

THE DENTAL ADVISOR™

"Improving Patient Care Through Research & Education"

3M ESPE Lava™ Crowns and Bridges 6-year Clinical Performance + + + + 1/2

3M ESPE
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Description

3M ESPE Lava Crowns and Bridges are a part of the *Lava Precision Solutions System* for anterior and posterior crowns and bridges up to 42 mm in length. Tooth preparation is similar but more conservative than that for ceramic-metal restorations with a chamfer margin. Dies are scanned using a *3M ESPE Lava Scan ST Design System* followed by milling and sintering of the zirconia coping or framework. The system also accepts digital impression files from the *3M ESPE Lava Chairside Oral Scanner C.O.S.* The zirconia substructure is colored with one of seven available shades or white to coordinate with the final restoration, which is overlaid with *3M ESPE Lava Ceram* veneering ceramic. The zirconia ceramic provides high strength, while the overlay ceramic is designed for optimal esthetics. *3M ESPE Lava* restorations may be cemented with traditional or self-adhesive resin cements. This product received a 95% clinical rating.

Clinical Evaluation Protocol

• The first *Lava* restorations were placed starting in 2003. Since that year, a total of over 1200 *Lava* restorations have been placed and documented. These restorations include anterior and posterior crowns, as well as 3- and 4-unit bridges.

Consultants' Comments

- ◆ *"Zirconia based restorations are the future in dentistry and will eventually replace most PFM restorations."*
- ◆ *"Overall, I have been very pleased with the Lava restorations. They are highly esthetic and life like."*
- ◆ *"My patients love the esthetics and the fact that the crowns do not appear grey like PFMs can."*
- ◆ *"Like any material there is a learning curve. I have seen Lava crowns get more and more esthetic over the six-year period I have been using them. The laboratories I work with love the outcome."*

Laboratory Consultants' Comments

- ◆ *"As a laboratory owner, it is so much more gratifying to work with zirconia as compared to metal. The results are much better."*

- Most restorations were cemented with **3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement**.
- Six hundred and forty restorations were recalled at year six. The restorations included 42% molar, 39% premolar, 12% anterior, 6% bridges and 1% implants (see Figure 1)
- Restorations were evaluated on a 1 – 5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.
- The vast majority of the restorations were fabricated by Nellmar Laboratory and Alpha Dental Studio.

REPRINT

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Ratings

Excellent	+++++
Very Good	++++
Good	+++

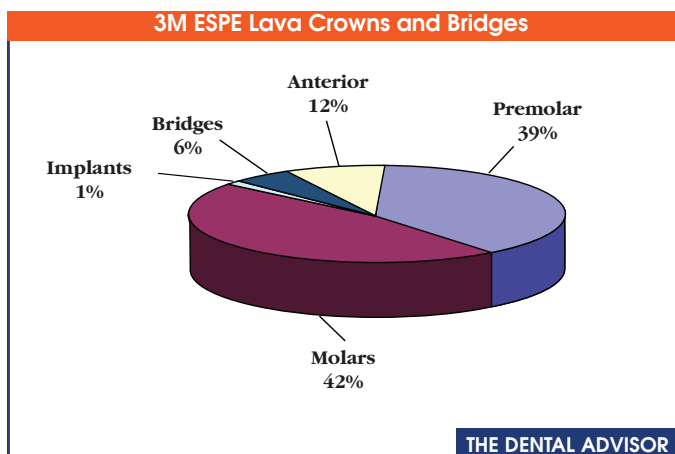


Figure 1

Clinical Observations

Resistance to Fracturing and Chipping

Figure 2 shows the fracture and chipping of *Lava* restorations at 1, 3, and 6 years of service. The fractured restorations were those that were replaced. In many cases, the fractures resulted in the delamination of a large portion of the ceramic, where a large piece would literally shear off the coping. The reasons for the fractures were either due to the thickness of unsupported ceramic or possibly to rapid heating or cooling of the veneering ceramic.

Rapid cooling of the restoration can result in the build-up of undesirable stresses within the restoration. None of the fractures involved a substructure or coping failure. The chipped restorations were not replaced. Most often the chips were minor and the restoration just needed to be smoothed and polished.

Esthetics

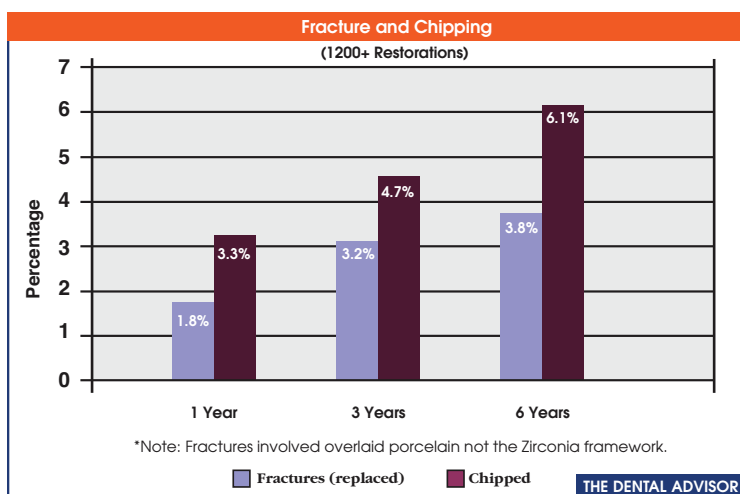


Figure 2

Eighty-four percent of the restorations had excellent shade match while 16% received a very good rating. *Lava* restorations have a definite edge in esthetics over PFM restorations because the *Lava* coping can be fabricated in a different shade and it can act as a good dentin simulator. Furthermore one does not have the grayish appearance of the metal to contend with. *Lava* restorations are in general more esthetic and vital in appearance.

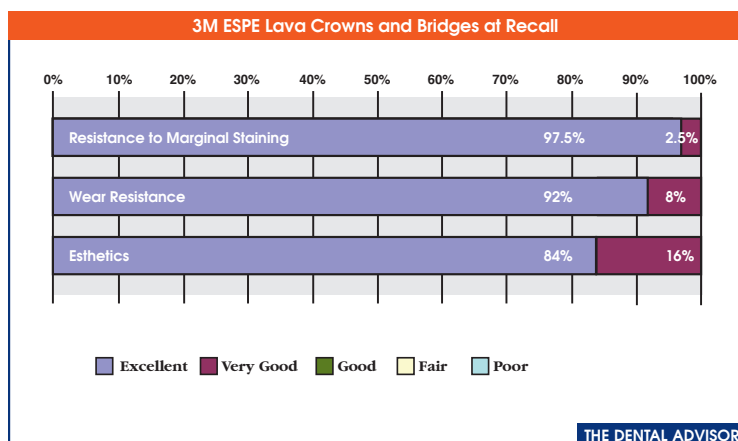


Figure 3

Resistance to Marginal Staining

A distinct advantage of *Lava* crowns is the fact that the core is opaque and the margins of the zirconia core are very close or at the margin of the preparation. The design of the coping and its closeness to the margin can eliminate graying at the margin that can be detected in more translucent restorations. During the six-year evaluation, only 2.5% of the restorations exhibited slight graying at the margins.

Wear Resistance

Ninety-two percent of the *Lava* restorations exhibited no wear while 8% exhibited slight wear of the overlaid porcelain. Minimal amount of wear was noted in about 17% of the teeth opposing *Lava* restorations. This wear was most visible in anterior teeth.

Summary

3M ESPE Lava Crowns and Bridges performed exceptionally well over the six-year evaluation period in their resistance to fracture and marginal staining and exhibited minimal wear.

Editors' Note: Curved and long span bridges up to 48 mm in length and approximately 18 mm in height will be available with the launch of the larger *Lava Zirconia Multi XL* material later this year. ■