Hornbrook

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Hot Topics in Aesthetic and Restorative Dentistry

Optimizing Success Through Materials Choice and Proper Diagnosis and Planning

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I. **Goals For the Day**
   A. All ceramic options and metal-free alternatives
      1. No prep, minimal prep veneers
   B. Cementation update
   C. Lasers in dentistry

II. **HornbrookGroup**: Live patient and hands-on education in Chicago.
   A. Hornbrookgroup.com, 1-866-hornbrook

III. **Dentistry is Changing:**
   A. Metal free
   B. CAD: CAM
   C. Lasers: Closed flap osseous re-contouring using the **VersaWave (Hoya)**
   D. Chairside oral scanners (digital impressions)
      1. C.O.S. (3M)
      2. Cadent (Itero)
      3. Cerec Connect (Sirona)

IV. **Functional Occlusion**
   A. If there is anterior pathology (chipped teeth, short teeth, anterior abfraction),
      these should be red flags that something is going on in the posterior that needs to
      be addressed.
   B. Ultimate Occlusion
      1. An orthopedically stable joint position maintained by the dentition
      2. Natural tooth morphology
      3. Aesthetics drives function
      4. Advanced instrumentation helpful in verifying success, not mandatory
C. Posterior interferences: Eliminate “Fulcruming” interferences prior to taking bite registration

V. Why are We Here?
   A. To combine traditional excellence with state-of-the-art technology

VI. In Search of the Undetectable Restoration: “Invisible Beauty”
   A. Restoration: A reconstruction of the original form; a restoring to an unimpaired or improved condition; to bring back to its original state

VII. Elimination of Metal
   A. Choosing materials:
      1. Anterior: aesthetics, form, function
      2. Posterior: strength, function, form, aesthetics

VIII. Veneers and All-Ceramic Crowns
   A. Pressed ceramic (Luecite reinforced)
      1. Empress (Ivoclar)
      2. Authentic (MicroStar)
      3. OPC (Pentron)
      4. Finesse All-Ceramic (Dentsply)
   B. CAD Ceramics (Leucite reinforced)
      1. Empress CAD
   C. Powder-liquid ceramic
      1. d.SIGN (Ivoclar)
      2. Ceramco II & III (Dentsply)
      3. Creation (Jensen)
IX. **Leucite Reinforced Ceramics** (both Pressed and CAD)

A. Applications
   1. Veneers
   2. Crowns
   3. Inlays/onlays
   4. Anterior cantilever bridges
   5. Multi-unit bridges (when pressed to substructure)

B. Advantages of Pressed Ceramic
   1. Higher strength than powder-liquid (Typically 2-2.5 x higher biaxial fracture strength)
   2. Ability to see final contour before it becomes glass
   3. Excellent marginal integrity
   4. Wear compatibility
   5. Translucent core
   6. Bondable
   7. Long track record

C. Fabrication techniques
   1. Shaded/stained: posteriors only! Very dense, excellent margins, occlusal anatomy like cast gold
   2. Cutback and layered: create anterior incisal characteristics

X. **Powder-Liquid**

A. Advantages of powder-liquid
   1. Ability to alter opacity/translucency in single restoration
      a. Pink opaque ceramic used for tetracycline-stained teeth
   2. Internal shading and coloring

B. Fabrication techniques:
   1. Refractory technique: use die material that will tolerate the heat of a porcelain furnace: very accurate margins.
2. Foil technique: platinum foil swedged onto master die: least accurate margins unless very definitive deep chamfer

XI. Preparation Requirements
A. Veneers
   1. Minimal 0.5 mm reduction traditionally. Now can fabricate as thin as 0.2 mm

XII. Prepless, Minimal Prep, No Prep Veneers: Lumineers does not have exclusivity!
A. Can use Pressed (0.3) ceramic, but very difficult for ceramist.
   1. Emprethins: Gold Dust Dental Lab, www.emprethin.com
B. I prefer a very light margin for finish line
C. Ideal scenarios
   1. Light preparation shade
   2. Good position in arch
   3. Close to ideal profile
D. Additive technique:
   1. Flowable resin design in mouth
   2. Wax-up prescription: please wax up non-prep veneers teeth numbers 4-13.
      Centrals should be 10.5 mm and laterals 0.5 mm shorter than centrals.
      Minimal amount of wax as possible, but you need to be able to reproduce the wax-up in ceramic.

XIII. When Do I Do What?
A. Increasing length over 2.5 mm- pressed ceramic
B. Diastema over 2.5 mm- pressed ceramic
C. Minimal or no prep cases: ask your ceramist! Most like to use powder-liquid, I prefer pressed.
D. Tetracycline staining- powder-liquid (pink opaque layer)
E. Wear cases/full mouth rehabs- pressed ceramic
XIV. **Posterior Indirect**

A. Empress: Pressed and CAD
   1. Veneers, crowns, inlays, onlays, cantilever bridges

B. E.Max pressed: flexural strength 400 mPa
   1. CAD: “Blue Block”-laboratory or in-office using Cerec
   2. Waxed and pressed
   3. Posterior crowns

C. Core Crowns- endodontically treated teeth

XV. **Cements For Powder-Liquid, IPS Empress, and E.Max**

A. Must be adhesively bonded using a resin cement and a dentinal adhesive system
   1. Anterior: favorite cements
      a. Variolink Veneer (Ivoclar)
      b. RelyX Veneer Cement (3M)
      c. NX3 (Kerr)
   2. Posterior: favorite cements
      a. RelyX ARC (3M)
      b. NX3 (Kerr)
   3. Adhesive systems (4th and 5th generation “Total-etch” systems)
      a. 4th generation
         (1) All Bond 3 (Bisco)
         (2) OptiBond FL (Kerr)
         (3) Scotchbond Multipurpose Plus (3M)
      b. 5th generation
         (1) OptiBond Solo Plus (Kerr)
         (2) Excite (Ivoclar)
         (3) Single Bond Plus (3M)
         (4) P & B NT (Dentsply)
         (5) One Step (Bisco)
XVI. Veneer Cementation: “Tack & Wave” Technique

A. Total-etch using phosphoric acid
B. Systemp Desensitizer (Ivoclar)
C. 4th or 5th generation bonding system
D. Light polymerize
   1. Curing lights
      a. Halogen:
         (1) OptiLux 501 (Demetron/Kerr)
      b. LED
         (1) Demi (Demetron/Kerr)
         (2) Bluephase G2 (Ivoclar)
E. Seat all restorations
F. “Tack” using 2.0 mm light guide (Ivoclar)
G. Wave 3-5 seconds using large light guide
H. Peel away access using scaler, scalpel, etc.
I. Floss through contacts
   1. Serrated Saw
   2. Floss
J. Place oxygen inhibitor on all margins
K. Light polymerize for at least one minute per tooth
L. Rinse
M. Remove excess using scalers, blades, etc.
N. Finish margins using 15 micron finishing diamonds
O. Polish margins using porcelain finishing system
   1. OptraFine (Ivoclar)
P. Finish interproximals using finishing strips
   1. 1954N (3M)
   2. Epitex (GC)
XVII. **Anterior Multi-Unit And Posterior Metal-Free**: Anterior bridges, posterior bridges, posterior “Cementable” full coverage crowns

A. Cantilever bridges: Can be made using Empress

B. Aluminum Oxide: Procera, WolCeram, InCeram…
   1. Model is scanned and an alumina oxide “Coping” is milled

C. Zirconium: The future of metal replacement: Zirconium Oxide is not a metal! By definition, zirconium oxide is an oxide ceramic with a fine grain, polycrystalline structure.
   1. Features of zirconium
      a. Strongest core material- “Transformation Toughening”
      b. Cementable all-ceramic
      c. Opaque core
      d. Multi-span bridges
      e. Very accurate CAD-CAM technology
   2. Different systems available: Lava, Everest, Cercon, Vita YZ, Procera Z, Cerec-in-lab…
   3. Compromises with Zirconium: when we first started using it.
      a. Can only use powder-liquid systems as overlying ceramic
         (1) Authentic-pressed-to-metal: using pressed-ingot technology with metal support
         (2) Overcome by: Pressed to zirconium: overcomes the disadvantages of powder-liquid
            (a) E.Max (Ivoclar) and Noritake
               1. Pressed ceramic to zirconium or alone
               2. Excellent for mixed-media cases
               3. Can be used for multi-span bridges
      b. Opaque margins
         (1) Margins can be cutback and pressed for better aesthetics: 360 degree pressed margins.
            (a) Two advantages:
1. Better aesthetics
2. Can be etched and bonded
3. Margins can be deep chamfer or butt joint: “KR” diamonds to create butt joint without sharp internal line angles
c. Opaque facials compromise anterior aesthetics
   (1) Lingual zirconium only for anterior cases
   (2) Modified Zirconium framework designs
4. Cements for Zirconium supported restorations
   b. Self-etch resin cements
      (1) MaxCem Elite (Kerr)
      (2) Relyx Unicem (3M)
      (3) Multilink (Ivoclar)
      (4) BisCem (Bisco)

XVIII. Posts And Cores
   A. Fiber-reinforced posts systems
   B. Post cementation
      1. “Total-etch” technique
      2. 35% phosphoric acid etch
      3. 4th generation adhesive
      4. Choose light transmitting post (if possible)
      5. Resin cement/core material
      6. LuxaCore (Zenith)
      7. MultiCore Flow (Ivoclar)

XIX. Lasers In Dentistry
   A. Soft tissue
      1. Diode laser
         a. Micro 980 (HoyaConBio)
b. Navigator (Ivoclar)

2. Gingivoplasty
   a. Evaluate biologic width: >2.5 mm between osseous crest and free gingival margin

3. Frenectomies, ovate pontics, periodontal treatment, etc.

4. Hard and soft tissue:
   a. Erbium-YAG (VersaWave: HoyaConBio)
      (1) Gingivectomies
      (2) Frenectomies
      (3) Closed-flap osseous recontouring
         (a) Remove soft tissue first
         (b) Position tip into sulcus and remove bone
      (4) Hard tissue: direct restorations
         (a) Enamel dentin, caries

Thanks for spending the day with me!

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NOTES