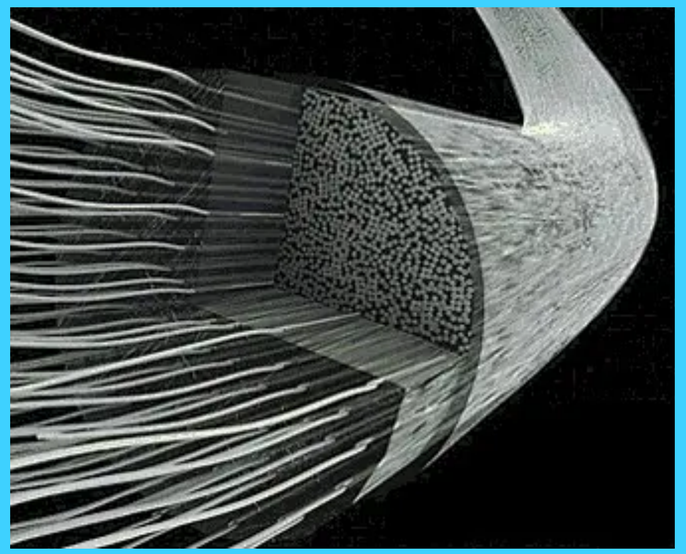
glasfiberforstærket Komposit

PTO

Vingsted

d. 2. oktober 2026

25 års erfaring på halvanden time





KlinikDag 2026

GC

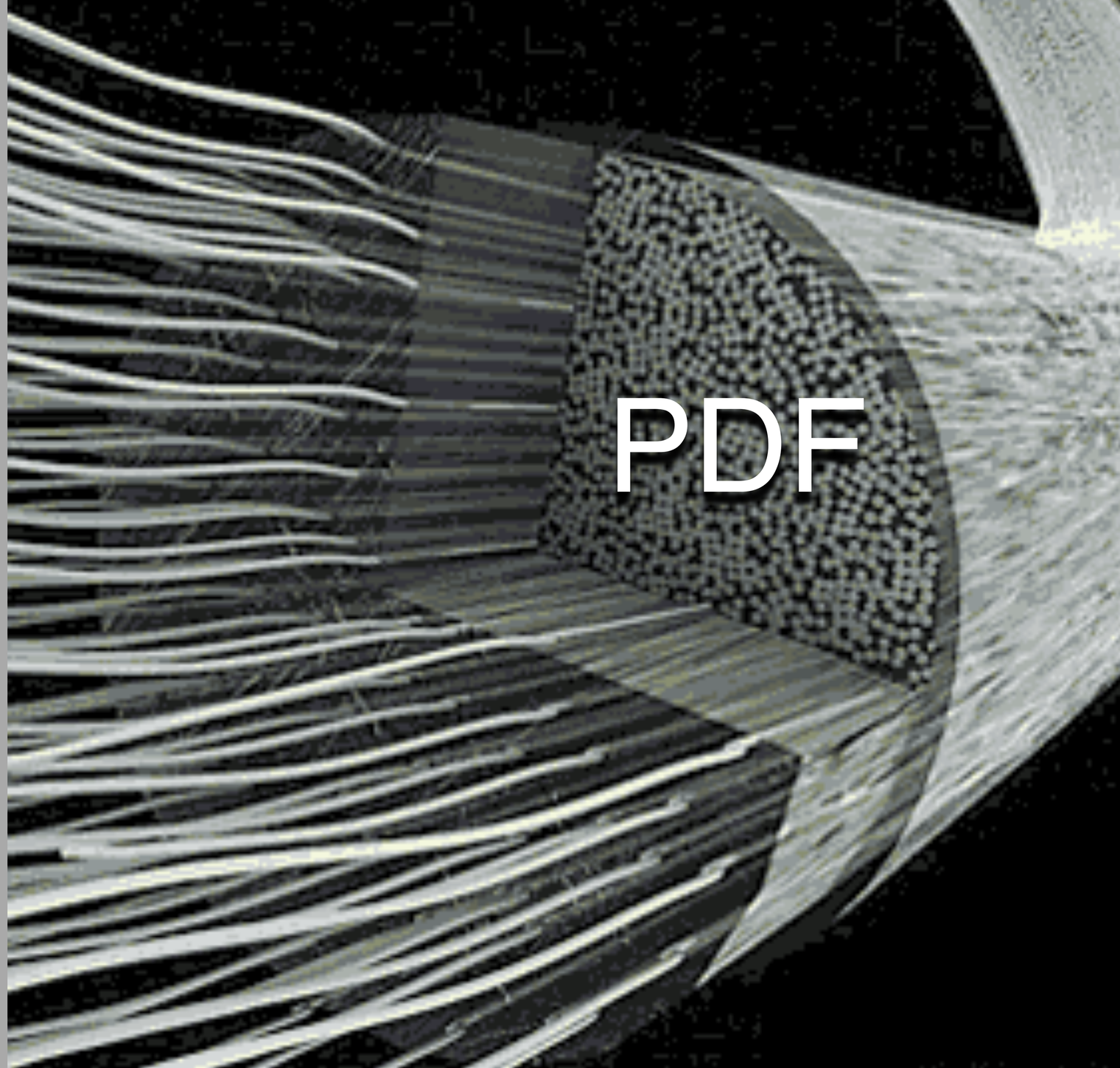
Smile for the World

Since 1921
100 years of Quality in Dental

Tandlæge Jan Frydensberg Thomsen

program

- lidt historie
- forskellige produkter
- everStick/everStickPost
- cases
- everStickNet
- cases
- everXPosterior flow og komposit
- cases





Professor Pekka Vallitu

silaniserede glasfiber bundter - resin og en plastikpose

1997

silaniserede glasfiber bundter i bisgma resin dækket af en termoplastisk polymer

2000-2003



everX Posterior

2013



everX Flow

2019



everStick


everStick®C&B
everStick®C&B
everStick®PERIO
everStick®POST 1.2
everStick®ORTHO

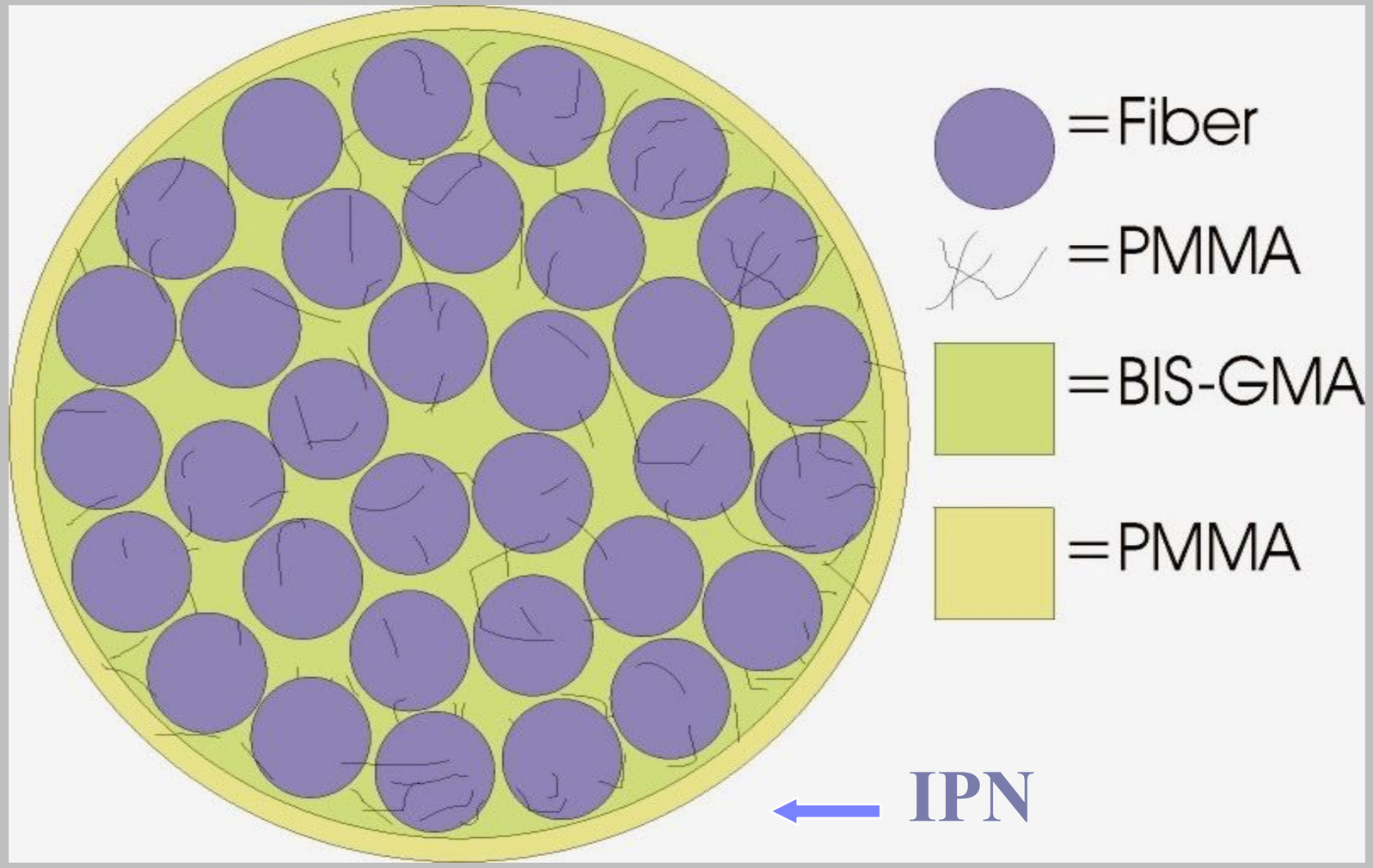


everStick

- Unidirektionelt orienterede silaniserede glasfibre
- Imprægneret i BISGMA og termoplastisk polymer
- Dette betyder :
- Går kemisk i forbindelse med komposit
- Meget høj brudstyrke
- Bonder til tandsubstansen med vores adhæsiver
- Kosmetisk velegnet pga. transluscente glasfibre
- Metalfrit materiale
- Billigt

Hvordan virker det?

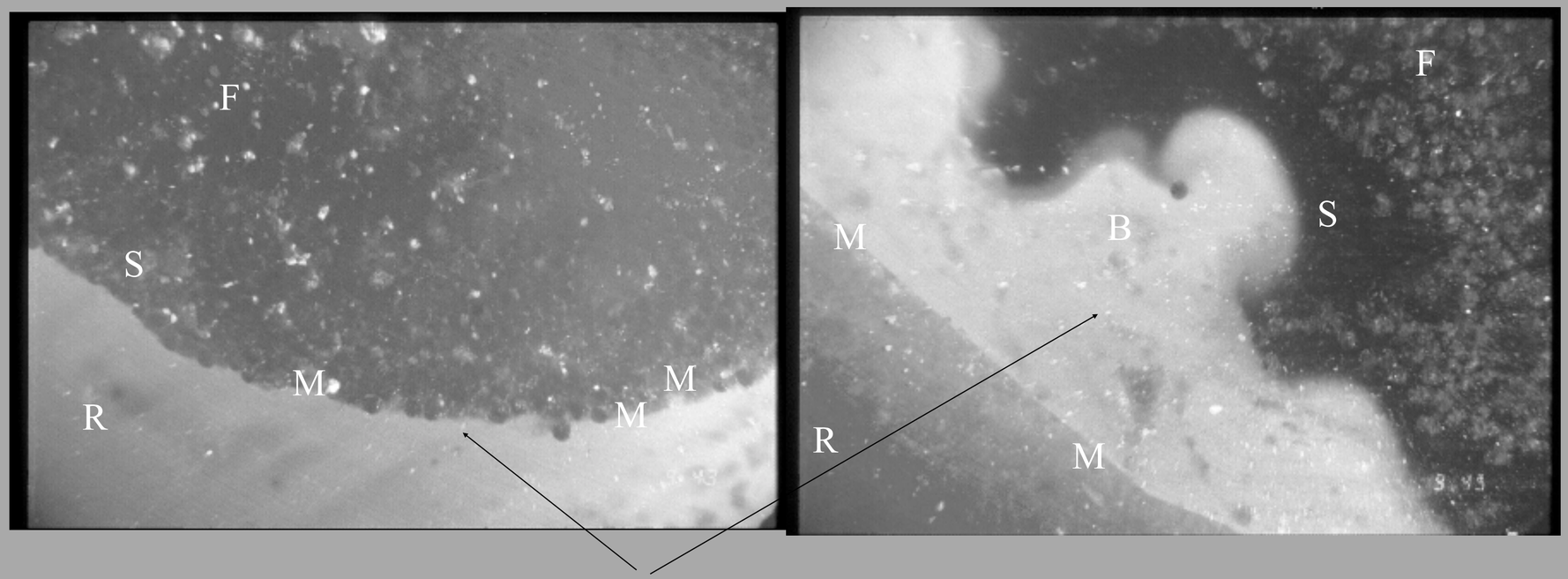
everStick-fiberbundets opbygning



IPN

- **Interpenetrating Polymer Networks**
- adhæsionen der opstår gennem monomers (resin) gennemtrængning af fiberbundtets overfladepolymer
- har været udnyttet i årtier ved reparationer af hel- og delproteser også ved påsætning af akryltænder på en akrylbasis

Resins evne til at penetrere ind i everstick POST matrix



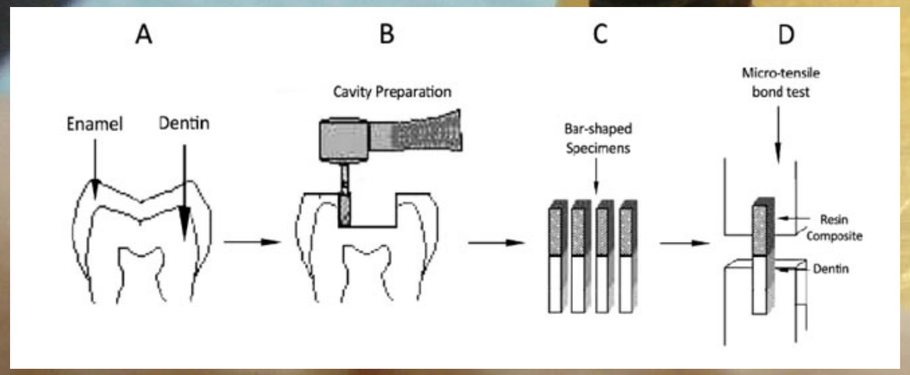
Præfabrikeret fiberstift

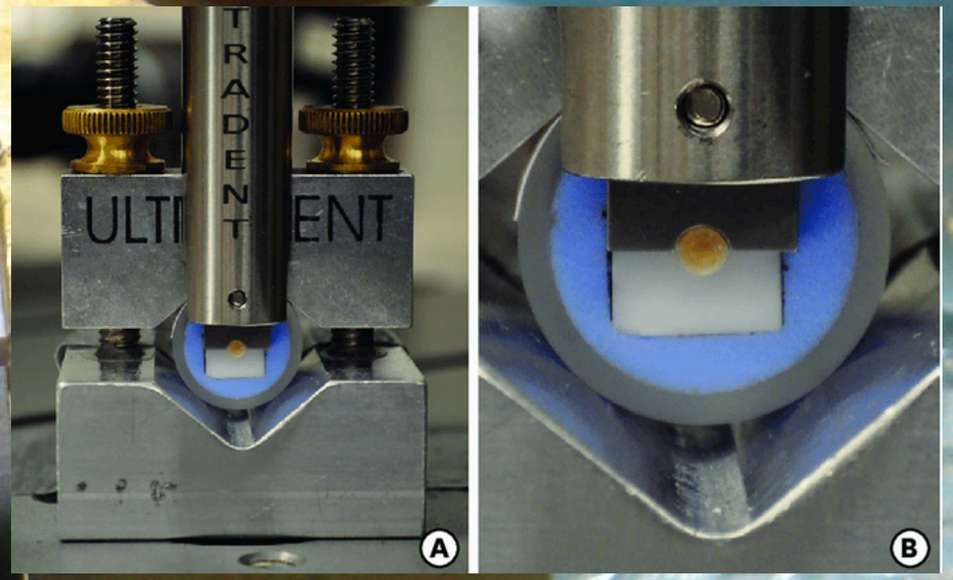
everStickPOST

Adhesive bonding resin penetrates into to IPN matrix of all everStick products but not into cross-linked matrix of pre-fabricated FRC post

Mannocci F, Sheriff M, Watson TF, Vallittu PK. Penetration of bonding resins into fiber posts: a confocal microscopic study. Endodont J 2005;38:46-51. Bitter K, et al., Quintessence Int 2007; 38:121-128.

er et bundt glasfibertråde indlejret i resin stærkt nok?





micro - macro - shear - tensile

MPa

hvad er MPa



9.806 mm2

1 MPa



Hvor stærk er everStick?

fuldt polymeriseret!



Komposit bøjestyrke: 80-160 MPa

Bøjestyrke (Flexural Strength) op til 1280 MPa



som støbt krom-kobolt metal

Elasticitetsmodul ca. som dentin

Komposit trækstyrke: 35-75 MPa

Trækstyrke (Tensile Strength) 183 MPa


Glasfiber og resin: 80-90 % af samlede vægt

80% efter volumen

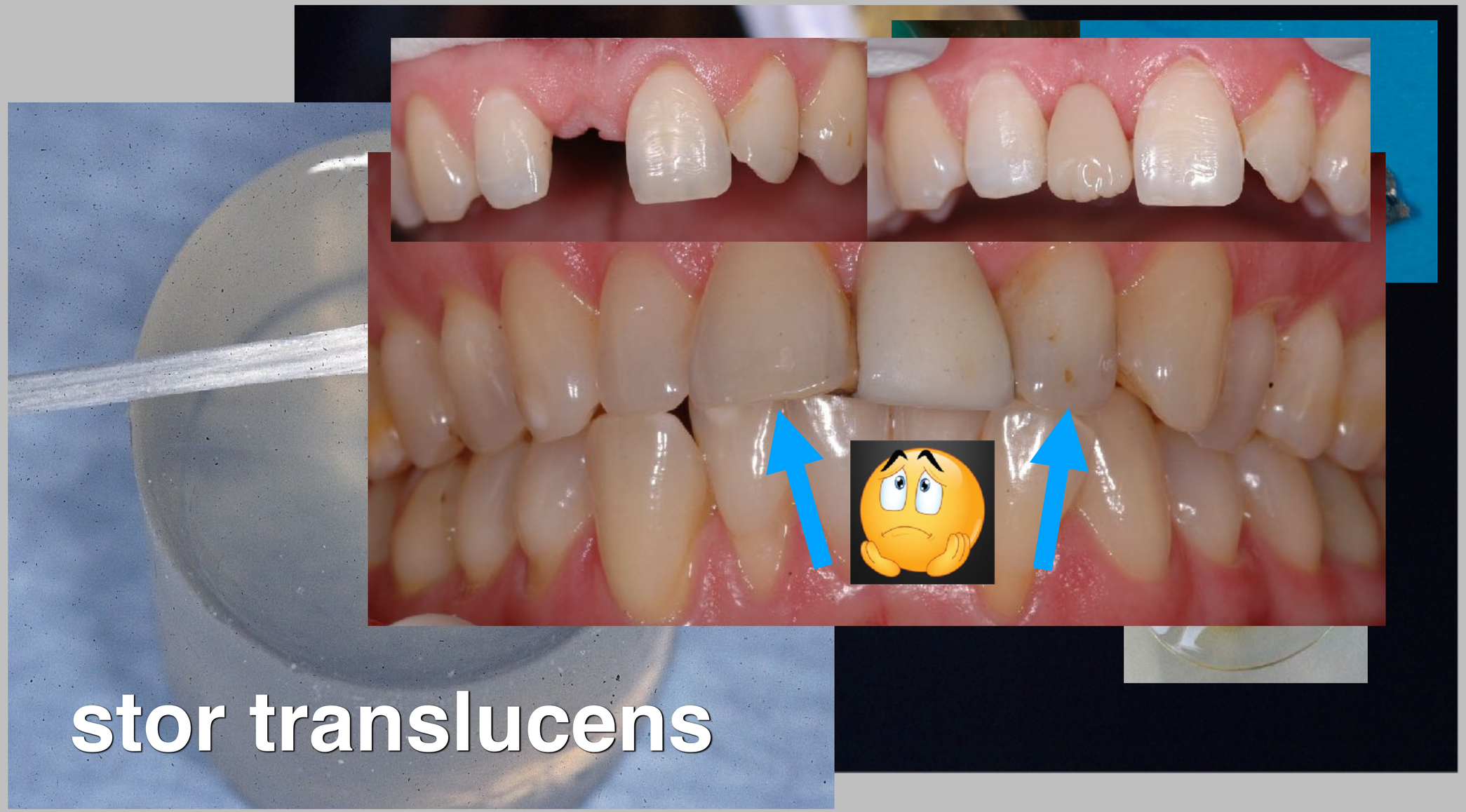


Car er =



flere fordele ved everStick

flosser ikke



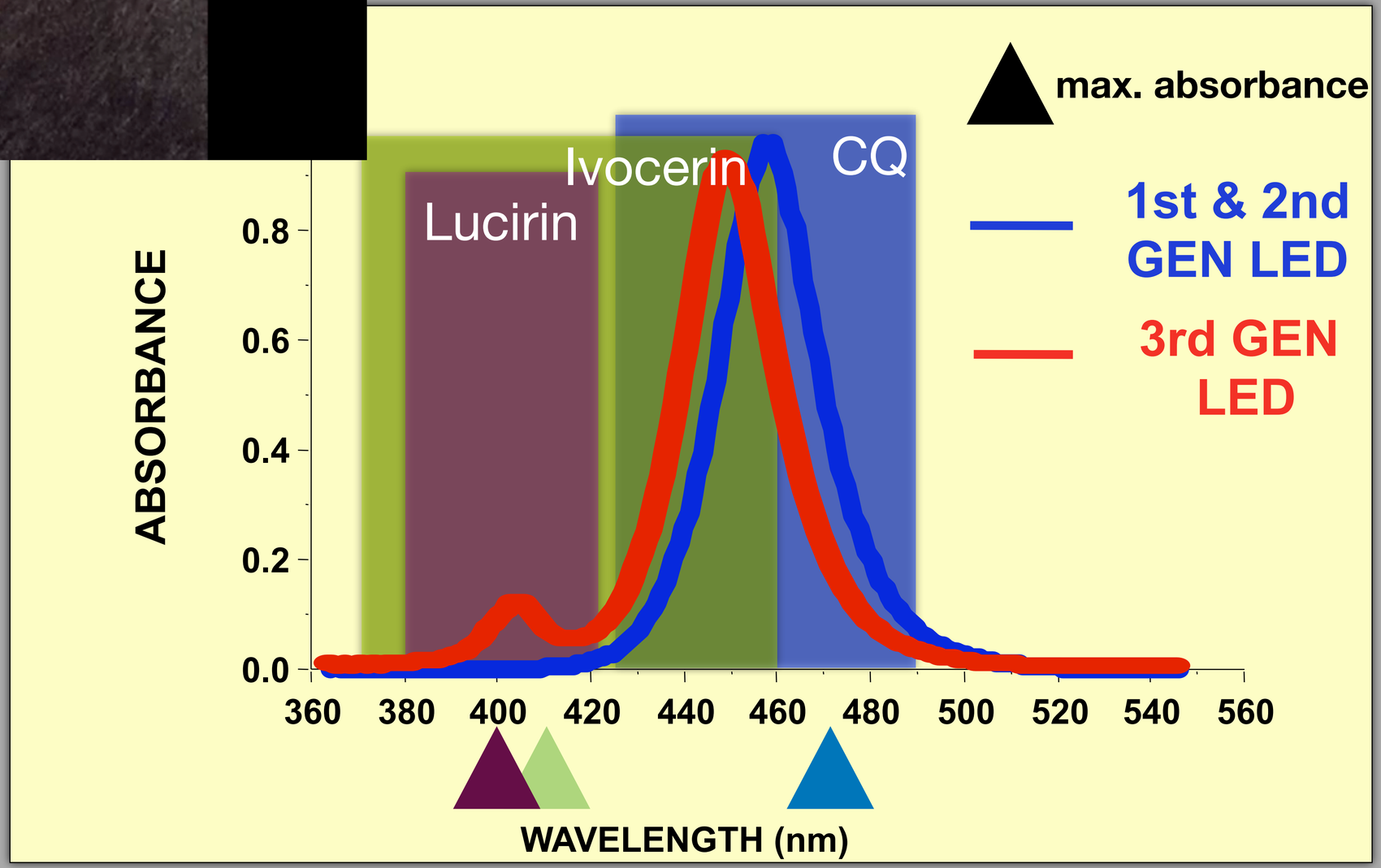
stor translucens

apropos CAMPHORQUINONE

kan polymeriseres met alle polymeriseringslamper



NITIATOR SERIES ABSORBANCES





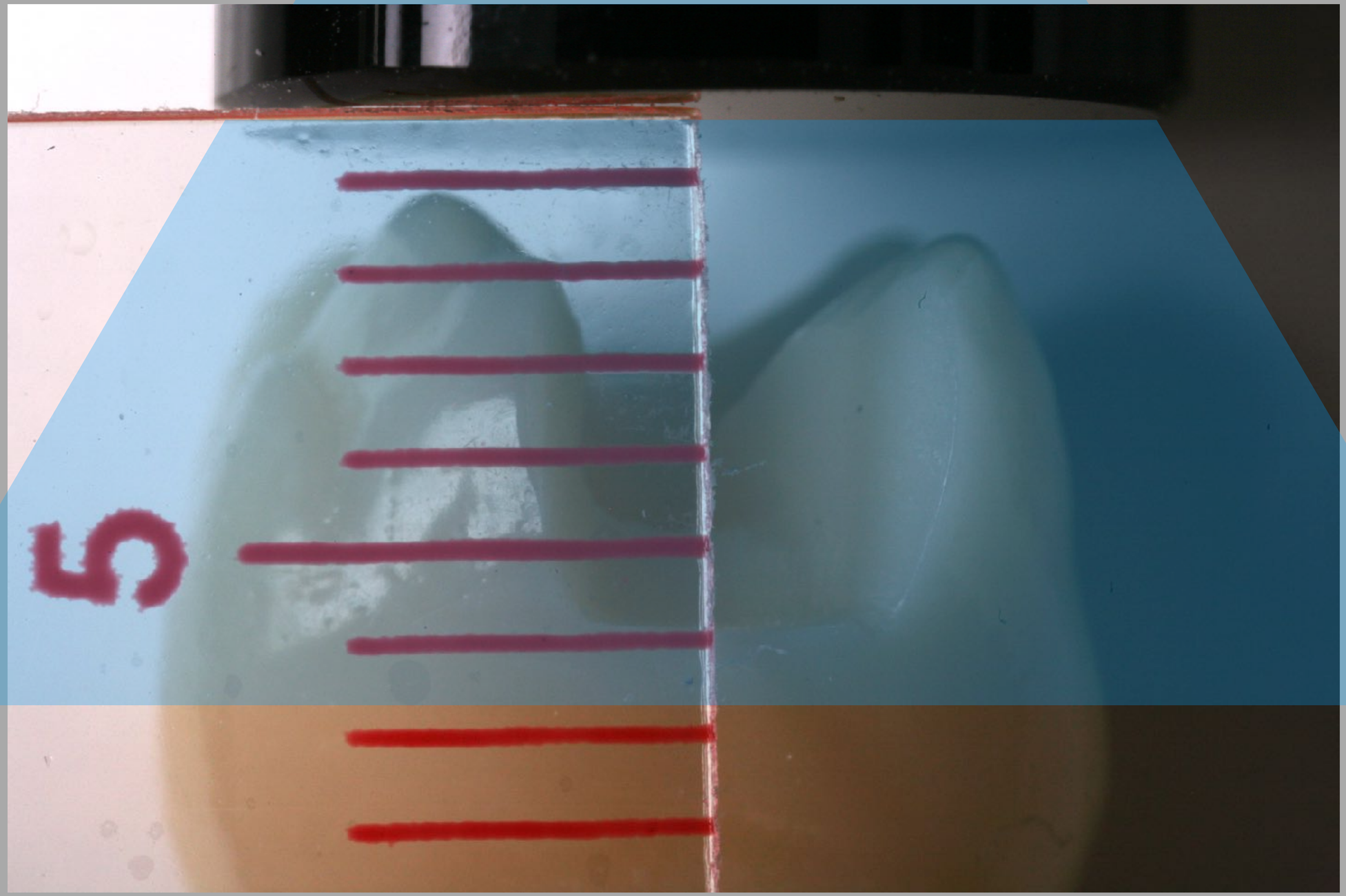
power density




0
400
800
1200
1600
2000
200
600
1000
1400
1800
mw/cm²




0
400
800
1200
1600
2000
200
600
1000
1400
1800
mw/cm²


5

underpolymerisering

tab af lysintensitet på 10 mm:

op til mere end 80%

Mayer et al. 2002

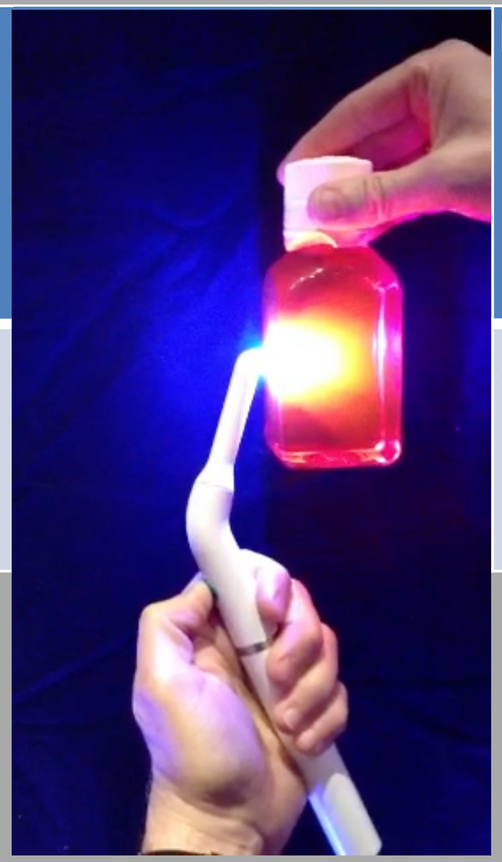
SÅ TÆT PÅ SOM MULIGT

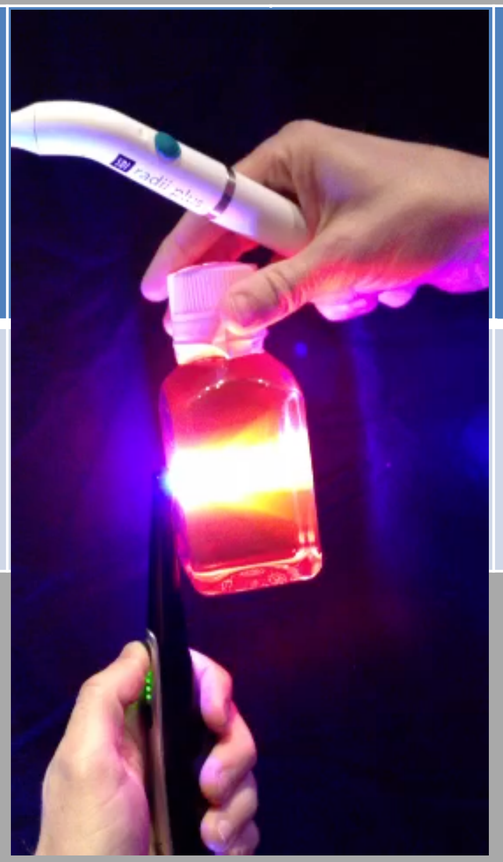


standarden på lyspol. Lamper mht. power density

power density

Brand				Radii Plus		
ISO-DOC Irradiance Change from 0-10 mm (%)		-62%		-90%		-66%





Improving clinical and laboratory relevance of ISO curing light testing
Deacon et al. (2013) IADR CED abstr. No 508

lyspol. lampe standarden på klinikkerne


defekt lysleder



Light intensity mW/cm²; Ulbricht sphere

- Total number of tested LCU: 659 (301 dental offices)
- 7 % below 200 mW/cm²
- 26 % below 400 mW/cm²
- 37 % of light guides contaminated with composite / bonding
- 5 % of light guides damaged
- 6 % of light guides damaged and contaminated

Ernst et al. 2006, DZZ 61(9)

hvor lang tid skal jeg lyse med MIN lampe?

polymeriseringstid ?

nødvendig energi dosis: 12000 – 16000 mJ/cm²

i.e. Koran and Kuerschner 1998

$$\text{polymeriserings tid [s]} = \frac{12000\ \text{mW s / cm}^2}{\text{Intensitet [mW / cm}^2\text{]}}$$

$$= \frac{12000\ \text{s}}{1200\ \text{mW/cm2}} = 10 \quad \times 2 \quad = 20\ \text{sek}$$

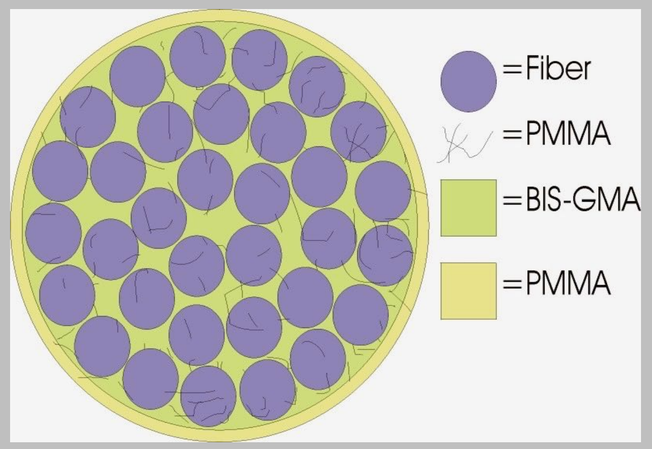
fiberforstærket plast

everStick Ortho - Perio - C&B - Post





1600 glasfibertråde i bundtet





Kliniske fordele ved everStick retainer

- Æstetisk – naturlig tandfarvet retainere
- Metal fri – komfortabel for patienterne
- Hurtig at udføre – ingen forudgående bukning af tråd
- Let at adaptere direkte på tænderne og bondes på plads
- Pålidelig adhæsiv bonding

Placement procedure

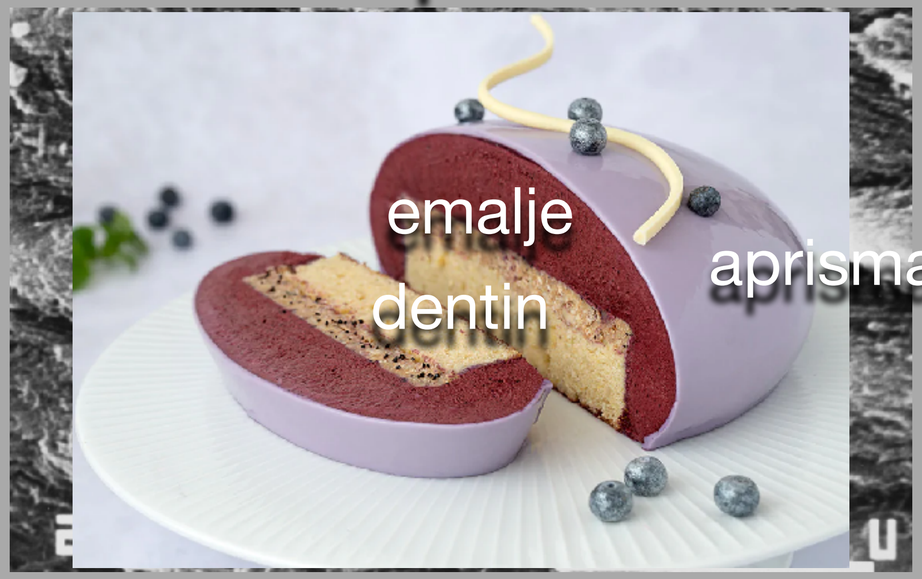


After careful etching, bonding and light curing add a continuous layer of flow composite.

bonding til upræpareret emalje

31.2 Mpa ----- 47.9 Mpa
Haddad, Hobson and McCabe
Dent Mat 2006

ved fjernelse af aprismatiske emalje



specielle nødvendige instrumenter





brede hovede skærmer for polymeriseringslyset



kan fastholde enden på fiberbundtet



Placement procedure

- Press one end of the fibre into the flow composite.
- Light cure 5 to 10 seconds.
- Use StickSTEPPER to protect the rest of the bundle from the light.



Continue by adapting the fibre to one tooth at a time.
The retainer should be placed close to the incisal edge.


40 sek pr. tand

Placement procedure





When the whole retainer is placed, add a layer of composite over the fibre bundle. Light cure in sections 40 seconds each.



klinisk case af

Vittorio Cacciafesta, DDS, MSc, PhD

M. Francesca Sfondrini, MD, DDS

Italien



StickREFIX D

OBS - Hyppigste fejl



© Stick Tech Ltd

FIBER LÆGGES DIREKTE PÅ BONDED TANDOVERFLADE

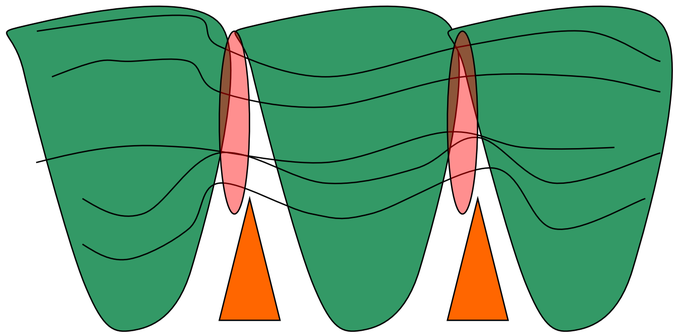
applicer et tyndt lag flow!

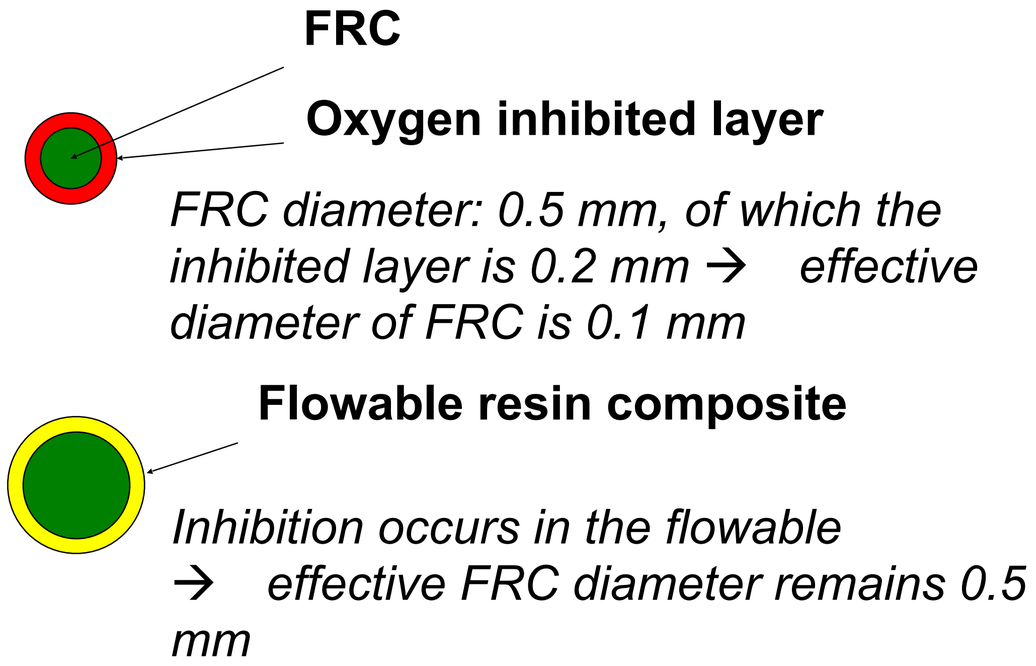
FIBER LÆGGES PÅ HÆRDET PLAST

fiberen placeres på upolymeriseret plast

Why cover connectors / interproximal areas with composite resin?

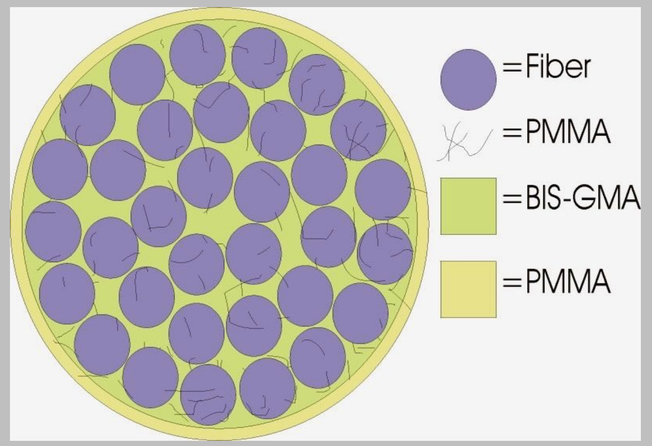
- To protect the FRC
- To eliminate oxygen inhibition to effect the polymerisation of FRC







2000 glasfibertråde i bundtet

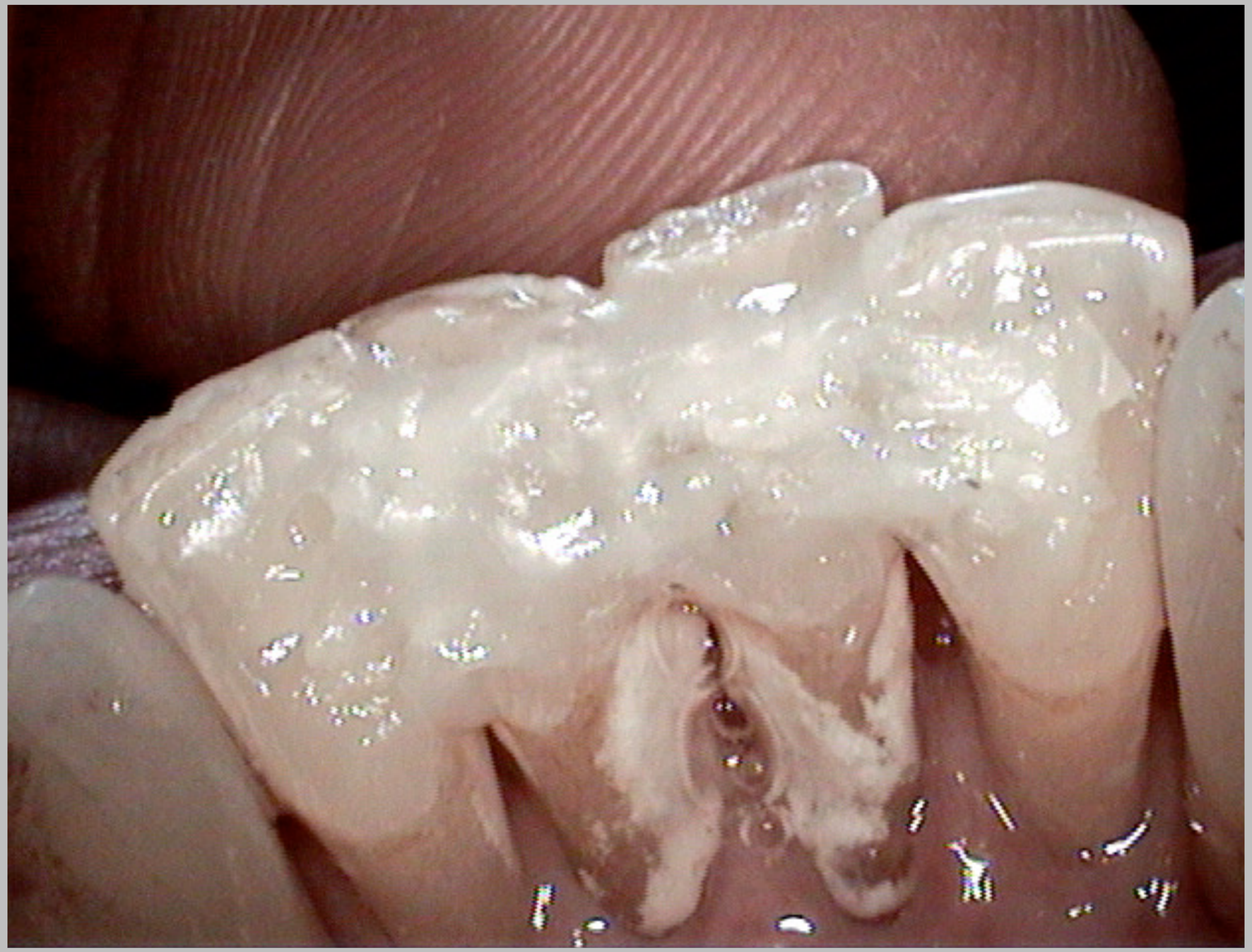




fiksering af UK front pga. parodontose/løsning af tænder











efter 5 år











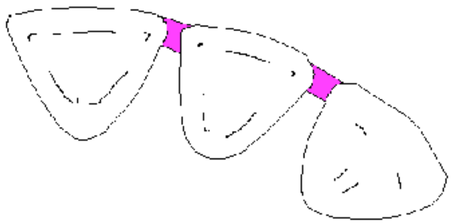



40 sek

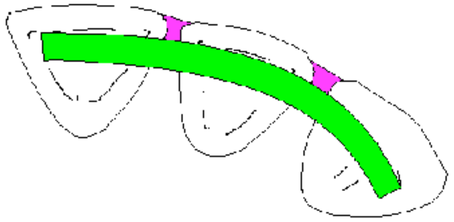

hvorfor gik den løs?



Syre procedure
Bond procedure



Approximalrum lukkes
med komposit/flow



Oralflade dækkes med komposit/flow
Fiber lægges ned i upolymeriseret komposit

Important to remember

- good moisture control
- use wedges to leave interproximal spaces open
- tooth surfaces must be cleaned with pumice and water
- careful etching to a sufficiently wide area
- flow composite must surround the whole fibre bundle
- careful light curing one tooth at a time
- place fibre bundle close to the incisal edge – in the region of the highest tensile stress

Clinical evaluation of FRC-periodontal splint

Clinical evaluation of unidirectional E-glass fibre-reinforced splint: up to 4.5-years follow-up

Result: the overall survival rate was 94.8%.

Conclusion: Direct FRC splint demonstrated acceptable clinical survival-rate. The FRC splint could delay extraction of teeth for at least up to 4.5 years

Kumbuloglu O, Saracoglu A, Özcan M. Clinical evaluation of unidirectional E-glass fiber-reinforced-composite resin splint: up to 4.5-years follow-up.
J. Dent 2011 Dec; 39(12):871-7



i fronten



henvist fra kirurg



Stel?












everStick®C&B
GC

EUROPEAN JOURNAL OF INFLAMMATION Vol. 9, no. 3 (S), 73-79 (2011)

EVERSTICK® AND RIBBOND® FIBER REINFORCED COMPOSITES: SCANNING ELECTRON MICROSCOPE (SEM) COMPARATIVE ANALYSIS

A. LUCCHESE[1], F. CARINCI [1], G. BRUNELLI[2], R. MONGUZZI[1],

[1]*Department of D.M.C.C.C., Section of Maxillofacial and Plastic Surgery, University of Ferrara, Ferrara, Italy*
[2]*Department of Dentistry and Maxillofacial Surgery, Don Orione Institute, Bergamo, Italy*

of tooth structure, making the technique reversible and conservative. In addition fibers reinforcement makes it possible to satisfy the aesthetic needs of patients in an inexpensive minimally invasive fashion and hence it represents an effective alternative to current more costly, time consuming and invasive techniques (3-7).

The presence of spaces between the fibers and groups of fibers suggests ways to enhance product quality, as these gaps can become bacterial growth sites, sources of humidity or assist crack propagation, leading to fracture after they are placed in the oral cavity and subjected to occlusal stress.

The objective of this study was to compare the morphological characteristics and to evaluate the capacity of impregnation through a SEM analysis of two types of fiber-reinforced composites (FRC's): Everstick ® and Ribbond ®.

Exposure to the fluid resin (Heliobond®) in the two types of fibers was performed according to information supplied by the manufacturer. However, the penetration of the fluid resin in each fiber was compared after different application times before curing.

SEM analysis of the samples not impregnated with fluid resin showed a longitudinal direction of Everstick® fibers (group A1) and a linear but interwoven direction for Ribbond® (group B1).

Voids measuring between 0 and 20 µm could be observed between fibers and groups of fibers in both groups (A1 and B1).

Images of the surface of samples of fibers of Everstick® (group A2) and Ribbond® (group B2), treated with fluid resin (Heliobond®) for 5 seconds before curing, showed a uniform and homogeneous coverage by the fluid resin. However there was a difference between these two Groups: Ribbond® fibers showed a number of non-fissured crazes (microcracks) which were uniformly distributed over the surface and probably due to resin shrinkage during curing. In the Everstick® sample, crazes (microcracks) could be observed both on the surface and in the central portion, especially in the area of the cut. In cross section it could be clearly observed that exposure to Heliobond® for just 5 seconds was not sufficient for a deep impregnation of the adhesive.

On the other hand, cross section images of Everstick® (group A3) and Ribbond® fibers (group B3) impregnated for 5 minutes showed a great penetration, although still non-homogeneous, of Heliobond® with the presence of 5 to 10 µm voids in the central portions of the fibers.

The present SEM observations indicated that the two types of fiber-reinforced composites show structural characteristics differing in number, diameter, length and orientation and showed that the usage of fiber-reinforced composites, without a preliminary treatment through impregnation of the fibers with fluid resin, determines imperfections at a level that could compromise clinical applications.

Even with a limited impregnation time, 5 seconds, could considerably reduce imperfections (voids, curing crazes, microcracks) of the fibers, presumably making them more resistant to external agents.

Considering the advantages of a longer fiber [illegible] it is recommended that such procedure would be most indicated for clinical application.

When using fiber-reinforced composites as a product in a fixed retention system, it is recommended that the fibers are subjected to a preliminary treatment in order to enhance their morphology and maximize their clinical efficiency.

ACKNOWLEDGEMENTS

This work was supported by FAR from the University of Ferrara (FC), Ferrara, Italy and by Don Orione Service s.r.l., Bergamo, Italy.

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3. Freudenthaler JW, Tischler GK, Burstone CJ. Bond strength of fiber-reinforced composite bars for orthodontic attachment. Am J Orthod Dentofacial Orthop 2001; 120: 648-53.
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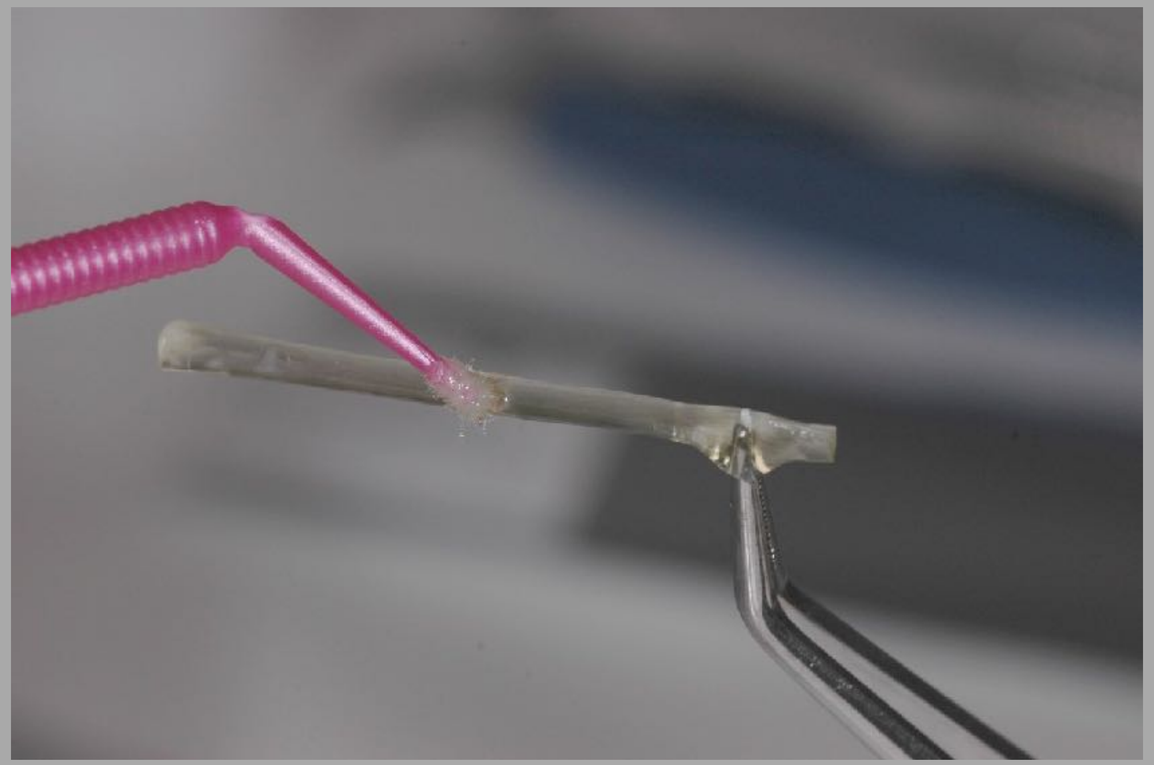
7. Ellakwa AE, Shortall AC, Marquis PM. Influence of fiber type and wetting agent on the flexural properties of an indirect fiber reinforced composite. J Prosthet Dent 2002; 88:485-90.
8. Yavirach P, Chaijareenont P, Boonyawan D, Pattamapun

Husk at applicere en ren resin ca. 5 min før fiberen skal hærdes



indlægsbro med kp tand som mellemled

gammel maryland bro



situationsaftryk over bro



trimmet stent m hul



stent kontrolleres intraoralt



Maryland bro



ankertænder rengøres



stent kontrolleres





Facialflade i emaljeplast



retention i stent



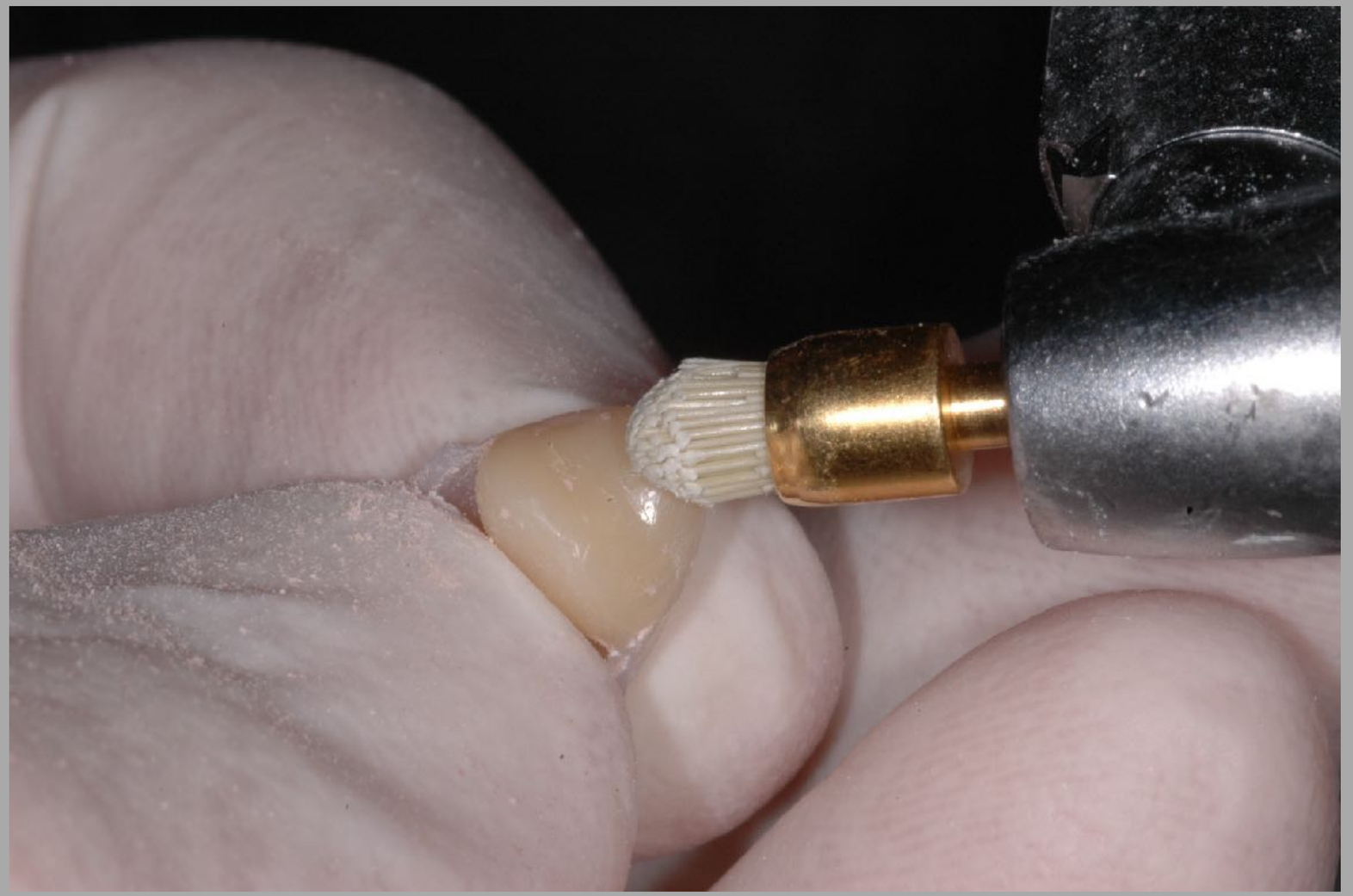
dentinbody på emalje



”præfabrikat”



højglanspolering af pontic



længdebestemmelse af fiber



everStick C&B



modellering af spor til fiber



klar til montering



bonding



”Marylandbro”



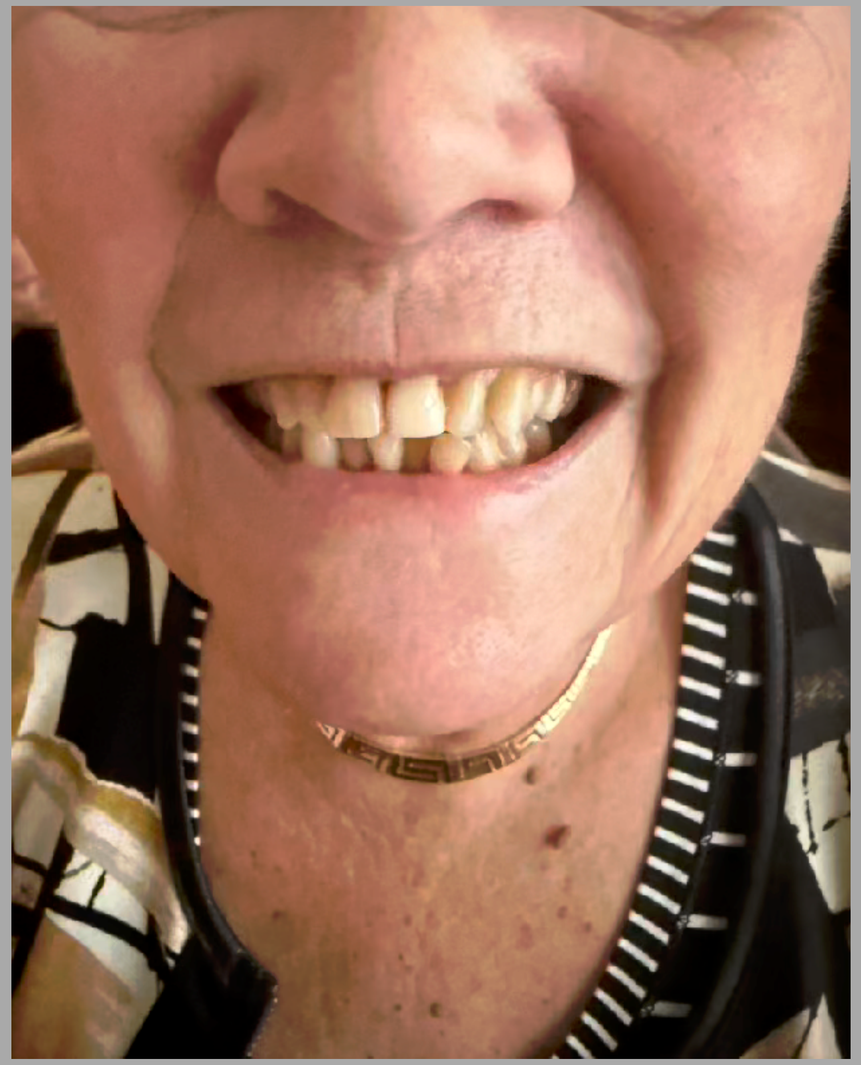
3 års kontrol



3 års kontrol



19 års kontrol

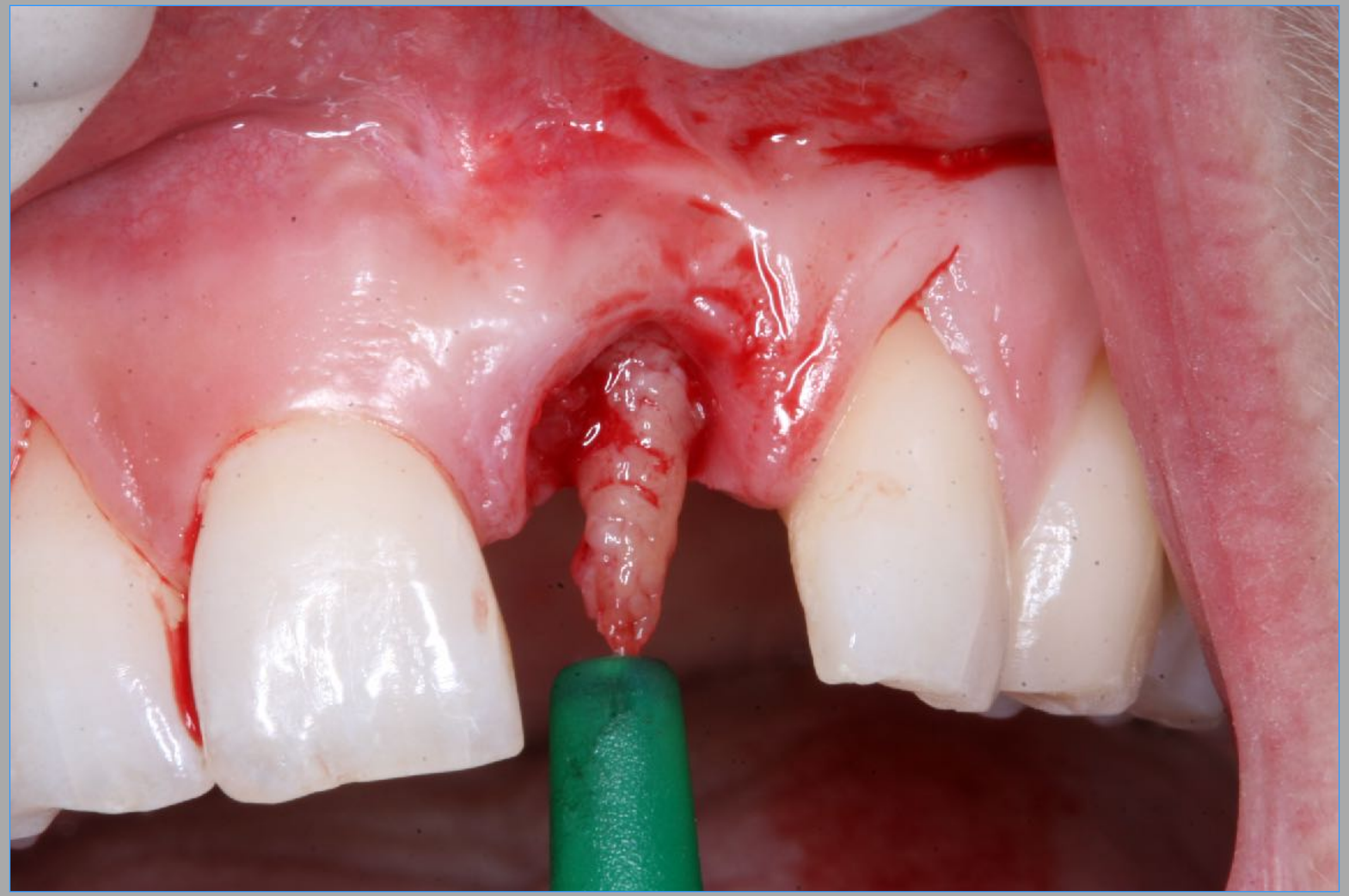


Provisorier

i fronten

provisorisk ætsbro med plasttand lavet direkte postoperativt







Kp som langtidsprovisorisk behandling



Kp som langtidsprovisorisk behandling



cementeret med self-adhesive cement


SpeedCEM® Plu
Refill
SpeedCEM® Plus
Self-adhesive self-curing dental resin cement
with light-curing option
Ivoclar
vivadent


A2
G-CEM LinkAce™


CEM LinkAce™
ADHESIVE RESIN CEMENT
4.6g(2.7mL)
G-CEM LinkAce™
SELF ADHESIVE RESIN CEMENT
A2 4.6g(2.7mL)


3M
RelyX™
Universal
Resin Cement – Trial Kit
3M
STEP BY STEP


NEW LOOK
IMPROVED
BOND
STRENGTH
Maxcem Elite™
Self-Etch / Self-Adhesive Resin Cement
net wt 10 g


Maxcem Elite™
Self-Etch / Self-Adhesive Resin Cement
net wt 5g
Maxcem Elite™
Self-Etch / Self-Adhesive Resin Cement
net wt 5g


Heraeus


iCEM
Self Adhesive

Kp som langtidsprovisorisk behandling



2008 2026

Teflon tape



individuelt abutment



biologisk bredde:

ved tænder: 2-3 mm

ved implantater: 3-4 mm

lamineret ZrO2 krone





Tarnows 5 mm eller mindre afstandsregel approksimalt ved tænder

Tarnow: ved implantater i gennemsnit 3.4 mm



i sidesegmenterne



Plastvarmer



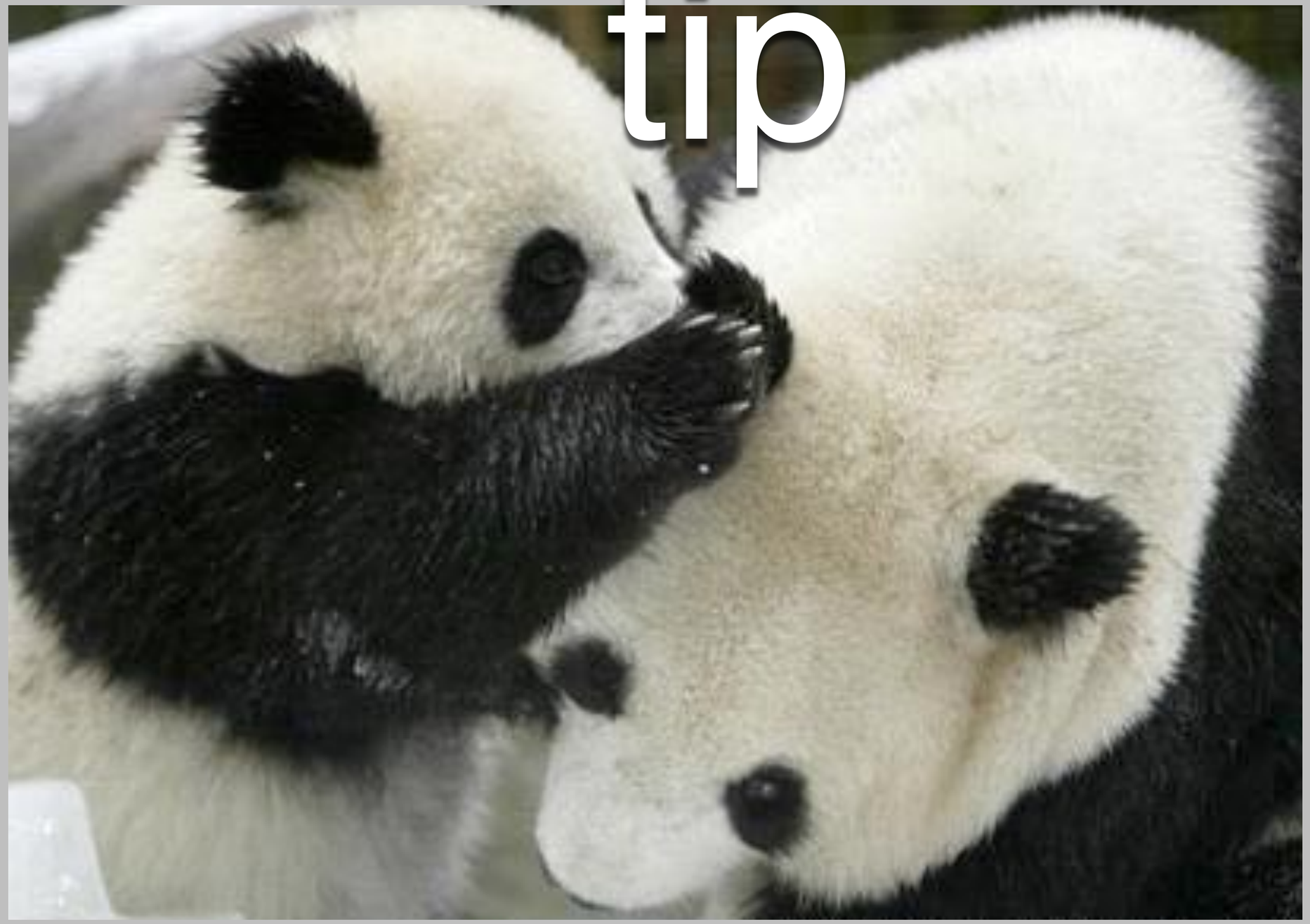
bedre og mere stress fri metode

chairside - indirekte teknik

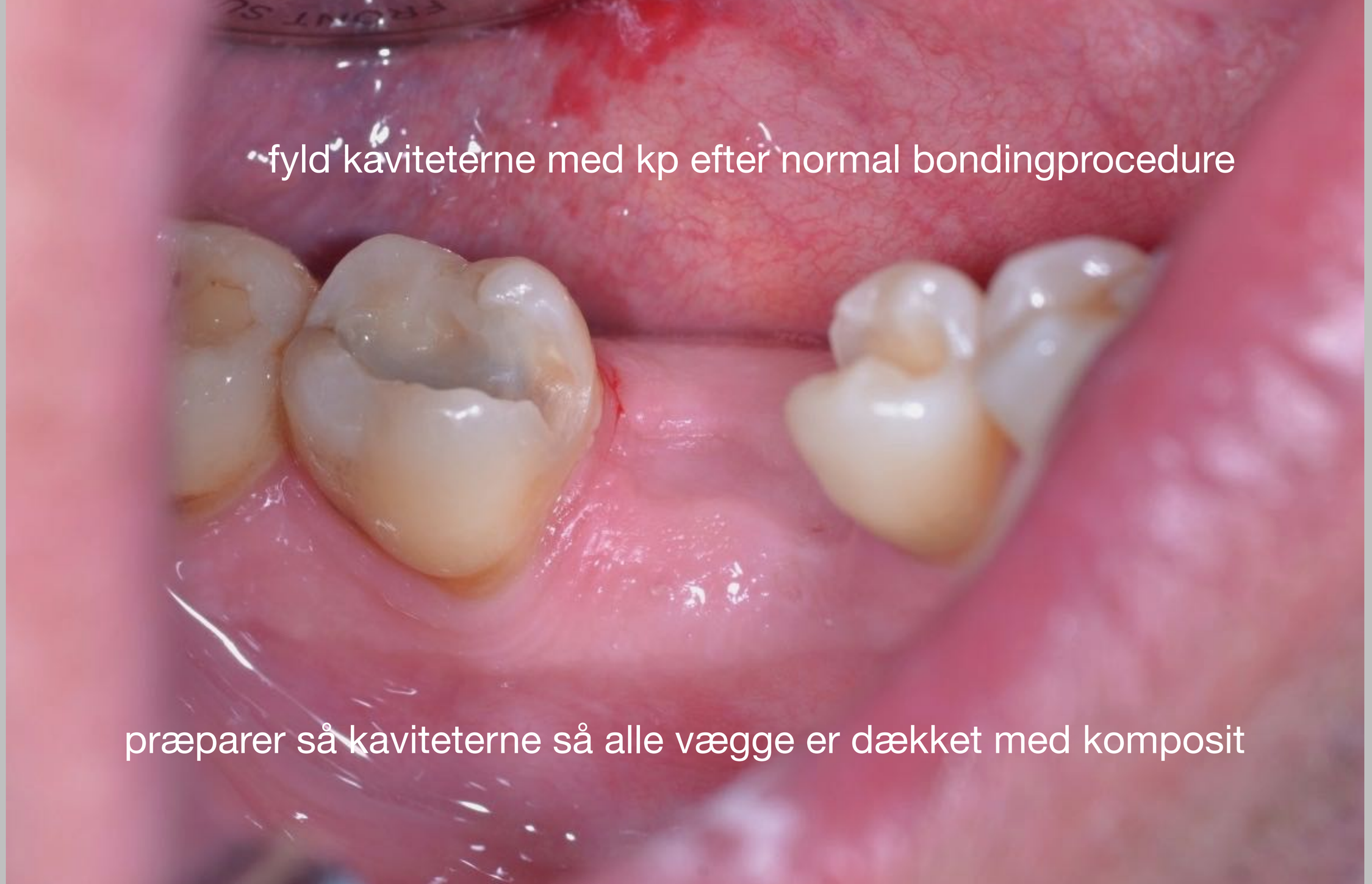



ORBIS
STAINLESS


OBS!


tip




fyld kaviteterne med kp efter normal bondingprocedure
præparer så kaviteterne så alle vægge er dækket med komposit

situations aftryk i alginat

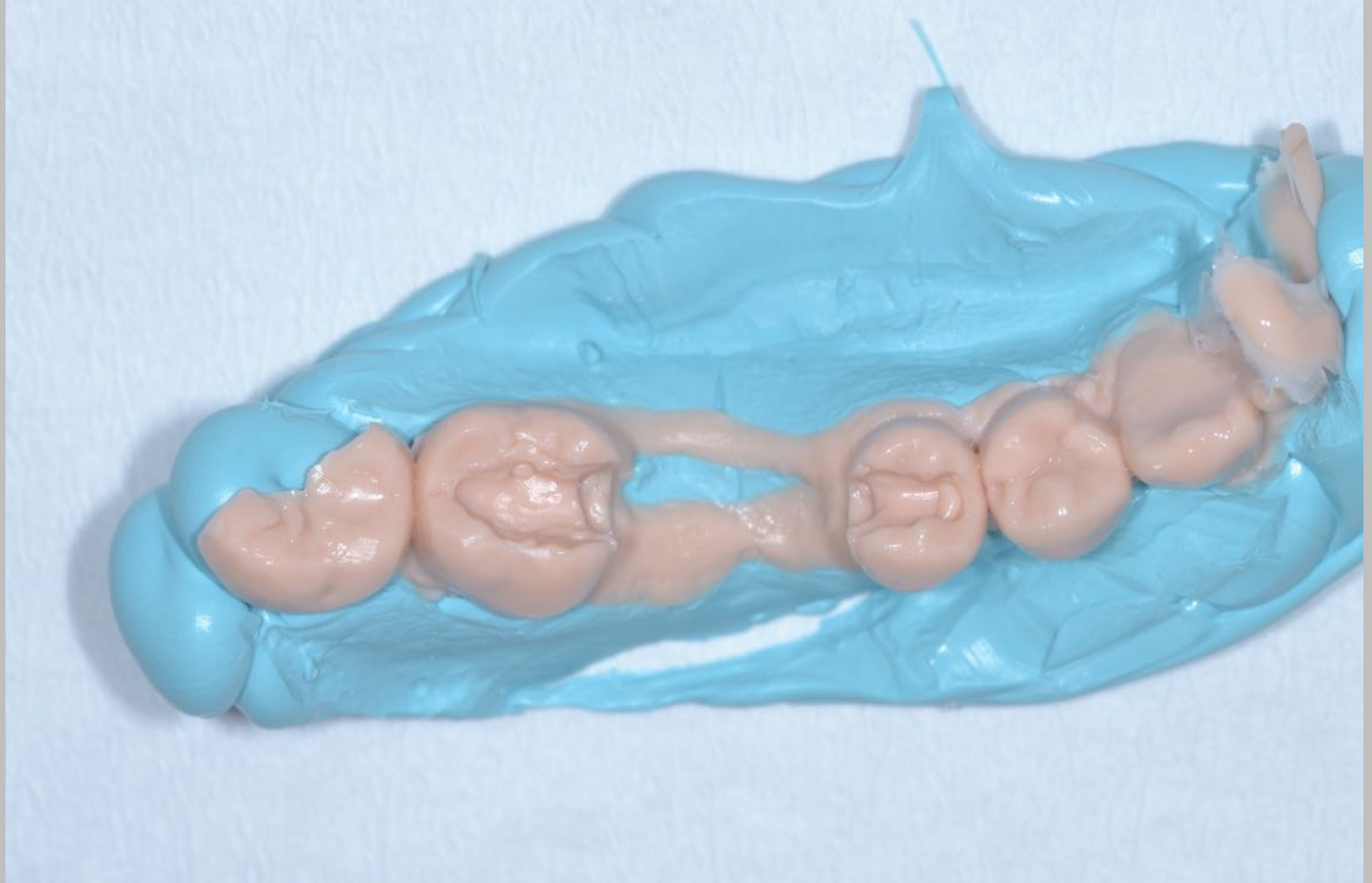


quick dye materials





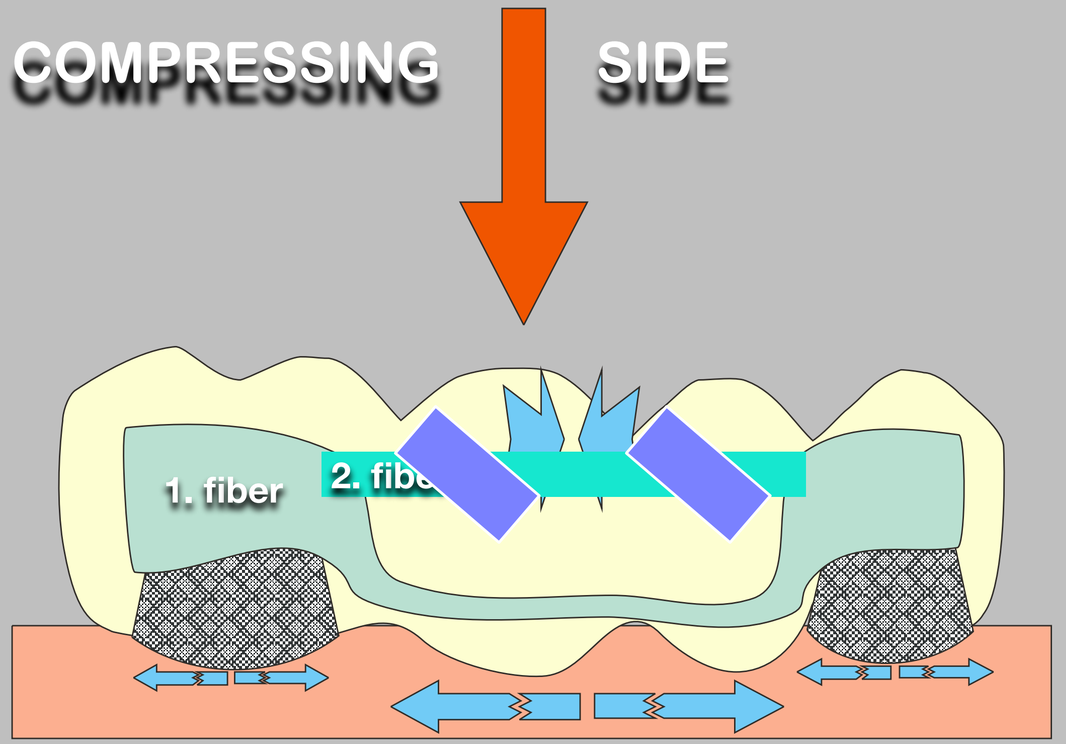





everStick®C&B
everStick®C&B
everStick®C&B



placer fiberbundtet gingivalt i mellemledene



placer fibre på tværs horisontalt for at styrke ved torsionsbevægelser

STRETCHING SIDE






















3 mdr kontrol

Reliable solution for direct bridges

Inlay-retained FRC Restorations on Abutments with Existing Restorations: 6-year Results

Result: Survival rate after 6 years was 95,2 %

Conclusions: Direct, inlay-retained, fiber-reinforced-composite restorations offer acceptable clinical survival rate with the adhesive system and the veneering composite used.

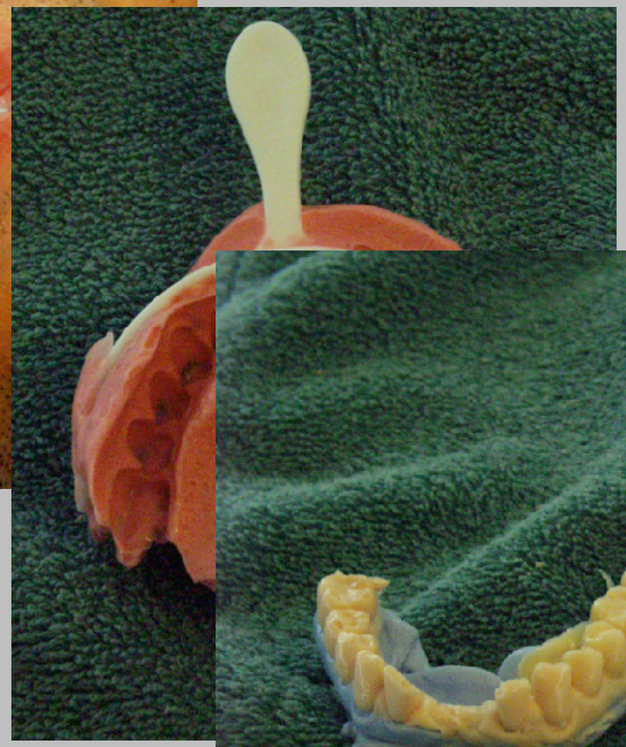
Özcan M. Inlay-retained FRC Restorations on Abutments with Existing Restorations: 6-year Results. Results presented in IADR 2010, Abstract no 106.

indirekte teknik i fronten

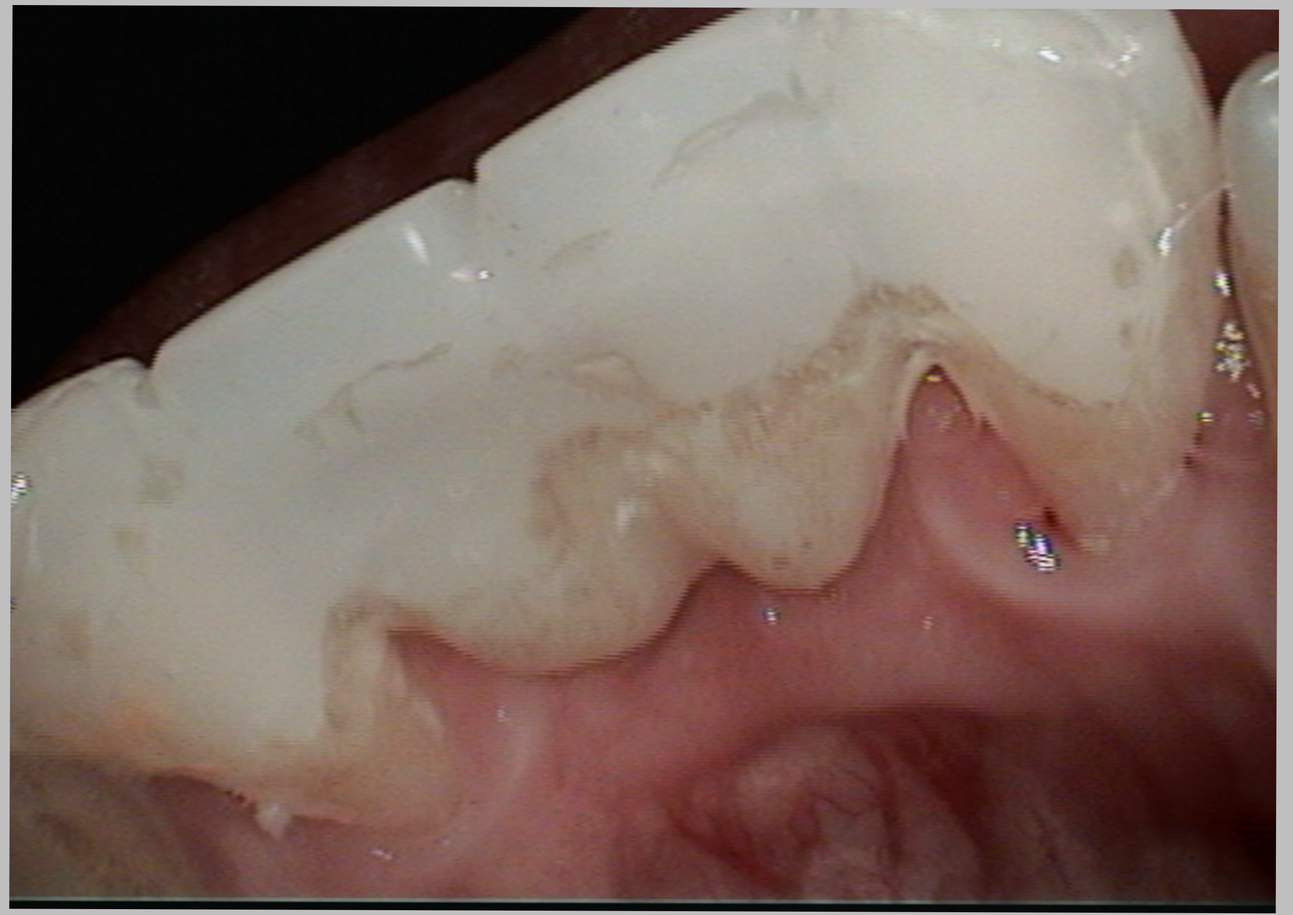










8 1/2 års kontrol

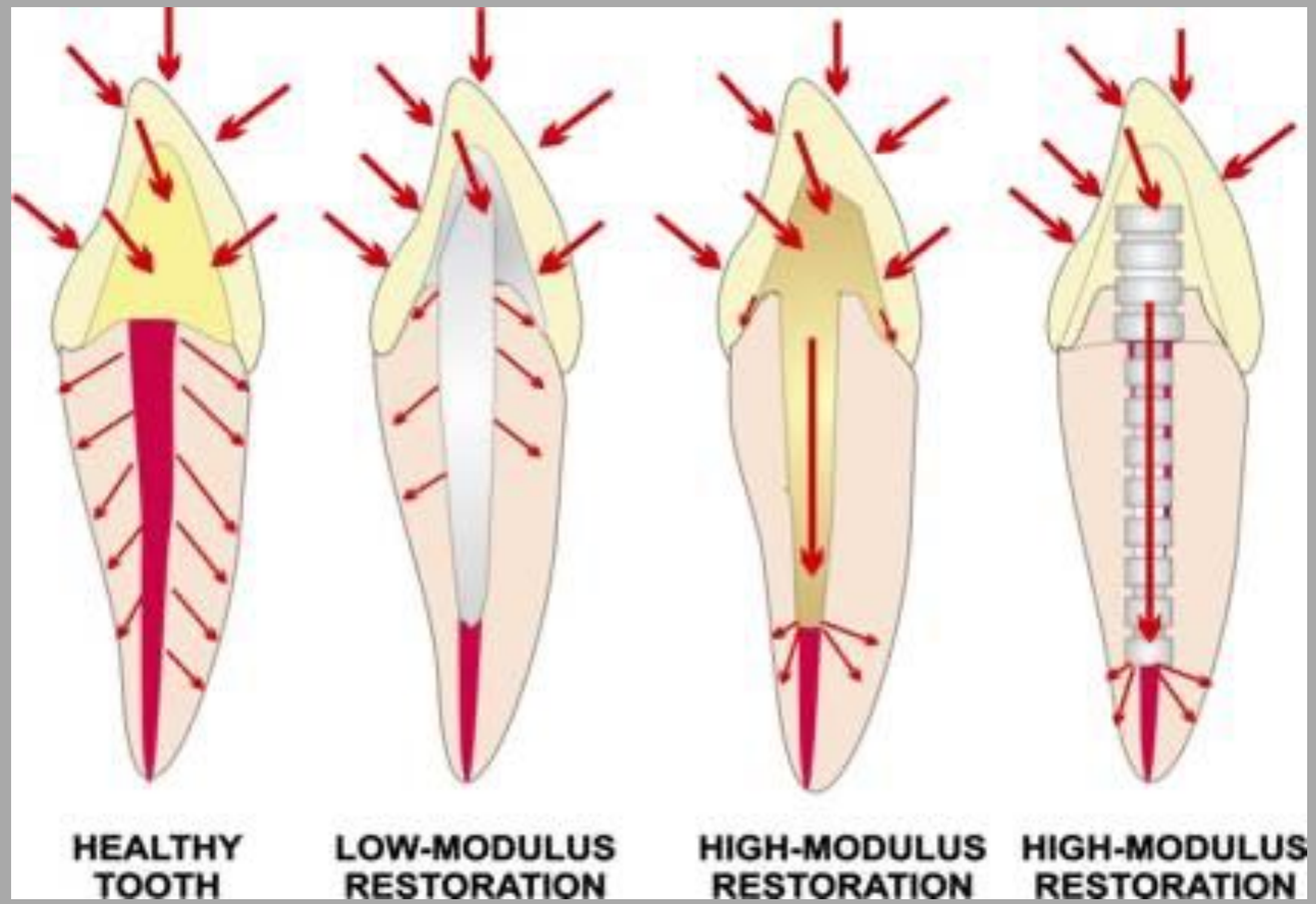






everStickPosts

Præfabrikerede- vs. Støbte stifter



lidt tandsubstans - rodbehandlet med infraktion

krone eller ex og implantat?



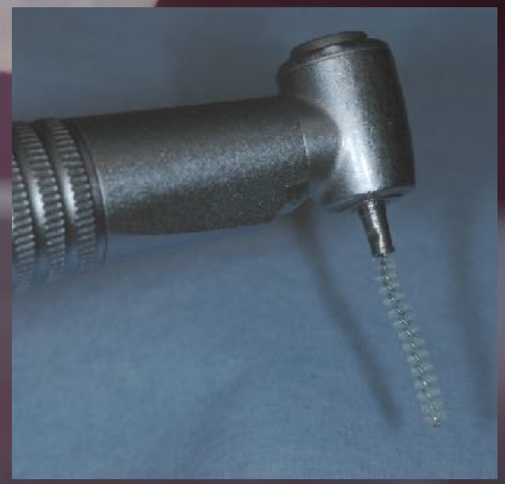


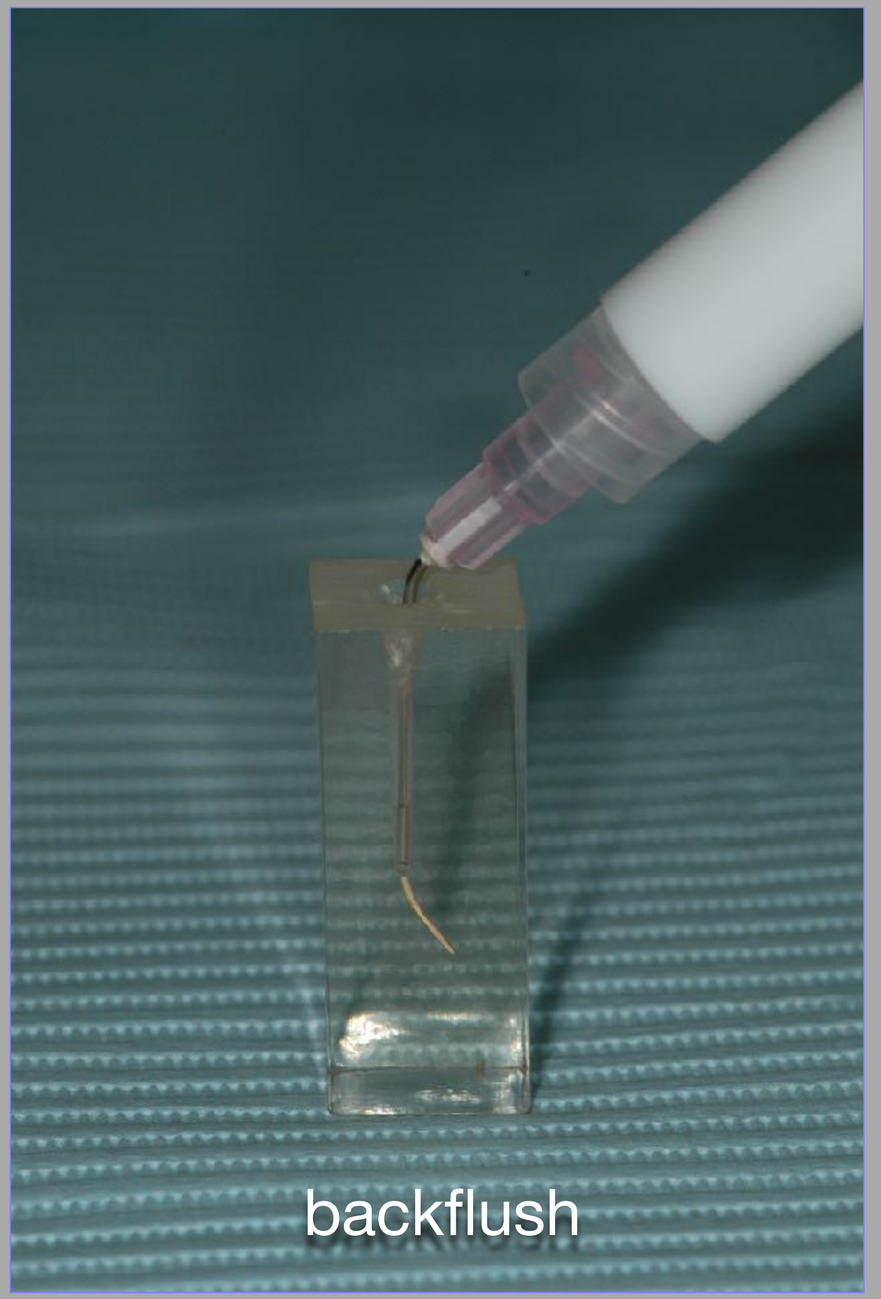


Dr. Lorenzo Vanini

Rotoprox



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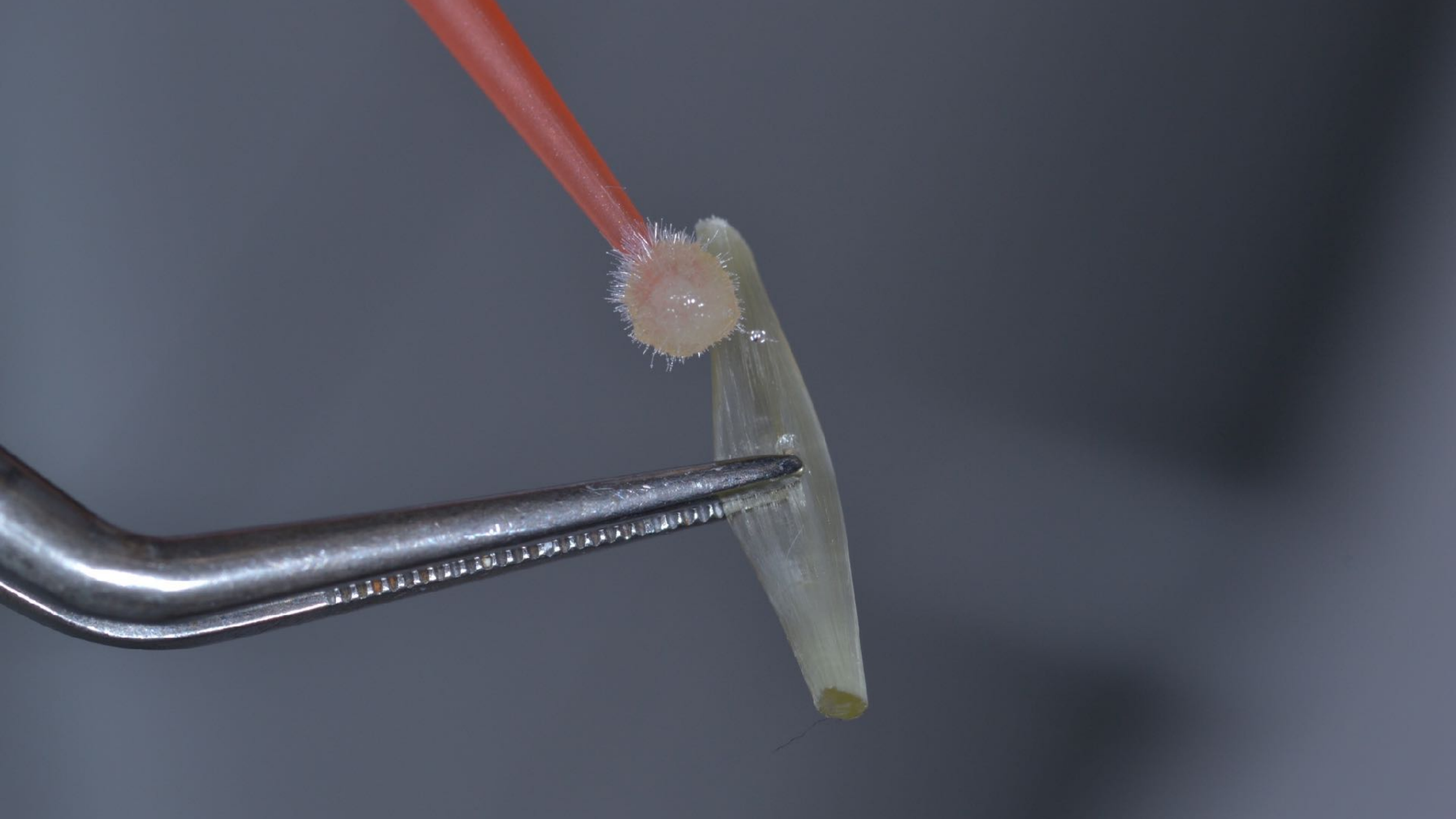
applikation af primer













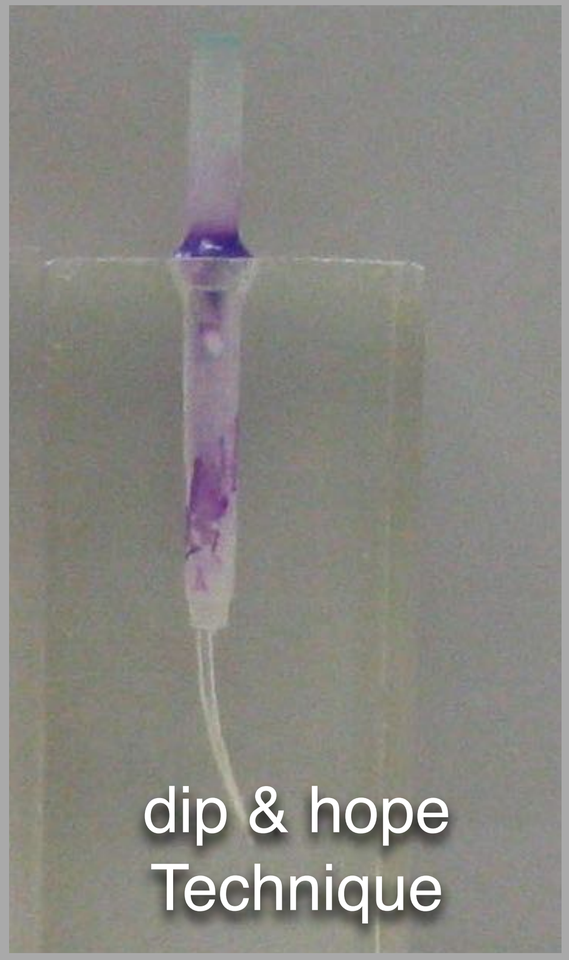


hvordan appliceres cementen ?

cementeret med backfill



cement appliceret på stiften



courtesy Dr. Phil Brown







Misura

LM Style Italiano






14 months later
husk ferule og biologisk bredde







combo case



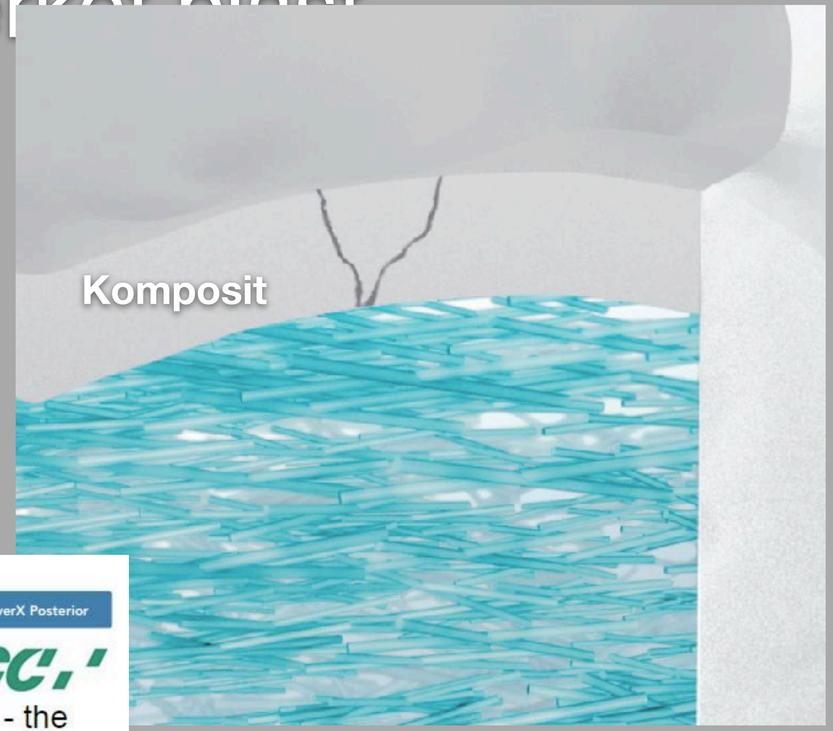
t tand med



cementeres med adhæsiv teknik

tanden bygges op i fiberforstærket plast

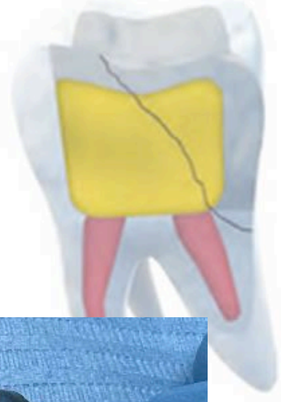




FIBRES PREVENT AND STOP CRACK PROPAGATION

everX Posterior

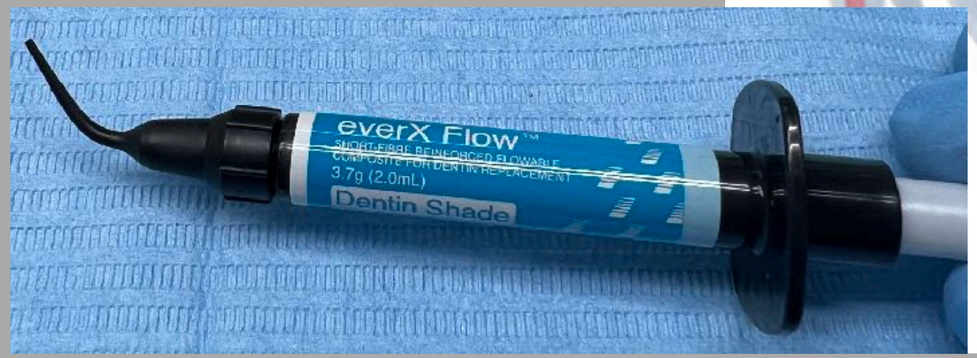
GC



Conventional composite substructure - the crack propagates through the composite obturation



Posterior exerX substructures - crack propagation is stopped





færdige ¾ Kp krone bygget op i med 2 everStick stifter



10 år

Loading performance of endodontically treated teeth reinforced by everStickPOST

Many studies showed a significant increase in the fracture resistance of restored teeth when the individually formed fibre posts were adapted closely to the canal walls. When using everStickPOST, it is possible to fill large and irregular root canals more efficiently than with a single, prefabricated centrally positioned post.

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Fráter M *et al.*
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15. Direct restoration of severely damaged incisors using short fiber-reinforced composite resin.
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18. Flexural properties of fiber reinforced root canal posts.
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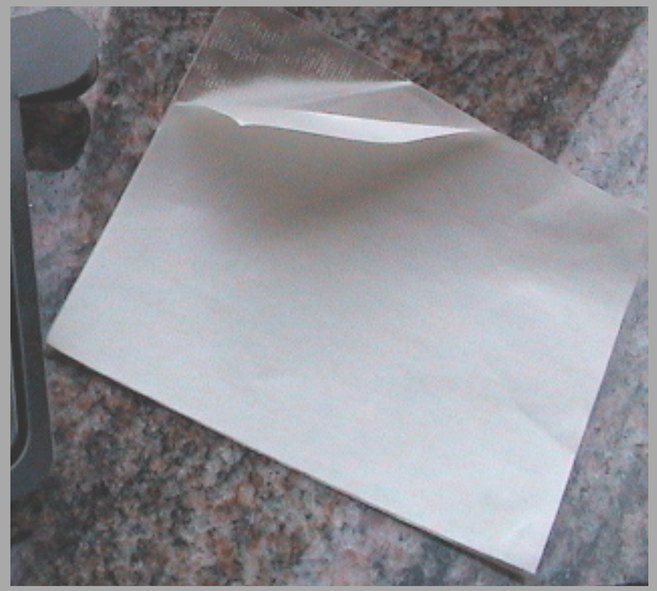
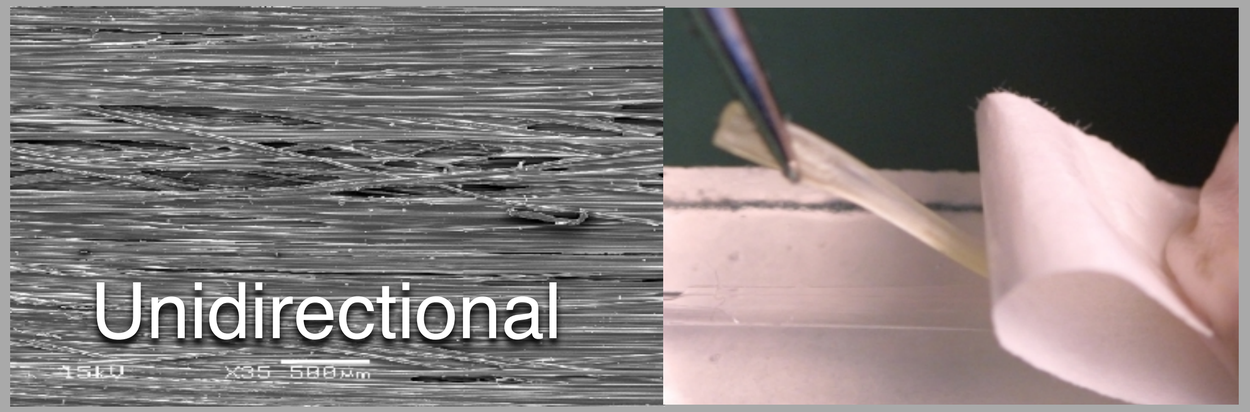
everStickNet



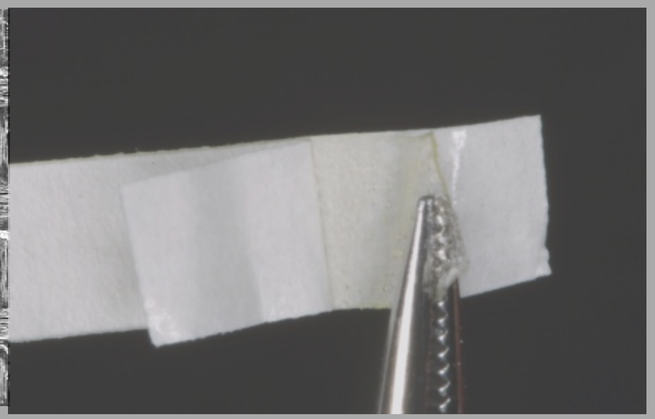


everStick



everStickNet





symptom givende infraktion

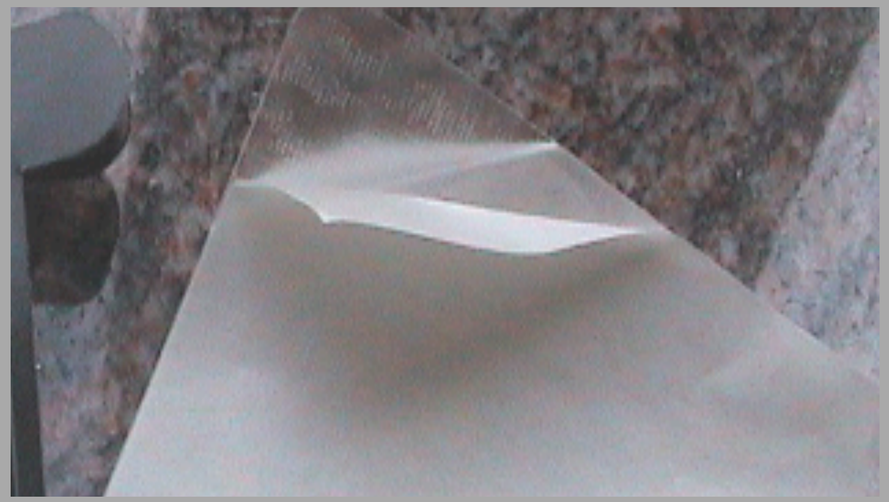
plast overdækning

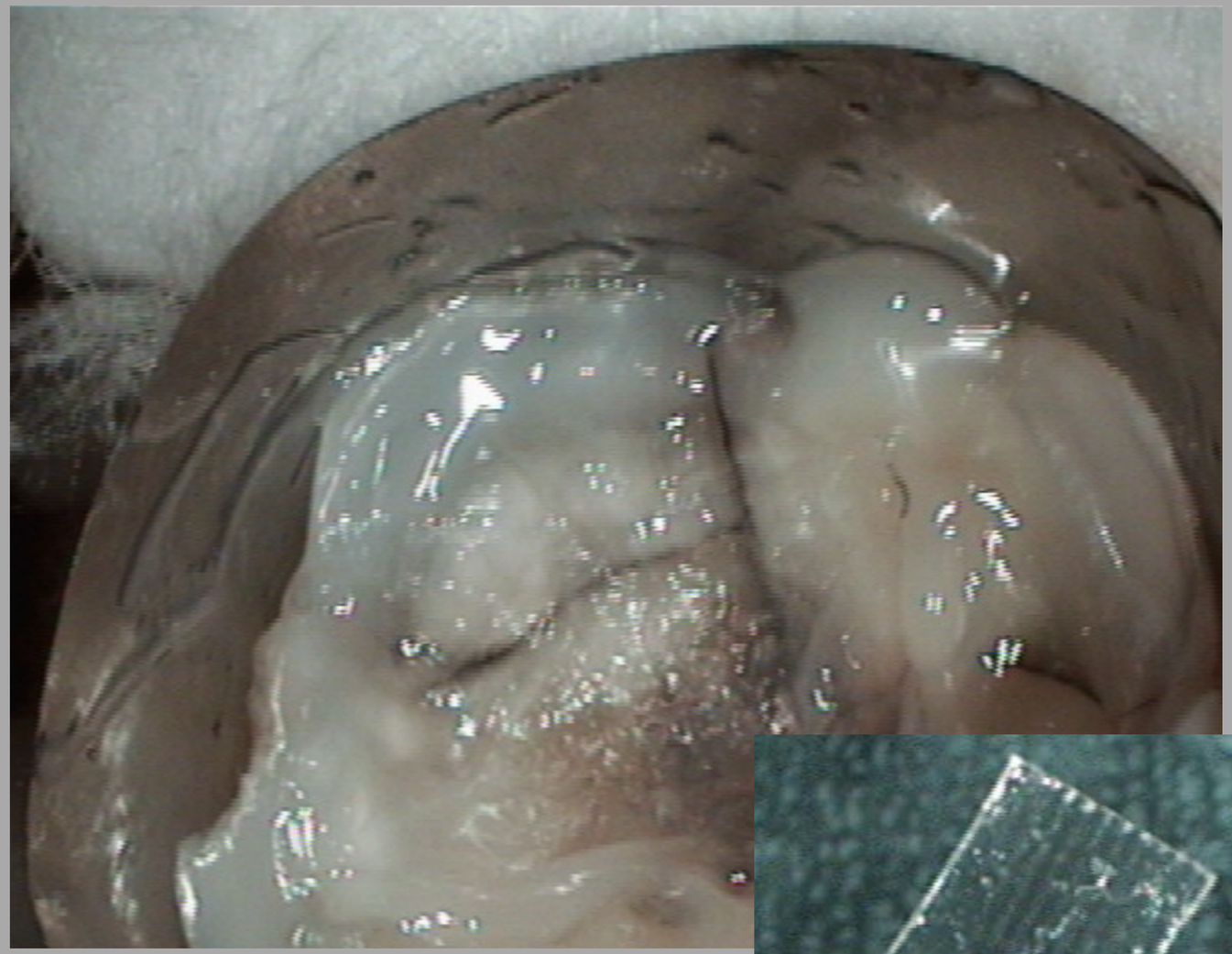
med glasfiber armering



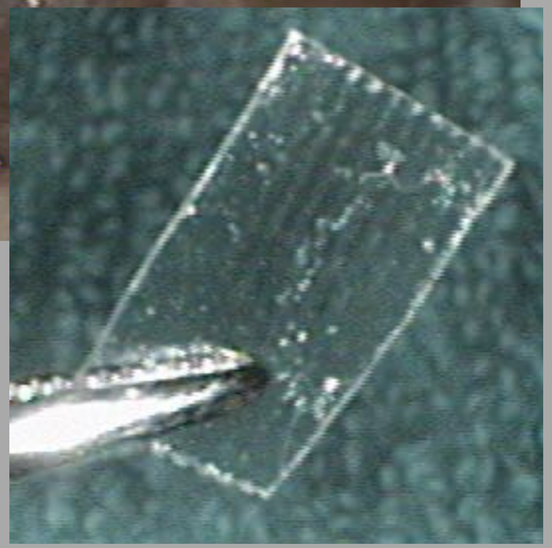


efter bondingprocedure og polymerisering appliceres et tyndt lag flow, som ikke polymeriseres og det aktiverede net anbringes





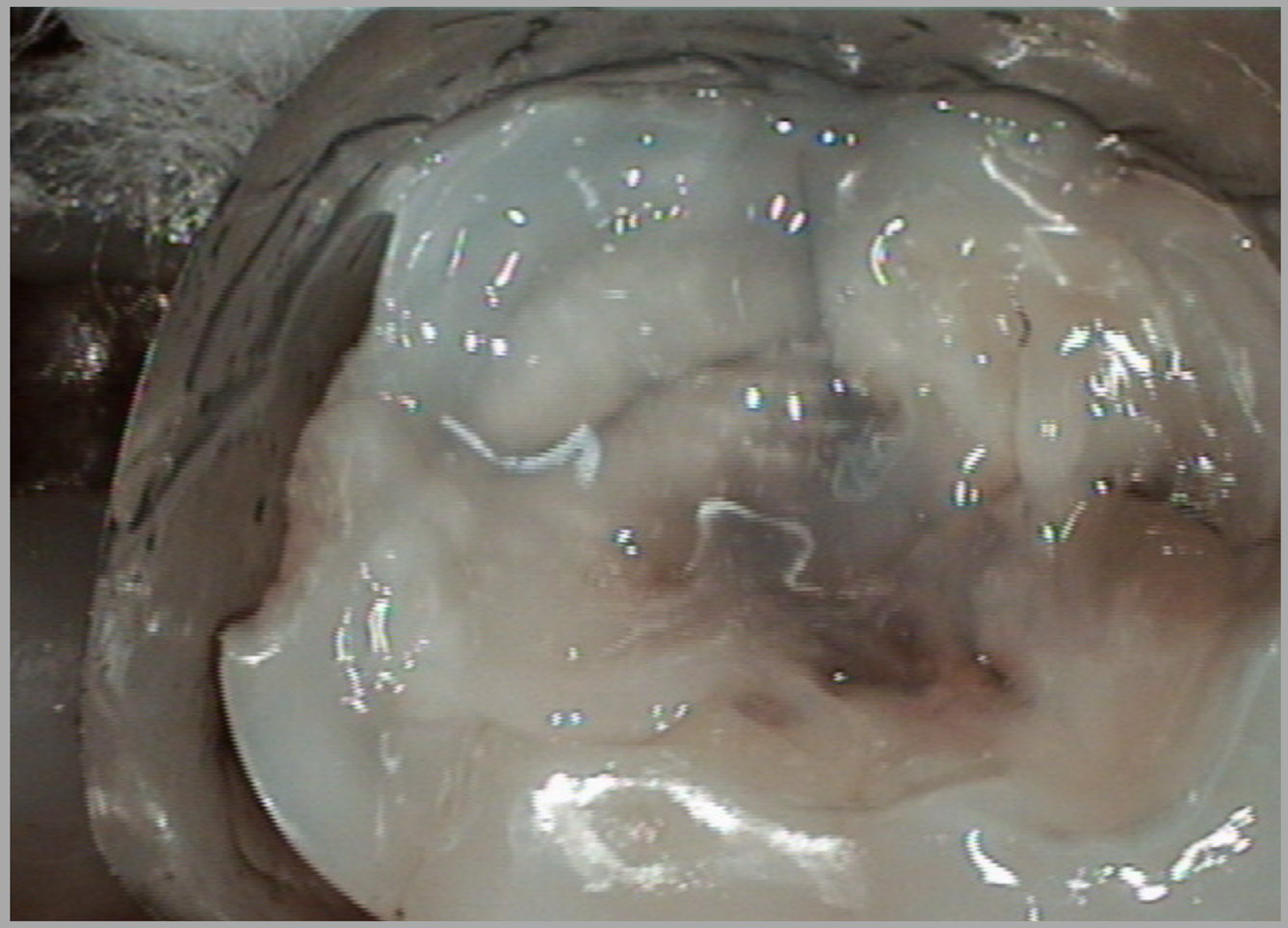
aktiveres med ren resin




DENSPLY


DENSPLY

Net anbragt og dækket med tyndt lag flow



polymeriseres i 40 sek.





efter endt bondingprocedure og polymerisering





everStick®NET

Fracture behaviour of everStickNET reinforced restorations

Literature findings support the use of bidirectional fibre reinforcement (everStickNET) to increase the load bearing capacity of restorations. everStickNET has a beneficial effect on the failure mode and thereby on the re-restorability in case of fracture. A number of authors stated that everStickNET is also a suitable material to repair veneers.

1. Fracture behaviour of MOD restorations reinforced by various fibre-reinforced techniques - An in vitro study.
   Sáry T *et al.*
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   Turkaslan S *et al.*
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   Turkaslan S *et al.*
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   Goguţă LM *et al.*
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   Turkaslan S *et al.*
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    J Oral Rehabil. 2003 May;30(5):501-6.

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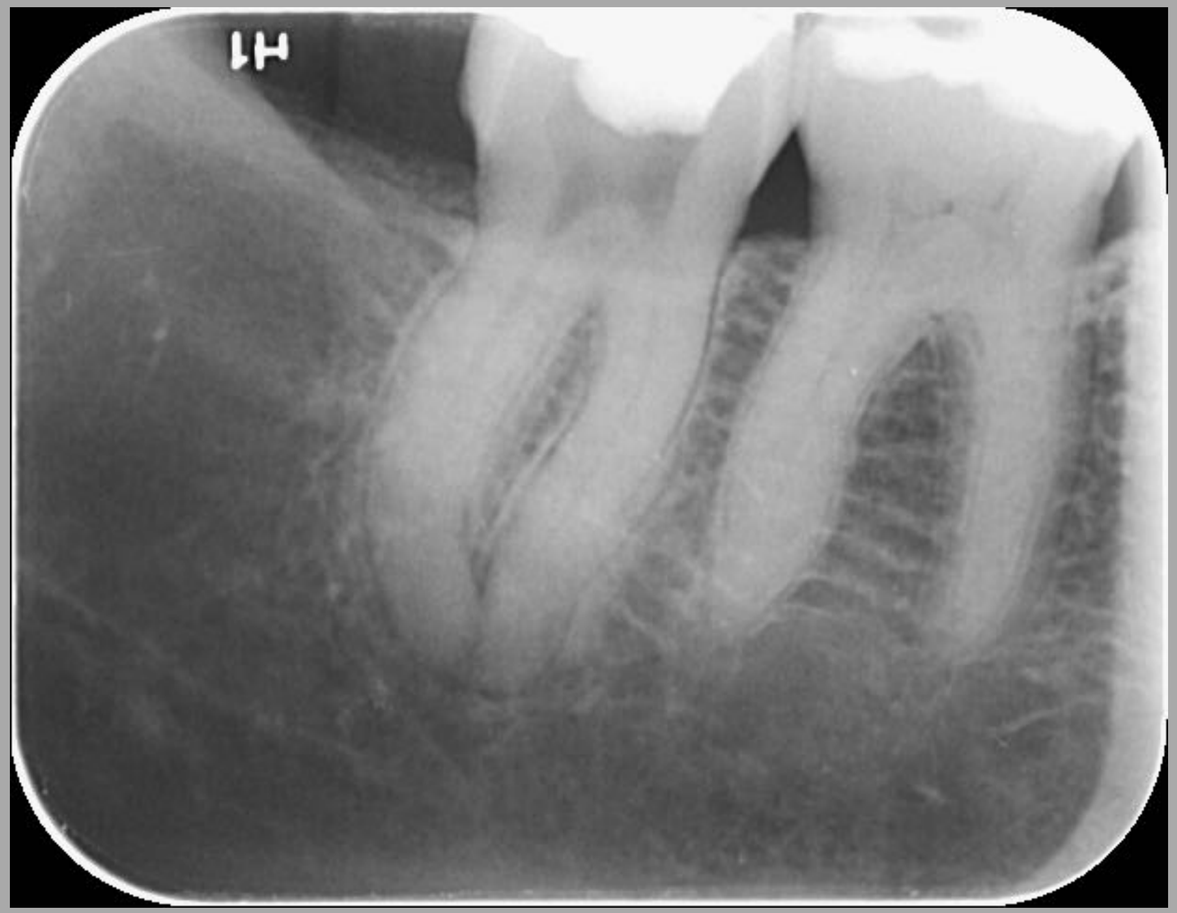



henvises tilbage til egen tandlæge for kronebehandling

Reparation af porcelæn


Sandblast and application of primer with 4 meta monomer

















Since 1921
100 years of Quality in Dental

Why choose everStick?

- Minimally invasive and reversible; leave other treatment options available
- Superior mechanical properties
- Unique patented bonding
- As strong as metal
- Elasticity close to that of dentin
- Extensive research data
- More than 300 publications and several dissertations
- Long term clinical data with excellent success ratio