



Top bonding tips for working with Zirconia from Dr. Nasser Barghi (SDA Convention 2017)

I really enjoyed Dr Nasser Barghi's lecture on All-Ceramic restorations. He has lectured worldwide on this topic and I saw him at the Singapore Dental Association Convention 2017.

He shared some tips to improve the bond strength of Zirconia restorations, which I share below (as well as generic tips for working with Zirconia to maximise success).

At the end of his presentation, I stood behind the microphone and asked an important question:

"Seeing as you shared so many great tips on bonding Zirconia - are we at a stage now that we should be considering partial coverage restorations to be made from Zirconia?"

He thought it was a great question, but basically the answer is '**No**'.

Lithium disilicate (eMax) is still king for that. We can definitely *improve* the bond strength of our Zirconia restorations, but not to the extent that we should be doing veneers or onlays in Zirconia. Still try to stick to timeless principles of retention form when using Zirconia. Those that disagree with this...don't shoot the messenger! Who knows what the future of Zirconia bonding will achieve?

Top tips for increasing bond strength of zirconia restorations:

When deciding to bond zirconia restorations, we can use a light cure to cure through Zirconia if it is thin. Light penetrates up to 1.5mm of zirconia. If you are unsure, you can place some composite on the intaglio surface of the zirconia restoration, and light cure from the outside to see if it will cure through the zirconia. Dr Barghi advises using a translucent cement to aid light curing.

Use a 'soft sandblasting' protocol with 50 microns aluminium oxide. Co-jet gives **no** added benefit. Use less pressure (less than 3.5 bar, less than 30s, 50 microns). Sandblasting will actually help even if you're not bonding but just cementing.

Use a 10-MDP containing primer such as Monobond (Ivoclar) or Z-prime - both are mostly

solvent and thin film thickness. Use Scotchbond Universal on tooth.

Prime the crown BEFORE inserting for try in - this will prevent phosphate in saliva affecting your bond. Once contaminated with saliva, sandblast, or Ivoclean. If you use Ivoclean, you must re-prime. To summarise steps:

The crown arrives already sandblasted. Place primer on intaglio surface 5 minutes before patient is due, but remove the excess after 20 seconds

Try in the mouth. Then clean the saliva with ethanol. If you use Ivoclean, re-prime. If use ethanol, you don't need to re-prime.

Prime the tooth with Scotchbond or equivalent + cure (anterior), or a dual cure primer (posterior).

Bond crown, making sure to hold down crown while light curing.

If cementing with RMGIC cement, then still use a resin bonding system, including a primer on the zirconia. This will improve the bond strength.

Was any of this supported by the literature? You bet! But I was so busy jotting down these notes, I had no chance of capturing the references.

Here are some more generic tips for working with Zirconia restorations:

Use polychromatic (pre-shaded) zirconia blocks for enhanced aesthetics

Instruct your lab to avoid gross reduction of zirconia framework - this will prevent fractures. Once the framework is adjusted, it causes crack propagation, weakening the restoration.

Tell the lab to limit the die space to 60 microns. This ensures good adaptation and retention.

Ensure layering ceramic is not in excess - if the layering ceramic is too thick, it will be unsupported and more likely to chip away. Essentially, layering ceramic must always be adequately supported.

Think of Porcelain Fused to Metal (PFM) crowns where you decide to keep the palatal in metal, to reduce how much preparation is needed or for strength purposes. This same logic can be applied to Zirconia restorations. Keep the palatal surfaces in monolithic zirconia, even up to incisal edge if occlusion permits. There is no need to put layering ceramic palatally. Keep it minimal prep, and negate the issue of layering ceramic chipping away. The labial part can be layered for aesthetics. It just makes sense!

So, can you bond Zirconia predictably? It is debatable.



Can you modify your protocol to *improve* bond strengths when working with Zirconia restorations? Yes!

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