Implant Abutments and Crowns on your CEREC

Welcome
Welcome

Bob Marcus D.M.D.

• UConn Dental 1993
• Poway (SD) office since 1997
• CEREC user since 2004
• CEREC Mentor and Trainer
• Founder of Kick Your Apps, Inc.
• Control Freak
Implant Abutments and Crowns on your CEREC

Welcome
Welcome

Many thanks to our sponsors!
Implant Abutments and Crowns on your CEREC

OmniCam or BlueCam? Yes.
Before We Start

Terminology

:Abutment (split)  
~versus~  
Hybrid (Big Mama)
Before We Start

Why Make Abutments In-House?

- All Digital
- Control
- Fun
- Internal Marketing
- Cost Effective
- Esthetics
Before We Start

Are e.max blocks strong enough?
Before We Start

Is subgingival e.max biocompatible?

- **glazed** e.max favored cell migration
- **polished** and untreated e.max showed considerable cell density and higher cell adhesion
- no cytotoxicity

Before We Start

Is subgingival e.max biocompatible?

So....

*glaze* and/or *polish* here

*polish* here
Before We Start
Before We Start

The Plan:

• Part I: Consult appointment
• Part II: Parts in stock
• Part III: Imaging
• Part IV: Design and Mill
• Part V: Try in, Crystallize, Finishing & Delivery
Before We Start

The Plan:

Can this be done in one appointment?

• Part I: Consult appointment 15 minutes (?)
• Part II: Parts in stock
• Part III: Imaging 15 minutes
• Part IV: Design and Mill 30-45 minutes
• Part V: Try in, Crystallize, Finishing & Delivery 60 minutes

Total: about 2 hours
Part I
Consult Appointment
Part I: Consult Appointment

Present the Case

- clear expectations about healing times, post-op pain, food entrapment, hygiene, options

Discuss Fees

- it’s not just an abutment and crown!
- possible additional fees:
  - OS/perio
  - bone graft
  - surgical guide
  - temporary
  - tissue adjustments
Part I: Consult Appointment

Make the Referral (if needed)

• YOU CONTROL THIS!

• convey to the surgeon:
  • implant **brand** desired
  • implant **size** desired
  • **depth** requested
  • **angulation** requested
  • **guide** if needed

• Meet with your surgeon and set general preferences for all cases.
Part I: Consult Appointment

Decide Temporary Style

• none
• flipper
• Essex
• One-Wing Maryland Bridge
• Immediate load (careful!)

Have samples available!
Part I: Consult Appointment

Select Shade

• photos if needed
Part I: Consult Appointment

Schedule Patient for Imaging Appointment

• leave enough lead time to order/receive parts.
Part I: Consult Appointment
Implant is placed and healed. Now it’s ready to restore.
Part II: Parts
Part II: Parts

Parts to order/stock

• Scan Post (used many times)
• TiBase Kit (one per restoration)
• Screwdriver/Torque Wrench
• Scanbody
• Blocks
• Crystallization Pins
• Monobond Plus
• Monobond Etch and Prime
• Ivoclar Multilink Hybrid Abutment Cement.
Part II: Parts
Implant Abutments and Crowns on your CEREC

Part II: Parts: Scanpost
Part II: Parts: TiBase Kit
Part II: Parts: Scanbody
Implant Abutments and Crowns on your CEREC

Part II: Parts: **Screwdriver**
Implant Abutments and Crowns on your CEREC

Part II: Parts
# Implant Abutments and Crowns on your CEREC

## Part II: Parts: Ordering

### Your Order Form for TiBase, Abutment Screw and ScanPost

TiBase and ScanPost are delivered without Scanbody. Please order these separately.

The following components are compatible depending on the connection:

<table>
<thead>
<tr>
<th>Connection</th>
<th>Scanbodies for Omnicam</th>
<th>Scanbodies for Bluecam</th>
<th>InCoris Z1 mesio F0.5</th>
<th>InCoris Z1 mesio F2</th>
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* ^1x Titanium base, ^2x Abutment screw, ^3x Abutment screw, ^4x ScanPost, ^5x Abutment screw, ^6x Scanbody

<table>
<thead>
<tr>
<th>Manufacturer / Implant</th>
<th>Implant Diameter</th>
<th>Platform</th>
<th>Connection</th>
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</table>

THE DENTAL SOLUTIONS COMPANY™
# Part II: Parts: Ordering

The following components are compatible depending on the connection:

1. 1x Titanium base, 1x Abutment screw
2. 2x Abutment screw
3. 1x ScanPost, 1x Abutment screw
4. 36x Scanbody

TiBase and ScanPost are delivered without Scanbody. Please order this separately!

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### Scanbodies for Omnicam

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### Scanbodies for Bluecam

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Implant Abutments and Crowns on your CEREC

Part II: Parts: **Blocks**

**Why e.max?**
Implant Abutments and Crowns on your CEREC

Part II: Parts: **Blocks**

**Why e.max?**

**Strength**
- Usually MPa
- Influenced by many factors (finishing, firing, etc.)

**Fracture Toughness**
- Inherent to a material
- Resistance to crack propagation
- A more appropriate way to compare materials

**Zirconia**
- As translucency increases, fracture toughness decreases
- HT Zirconia about same fracture toughness as e.Max
Fracture toughness of Five CAD/CAM glass-ceramics

T. Hill¹* and G. W. Tyowsky¹

¹Ivoclar Vivadent, Inc., Amherst, NY, USA

INTRODUCTION

CAD/CAM technology is becoming more common in the production of dental restorations. With the increased number of available restorative materials, it is difficult for clinicians to differentiate between them. Many mechanical properties are required to determine the long term clinical success.

One clinically relevant property is fracture toughness. “Fracture toughness is an important property of dental ceramics since it is often “inherent” to the material and can be used to predict other properties, such as strength. Therefore, fracture toughness values allow meaningful comparisons to be made among ceramics used for structural purposes.”¹

MATERIALS AND METHODS

V-notch Creation

The V-notch was finished to 2 mm using a razor blade with 1 μm diamond paste (DMT I paste). The specimens were in ethanol bath.

Specimen Testing

Specimens were loaded to fail three-point testing fixture (3 mm) at a crosshead speed of 0.5 min in an Instron testing mac...
Part II: Parts: **Blocks**

**Why e.max?**

<table>
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<tr>
<th>Material</th>
<th>Microstructure</th>
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<td>35 - 45% Leucite</td>
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<tr>
<td>Suprinity®</td>
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<td>22 - 28 %</td>
<td>12 - 18 %</td>
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<td>Celtra™ Duo</td>
<td></td>
<td>6.5 - 11 %</td>
<td>25 - 31 %</td>
</tr>
<tr>
<td>Obsidian™</td>
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<tr>
<td>IPS e.max® CAD</td>
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<td>70%</td>
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</table>
Part II: Parts: Blocks

Why e.max?

![Fracture Toughness, $K_{IC}$ graph](image-url)

- Group 1: A (1.07 MPa-m$^{1/2}$)
- Group 2: B (1.36 MPa-m$^{1/2}$)
- Group 3: B (1.38 MPa-m$^{1/2}$)
- Group 4: C (1.71 MPa-m$^{1/2}$)
- Group 5: D (2.11 MPa-m$^{1/2}$)
Part II: Parts: **Blocks**

**Why e.max?**

**DISCUSSION**

In a review of several clinical trials, fracture toughness was one of two properties that correlated to clinical success of ceramic materials. Fracture toughness is inherent to the material while flexure strength can be manipulated by altering the surface or incorporating residual stress in the material. For the materials examined, fracture toughness, $K_{IC}$, increased with increased crystal volume fraction for the lithia based materials.
Part II: Parts: Blocks

Which e.max block should we choose?

Ask yourself: will we split?

Your choice will mostly depend on these factors:

• Need to place a temporary crown over abutment?
• Screw access position
• Path of draw
• Esthetics
• Personal preference
Implant Abutments and Crowns on your CEREC

Part II: Parts: **Blocks**

**Hybrid Abutment Crown Blocks**

- All are LT
- BL2, A1, A2, A3, A3.5
- B1, B2
- C1, C2
- D2
- 14 or 16 mm

- These can be custom stained in addition.
Implant Abutments and Crowns on your CEREC

Part II: Parts: Blocks

Hybrid Abutment Crown Blocks

[Images of hybrid abutment crown blocks]
Implant Abutments and Crowns on your CEREC

Part II: Parts: Blocks

Abutment Blocks

- MO 0 – for shades BL1-4
- MO 1 – for shades A1, A2, B1, B2, C1, C2
- MO 2 – for shades A3, A3.5,
- MO 3 – for shades A4, D3, D4
- MO 4 – for shades C3, C4, D2

- These can be custom stained in addition.
Implant Abutments and Crowns on your CEREC

Part II: Parts

Crystallization Pins
Part II: Parts

Cost

• Scan Post ($98.50, used up to 100 times)
• TiBase Kit ($87.50, one kit per restoration)
• Screwdriver Kit (you have this already)
• Scanbody ($35.50 for a box of 36 - Omnicam only)
• e.max Blocks (Abutment: $58.40; Hybrid $68.20)
• Crystallization Pins ($39.95 for 3, used many times)
• Ivoclar Monobond Plus (you have this already)
• Ivoclar Monobond Etch and Prime (you have this already)
• Ivoclar Multilink Hybrid Abutment Cement ($180; many uses per tube; comes with Monobond Plus)

• FINAL COST PER TOOTH: $160-220.
Part II: Parts

Other Handy Parts

Bone Profiling Kit

Pictured: Straumann Kit (contact your rep)

Latch Extender

Flexi-Flange Drill Extender
Patterson Item #309-5437
Implant Abutments and Crowns on your CEREC

Part II: Parts
Part III:
Imaging Appointment
Part III: Imaging Appointment

3 key differences from a standard crown

• **Trimming:** Careful here... the software will let you go forward without!

• **Gingival Mask:** we are now dealing with tissue more than ever.

• **Split function**
Part III: Imaging Appointment

Parameters

Best practice is to set the defaults (in Configuration) versus each case separately.
Part III: Imaging Appointment

Parameters: Abutment Anatomic
Part III: Imaging Appointment

Parameters: Abutment Multilayer Framework
Part III: Imaging Appointment

Parameters: Abutment Crown Veneering Structure
Part III: Imaging Appointment

But first....
Which burs should be used?
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

While we’re in the settings…

Burs for Zirconia
Part III: Imaging Appointment

While we’re in the settings....

Burs for e.max

12S not 12
Part III: Imaging Appointment

While we’re in the settings....

Burs for Telio

12S not 12
Part III: Imaging Appointment

Administration

Key point: Multilayer versus screw retained

- Multilayer Abutment and Crown
- Hybrid Abutment Crown

Bottom line: choose multilayer no matter what!
Part III: Imaging Appointment

Administration  Key point: TiBase versus Scanpost

Bottom line: Don’t do this! Choose carefully!
Part III: Imaging Appointment

Scanning

Scanpost notch will affect sprue position.

- Sprue position cannot be adjusted in the mill preview. This is because the notch is already built into the block and that will determine orientation.
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Scanning

Scanpost notch will affect sprue position.

Hybrid abutment/crown: place the notch away from the direct buccal or lingual to keep the sprue off the contact!
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Scanning

Scanpost notch will affect sprue position.

**Abutment**: place the notch at the direct buccal or lingual to force the sprue to the mesial or distal where there’s more room and it won’t be on you margin. (By the way this doesn’t always work.)
Part III: Imaging Appointment

Version 4.4 versus Version 4.5
Part III: Imaging Appointment

Version 4.4 Scanning

Gingival Mask

- What is it?
- Why do we need it?
- Managing the tissue as part of a CEREC restoration is new to us. More on this later.
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Version 4.4 Scanning

Gingival Mask

Remember…. You **MUST** add this catalog manually.

Click “Add Catalog” and choose the correct gingival mask catalog.
Part III: Imaging Appointment

Version 4.4 Scanning

Always follow a set sequence so you don’t forget anything… remember: the patient is going to leave!

1. Buccal Bite
2. Opposing Arch
   - Remove the Cover Screw -
3. Gingival Mask (IP contacts are important here)
   - Place the ScanPost, copy over, slice of bread…
4. Treatment Arch
Part III: Imaging Appointment

Version 4.5.x Scanning

Always follow a set sequence so you don’t forget anything... remember: the patient is going to leave!

1. Buccal Bite
2. Opposing Arch
   - Remove the Cover Screw -
3. Treatment Arch (IP contacts are important here)
   - Place the ScanPost and Scanbody -
4. Scanbody Arch
Part III: Imaging Appointment

Version 4.4 Scanning

Scanning Notes

- Omnicam users may copy the gingival mask catalog over to the treatment arch catalog. Use caution. If your Scanbody “floats” over the model the machine will consider it an artifact! Using the cut tool is highly recommended prior to scan. “Slice of bread”.
- “Understand” the tissue architecture and quality and your plan for it (i.e. blanch, laser, cut, etc.)
- Move forward to process the models until the design phase while the patient is still there!
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Version 4.5.x Scanning

Scanning Notes

- Scanning the treatment arch then copying it to the scan body arch is not recommended.
- “Understand” the tissue architecture and quality and your plan for it (i.e. blanch, laser, cut, etc.)
- Move forward to process the models until the design phase while the patient is still there!
Part III: Imaging Appointment

Scanning

scanning demo
Part III: Imaging Appointment

Model Axis

Easy way: 50 tips
Part III: Imaging Appointment

Trim (required)

“Slice of bread” method
Part III: Imaging Appointment

Trim (required)

“Slice of bread” method
Part III: Imaging Appointment

Trim (required)
Part III: Imaging Appointment

Trim (required)

Ut-oh.....
Part III: Imaging Appointment

Trim (required)

That’s better.
Part III: Imaging Appointment

Click Scanbody head

Double Click
Part III: Imaging Appointment

Did you get a blue line (not an error)?

You can now dismiss the patient.
Part III: Imaging Appointment

Schedule Patient for Delivery Appointment

• Same day if other treatment to be done
• 1-3 days MAX! Show off the technology!
Part III: Imaging Appointment
Part IV:
Design and Mill
Part IV: Design and Mill

But first: a quick review of “prep” guidelines, which we will need to remember later for abutment design.
Part IV: Design and Mill

Layer thicknesses: abutment with crown

- 0.5mm wall
- 1.5mm overall
- No sharp transitions
Part IV: Design and Mill

Layer thicknesses: hybrid abutment/crown

- 1.5mm wall
Part III: Imaging Appointment

Gingival Mask

Here we must make a choice: use the tissue contour as scanned or not.
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Gingival Mask

Gingival Mask off... flying saucer.
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Gingival Mask

Gingival Mask **off** ... flying saucer.
Part III: Imaging Appointment

Gingival Mask

Gingival Mask on... mimics the tissue contour per your parameters.
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Gingival Mask

Without gingival mask active
Implant Abutments and Crowns on your CEREC

Part III: Imaging Appointment

Gingival Mask

With gingival mask active
Part III: Imaging Appointment

Gingival Mask

Why is this important?
Part III: Imaging Appointment

Gingival Mask

demo
Part III: Imaging Appointment

Insertion Axis

Line up the arrow as desired.
Part III: Imaging Appointment

Insertion Axis

Does this even matter?
Part IV: Design and Mill

design demos
Part III: Imaging Appointment

Using Biojaw

Very Important for implant proposals which often are not as “perfect” as standard crowns.
Implant Abutments and Crowns on your CEREC

Part IV: Design and Mill
Part V: Finishing and Delivery
Part V: Finishing and Delivery

Sequencing Note

• Some prefer to crystallize/glaze/polish and assemble prior to the delivery appointment, and some prefer to try everything in prior for adjustments. The TiBase fits snugly in the crown for try in.

• Once cemented together, you cannot place it in the oven again (i.e. no adding contacts)! Make sure your shade is correct.

• My choice? Try in pre-crystallized state.
Part V: Finishing and Delivery

1. Remove the attachment
Part V: Finishing and Delivery

2. Test the fit (it always fits)
Part V: Finishing and Delivery

3. Remove the sprue (same as usual)
Part V: Finishing and Delivery

4. Clinical Try-in
Part V: Finishing and Delivery

5. Stain and glaze as you wish.

- You may stain BUT NOT GLAZE the area of an abutment that will be bonded to a crown. Stain will not reduce your bond.

- Polish is recommended for areas that will contact tissue.
Part V: Finishing and Delivery

6. Prepare for crystallization
Part V: Finishing and Delivery

7. Crystallize

Hybrid Abutment/Crown: Cycle 1
MO Abutment: Cycle 7

(other ovens: ask your Ivoclar rep)
Part V: Finishing and Delivery

Final Assembly

Materials Needed:
- Monobond Plus
- Monobond Etch and Prime
- Multilink Hybrid Abutment Cement
Part V: Finishing and Delivery

Assembly Step 1: Sandblast TiBase

TIP: You can use the back side of the TiBase kit foam as a quick sandblast tool!

Sandblast bonding surface only!
Part V: Finishing and Delivery

Assembly Step 1: Sandblast TiBase

**TIP:** Or, you can use a composite cap:

Sandblast bonding surface only!
Part V: Finishing and Delivery

Assembly Step 2: Monobond Etch and Prime

Etch/prime e.max bonding surface only.
Etch to very top on hybrid abutment/crown.
Part V: Finishing and Delivery

Assembly Step 3: Monobond Plus

• TiBase only
• 60 seconds, air dry.
• No rinse.
Assembly Step 4: Apply cement and join.

- use sparingly
- twist to “find” the notch and press firmly together
- clean up excess with cotton roll
- self (not dual) cure: 6 minutes
- polish the juncture afterward (fine football carbide/Diashine)
Part V: Finishing and Delivery

Assembly Step 5: Polish Edge
Implant Abutments and Crowns on your CEREC

Part V: Finishing and Delivery

Seating: Hybrid Abutment/Crown

- Same protocol as e.max (i.e. no sandblast!)
- Monobond Etch and Prime internally, wash, dry
- seat, torque, dry, place plumber’s tape to cover screw
- bond, composite (Tetric IvoFlow then IvoCeram)
- if, during the process, the surface is contaminated, you may etch and prime in the mouth.
Part V: Finishing and Delivery

Seating: Abutment

- Same protocol as e.max (i.e. no sandblast!)
- Monobond Etch and Prime in and out; wash, dry
- seat, place plumber’s tape to cover screw
- seat crown by your normal method
- if, during the process, the surface is contaminated, you may etch and prime in the mouth.
Tips

- Milling errors
- 12S not 12
- Milling times
- What about a screw-retained bridge
- What about tissue training?
- 3.3 S BL: too wide at base?
- Straumann Tissue Level exceptions.
- TiBase too tall?
- Multiple Unit insertion path
Last chance for questions!

- Part I: Consult
- Part II: Parts
- Part III: Imaging
- Part IV: Design and Mill
- Part V: Try in, Crystallize, Finishing & Delivery
The End!

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