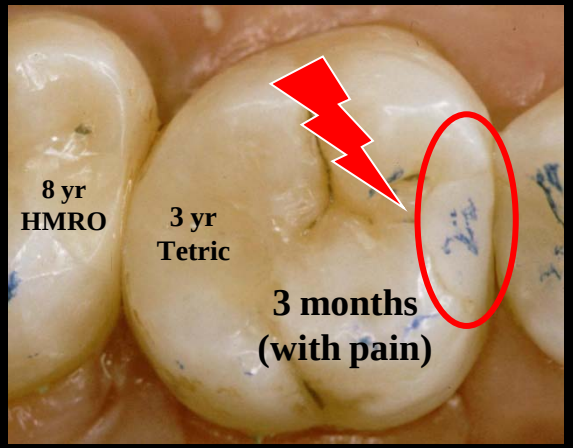






There are differences between materials (this is Evo-Ceram) but marginal stability is the key to aesthetic stability.

The key to marginal stability is preparation technique.

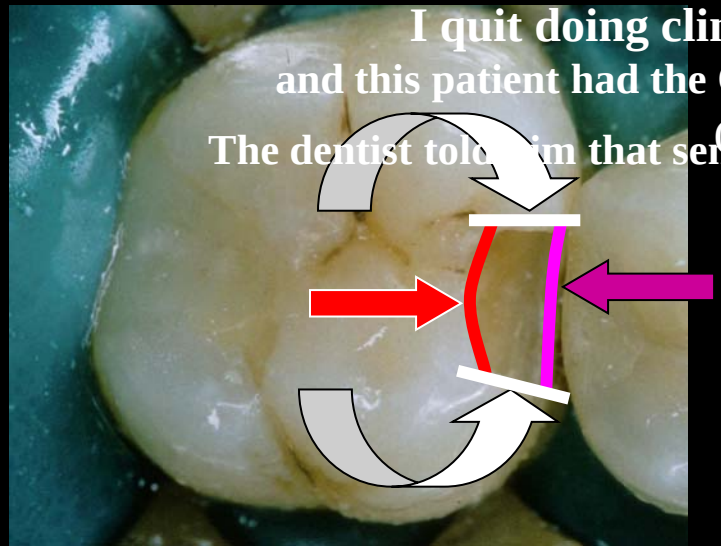


What is wrong with this preparation?

I quit doing clinical dentistry for several years

and this patient had the OM axial walls done in a d[illegible]ce

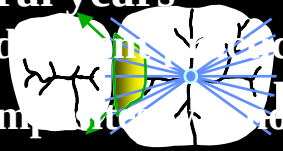
The dentist told [illegible]m that sensitivity with posterior comp[illegible]normal!



occlusal
(vertical)

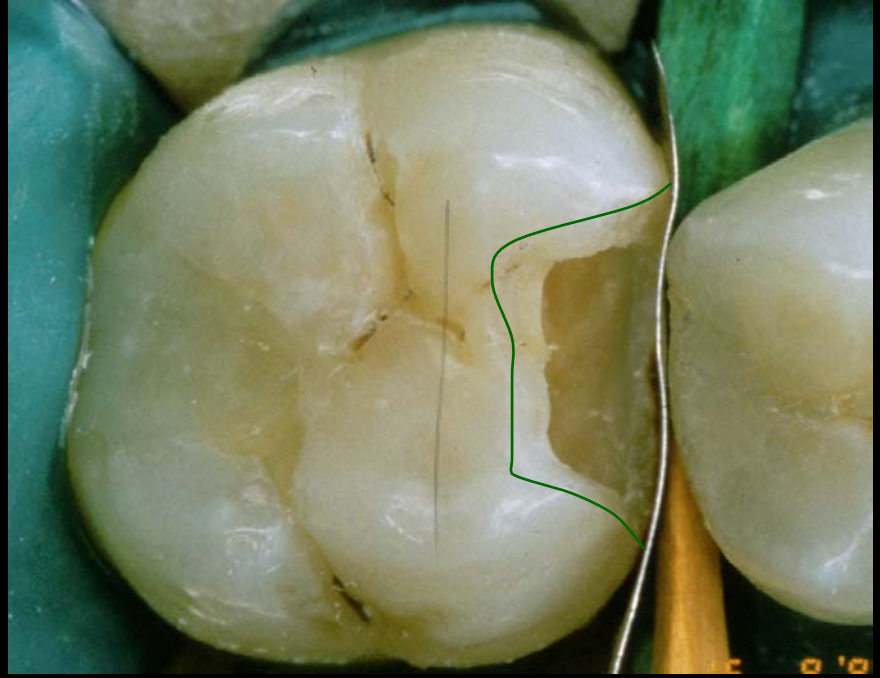
gingival
(flat)

axial walls
(unsupported prisms)



hing!

if you think that the pr[illegible]on
technique[illegible]lgam a[illegible]posite
is the s[illegible]ase use [illegible]gam



12 year recall
(the other composites
are 15-20 years in-situ)

SonicSYS
did not exist

Preparation is the first key to success

and the other things are only details

contouring
the wedge

Bonding to Beveled vs Non-Beveled Enamel at the Gingival Margin

Purk J, et.al. J Dent Res 2010 (AADR), Abst 15

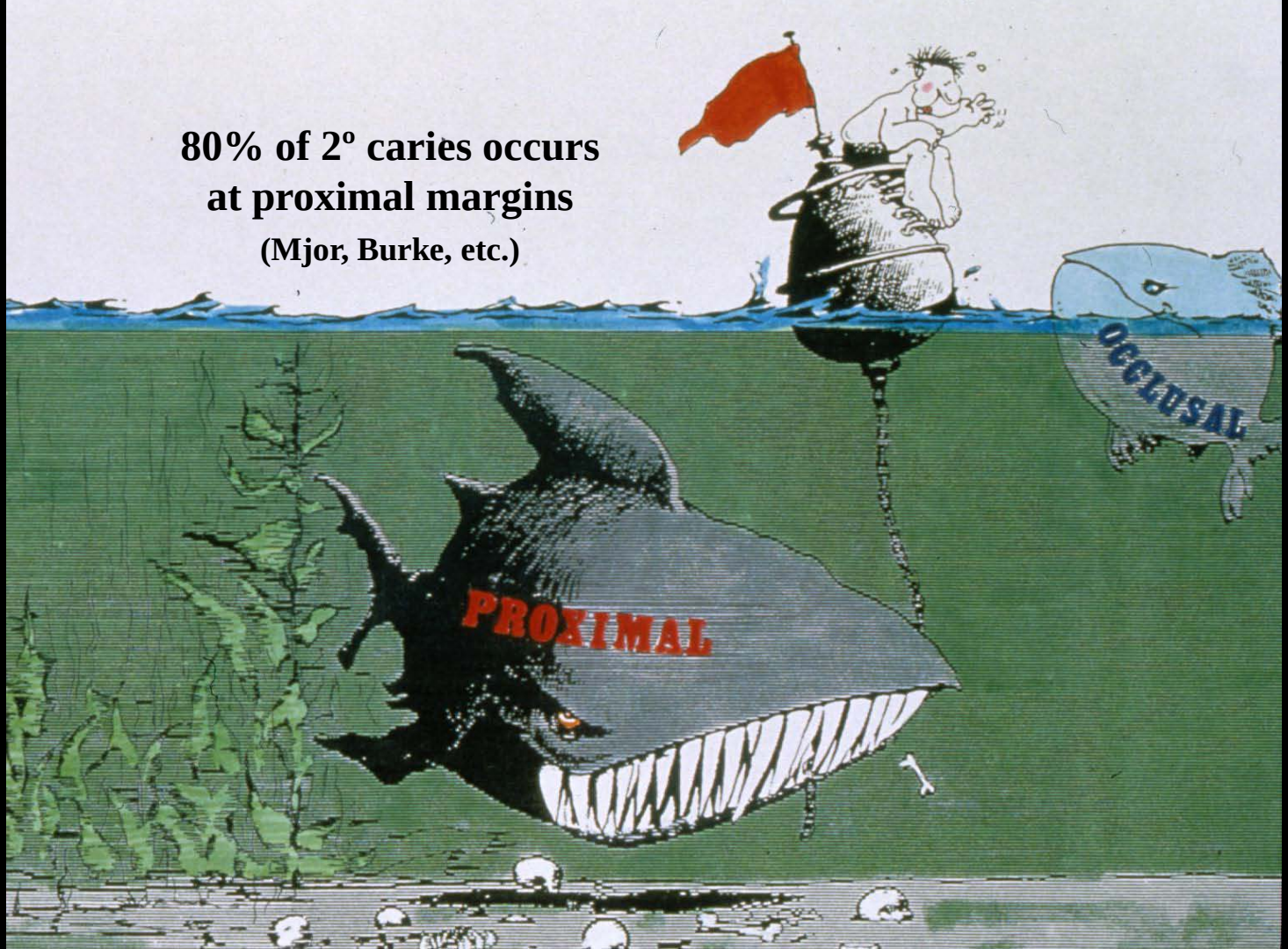
Adhesive	Beveled	N	Mean ±(StD) MPa	Debonds
Clearfil-SE	Yes	14	19.8±9.7	3
Clearfil-SE	No	3	7.1±4.0	17
Excite	Yes	21	28.2±6.1	0
Excite	No	5	19.2±5.7	13
PQ1	Yes	18	30.0±9.6	0
PQ1	No	5	6.6±4.4	17

80% with ZERO

Hinoura, et.al. Operative Dentistry 1988
Loesche, et.al. Dtsch Zahnaertzl Z 1993
Haak, et.al. J Dent Res 1996
Syrek, et.al. J Dent Res 1998
Lutz, et.al. Peter Sculc Publishing 1985
Cheung, et.al. Quintessence Int. 1990
Hoffmann, et.al. J Dent Res 1994
Kao, et.al. J Dent Res 1997
Guenther J, Haller B. DGZ 1997

80% of 2º caries occurs at proximal margins

(Mjor, Burke, etc.)



Uwe Harder Graphic Design

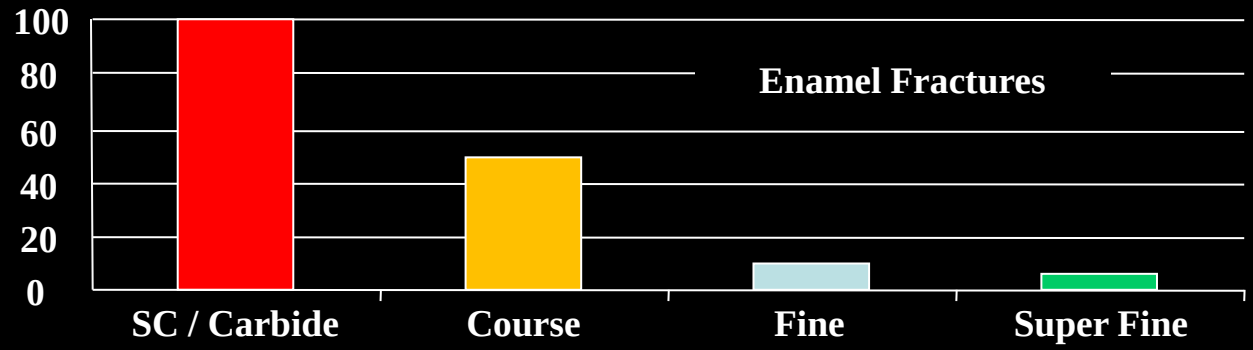
Liechtenstein

Diamonds with a average grit size >80 µm at high speed cause significant prism derangement in subsurface enamel.

Xu HH, Kelly JR, Jahanmir S, Thompson VP, Rekow ED
Enamel Subsurface Damage Due to Tooth Preparation with Diamonds
J Dent Res 1997; 76(10):1698-1706

Enamel fractures from preparation instruments
super course diamond = new carbide
>> course diamond >> fine diamond > extra fine diamond

Nishimura K, et.al. J Med Dent Sci. 2005;52(1):9-15



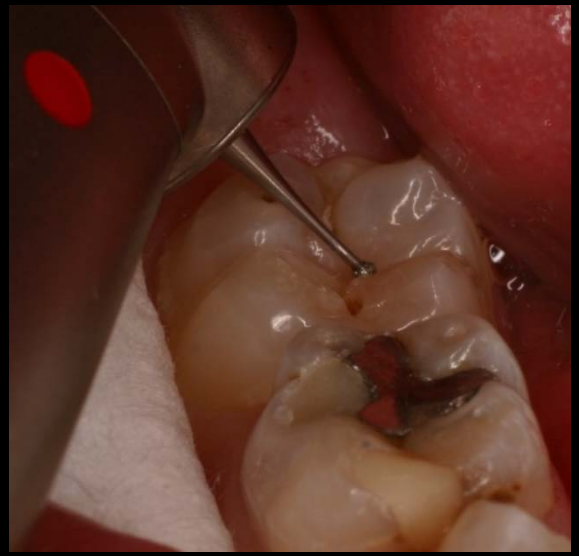
Conclusions

Finishing with either
15 µm or 40 µm is acceptable

No justification
for diamonds
larger than 80 µm

female dentists
may disagree

Always remove aprismatic surface enamel, even when etching



Rubbing the adhesive on etched enamel reduces bond strength

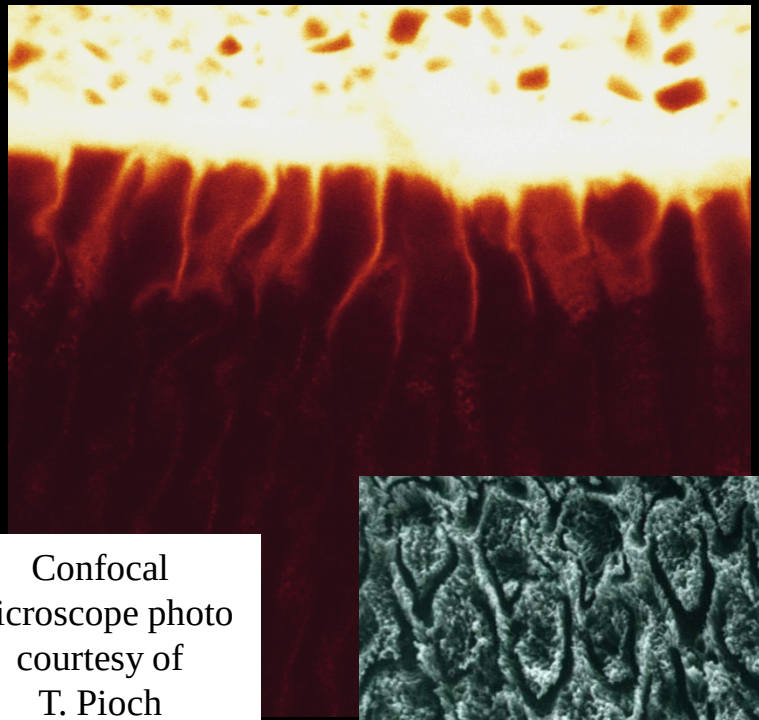
Moll K, et.al. 1997
Stoll R, et.al. 1999

Bond to subsurface (i.e. prepared) etched enamel was superior to unprepared etched enamel.

31.2 MPa vs 47.9 MPa

Haddad R, Hobson RS, McCabe JF. Dent Mater. 2006

Contact Time (Infiltration Time)

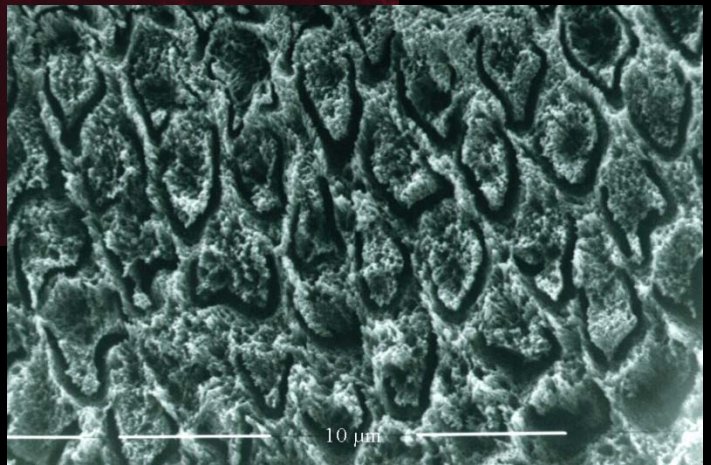


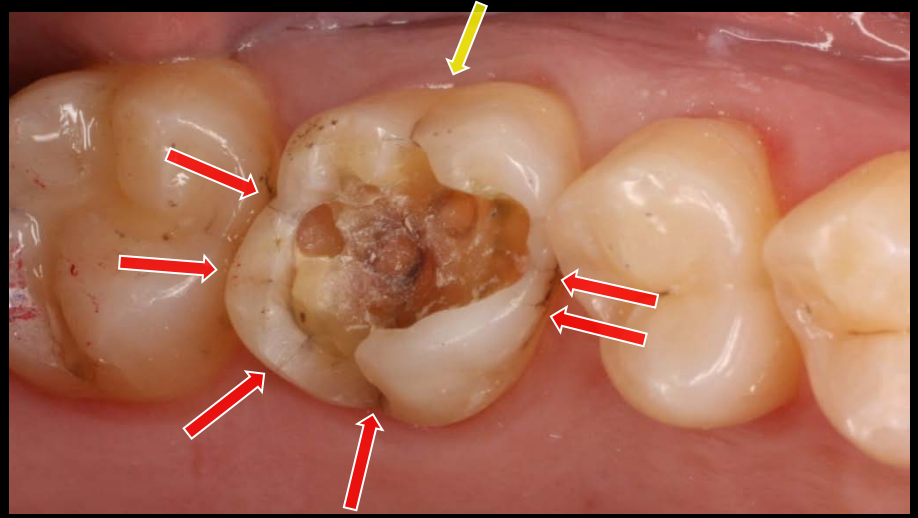
Confocal microscope photo courtesy of T. Pioch

Important on dentin
... and also on enamel.

"Unfilled resin on etched enamel requires more than 30 seconds for complete penetration."

Chosak and Eidelmann, 1988





Compromises with direct composites

Multiple enamel fractures,
margins on cusp tips,
thin mesial marginal ridge

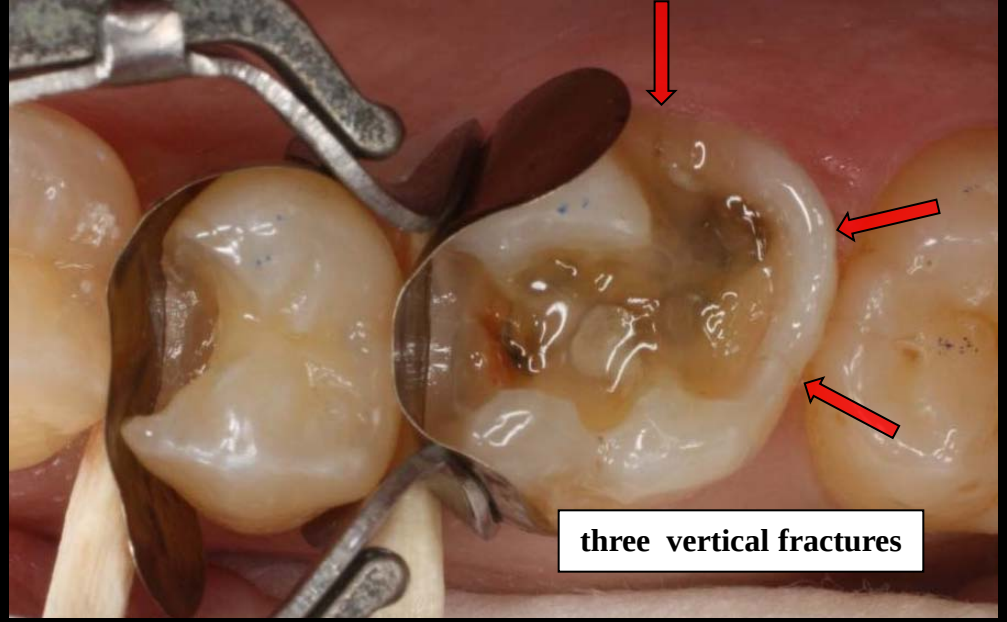
Three options

direct Class I
direct MOD-Onlay (mp and dp)
indirect Onlay (all cusps)

The cost ratios

direct Class I / direct onlay ca. 1:4
direct onlay / indirect ca. 1:3
direct Class I / indirect is 1:12

Risk of unrestorable fracture?

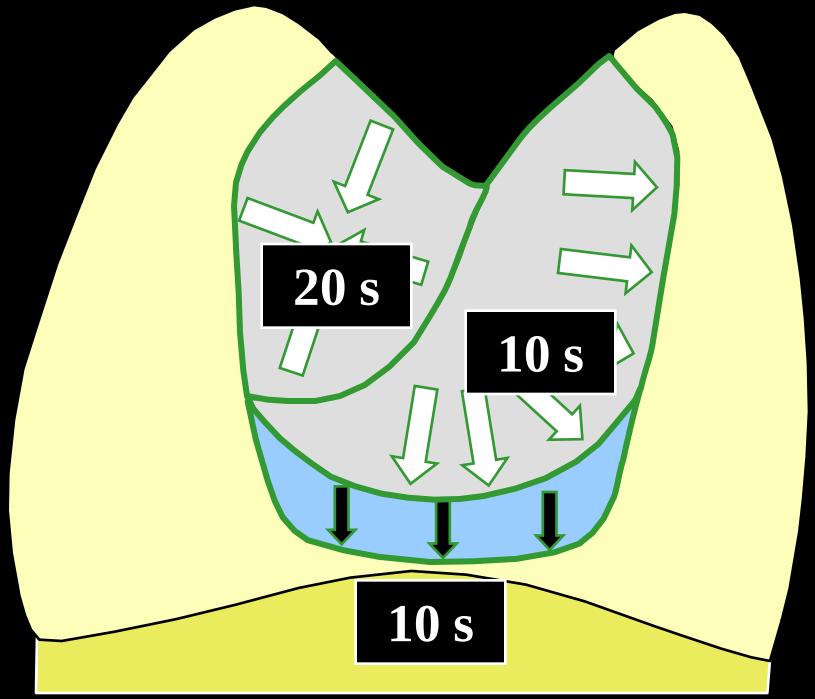


Compromises with direct composites

Thin distobuccal enamel but no occlusal contact, fairly low fracture risk

White line at margin, but "only" an aesthetic problem

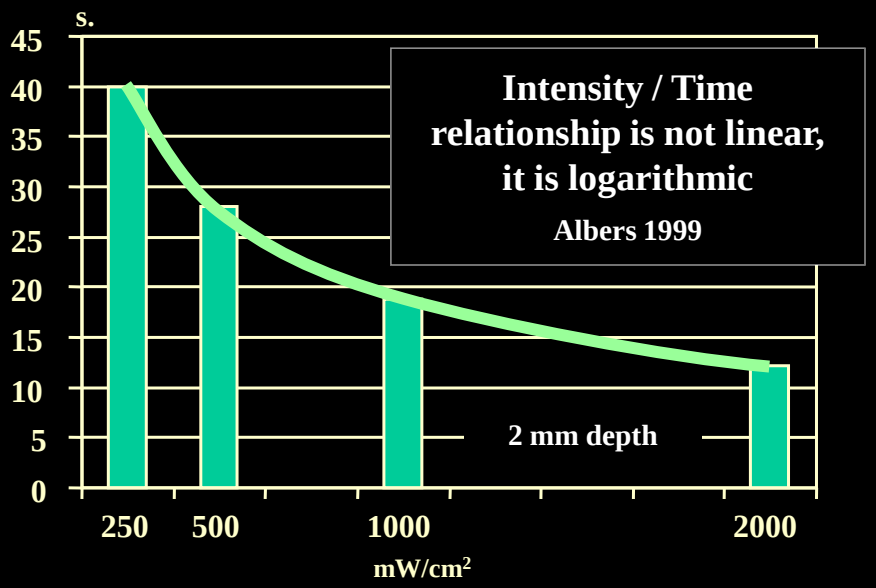
Very large Cl II
"oblique layering technique"
(after curing the bond + flow)



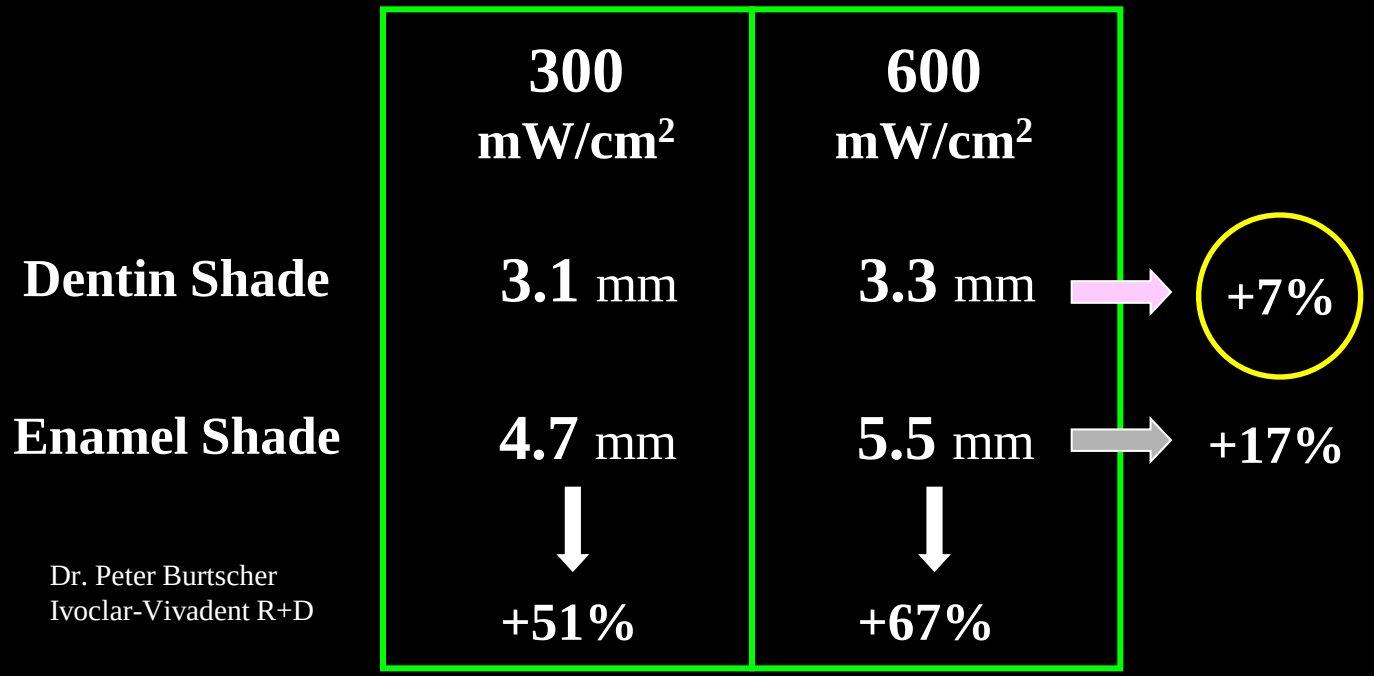
Easier to model the correct anatomy
Reduces cusp deformation
Useful to control matrix adaptation

Curing times with 600 mW/cm²

My assistant has the light, so it does not really cost me much time



Composite opacity has a large influence on curing depth, light intensity is only a minor factor

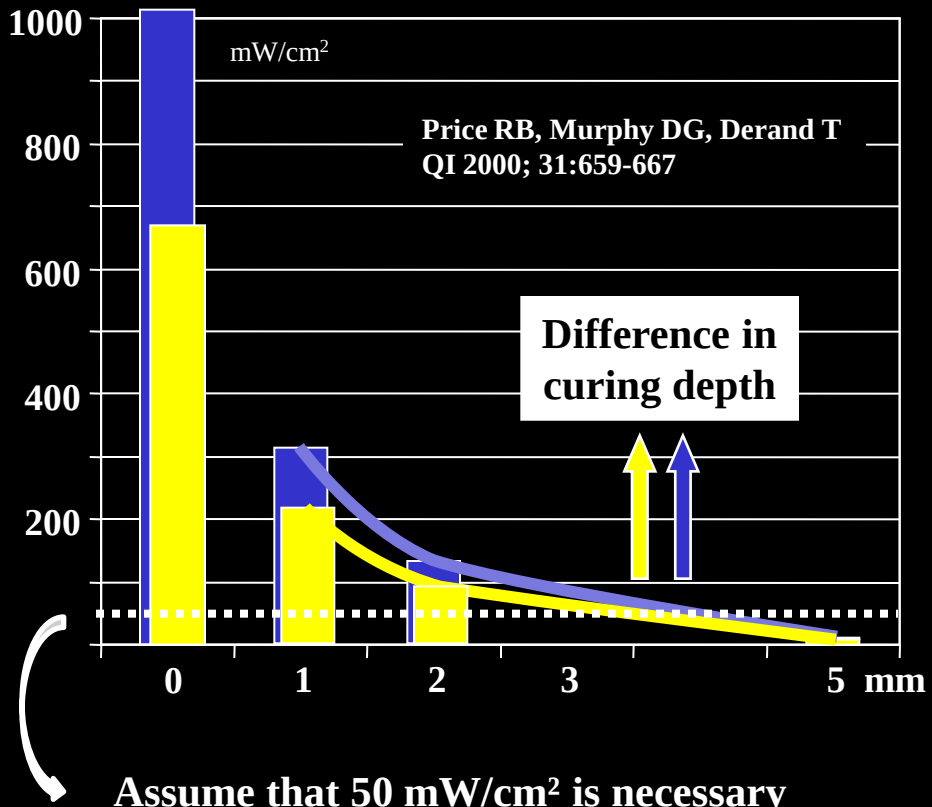


Dr. Peter Burtscher
Ivoclar-Vivadent R+D

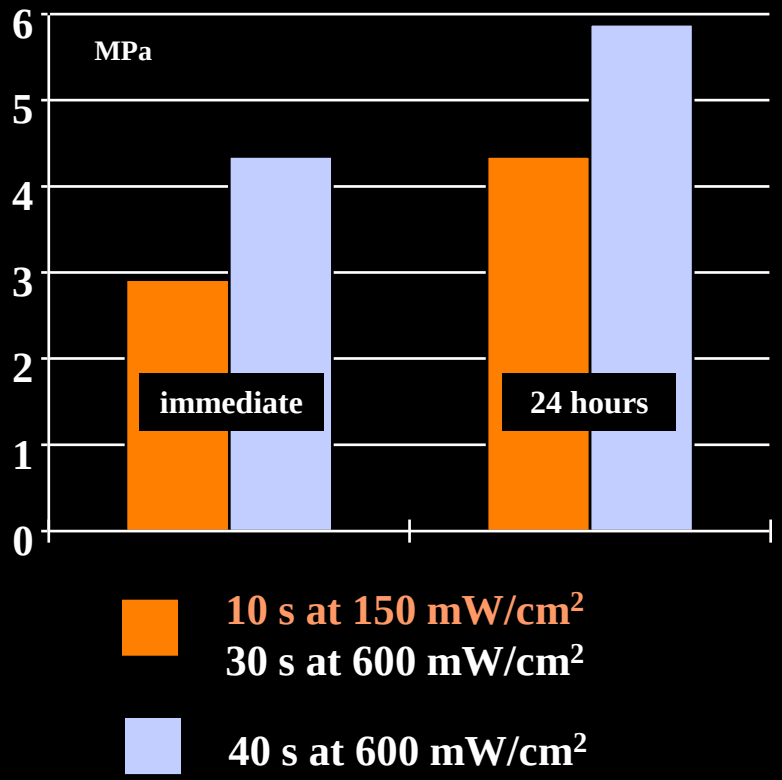
In the only clinical situation when curing depth can be a problem, i.e. with opaque composites, more intensity doesn't really help you!

Light attenuation is linear!

	mW/cm²
Turbotip	
Normal Tip	
0 mm:	1014 / 682
1 mm:	310 / 215
2 mm:	129 / 91
5 mm:	11 / 8



Shrinkage stress and light intensity



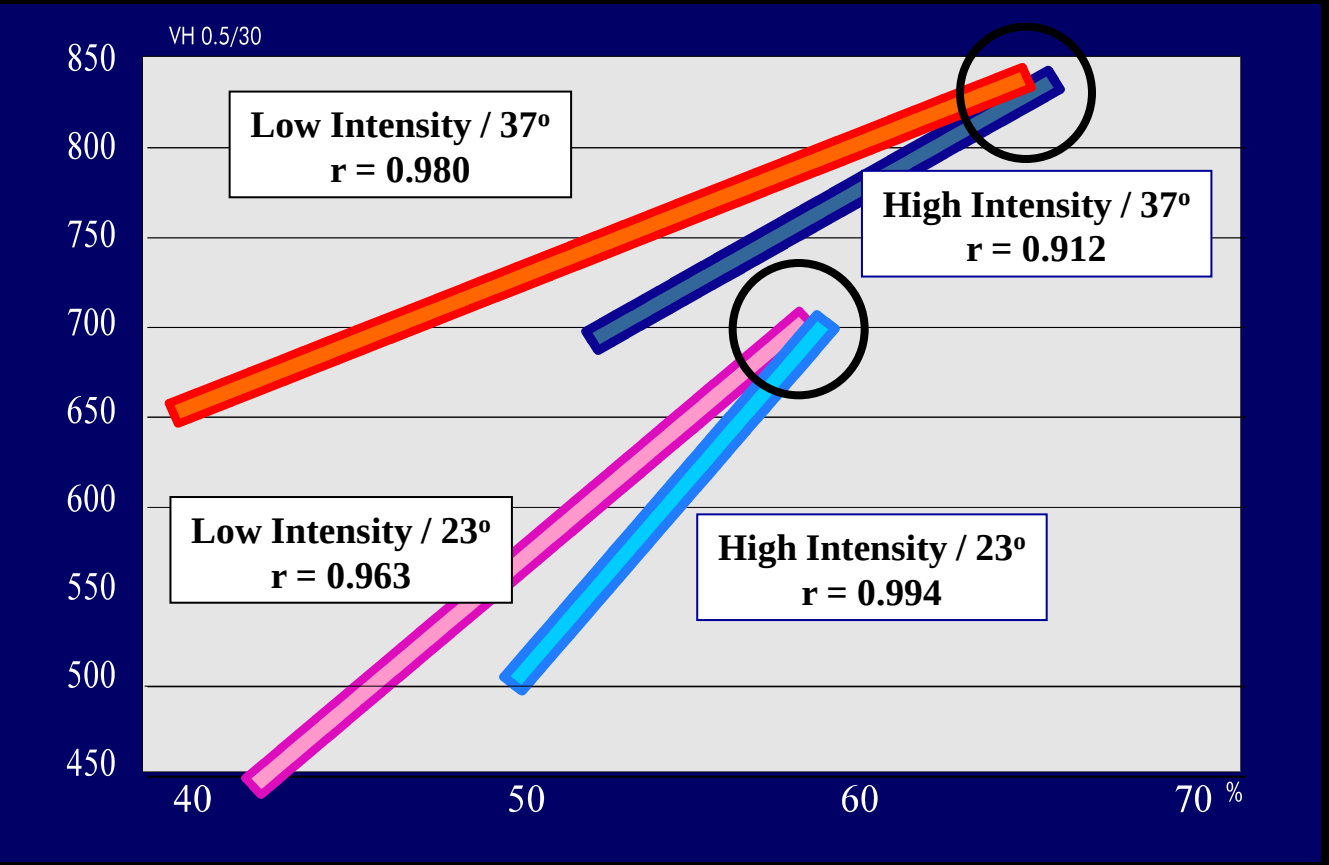
Kuerschner R, et.al. J Dent Res 1998

A few others determined that higher light intensity increases shrinkage stress

Reinhardt, Goracci, Unterbrink, Suh, Uno, Kanka, Sakaguchi, Mehl, Bouschlicher, Aarnts, Frommater, Ernst, Garcia-Godoy, Yoshikawa, Brand, Feng, Watts, Choi, Lahlsingh, Walker, Loesche, Matsutani, Glockner, Feilzer, Davidson

Maybe all of them are idiots

Correlation of hardness and conversion rate



Low Intensity
250 mW/cm²

"High" Intensity
450 mW/cm²

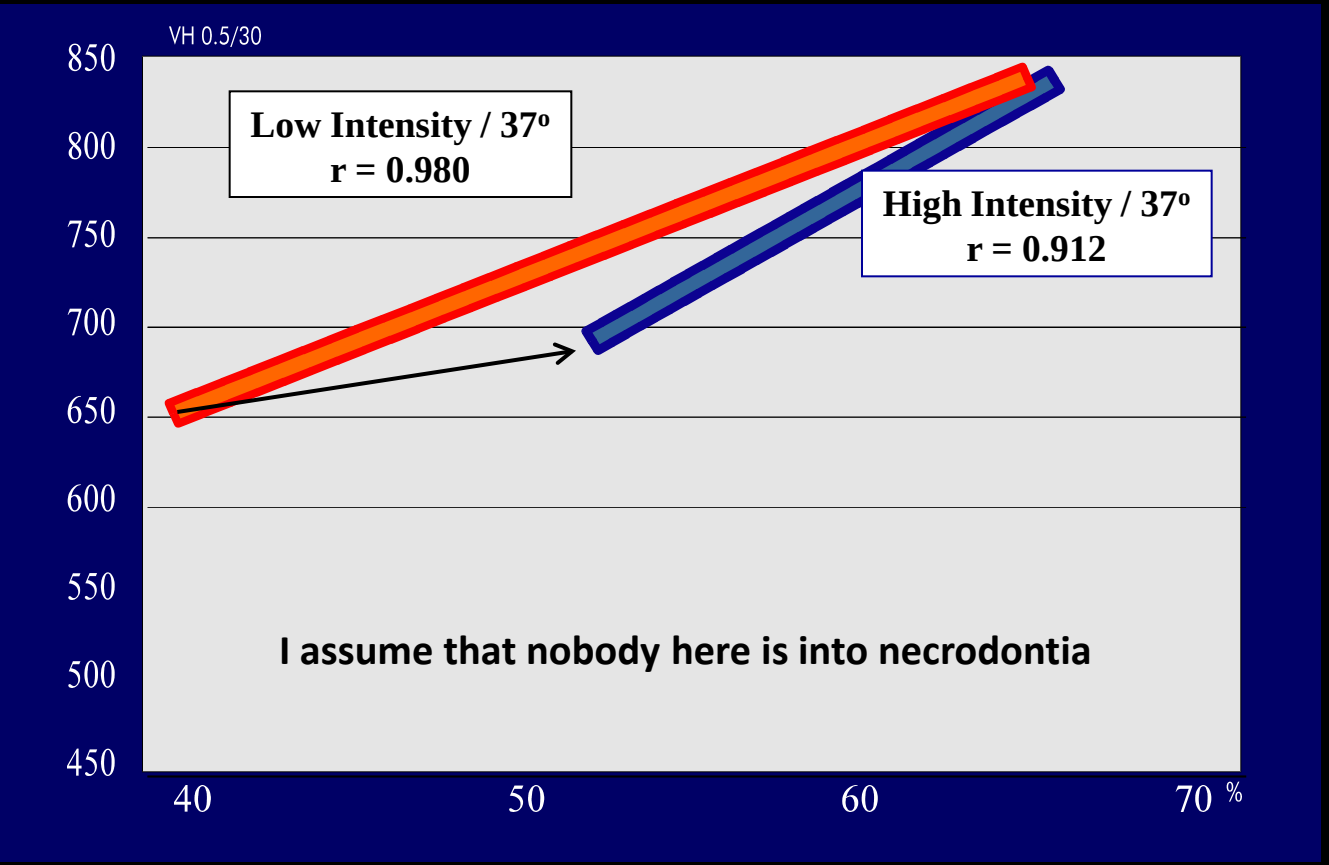
Surface to 5 mm
Argon atmosphere
40 s curing time

Koran & Kuerschner
American Journal of Dentistry 1998
"Total energy dose"

only tested surface hardness and did not even consider postcure behavior

Muessner R, Unterbrink G. J Dent Res 1995 (IADR-CED)

Correlation of hardness and conversion rate



Low Intensity
250 mW/cm²

"High" Intensity
450 mW/cm²

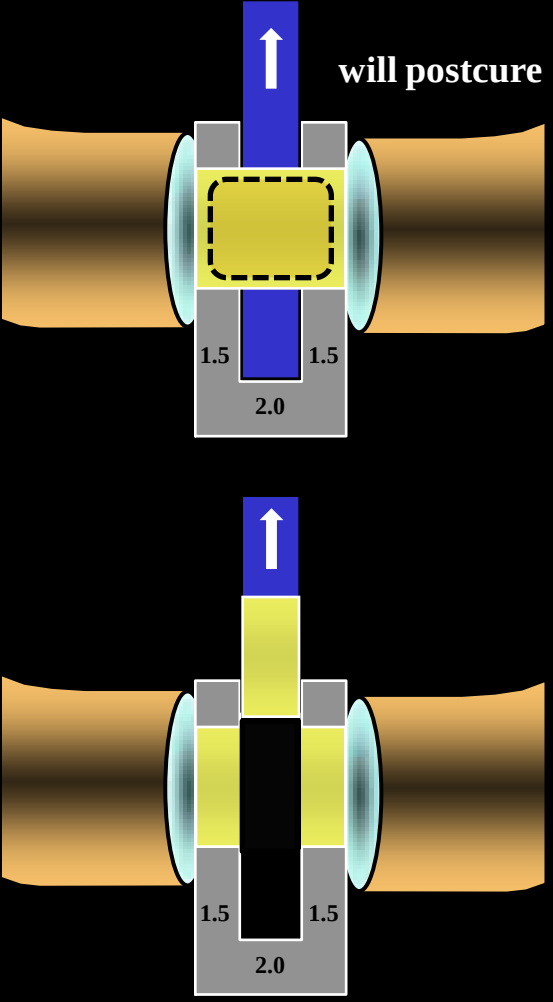
Surface to 5 mm
Argon atmosphere
40 s curing time

When there is no inhibition from oxygen

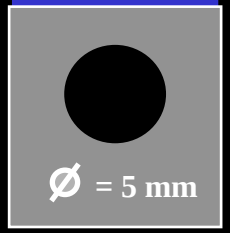
light intensity has very little influence on the final hardness

despite lower conversion

Muessner R, Unterbrink G. J Dent Res 1995 (IADR-CED)

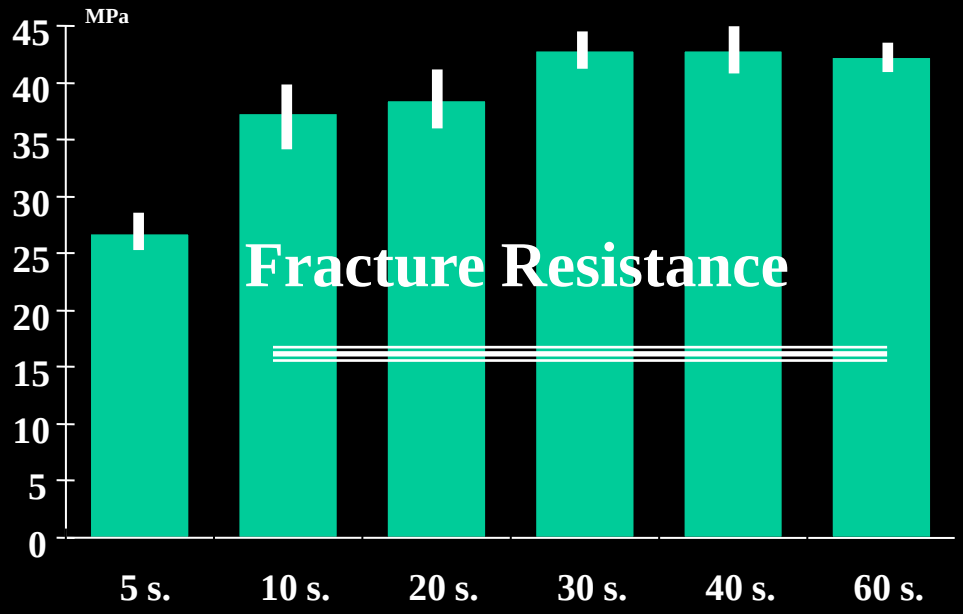


Pilo R, et.al.
Dent Mater 1994
10: 338-342



Fracture strength with variable curing times

72 hr. at 37°C Demetron 500 Heliomolar-RO



Huge differences after primary curing become much smaller after post-curing

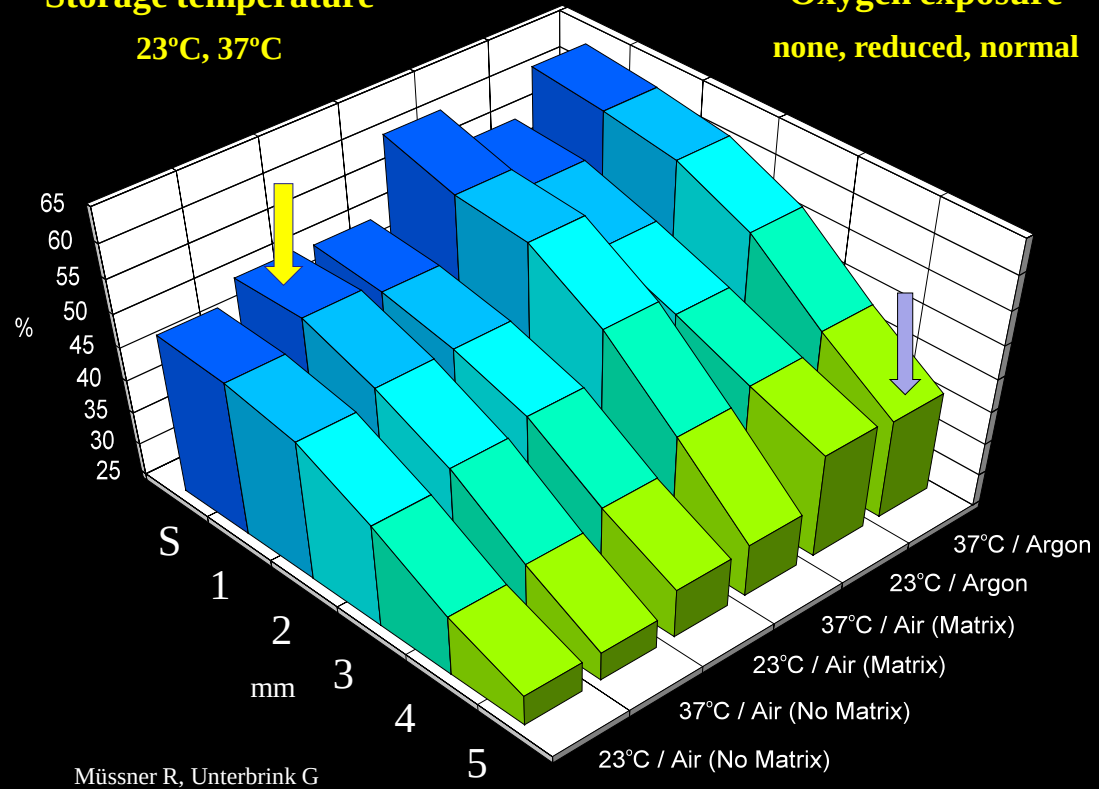
Degree of Conversion

Storage temperature

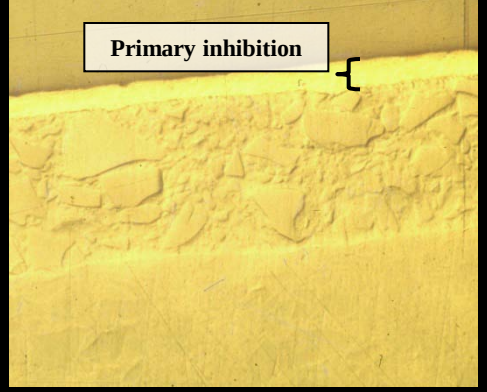
23°C, 37°C

Oxygen exposure

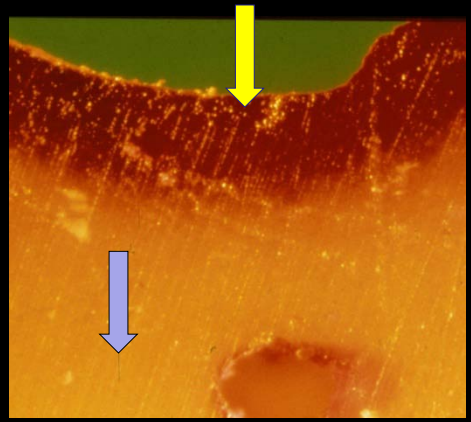
none, reduced, normal



Müssner R, Unterbrink G
J Dent Res 1995



Secondary inhibition
(inhibition of postcure)



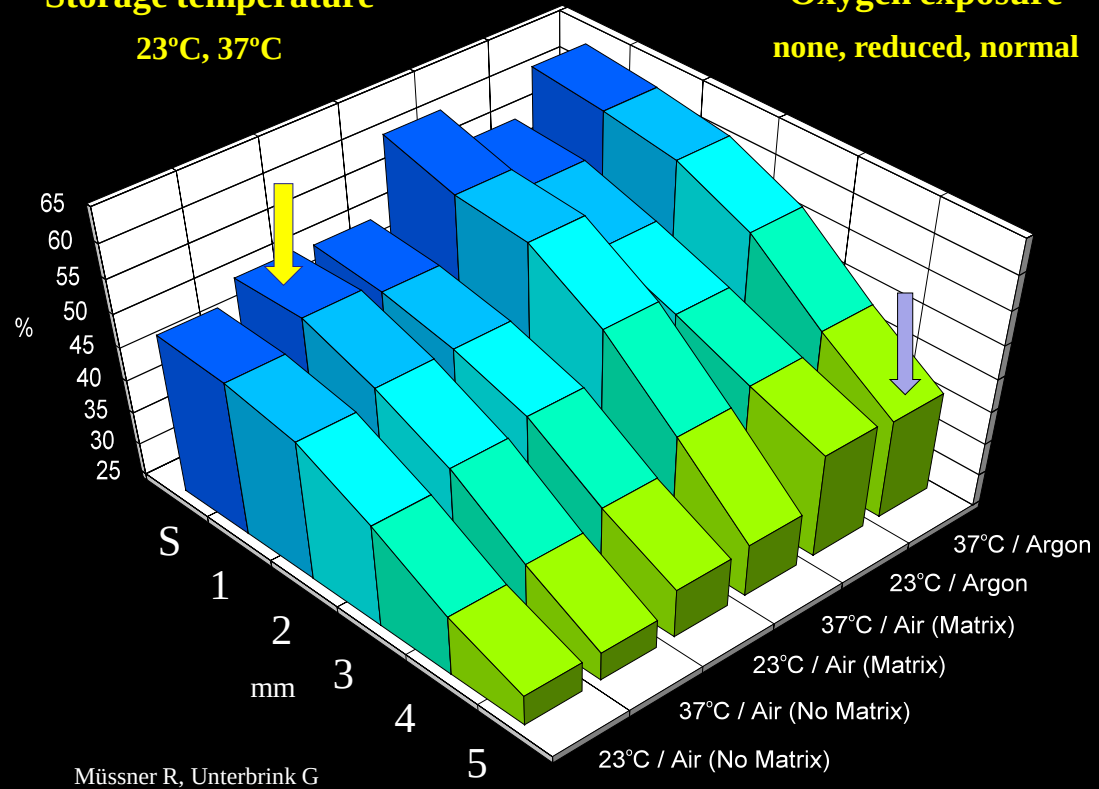
Degree of Conversion

Storage temperature

23°C, 37°C

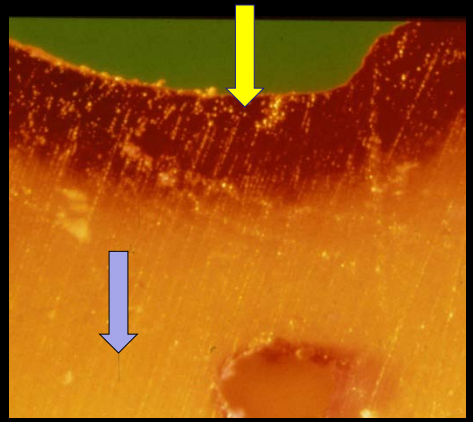
Oxygen exposure

none, reduced, normal



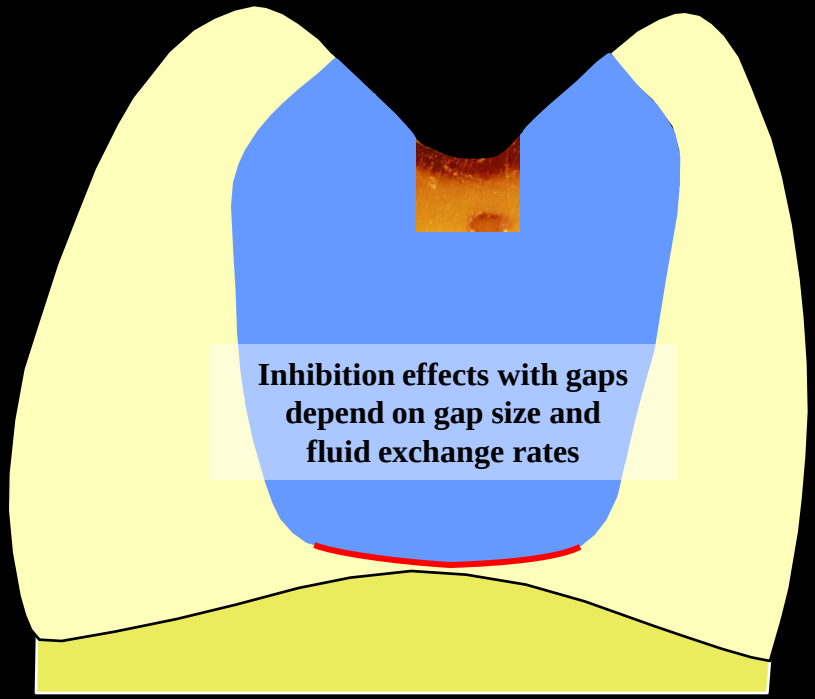
Müssner R, Unterbrink G
J Dent Res 1995

FTIR samples are secondarily inhibited

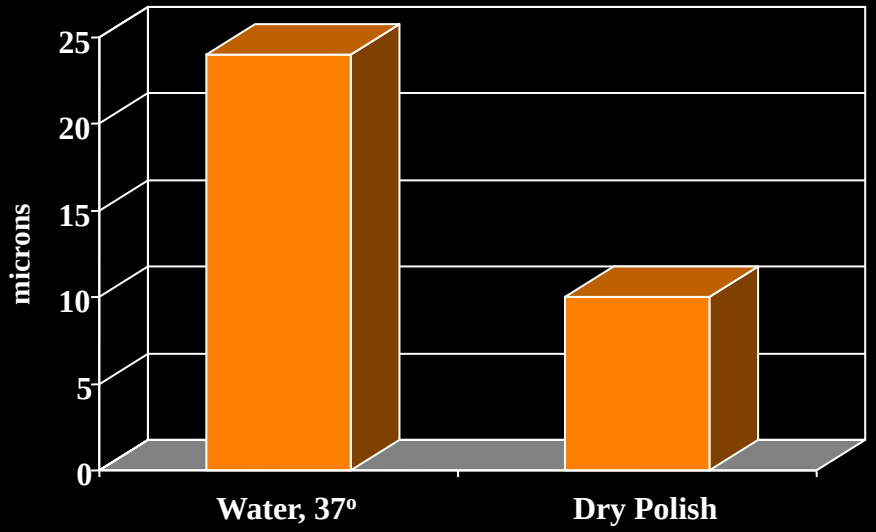


and dramatically exaggerate the effect of light intensity

Only free surfaces are secondarily inhibited (inhibition of post-curing)



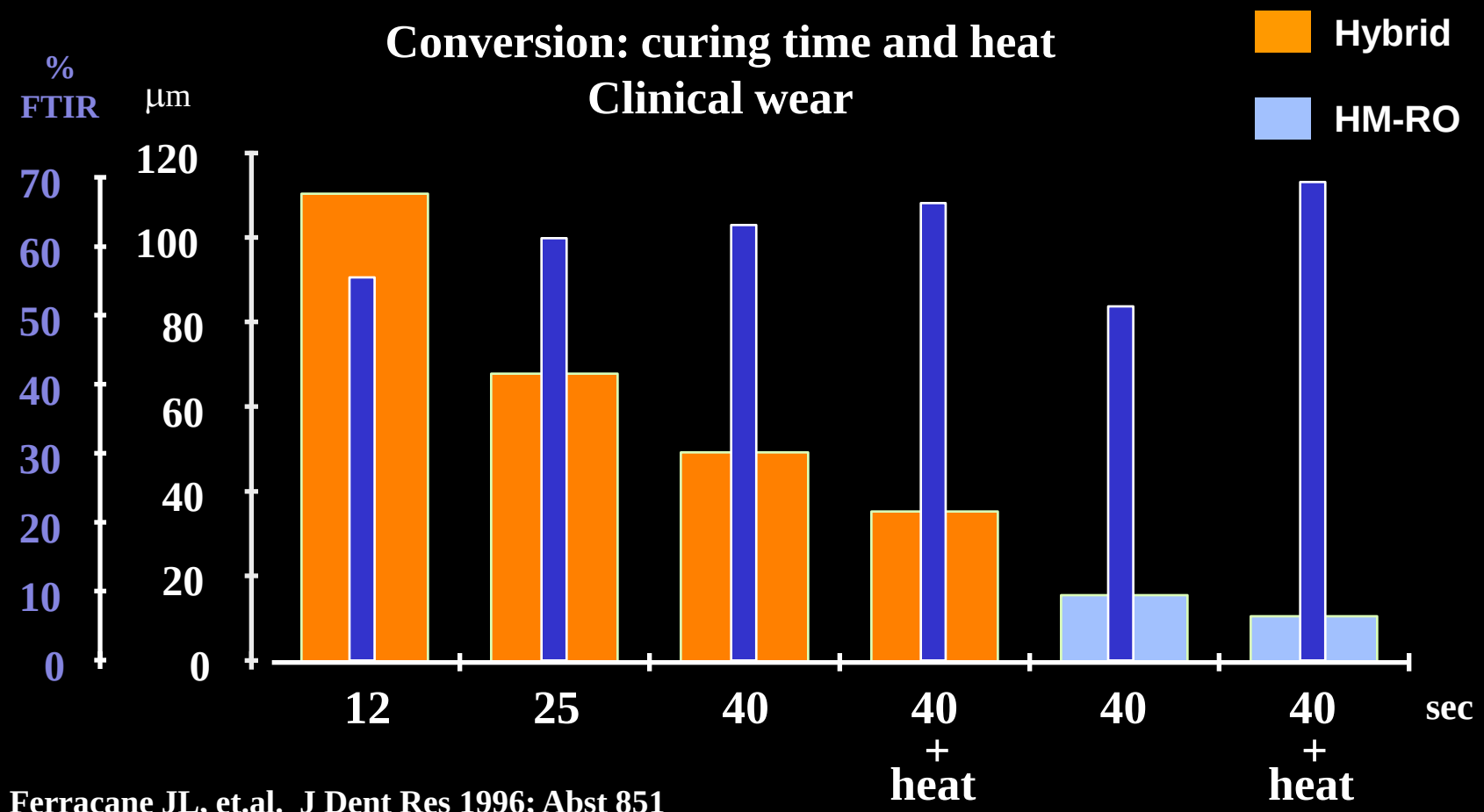
Toothbrush Abrasion: 8 hours
Dual Cement (microfilled composite)



Baseline temperature: 22° C
Rubber point at 20,000 rpm, 10 gram

At 0.1 mm depth after 15 s: 80° C
0.5 mm under surface: 25° C

Conversion: curing time and heat
Clinical wear

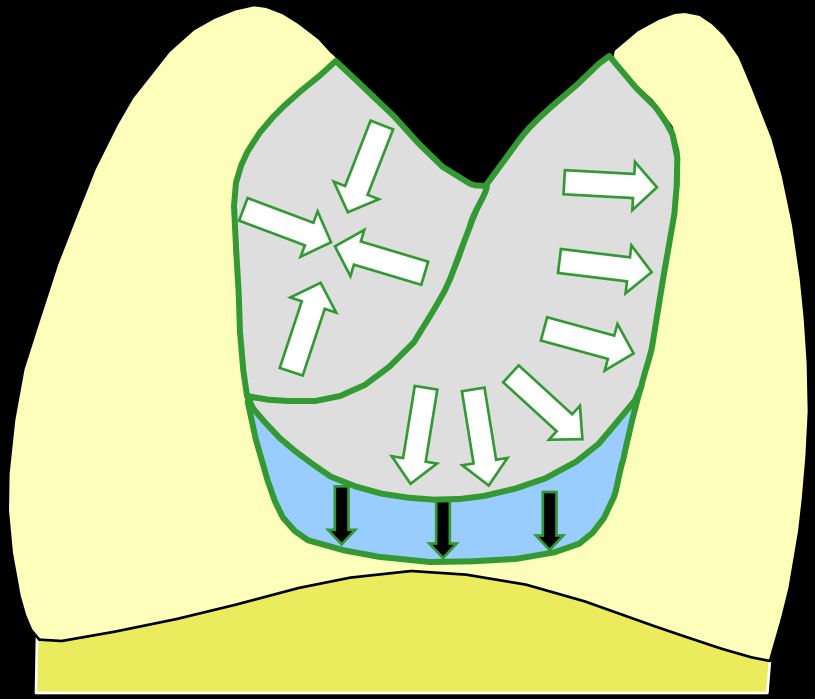


Ferracane JL, et.al. J Dent Res 1996; Abst 851

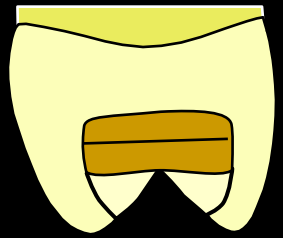
13 microns in 3 years!

5 year clinical recall
(shade intentionally incorrect)

Very large Cl II
"oblique layering technique"
(after curing the bond + flow)

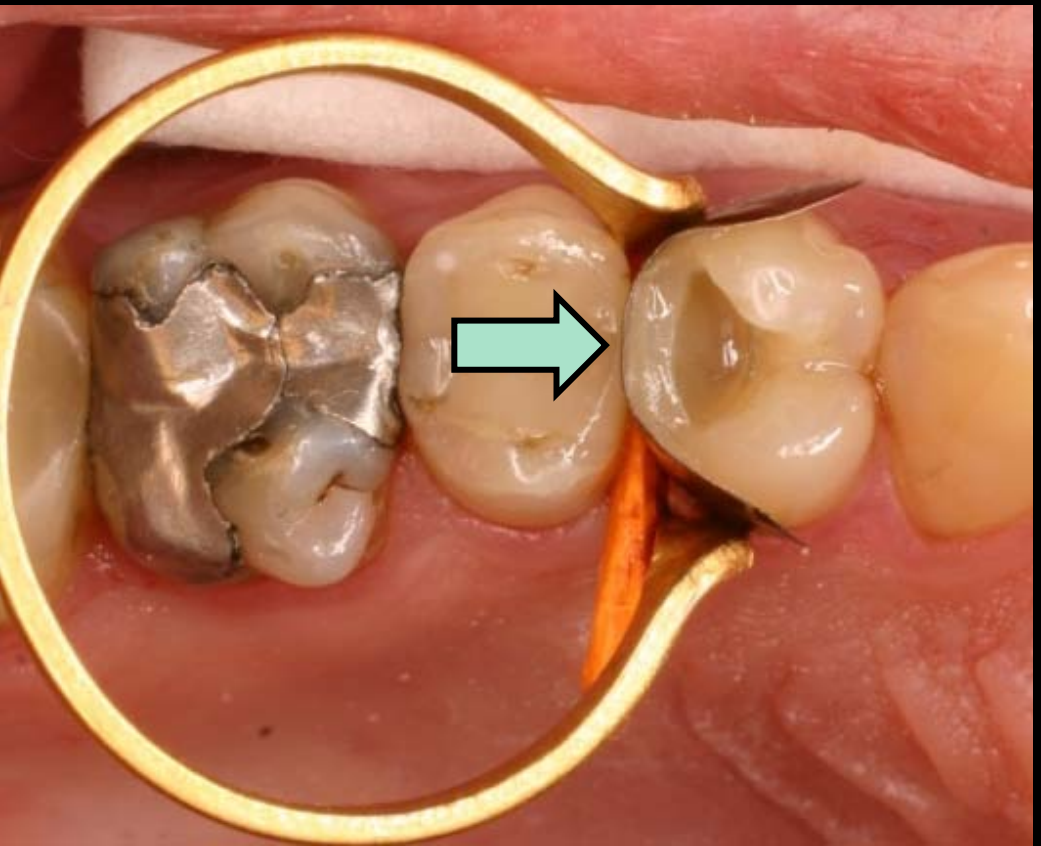


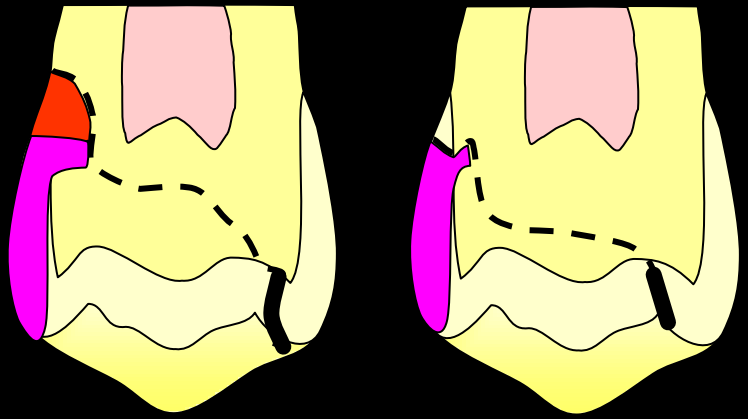
Class 1: individual cusp technique



dentin layer(s)
to level of fissure
(or GIC)

Class 2
Centripital technique (outside in)

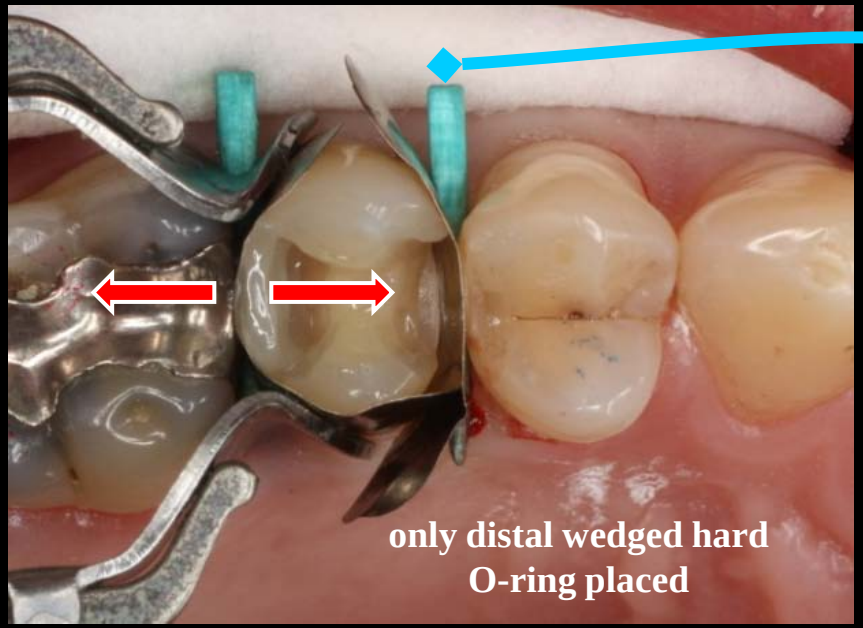




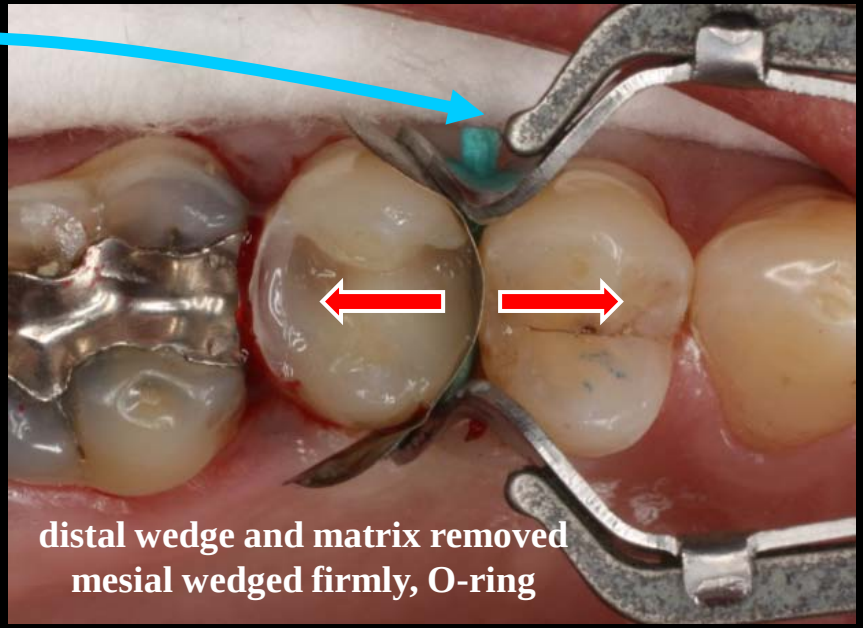
thin layer applied against matrix

Centripital Technique

MOD's, especially when I know it will bleed



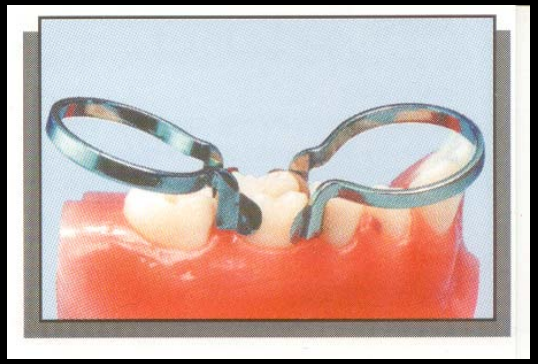
only distal wedged hard
O-ring placed

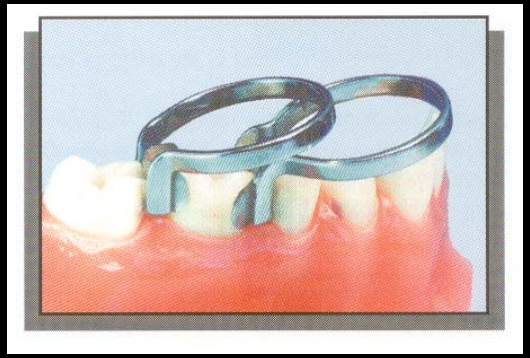


distal wedge and matrix removed
mesial wedged firmly, O-ring

Doing the entire restoration with a circumfirential matrix or both sectional matrices in place frequently leads to light or open contacts

Wirsching E, et.al. J Dent 2009



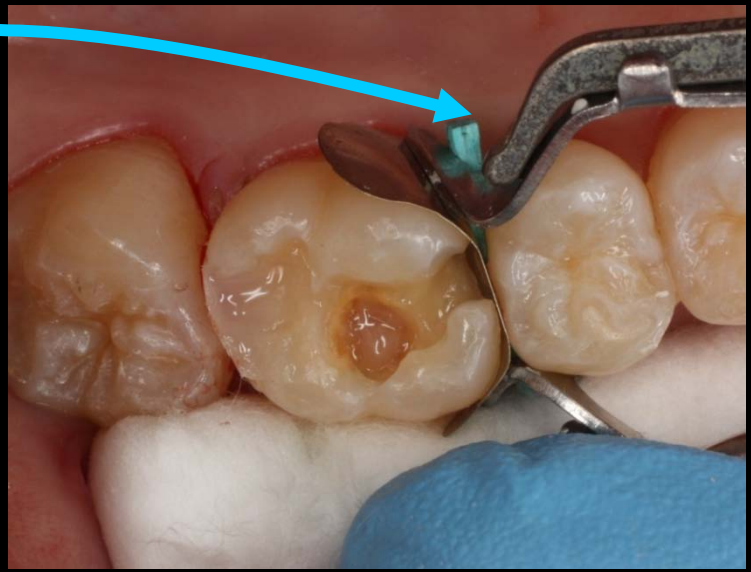


or bond wedges with adjacent proximals

solution for contacts

With MOD's
I no longer place both rings at the same time

Distal then mesial

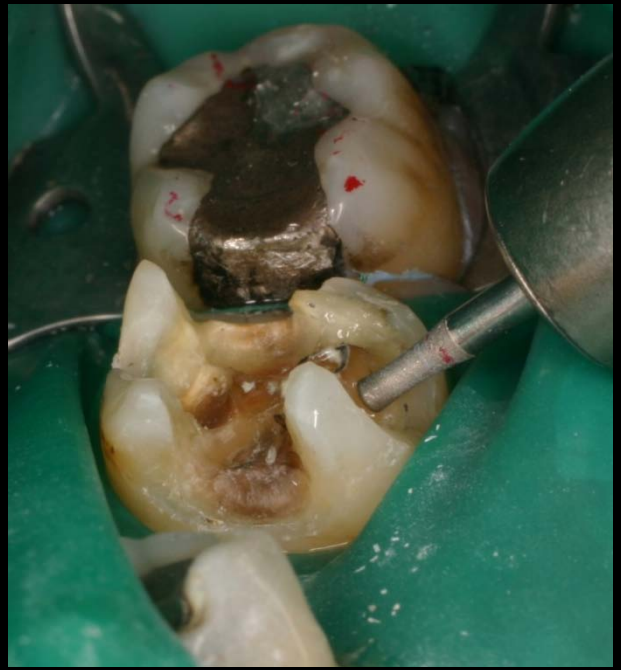


Distal wedged hard and bonded,
mesial wedged lightly

Remove distal matrix, wedge mesial firmly, O-ring

Limits?

after removal
of amalgam
(most of it)



marginal
finishing

finishing distal
proximal margin

An indirect onlay would be better but a crown would be worse

Limits?

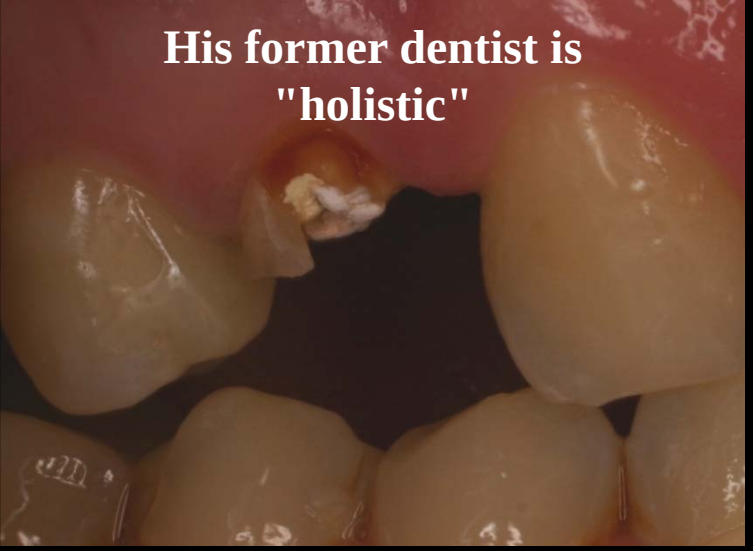
etching enamel
(self-etch adhesive)

If remaining cervical
wall thickness > 2 mm,
you should not do a crown

Krifka S, et.al. Oper Dent 2009

Bond + flowable, then
initial vertical layer(s)

final layer



22 year old male

Emergency: pain 14

The next appointment with his dentist was for extraction of 14, 16 and 46

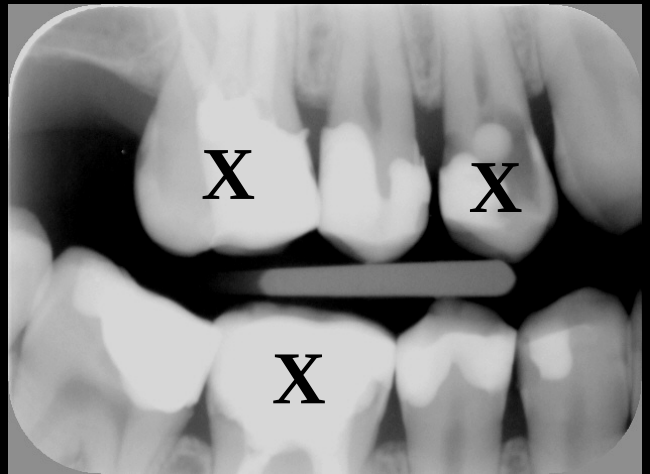
had already extracted 24, 26, 27, 35, 36 and 37 on the left side

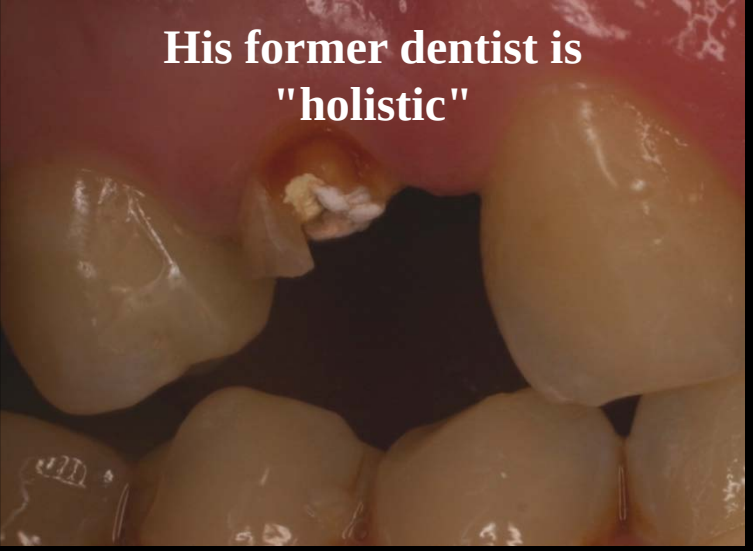
The dentist's website

Why would you want to keep something dead in your mouth?

Is enamel a living tissue?

Does ceramic respirate?





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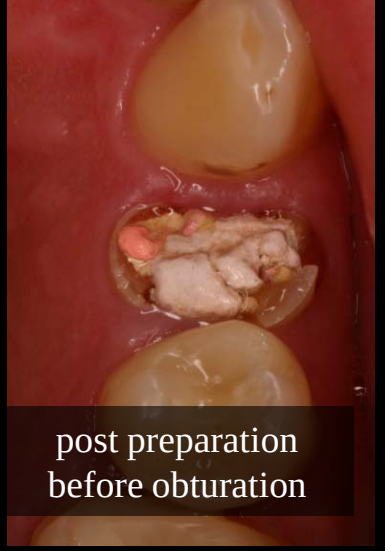
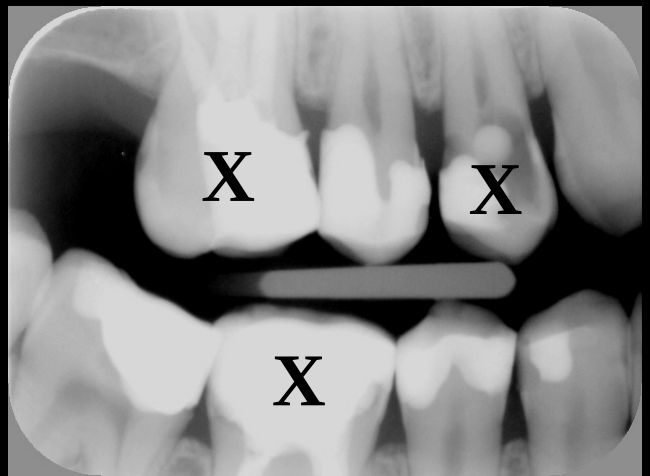
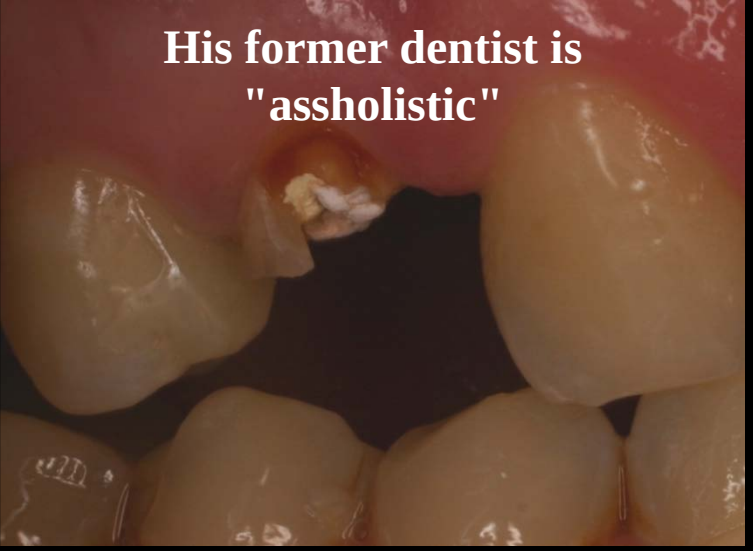


The dentist's website

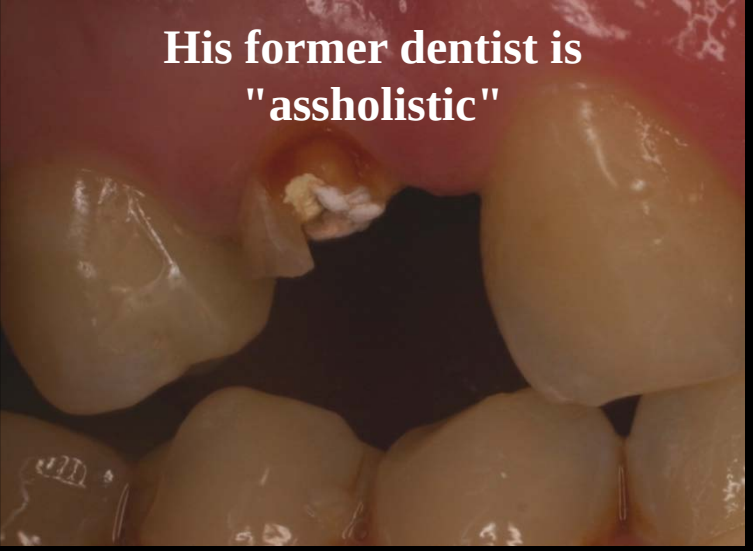
Why would you want to keep something dead in your mouth?

I don't know, maybe so that I can still chew my food.





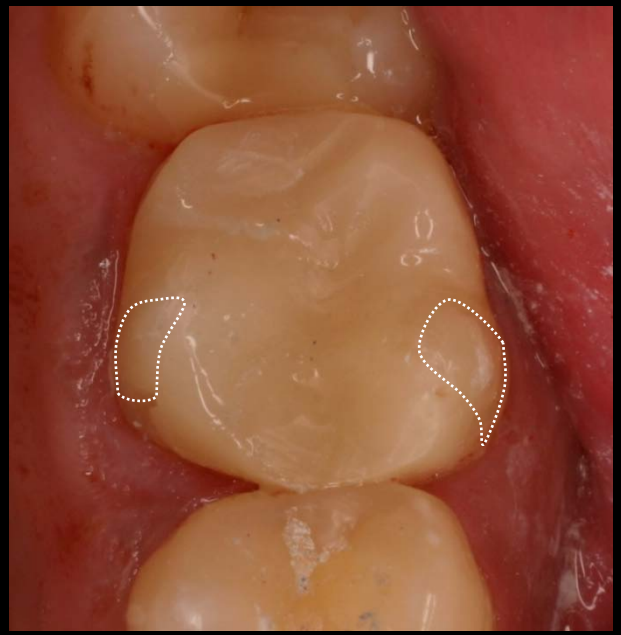
FRC posts 1.25 mm (buc+pal), Variolink-II, EvoCeram A2


His former dentist is
"assholistic"


2 years


5 years

Limits?



Preparation is a compromise to simplify application technique

Thin cusps not reduced to provide a guide for modelling the occlusal anatomy

Ceramic inlay failed because of a stupid preparation

Inlays in general are not very sensible

This is not easy dentistry

immediate

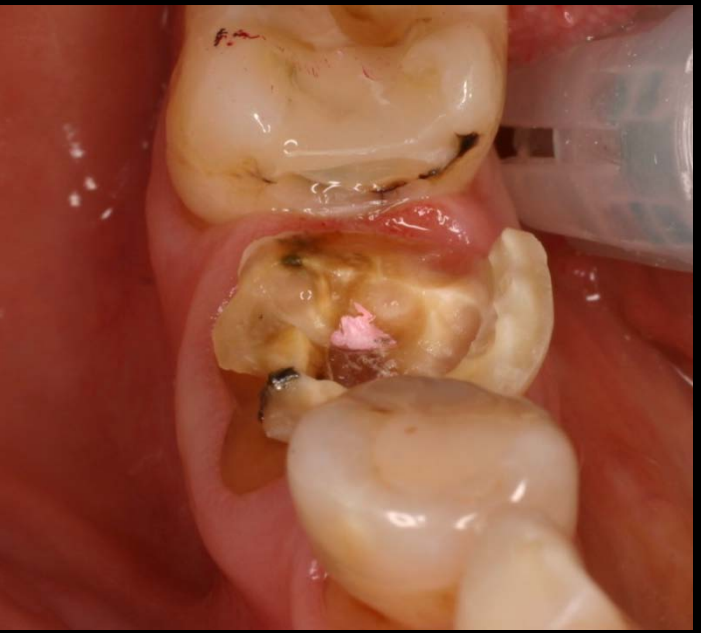
2 years

4.5 years

but it helps illustrate the quality of today's composites.

In my opinion, crowning this tooth would be even dumber

Limits?



the first layers must be done without a matrix

46 direct composite

Preparation Indirect "Monoblock"

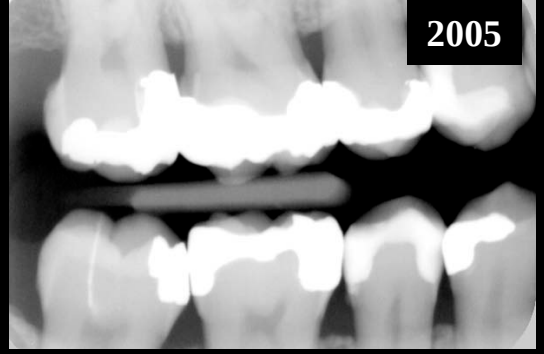
Conventional dentistry

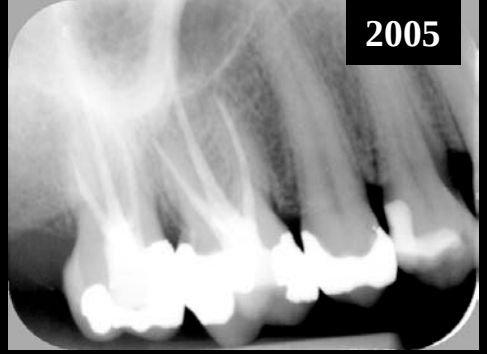
Patient requested recementation of her "new" crown.

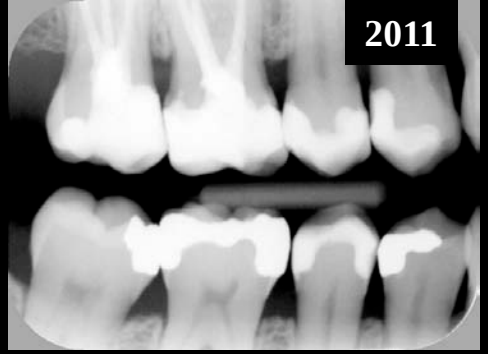
Refused extraction to wait for her dentist to return from vacation.

"He must be incompetent if he can't even recement a crown."

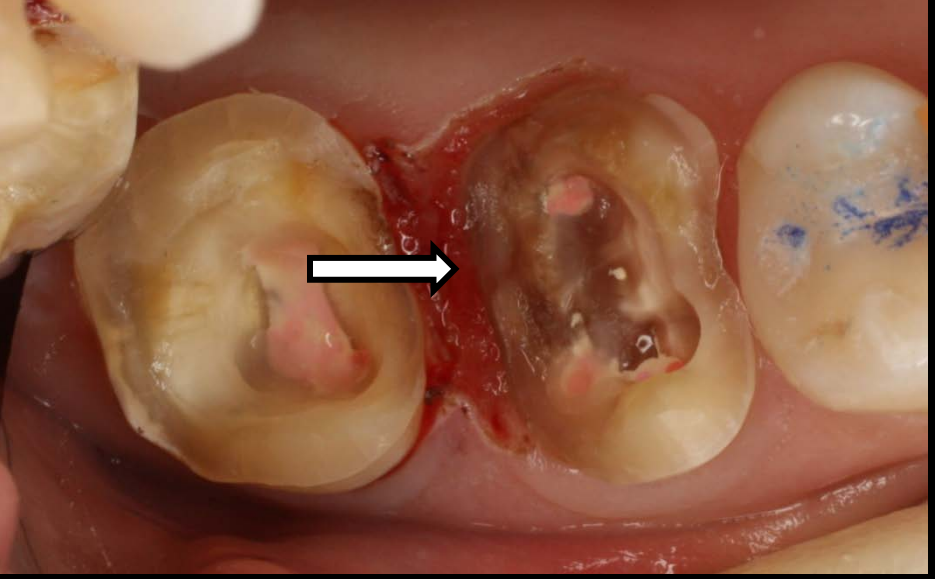
Conventional crowns: failure rates without ferrule ca. 800% higher
Sorensen JA, Engelmann MJ. J Prosthetic Dent 1990

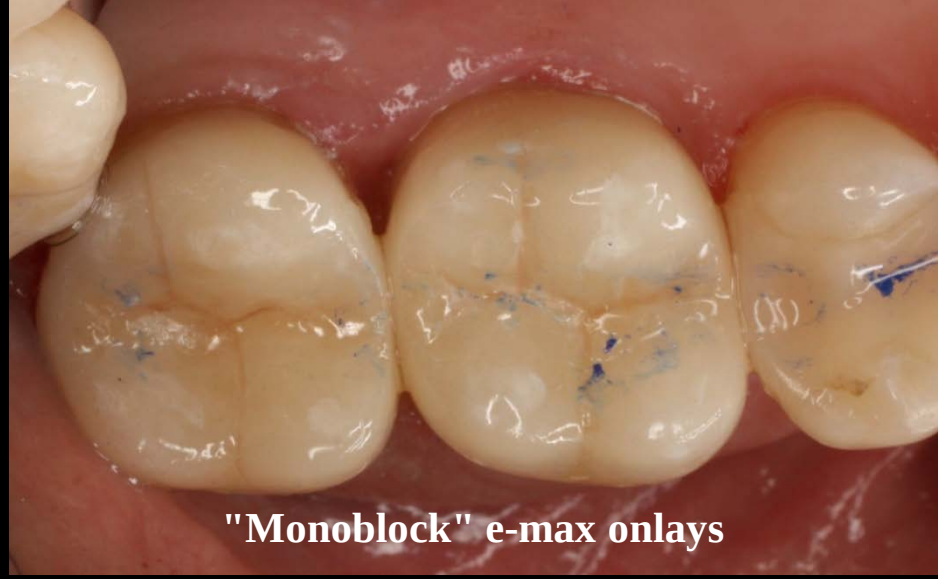






Endodontics and large composites in 2005. palatal caries on 16 in 2011. Her marriage had eliminated all financial problems. Time for crowns?

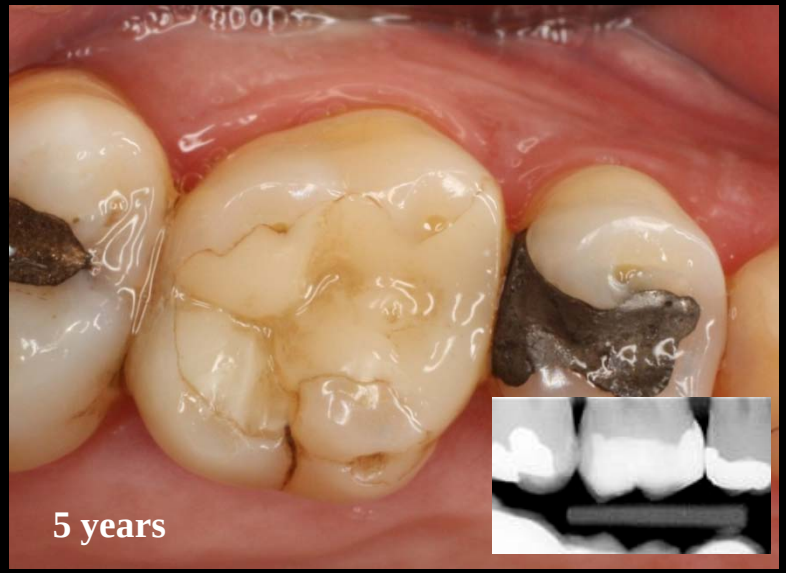




Margin inaccessible with floss. The first molar must be cemented first!

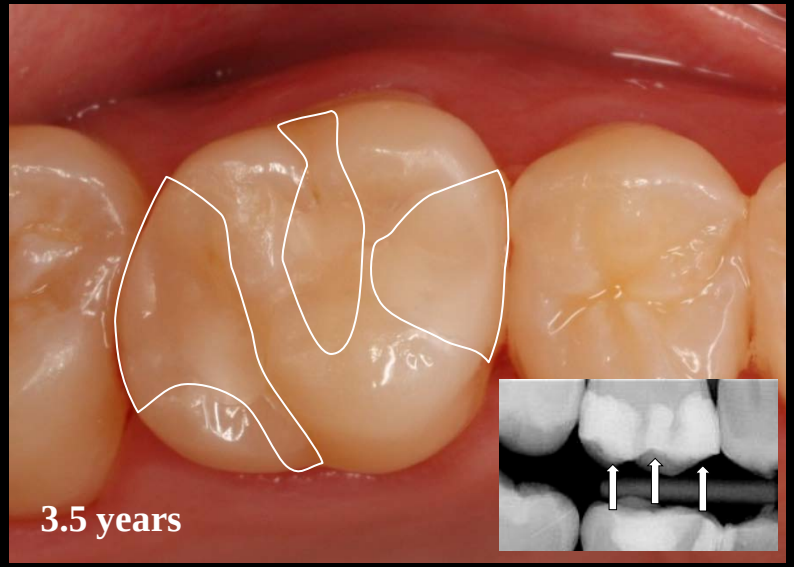
An FRC post and core + crown for the first molar is an option, but not for the second molar.

We will always see changes over time: risk analysis



This patient smokes, bruxes, and has ± hygiene

Previously restored with amalgam,
I made compromises with the preparation



Does not smoke or brux, good hygiene

Actually three separate composites
(reduces cusp flexure from occlusal load)



Maxillary molars: save as much of the oblique marginal ridge as possible



Why do we see so many composites that look like this?

Poor preparation technique, inferior materials, contamination?

How long has the MOD restoration in 36 been in function?

Replacement due to post-op sensitivity

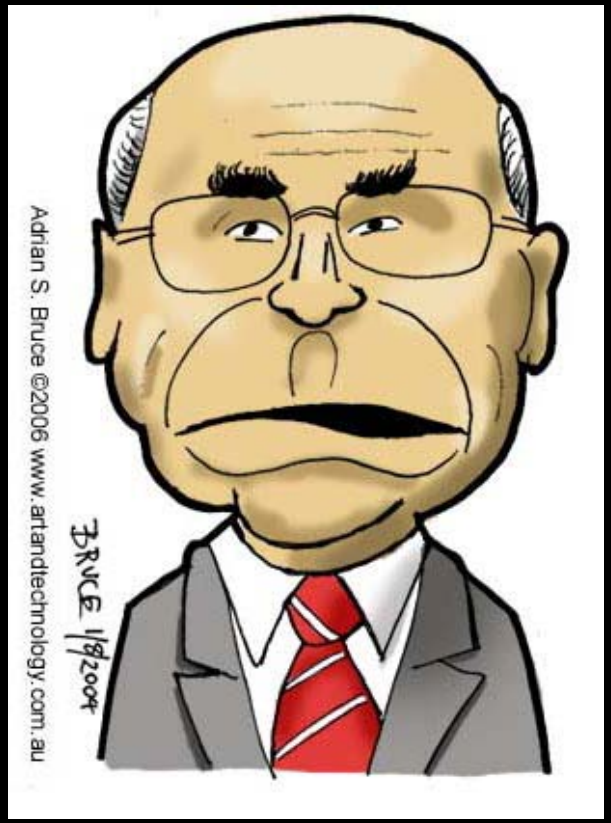
(and the patient had to pay me also)

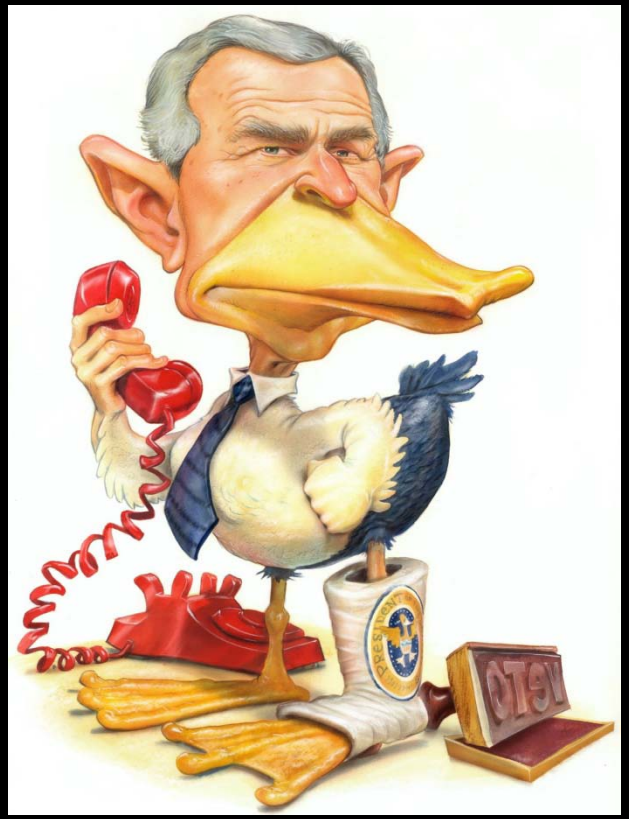
Political Axis of Evil

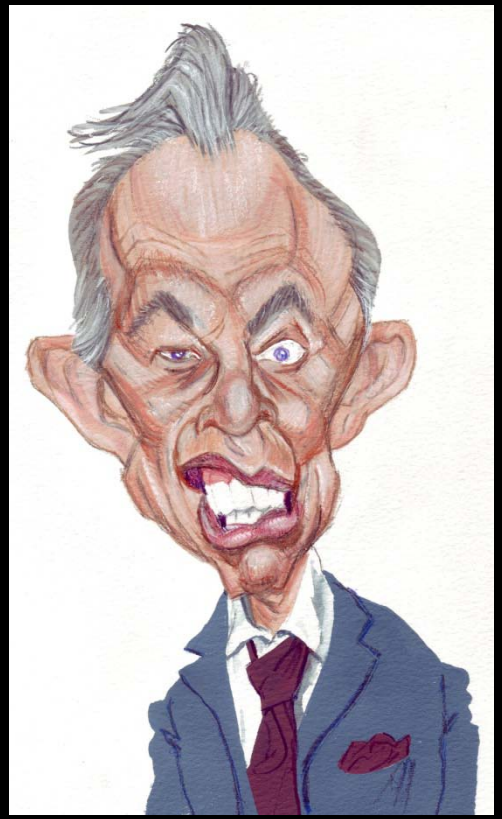
North Korea
Iraq
Iran

Political Axis of Evil II

other political opinions may be equally valid







Political Axis of Evil

North Korea
Iraq
Iran

Dental Axis of Evil

lecturers
Iraq
Iran

the good, the bad, and the ugly

Dental Axis of Evil

lecturers
insurance
Iran

They pay very
low fees for
restorative dentistry

the good, the bad, and the ugly

They pay very
low fees for
restorative dentistry

Dental Axis of Evil

lecturers
insurance
companies

the really ugly

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low fees for
restorative dentistry

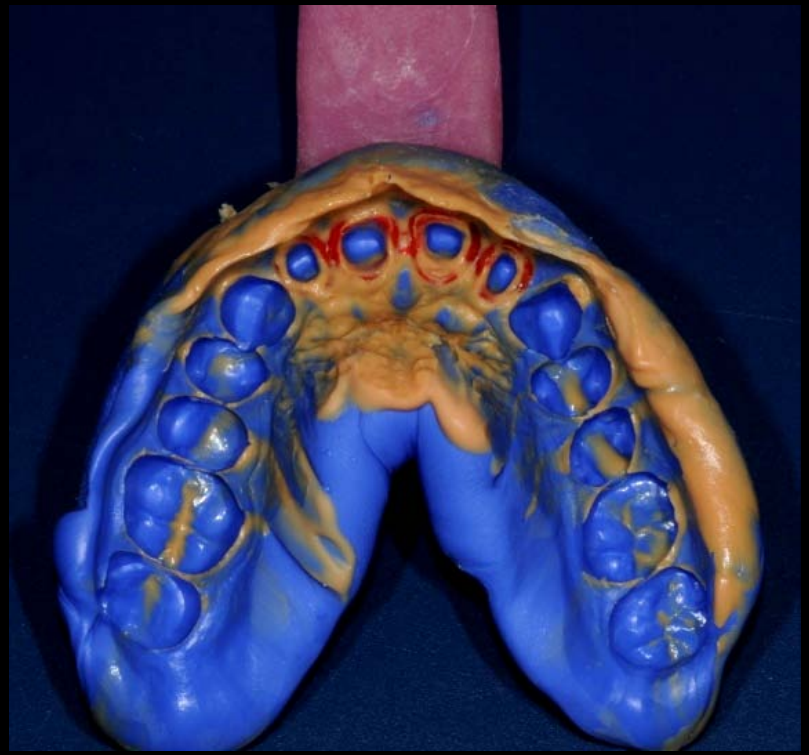
Dental Axis of Evil

lecturers
insurance
companies

FAST and EASY

Sponsor a lecturer who is ignorant or will lie for you

Indirect Restorations



Inlay indications are limited (whether gold, ceramic, or composite)
< 60% of ICD: direct composite,
> 70% of ICD: adhesive onlay and not an inlay.

The "Robin Hood" indication for inlays

Rich patients when your bank account is empty

Direct composite placed in 2007 (first molar)
Inlay done in 2010 in Singapore (second molar)

When I removed the rest of the inlay.

No bond between ceramic and cement, very low bond of cement to both enamel and dentin.

Direct composite placed in 2007 (first molar)
Inlay done in 2010 in Singapore (second molar)

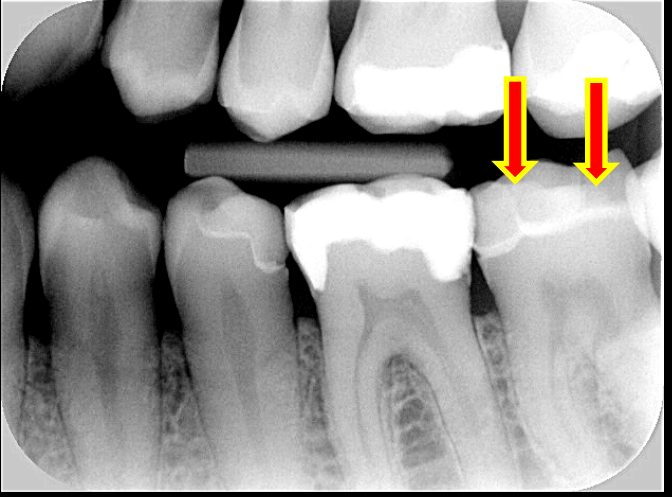
When I removed the rest of the inlay.

No bond between ceramic and cement, very low bond of cement to both enamel and dentin.

left 2007 and 2012

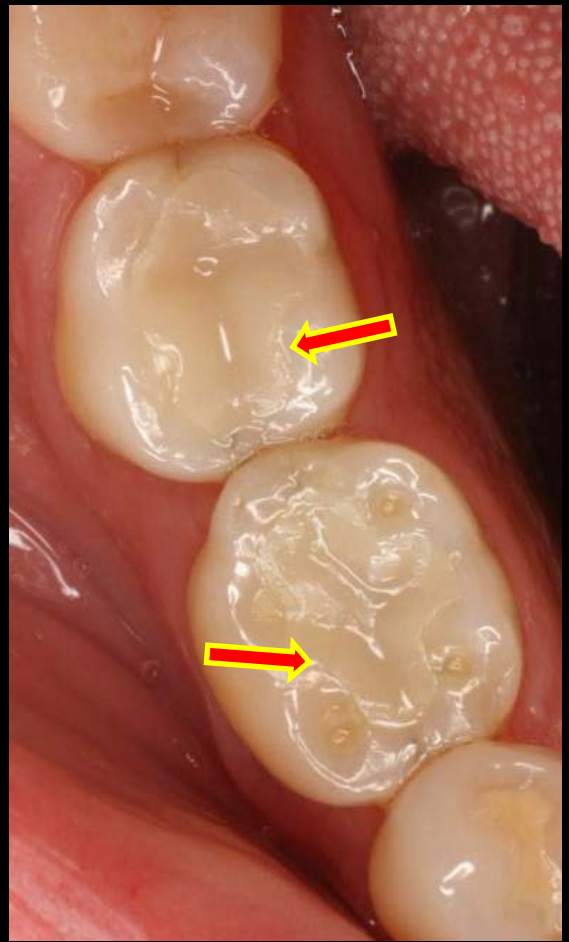
Two vertical fractures
demands preparation of OM

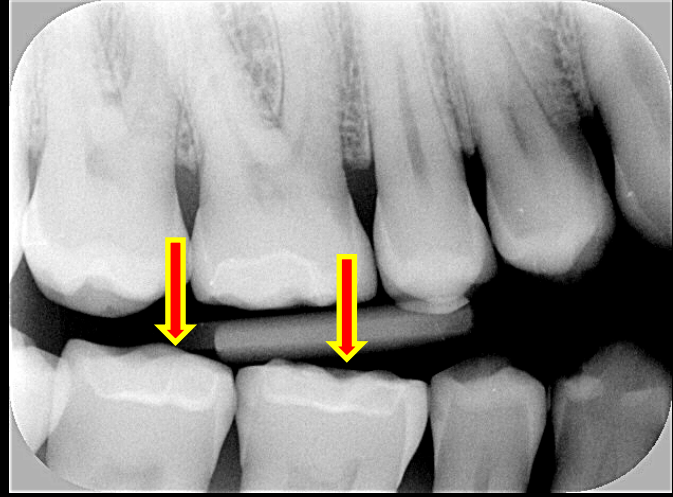
right 2007 and 2012



left 2007 and 2012

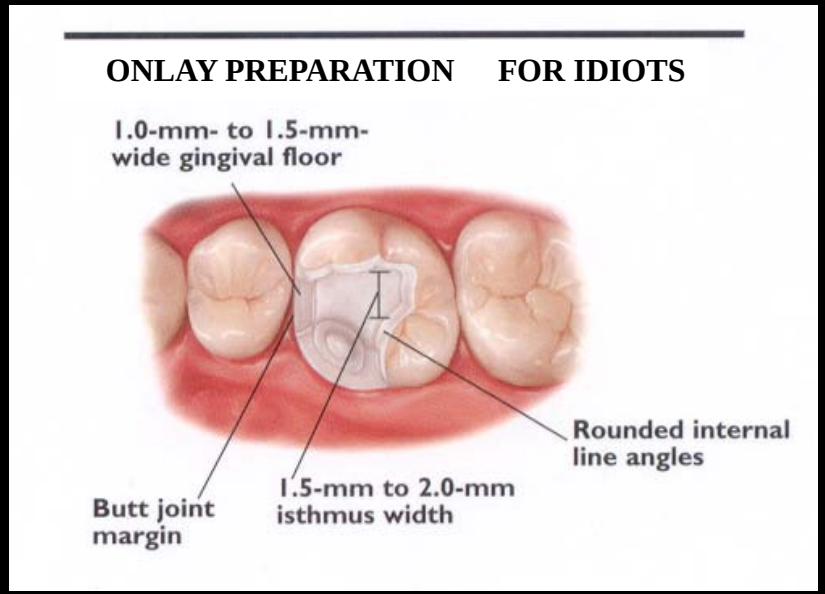
These inlays fractured
before or during cementation

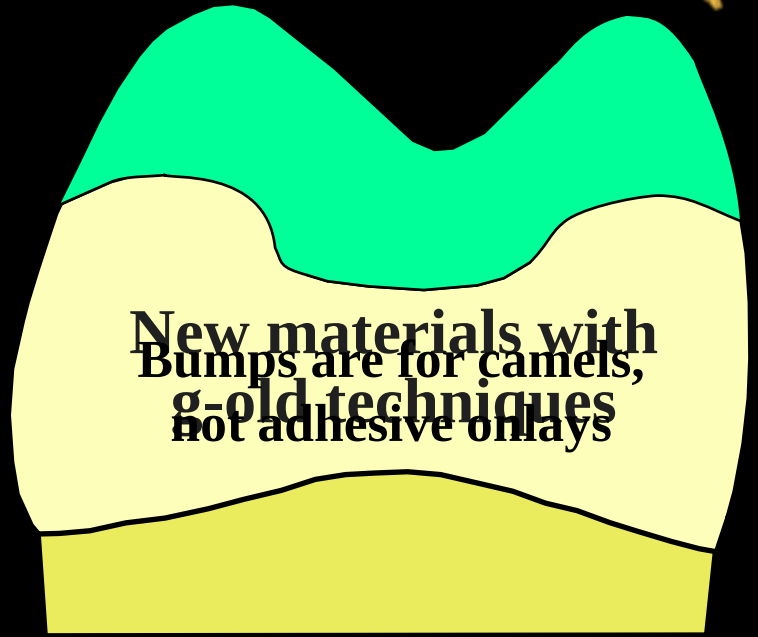




right 2007 and 2012

If we are not replacing an old crown,
we usually do not have to do the first one.





Ceramic onlays are frequently easier and certainly better

Posterior teeth

if buccal and lingual enamel is intact and cervically > 2 mm

a crown is never indicated!

In general, do an onlay when margins are near the cusp tips

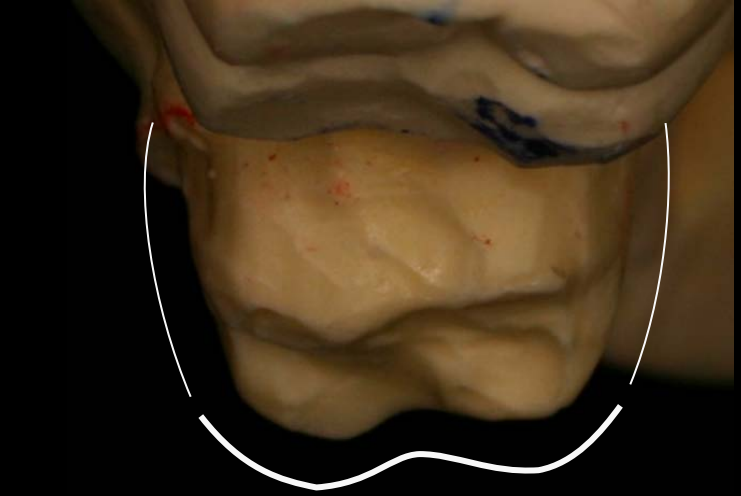
(depends also on occlusion)

Would you think about crowning this tooth?

Failure rates are lower than with metal ceramic crowns!

Kraemer	8 yrs	8%	1.0% [1]
Proebster	5 yrs	3%	0.6% [1]
Guess	3 yrs	3%	1.0% [1]
Edelhoff	5 yrs	2%	0.4% *
Guess	3 yrs	1.3%	0.4% *

[1] Empress * E-max press



Replacement of metal-ceramic crown

If the margins are easily accessible, and there was minimal axial reduction,

(anatomic occlusal reduction still possible)

Adhesive full ceramic is my choice

Deep subgingival margins or previously overreduced axial walls?

Metal ceramic is the best option (not zirconia).

Zirconia demonstrates stress corrosion like all ceramics

	initial	stressed	
Polished	1208 ± 97	748 ± 88	-38%
Particle abrasion (50 µm)	1131 ± 131	655 ± 155	-45%
Particle abrasion (110 µm)	720 ± 187	388 ± 193	-67%

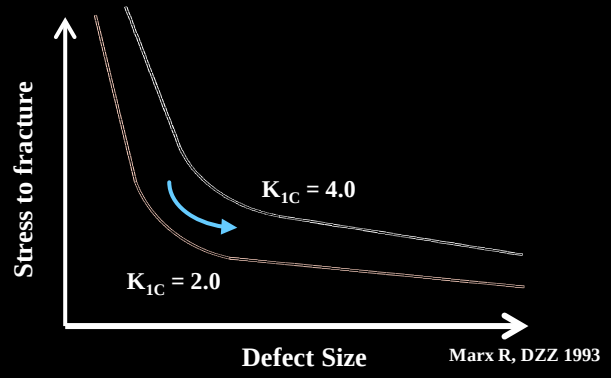
Aboushelib MN. Long Term Fatigue Behavior of Zirconia Based Dental Ceramics. Dent Materials 2010:3:275-85

Flexural strength

K_{1C}: fracture toughness
(relates strength to defect size)

"n": slow crack growth coefficient
(susceptibility to hydrolysis)

Acid solubility



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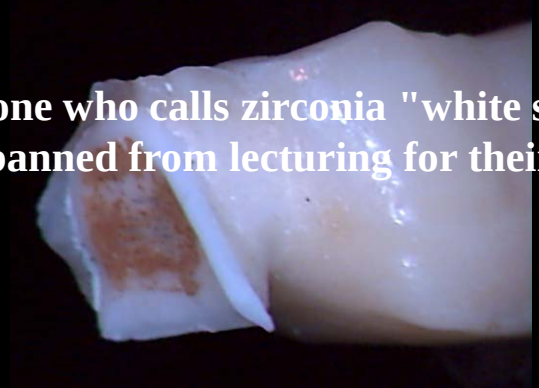
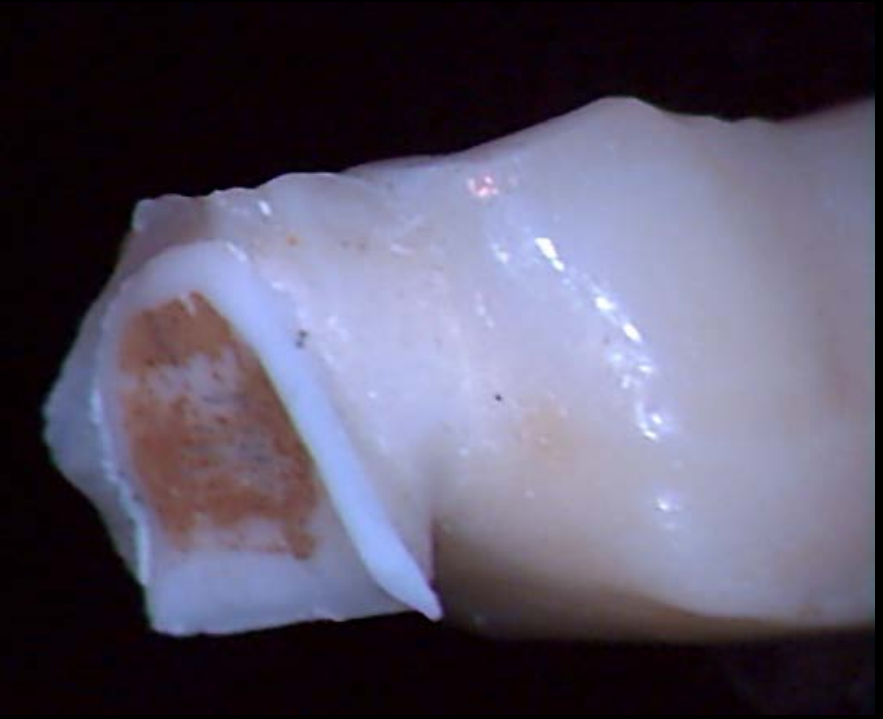
Aboushelib MN. Long Term Fatigue Behavior of Zirconia Based Dental Ceramics. Dent Materials 2010:3:275-85

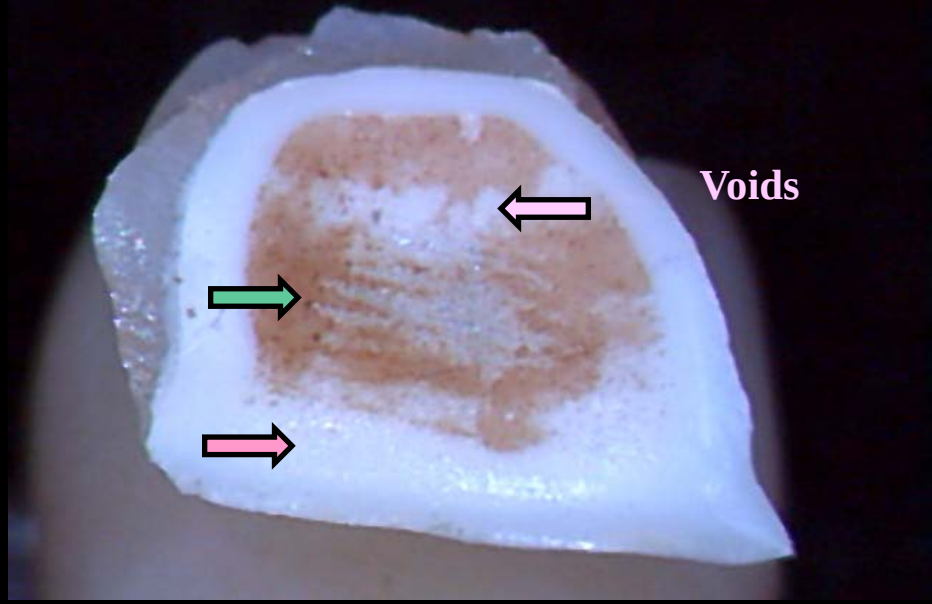
Internal adjustment at the cementation appointment and a hydrophilic cement give you this strength!



Anyone who calls zirconia "white steel" should be banned from lecturing for their entire life.

A "full-arch" FDP cemented about four years earlier
(multiple veneer fractures prior to this framework fracture)





This brown stuff is the cement.

At the margins the cement had dissolved.

The scratches are from a blunt spatula.

Correct use of conventional cements; glass ionomer or zinc oxyphosphate

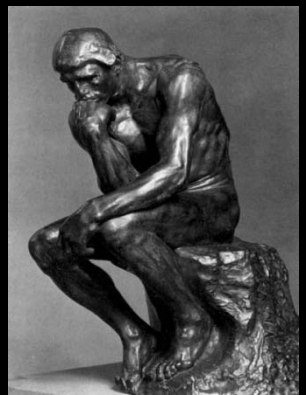
Maintain isolation during initial setting: ca. 10 minutes (high solubility)

Wait an additional 5-10 minutes before checking occlusion (cement is still very weak)

Tooth Colored Restorations: Harry Albers

The technique is easy,

but not fast if done correctly.



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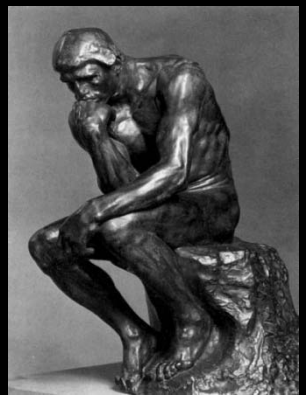
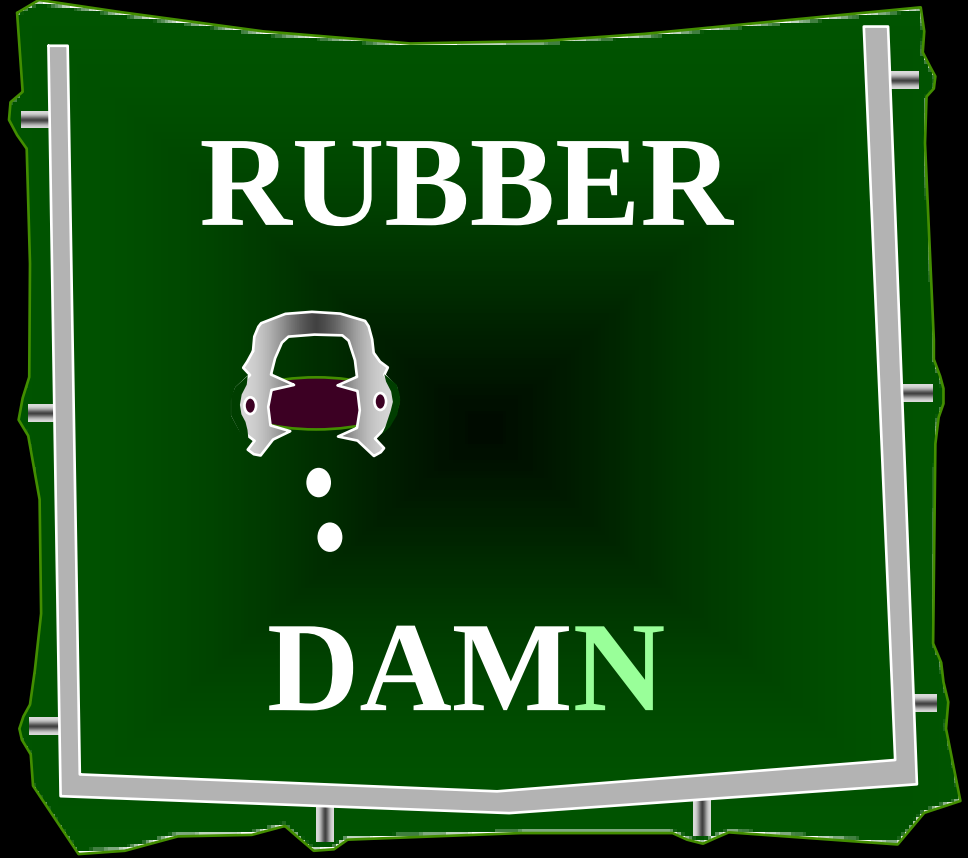
Maintain isolation during initial setting: ca. 10 minutes (high solubility)
Wait an additional 5-10 minutes before checking occlusion (cement is still very weak)

Tooth Colored Restorations: Harry Albers

Any wonder that failures like this occur?

The reason is the solubility of the cement!

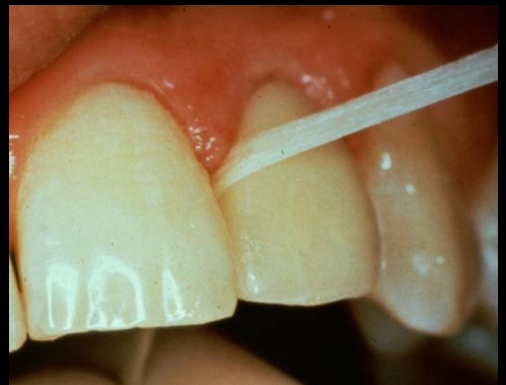


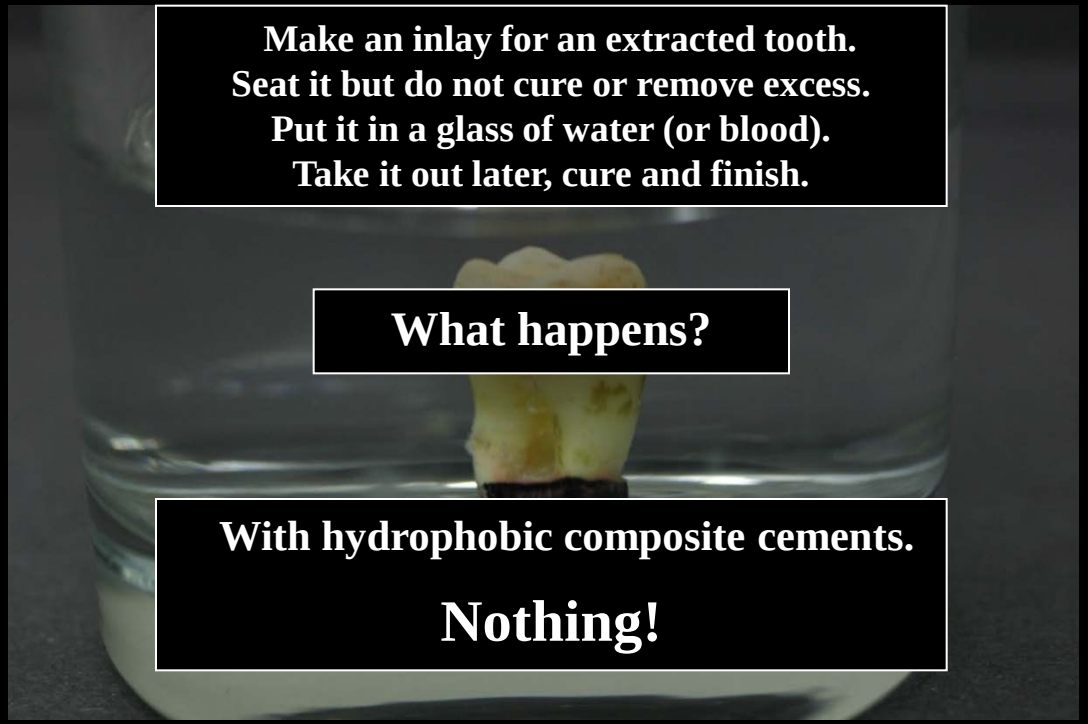


Anyone who tells you that you cannot do adhesive dentistry without rubber dam is an idiot

Contamination with blood or saliva during cementation?

The only critical time is between etching and seating (two minutes)





With conventional cements this is a problem!

Patient came immediately after fracture.
I did not do anything but wash off the blood.

Where is the cement?

Yes, it took more than ten years,
but the decision to use a conventional cement
(and a tapered metal post) led to extraction.

Zirconia: a classic case of substitution marketing
(do everything the same but with zirconia instead of metal)

What kind of dentists are cementing zirconia with conventional cements?

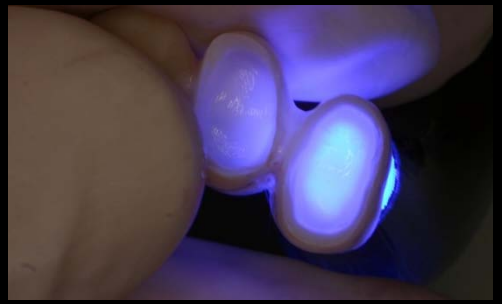
OLD FASHIONED ONES

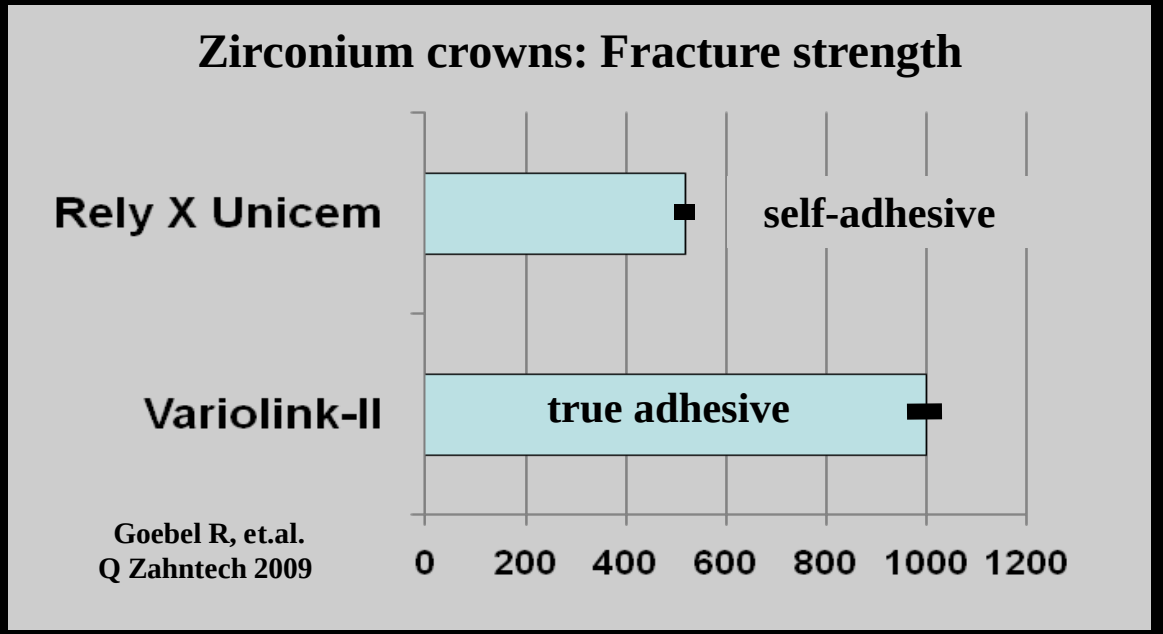
making believe they are modern?

OR

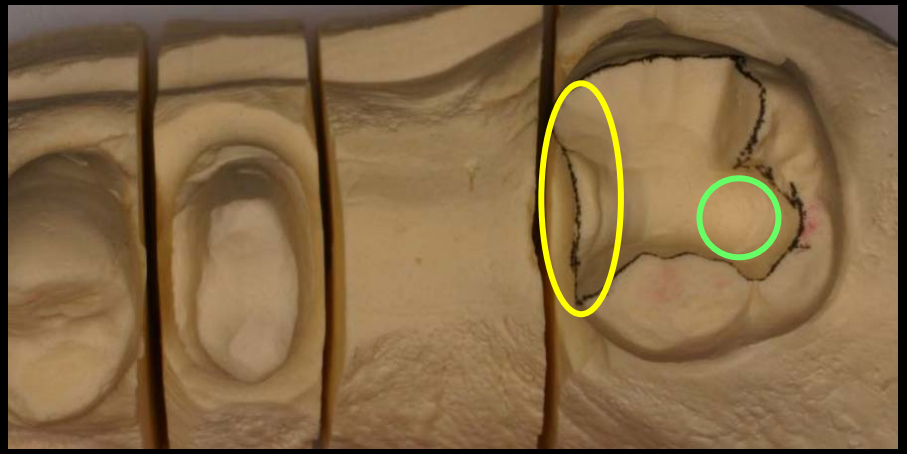
BRAIN DEAD

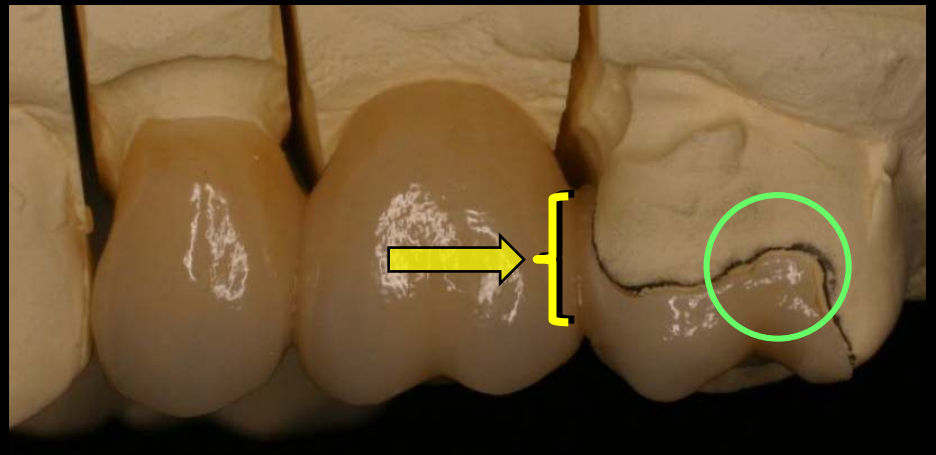
Adhesive cementation increases strength and reduces stress corrosion





Implant suggested, patient decided on metal-free FPD
Distal connector fracture is primary risk factor





Adequate connector dimension

Partial crowns

Deeper preparation distal (resistance form)

(Yes, I know zirconium is a metal)

ZirPress

high strength, good aesthetics, and bondable!

ZirPress ca. 50% stronger than seven competitive products.

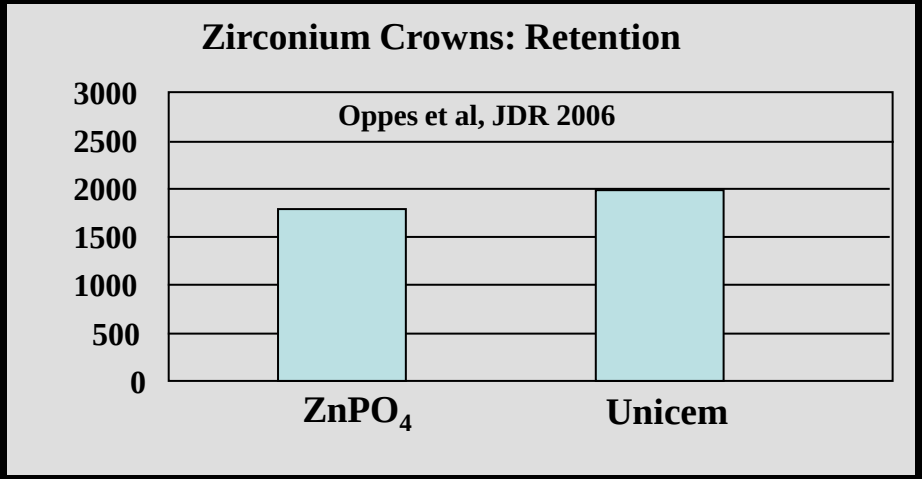
Stawarczyk B, et.al. J Dent Res 2010

Lower "chipping" rates in clinical studies with pressed veneering ceramics.

CAD-ON might be better

Loss of retention of a metal-ceramic crown: vital tooth.
Can you get enough mechanical retention for conventional cementation?

What about RMGI or self-adhesive cements?



Fatigue performance of gold crowns luted with resin cements.

Calibra = C+B Opaque > Panavia F > Rely X Unicem = Zinc Oxyphosphate

Uv JN, et.al. J Prosthet Dent. 2006

Loss of retention of a metal-ceramic crown: vital tooth.
Can you get enough mechanical retention for conventional cementation?

Prepare subgingivally?
Surgical crown lengthening?
Elective endodontics and post?
Hope the patient moves?

What about RMGI or self-adhesive cements?

Indication

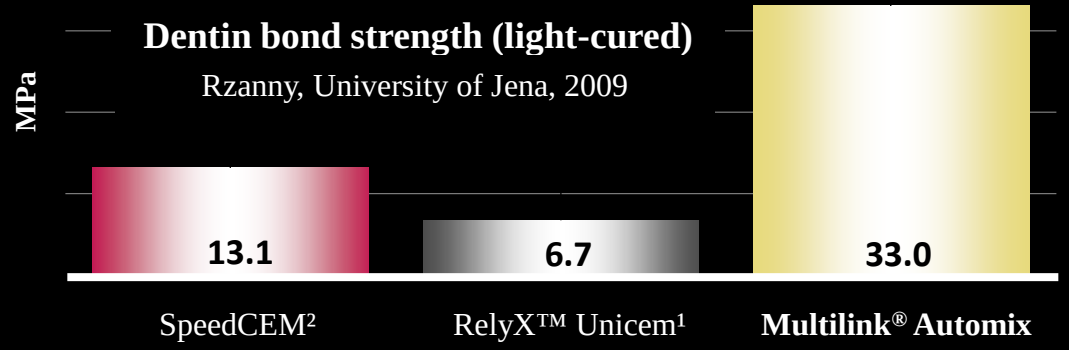
full coverage crowns
with adequate mechanical retention
and good accuracy
(in these cases, they are better than conventional cements)

How many crowns do you do for low caries risk patients?

Loss of retention of a metal-ceramic crown: vital tooth.
Can you get enough mechanical retention for conventional cementation?

Prepare subgingivally?
Surgical crown lengthening?
Elective endodontics and post?
Hope the patient moves?

What about RMGI or self-adhesive cements?



Clinical technique for all three is similar:
brief cure and fracture off the excess.

Why accept the lower bond strength?

Multilink:	**26.6 ± 9.0**
G-cem:	**3.8 ± 3.4**

Ritter R, et.al. J Dent Res 2010

Adhesive cementation reduces all of the risks.

Yes, you do need an adhesive and a silane. This takes about three minutes.

The rest of the technique saves you at least fifteen minutes!

No waiting on initial setting: brief cure, remove excess, finish curing.

No requirement for long isolation; low solubility immediately.

No risk when checking occlusion; very high early strength.

Significantly better retention.

Hydrophobic: helps prevent stress corrosion / long-term fractures.

Bonded gingival increment prior to impression
(could not get floss below margin)

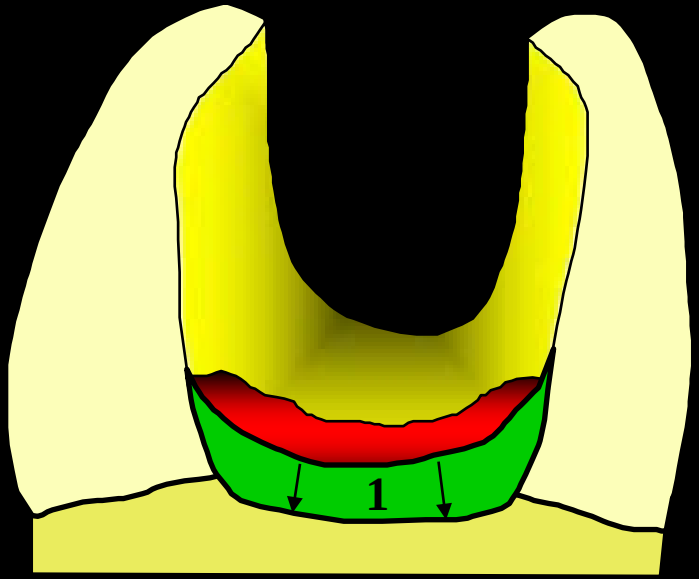
Time for bond maturation and completion of shrinkage

Bond of composite cement to gingival increment depends on free radical decay, i.e. time

(A technique I suggested for Cerec in the early 1990's)

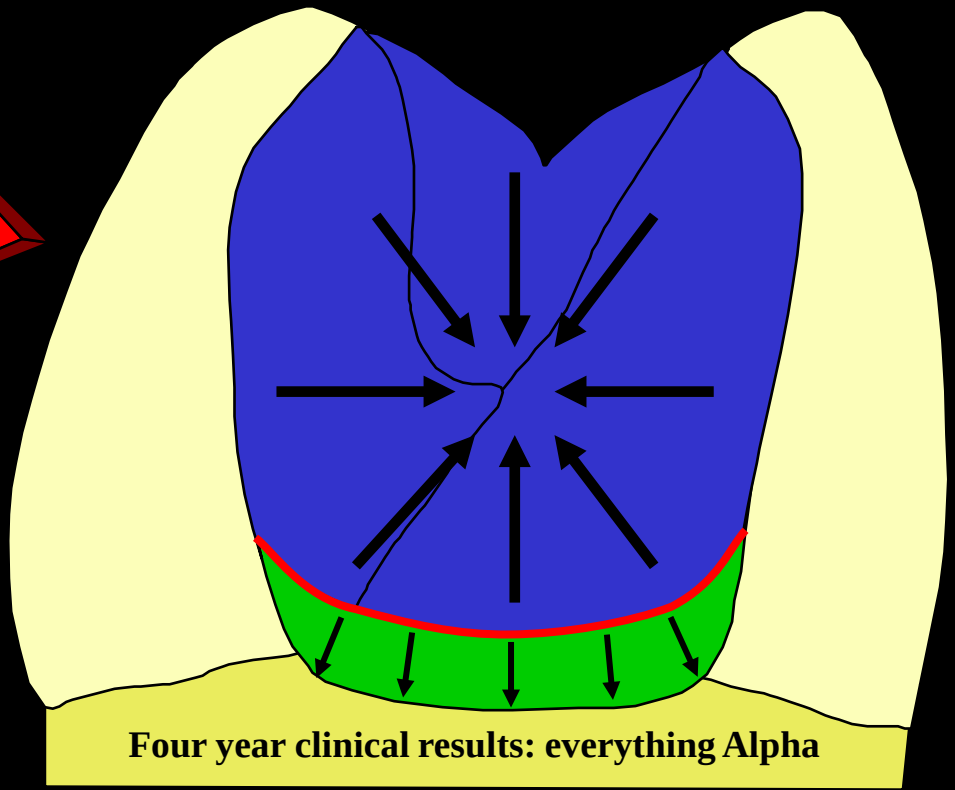
Decoupling Technique

T Cowan, G Unterbrink, NHF Wilson. J Dent 1996



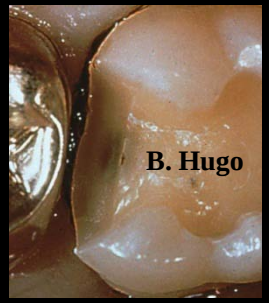
Application of "temporary separator" on gingival layer

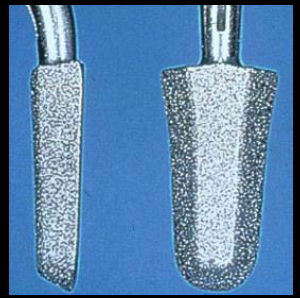
Dentin Adhesit polyurethane varnish catalysed by water with setting expansion



Four year clinical results: everything Alpha

No matter which cement you use, the requirements for a good result are the same.





A clear and sharp preparation margin and an accurate impression!

207 publications about dentist/technician cooperation during the last 30 years

Hatzikyriakos A, et.al.
Journal of Prosthetic Dentistry 2006;96(5):362-6

Laboratory Evaluation

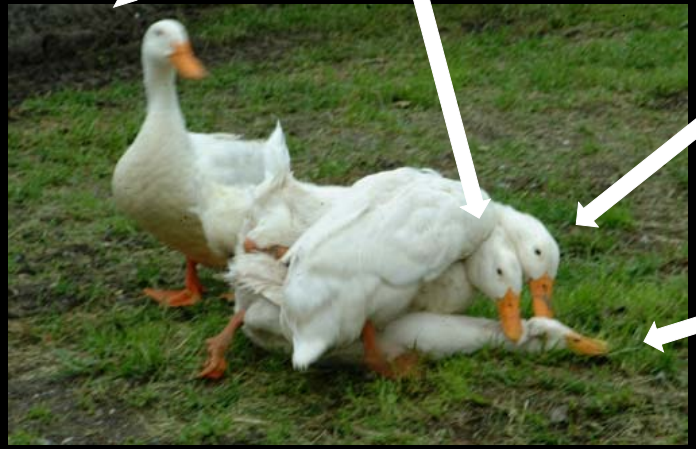
30% of impressions absolutely unusable
80% of models with at least one preparation with unclear margins

How does it really look with dentist/technician cooperation?

Ray

Dentist

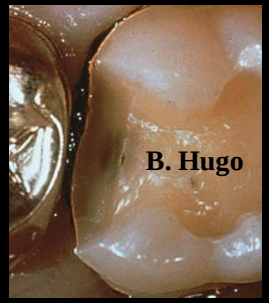
Technician

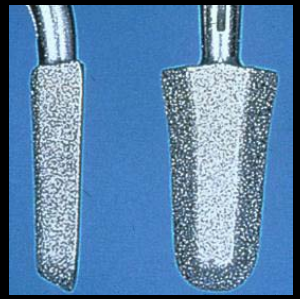


Patient

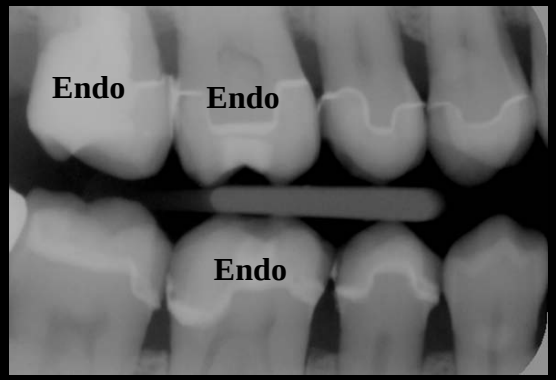
Every job needs a supervisor

No matter which cement you use, the requirements for a good result are the same.





A clear and sharp preparation margin and an accurate impression!

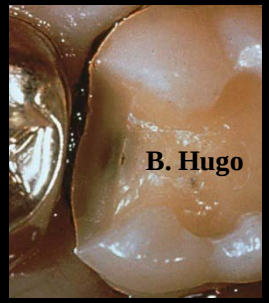


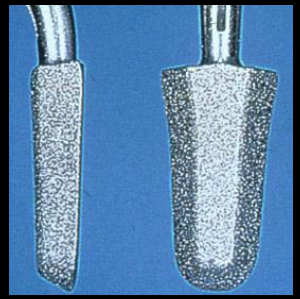
Without accuracy, conventional cementation is a bad dream,

but adhesive cementation is a real nightmare for both the dentist and the patient!

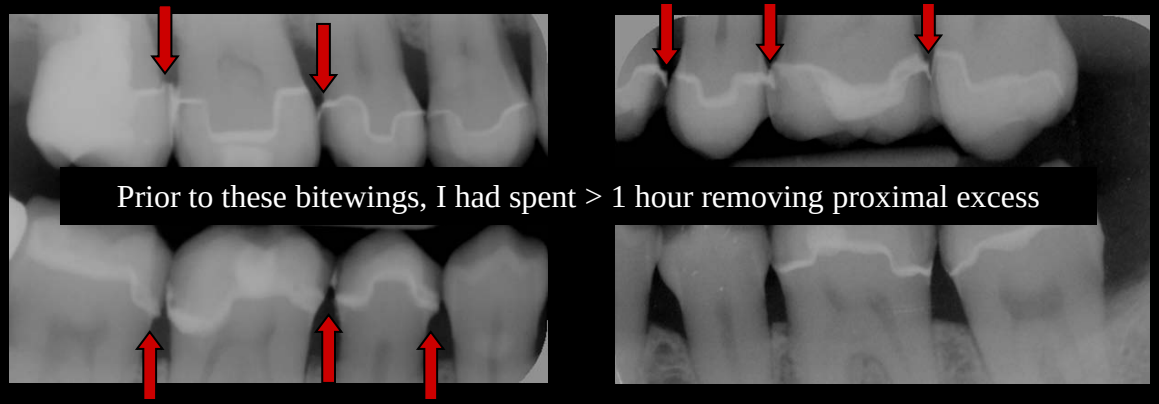
Emergency endodontics 17, patient decided to stay with our practice

No matter which cement you use, the requirements for a good result are the same.





A clear and sharp preparation margin and an accurate impression!



Without accuracy, conventional cementation is a bad dream,

but adhesive cementation is a real nightmare for both the dentist and the patient!

When the patient complained about problems with flossing, the dentist told her: "It's not necessary, we have eliminated the risk."

Univerity of Zuerich

Acceleration of Setting Reaction

Quantity of Adhesive

Multilink / Multilink Adhesive
Variolink-2 / Excite DSC
Panavia F / ED Primer

Do not use a dentin adhesive from one system and a cement from a different one

All manufacturers are aware of this: read the instructions for use

Acceleration of Setting Reaction: Good or Bad?

Metal ceramic or opaque ceramic crowns

Adhesive

Cement

Contact

Initial contact with adhesive during seating.

In this situation, acceleration of setting is an advantage.

Acceleration of Setting Reaction: Good or Bad?

FRC posts, inlays, etc.

Acceleration is

BAD

Whenever you will put the cement on or in the tooth first

Rotating path of insertion

Acceleration of Setting Reaction: Good or Bad?

FRC posts, inlays, etc.

Whenever you will put the cement on or in the tooth first

Use a combination without acceleration

or reduce the effect by extreme thinning of the adhesive
(reduce further by adding a layer of unfilled resin and air thin again)

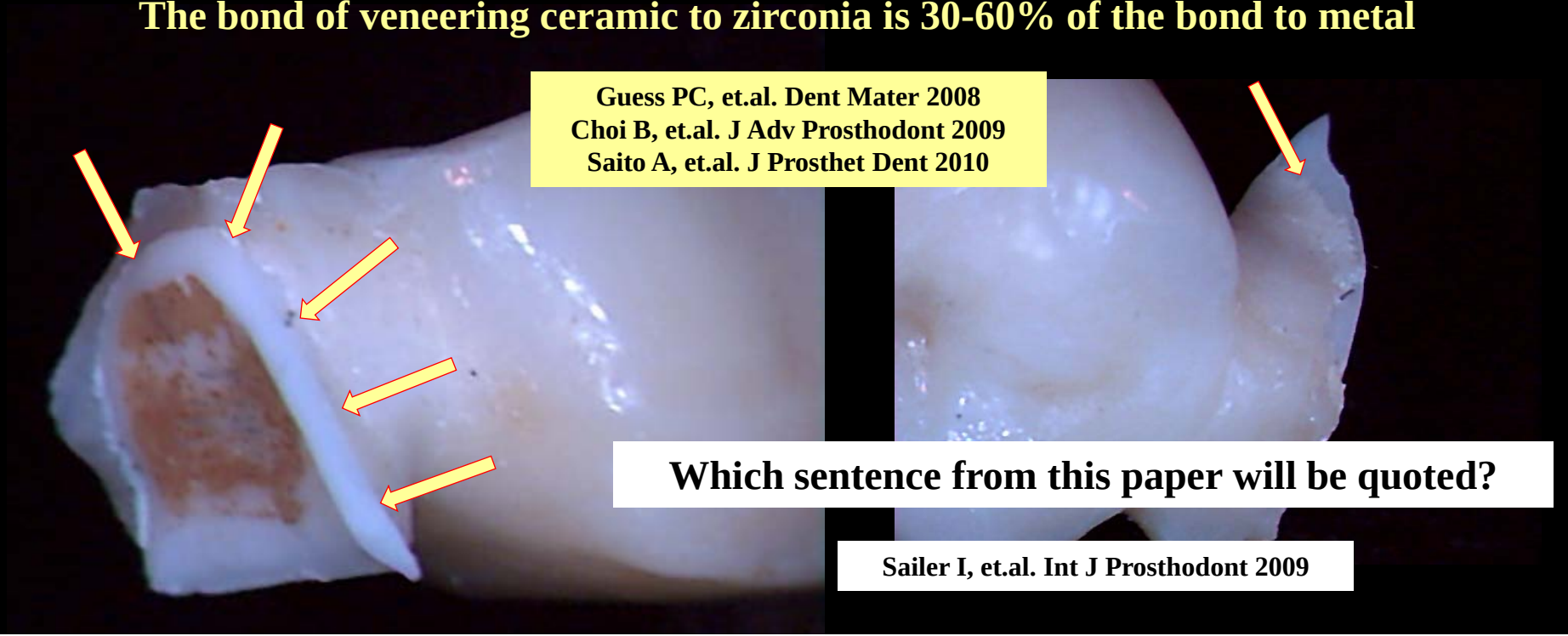
Syntac

+

Variolink-II

"Chipping" sounds pretty harmlesss

The bond of veneering ceramic to zirconia is 30-60% of the bond to metal



Guess PC, et.al. Dent Mater 2008
Choi B, et.al. J Adv Prosthodont 2009
Saito A, et.al. J Prosthet Dent 2010

Which sentence from this paper will be quoted?

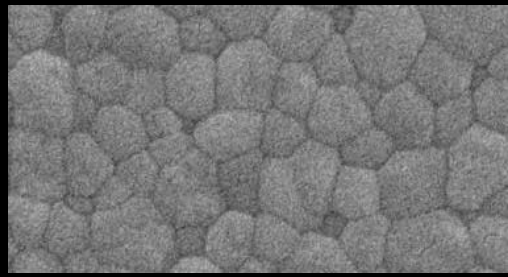
Sailer I, et.al. Int J Prosthodont 2009

"The survival of both kinds of FDP's was 100%."

Fractures of the veneer have been the main problem with zirconia

Veneer failures / year		
Nozaki	5 yr	0.8%
McLaren	5 yr	1.2%
Tinschert	5 yr	1.2%
Oden	5 yr	1.5%
Walter	5 yr	1.6%
Bind	3 yr	1.8%
Roediger	4 yr	3.0%
Sailer	5 yr	3.1%
Sailer	10 yr	3.2%
Edelhoff	3 yr	3.2%

phase transformation?
lack of interdiffusion zone?
thin core + thick veneer = stress inversion?



A linear failure rate over ten years is frightening!

Fractures of the veneer have been the main problem with zirconia

Veneer failures / year		
Nozaki	5 yr	0.8%
McLaren	5 yr	1.2%
Tinschert	5 yr	1.2%
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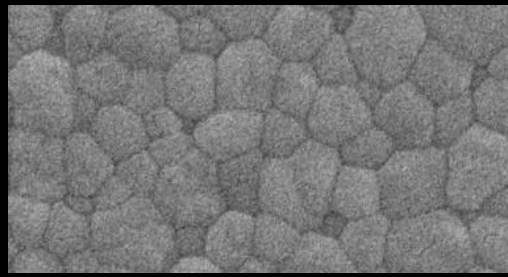
Bind	3 yr	1.8%
Roediger	4 yr	3.0%
Sailer	5 yr	3.1%
Sailer	10 yr	3.2%
Edelhoff	3 yr	3.2%
Christensen	2 yr	26.3%*

phase transformation?
lack of interdiffusion zone?
thin core + thick veneer = stress inversion?



* Private practices

Cercon 32/18, Lava 32/19, Everest 33/14

Improper preparations? Adjusted and not polished?
Non-anatomic frameworks? Slow cooling?

In the land of aesthetic excess, zirconia without veneering it

Naming it BruxZir is brilliant

Veneer fractures are not our fault, you didn't do a proper diagnosis

Nearly all companies have copied this concept, indirect proof that all of them have problems

Unfortunately, most cases presented in web sites look like this.

Crowns were unnecessary, the result is frighteningly ugly, and does not even address the problem of parafunction.

What do dentists find attractive about "inverted tin can" dentistry?

In the land of aesthetic excess, zirconia without veneering it

Naming it Bruxzir is brilliant

Veneer fractures are not our fault, you didn't do a proper diagnosis

Don't do veneered zirconium crowns for any patient with wear facets

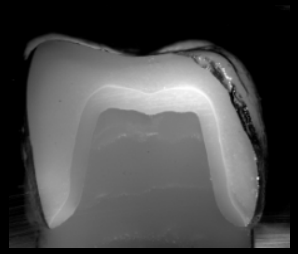
Cercon FPD's on implants
3 years

No framework fractures but
34% with veneer fractures.

Larsson C, von Steyern V, Nilner N.
Int J Prosthodont 2010;23(4):364

Veneer fractures with 4 of 6 crowns
< 2 years

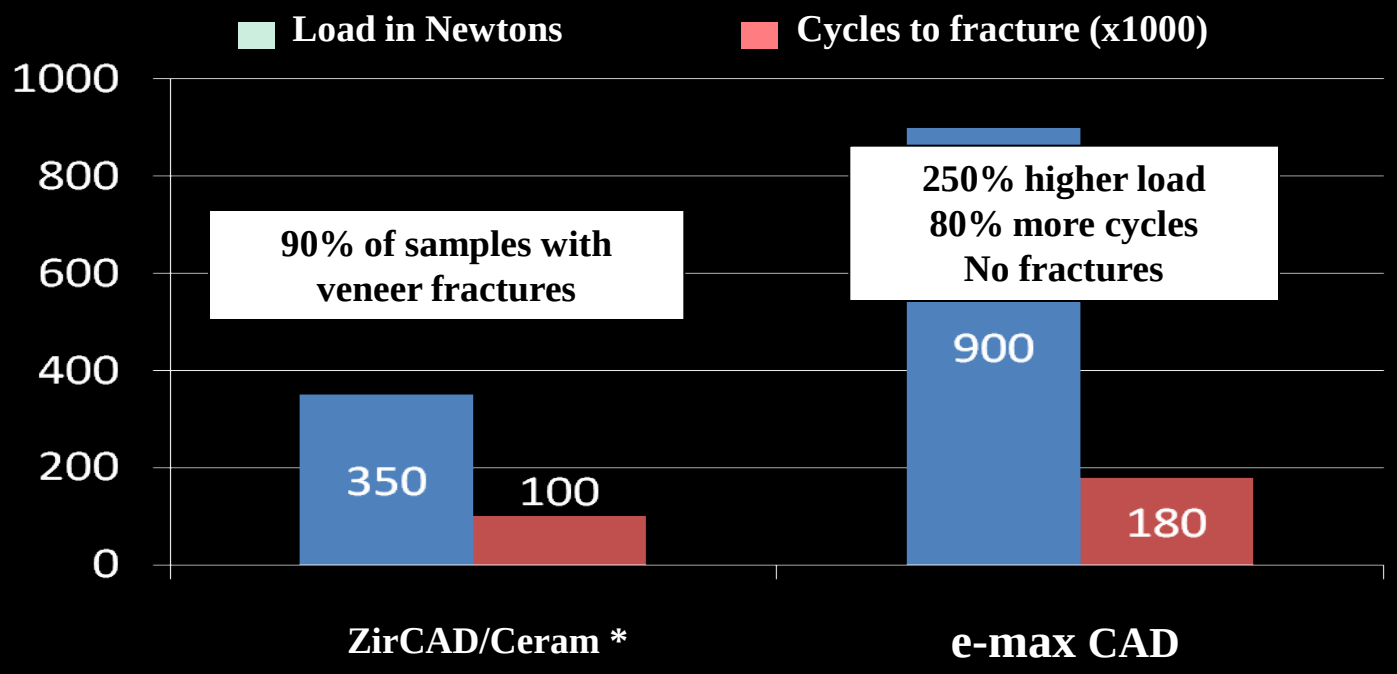
Cyclic fatigue load to failure



ZirCAD/Ceram

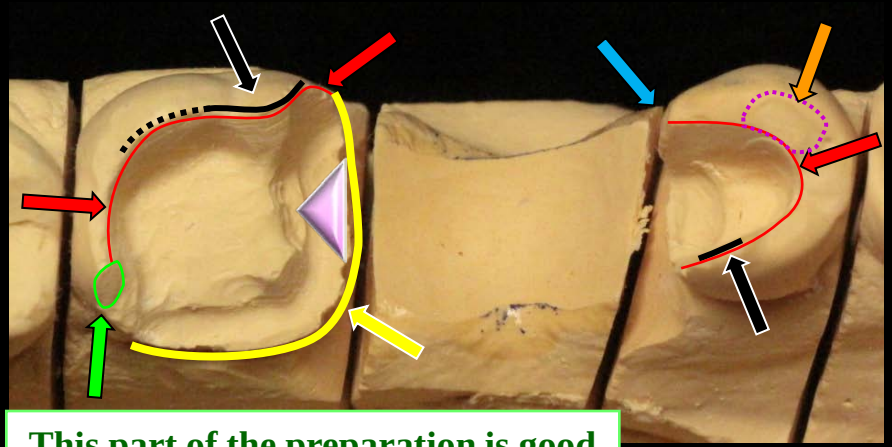
* Same results with LAVA and Cercon

e-max CAD



Guess PC, Zavanelli R, Silva N, Thompson VP. J Dent Res 2010

Website pictures from "America's holistic dentist" in CA



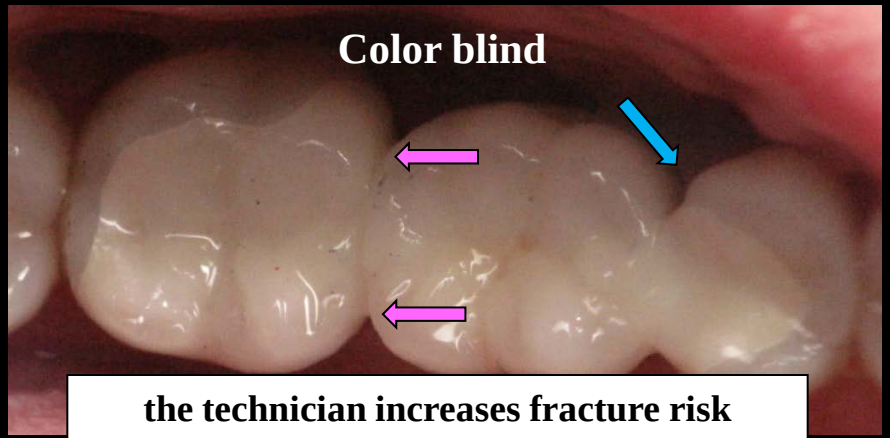
This part of the preparation is good

prepared but
not restored?

margins ending
outside cusp tips

wrong angles
for bond to enamel

finished?
(flat and fractured)



the technician increases fracture risk
with deep embrasures

Balancing contact
No resistance form

V
of
?

He thinks adhesive dentistry is magic

Adhesive dentistry is a modern interpretation of tradition.
It requires the same attention to detail as traditional techniques and is still dependent on classic mechanical principles.

Buying an adhesive should not automatically delete all brain files.

Adhesive dentistry is a modern interpretation of tradition.
It requires the same attention to detail as traditional techniques and is still dependent on classic mechanical principles.

Despite continuous attempts, fashion designers cannot ruin women.

Combining tradition with adhesive advantages

Adequate connector dimensions
Correct angles for bonding to enamel
Resistance form!

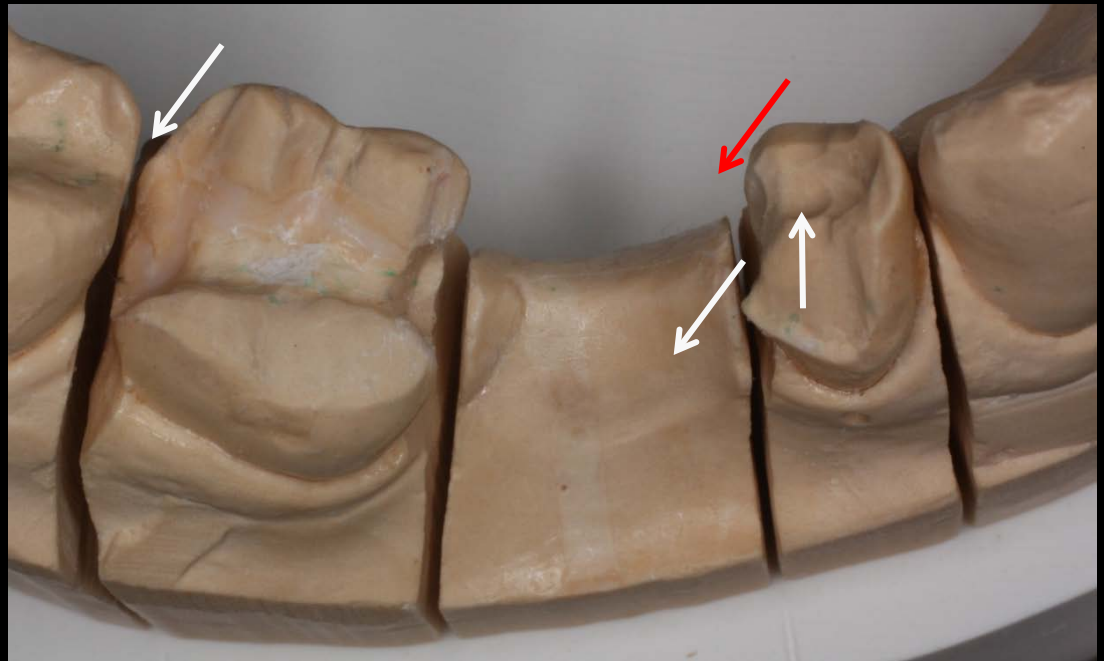
Preparing these teeth for metal-ceramic or zirconia crowns would be insane!

This is not experimental dentistry!

So much simpler than preparing crowns, and much less traumatic for the teeth.

Fewer difficulties with gingival retraction and impression techniques.

Retention of temporaries can be a nuisance.



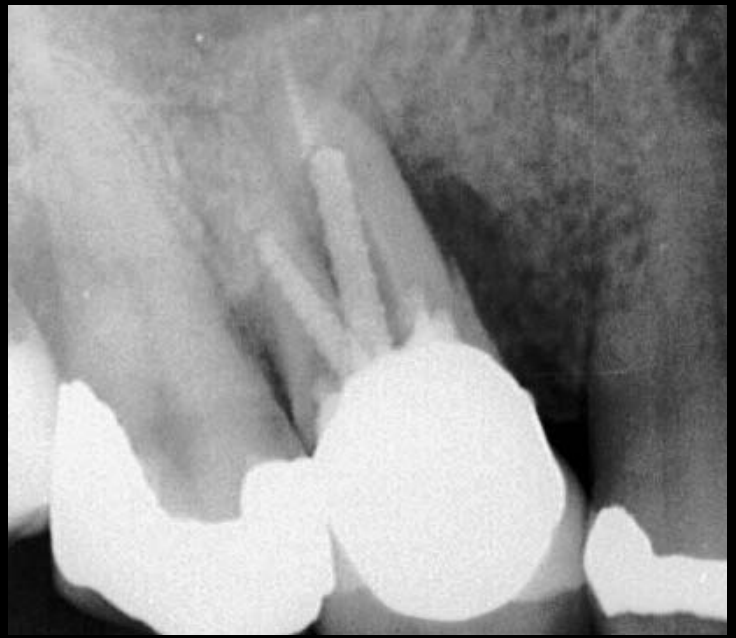
Crowned
ca. 2 years ago

Two weeks previously his dentist told him everything was fine!

Even if we ignore

the questionable endo, the poor fit of the crown, and the overhangs on the amalgams,

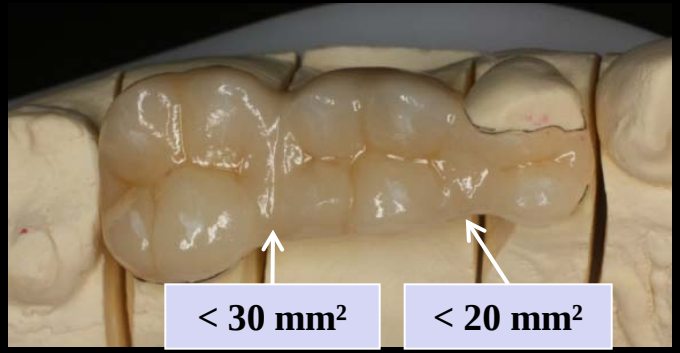
how can any dentist still use threaded posts?



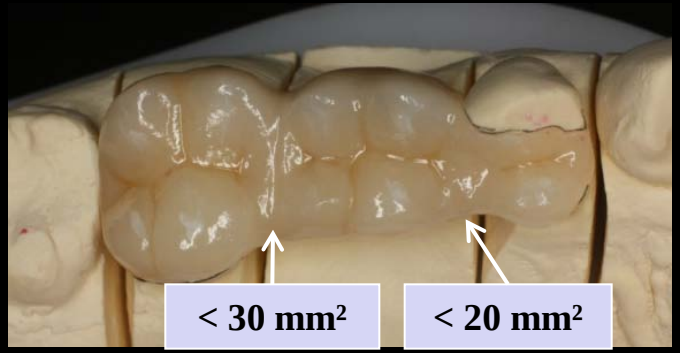
the palatal root is screwed

Crowned
ca. 2 years ago

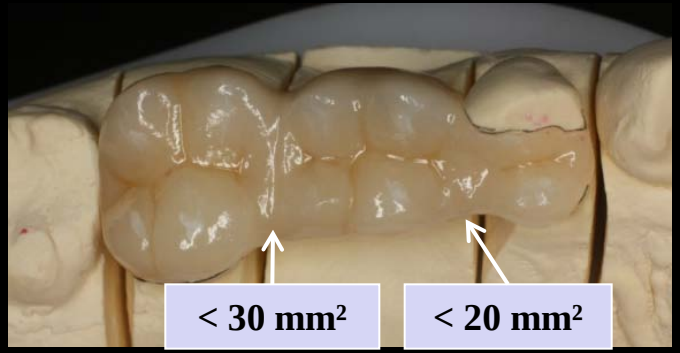
Two weeks previously his dentist told him everything was fine!



Who could seriously consider preparing either of these teeth for a crown?



Who could seriously consider preparing either of these teeth for a crown?



66 years old
A perfect patient

I want nice front teeth and
I don't care what it costs

Excellent hygiene
Intelligent

Crowns: e.max press
(adhesive)

Veneers
Empress Esthetic

Direct composites
Artemis

8+ year recall
(March 2012)

State of the Art

The least invasive possible treatment which produces the desired result

At a political dinner, I suddenly realized that I was the only woman at our table with teeth that look like teeth.

8+ year recall
(March 2012)

State of the Art

The least invasive possible treatment which produces the desired result

Take care of yourself.

I want a ten year recall picture

A short list of things which a good dentist does not use

Metal posts (especially "screw posts")




zirconia and carbon fibre posts are also pretty stupid

If you have these posts in your practice, buy a garbage bag on your way home

Fuss Z, et.a. J Endodontics 2001. F, Ferrari M, Watson TM. J Adhesive Dent 1999. Cormier CJ, Burns DR, Moon P. J Prosthodont 2001. Akkayan B, Gulmez T. Int J Prosthetic Dent 2002. Newman MP, et.al. J Prosthet Dent 2003. Fokkinga W, et.al. Int J Prosthodont 2004. Hayashi M, et.al. Dent Mat 2006. Salameh Z, et.al. J Endo 2007, Int Dent SA 2008.
etc.

A short list of things which a good dentist does not use

Metal posts (especially "screw posts")

Metal ceramic or zirconium for anterior teeth

5 years

Think about the "daughter principle"

(Do you want her to look like this in five years?)

Courtesy of
Dr. Kaneko

10 years

A short list of things which a good dentist does not use

Metal posts (especially "screw posts")

Metal ceramic or zirconium for anterior teeth

Single component bonding agents
(self-etching will work, but you must etch the enamel and add the flowable)

How can you ignore the experts and clinical study results?

Van Meerbeck B. Ernst C-P. Frankenberger R.
Perdigao J. Peumans N. Unemori M.
etc.

A short list of things which a good dentist does not use

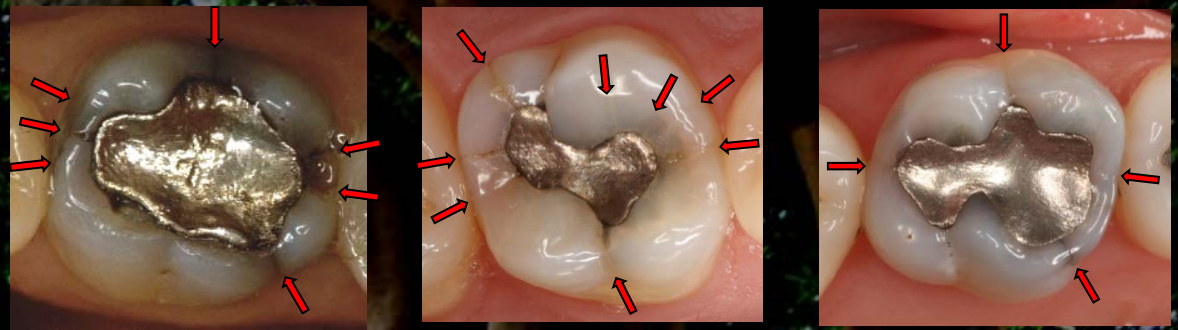
Metal posts (especially "screw posts")

Metal ceramic or zirconium for anterior teeth

Single component bonding agents

Amalgam

The "big bang" restorative
Gamma-1 to beta-1 phase shift and eternal expansion



A short list of things which a good dentist does not use

Metal posts (especially "screw posts")

Metal ceramic or zirconium for anterior teeth

Single component bonding agents

Amalgam

If you use these materials, you are automatically a member of the FDI

Federation of the Dumb and Ignorant

A short list of things which a good dentist does not use

Metal posts (especially "screw posts")

Metal ceramic or zirconium for anterior teeth

Single component bonding agents

Amalgam

And, a good dentist will try to avoid

Traditional crown preparations
Conventional cements

Dentists should hate doing crowns

because there is almost always a better alternative

Anyone doing more than a few initial crown preparations per month can award themselves two extra titles

Dr. Igno Ramus, MID, DTD.

Master of Iatrogenic Dentistry
Doctor of Tooth Dust

Retrolunar Avenue 6
Tradition Square, I-ma-Cretin

The End


The primary function of
the brain is to cool the blood.
Aristotle
SIEMENS

Maybe he had been at his dentist's office on the day he wrote this.

The primary function of the brain is to cool the blood.

Aristotle

You cannot convince your opponents, you can only wait for them to die.

Max Planck

Another way your garbage bag can contribute to quality in dentistry

Maybe he had been at his dentist's office on the day he wrote this.