

“Dentistry as a Beautiful Art”

How to Achieve Highly Esthetic and Predictable Direct Anterior and Posterior Composite Restorations.

New Materials New Rules...Is extension for prevention still valid?

New rules with Bonded Composite...

Composite doesn't require minimum depth
Bonded composite re-enforces cusps++
Bonded composites doesn't need mechanical retention
Preserves more tooth!!!
++Santos et al 2005; Shore et al 2003; etc...

Learning Objectives:

- Review the latest in the science of Composites and bonding systems.
- Compare composite restorative materials to identify which one has the ideal physical, mechanical and esthetic characteristics.
- Review the paradigm shift and new rules necessary to perform conservative and predictable anterior and posterior direct composite restorations
- Learn a technique to perform predictable, high quality and yet time effective anterior & posterior composites

Posterior Composite Restorations

Common Problems with Posterior Composite Restorations:

- Complicated Technique
- Post-op sensitivity
- Anatomical contours
- Micro leakage
- Durability
- Not Profitable

Perfect isolation! Is Rubber Dam Mandatory?

Edward Swift Jr. DMD, MS JAED 11-2003

Thordrup M, Isidor F, Horsted-Bindslev P. A 5 year study of direct and indirect resin composite and ceramic inlays. Quintessence Int 2001;32(3):199-205

Reich S, Wichmann M, Rinne H, et al. Clinical performance of large all ceramic CA-CAM generated restorations 2004 JADA Vol. 135, May 605-612

Steps for a Direct Composite Restoration
Tooth Preparation Guidelines



Steps:

What Matrix System?
Ring Matrix

BASE AND LINERS

- Ionoseal (Voco)
- Vitrebond (3M ESPE)
- Fuji Lining (GC)

Christensen GJ. Tooth sensitivity related to class I and class II resin restorations. *JADA* 1996 Apr 497 - 498

Ruiz JL, Mitra S. Using Cavity Liners with Direct Posterior Composite Restorations *Compendium* June 2006

Bonding System:

Goal is Predictable Clinical Success

- Strong adhesion
- No post-op sensitivity
- Proper seal
- Ease of use
- Durability

Enamel Bonding Is Unchanged:

1955 Michael Buonocore; Ray Bowen 1960s

Etch enamel with 37% phosphoric acid for 15-20 sec

15-25 MPa of bond strength.*

2 Families of Dentin Bonding Systems

1. Total Etch

- 2 Bottle (4th Generation)
- 1 Bottle (5th Generation)

2. Self Etch

- 2 Bottles (6th Generation)
- 1 Bottle (7th Generation)

4th Generation Dentin Bonding System

(Total Etch) Fusayama (1979) Total etch & Nakabayashi (1982) Hydrophilic resin and Hybrid layer

5th Generation

TE Bonding Technique



Notes _____

Abu-Hanna A., Gordan V. The effect of variation in etching times on dentin bonding. General Dentistry Jan 2004

Problems with Total Etch:

Complicated technique, Degradation of Bond & PO Sensitivity!!!

Berkowitz G, Horowitz A et al. Postoperative hypersensitivity in class I ...In general practice, Interim results. Compendium 2009 Vol 30;6:356-363

Carvalho et al Effect of HEMA/solvent combination on bond strength to dentin. J Dent Res 82(8)597-601,2003 ;

Tay F. Pashley D. Water treeing-A potential mechanism for degradation of dentin adhesives. Ame J Dent 16:6-12, 2003

Sixth & Seventh Generation, Self Etch

Total Etch versus Self Etch Adhesives, Effects on Postoperative sensitivity Perdigao J, et al JADA December 2003

Advantages of Self Etch? Forgiving!!!

Tay FR, Gwinnett AJ, Wei SHY. Micromorphological spectrum for over drying to oversetting acid condition dentin...Dental materials 1996;12:236-244
Perdigao J, et al Total Etch versus Self Etch Adhesives, Effects on Postoperative sensitivity JADA December 2003
Werner J.F. & Tani C. Journal of Adhesive Dentistry. 4(4):277-82, 2002

Advantages of SE... Less Sensitivity!!!

CRA:
No post-op sensitivity SE 24% & TE 12%
Severe SE 4% & TE 17%

Bond Strength & Performance SE?

Cura C. & al Effect of different bonding agents on shear bond strengths of composite-bonded porcelain to enamel. Journal of Prosthetic Dentistry. 89(4):394-9, 2003 Apr.
Turkun LS. The clinical performance of one and two step self etch adhesive systems at one year. 2005 JADA Vol.136 May: 656

Etch Enamel? Yes...

J.L. Ruiz, W. Finger, T. Endo Conventional and self-etching adhesive effects on retention of luting resins Abstract IADR 2004
Fabianelli A. & al Efficacy of self-etching primer on sealing margins of Class II restorations American Journal of Dentistry. 16(1): 2003 .

Self Etch, Improved Degradation of Bond

Marc Braem Microshear fatigue testing of tooth adhesives interface. Journal of adhesive Dent 2007 Vol 9 Supplement 2
Waidyasekera K, Nikaido T et al. Reenforcement of dentin in self etch adhesive technology: a new concept. J of Dent 2009; 37:604-609

SE Bonding Technique



Notes _____

Conclusions...

What Bonding System to Chose?

Curing

LED?

Curing Speed

Influence of different softstart polymerization techniques on marginal adaptation of Class V restorations

Muangmisngsuk A et al American Journal of Dentistry 16(2):117-9, 2003 Apr.

Filling Procedure



Notes

Morphology

Ruiz Composite Instrument Set:

CK Dental (800)675-2537

Finishing

Composite Resin Composition & Importance:

- Matrix _____
- Fillers _____
- Coupling Agent _____
- Others (Initiators, etc.) _____

Problems with Composite resins

- Wear
- Shrinkage
- Coefficients of Thermal Expansion

Skinner's Science of Dental Materials
K. Anusavice 2003 11th edition.

Performance

++ Gaengler P, Hoyer I et al Micromorphological evaluation of posterior CompOsites.. A 10 year report J. Oral Rehab 2004; 31(10):991-1000

Composite Classification

Large particle or Traditional 1-50µm (out of use)

Microfill < 0.05µm

Traditional Hybrid 20µm (out of use)

Microhybrids 0.04µm

Namofill 75- 20 nm

Flowable

Condensable

Bulk Fill Flowable (new)

Microfills

Advantages & Uses

Disadvantages_____

Microhybrids_____

≤0.4µm to 0.6µm average

Advantages &

Uses_____

Disadvantages

Nanohybrids or Nanofills... Advantages & Uses

Disadvantages

Flowables... Advantages and Uses

Disadvantages

Bulk Fill Flowable (New) Advantages

Composite Repair

Tezvergil A, Assila LV, Vallittu PK. Composite-composite repair BS...J. Dent 2003;31:521-525;

Gordan VV, Shen C, Mjor I. Marginal gap repair with flowable...General Dentistry September 2004

Gordan VV, Mjor I, Blum IR, Blum N. Teaching students repair of resin...JADA Vol. 134, March 2003

Supra-gingival Dentistry...

Ruiz JL, Christensen GJ. Rational for Utilization of bonded non-metal onlays... Dentistry Today 2006 Vo 25 No 9: 80

ADVANTAGES OF NON-METAL INDIRECT ONLAYS

- Conservative preparation.
- Gentle to Gingiva.
- Great esthetics.
- Easy to detect recurrent decay.
- No need for mechanical retention.
- Gentle to opposing teeth.
- Reparable.



% Tooth Removed?

Edelhoff D, Sorensen JA. Tooth Structure removal associated with various preparations...Int J Perio Rest Dent 2002 Vol 22 N.3 241

Part 2 Direct Anterior Composites

Goal of Esthetic Dentistry:

To provide our patients with natural looking restorations. Restoring teeth in the most conservative manner, looking to extend the life of the teeth and the health of the surrounding tissue. J.L. Ruiz

Learning Objectives.

- Identify the appropriate indications for a layered direct composite veneers and anterior layered composites.
- Understand the “Artistic” principles needed to create highly esthetic anterior restorations.

Principles & Technique for Highly Esthetic Composite Restorations:

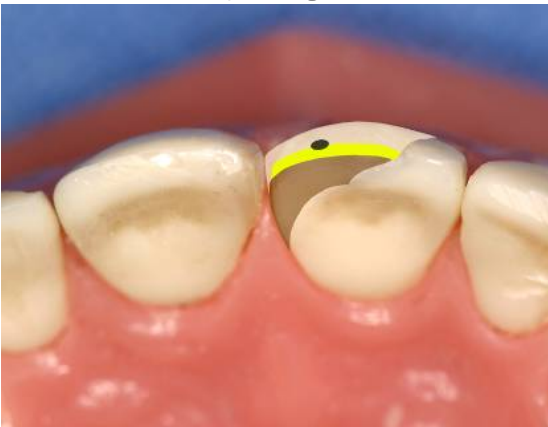
- Shade Matching
- Translucency / Opacity.
- Tooth Morphology.
 - Primary & Secondary
- Embrasures
- Incisal edge.
- Tooth characteristics
- Polishing

Shade Matching Requirements

Opacity & Translucency _____

Ikeda T, Nakanishi A et al. Color differences and color changes in Vita shade...Am J Dent 2003; 16(6):381

Composite Layering & The Disappearing Class IV



First layer

Second Layer

Third Layer

Fourth Layer

Primary Morphology:

(The Face) Facial Plains

The face of the tooth is the facial surface delineated by the **transitional line angles**.

Shadows beginning at the transitional line-angles delineate the boundaries of the face.

(Operatory Light)

Artificial, one-directional light (overhead light) will only allow for a two dimensional perception: length and width. Shadows add third dimension.



Technique to Achieve Primary Morphology

Techniques to achieve texture & Secondary Morphology

Creating Appropriate Incisal Embrasures

3M Soflex & Brasseleer Diamond Disk 943-080



Incisal Edge

Using Color for Tints and Stains
Incisal Edge Translucency Real and with stain_____

Characterization of Teeth

Most Used Tints

Yellow / Orange:

Increases chroma to create an illusion of narrowness

Blue / Violet:

Simulates translucency, decreases value

White

Increase value, opaquer and characterize

Brown & Ocher

Pit and fissures

Polishing

Patel SB, Gordan VV, Barret AA, Shen C The effect of surface finishing...JADA Vol 135
May 2004

“The Dento-Facial Esthetic Diagnosis System”...

How to Achieve Consistently Beautiful Smiles, not just
Beautiful Teeth!

Ruiz JL. Achieving Optimal Esthetics on a Patient with Severe Trauma...JERD 2005
Vol 17 N 5:287-291

DENTO-FACIAL ESTHETIC DIAGNOSIS FORM

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Patient Name:	Date:	PT Self Smile Score:
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CONCERNS	REFERRAL TO
1.	Endo:
2.	Perio:
3.	Ortho:
4.	OS:
5.	TMJ:

1. DENTO-FACIAL ESTHETICS				DIAGNOSIS / ETIOLOGY
				Occ/TMD:
1) Occ. Plane:	4) Lip Position:	6) Tooth Show (Smile):	9) Incisal Plane:	Caries:
2) Midline:	5) L 3rd Golden P:	7) Bucal Corridor:	10) Incisal Plane T Lip:	Perio:
3) F. Symmetry:		8) Ging. Show:	11) Conversational TS:	Esthetics:

2. GROUP ESTHETICS	IDEAL	MAINTENANCE
	1)	Occ/TMD:
12) Axial Incline:	2)	Rampant Decay:
13) Rotation:	3)	Compromised Perio:
14) Crowd/Space:	4)	#2, 7
15) Embrasure:	5)	#6, 11, 4, 18
16) UA Inclination:	6)	
17) Esthetic Zone:	7)	ADDITIONAL TREATMENT
18) O Jet/O Bite:	8)	
19) Lat. Occ. Plane: R L	9)	
	10)	
	11)	
	12)	
	13)	
	14)	
	15)	
	16)	
	17)	
	18)	
	19)	
	20)	
	21)	Option 1:
	22)	
	23)	
	24)	
	...	

Thank You

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