



FIVE-YEAR EVALUATION OF ZIRCONIA-BASED BRIDGES IN GENERAL PRACTICE: YEAR-THREE RESULTS

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INTRODUCTION

- The purpose of this practice-based multi-centre observational study is to evaluate the five-year performance of 50 all-ceramic bridges, constructed with a Lava™ (3M™ ESPE™, Seefeld, Germany) substructure and cemented using a self-adhesive resin based cement (Rely X™ Unicem, 3M™ ESPE™, Seefeld, Germany) placed in adult patients in 4 UK general dental practices.

METHOD

- Following Ethics Committee approval, four GDP members of the PREP (Product Research and Evaluation by Practitioners) panel, with practices in Scotland, England (2), and Northern Ireland, recruited patients complying with the protocol criteria. The practitioners recorded the pre-operative status of the gingival tissues adjacent to the teeth to be restored.
- After preparation, impressions were sent to the laboratory designated for use in the study. (Castle Ceramics, Tamworth, Staffs, UK) where dies & models were cast and sent to 3M ESPE, Seefeld, Germany, for the construction of the zirconia substructure. The frameworks were then returned to the UK laboratory for addition of the overlay ceramic, Lava™ Ceram (3M ESPE, Seefeld, Germany). The completed bridges were placed approximately 17 days after preparation, luted with RelyX™ Unicem and the baseline assessment forms completed (Table 1). Each bridge was reviewed, using modified Ryge criteria, within 3 months of the third anniversary of its placement by a trained calibrated examiner together with the clinician who had placed the restoration

Table 1 – Criteria for baseline evaluation

Margin adaptation	O=Optimal, 1=slight deficiency
Colour match	O=Optimal, 1=Slight mismatch, 2=Gross mismatch
Gingival health	1 = Healthy gingivae. 2= Mild inflammation – slight color change, slight edema, no bleeding on probing. 3= Moderate inflammation – redness, edema and glazing, bleeding on probing. 4=Severe inflammation – marked redness and oedema, tendency to spontaneous bleeding

MATERIALS

- Lava™ is a yttria-stabilised tetragonal-zirconia-polycrystalline (Y-TZP) ceramic. Lava™ Ceram is an overlay ceramic with a similar co-efficient of thermal expansion to Lava™. RelyX™ Unicem™ a self-adhesive, dual cure resin-based material was used to lute the bridges.

RESULTS

- To date 34 bridges (of mean age 35.6 months) in 29 patients (19 Female, 10 Male) have been reviewed at three-years. Distribution was: Anterior (incisor & canine pontics) = 12 (35 %) Posterior (molar & premolar pontics) = 22 (65 %)
- All the bridges were present, intact, with no secondary caries. No additional veneering porcelain chips (two reported at one-year^{1,2}) of the veneering porcelain detected. However it was recorded that an access cavity, for successful endodontic treatment, had been prepared & restored in the occlusal surface of a pre-molar retainer (a total of 3 (4%) of the abutments in this trial have been endodontically treated) The bridges were otherwise intact and performing well. The final composite restorations were optimal when examined using the same Ryge criteria as the Lava bridges.
- 31 (91%) of the Lava bridges were scored as optimal for marginal adaptation with no unacceptable scores and no pain or sensitivity was reported
- One (3%) of the bridges examined showed a slight shade mismatch, as reported previously^{1,2,3}, but it was of no concern to the patient. No staining was noted on any of the Lava bridges examined and all the bridges scored optimal for anatomic form.

Table 2 – Comparison of gingival health at Baseline, One,

	Baseline	One-Year	Two-years	Three-years
Facial	1 85% 2 15%	1 95% 2 5%	1 92% 2 4% 3 4%	1 94% 2 6%
Mesial	1 82% 2 18%	1 100%	1 100%	1 100%
Distal	1 85% 2 15%	1 95% 2 15%	1 96% 2 4%	1 100%

At the three-year reviews the gingival tissues maintained the improvement in the scores for gingival health noted at previous reviews^{1,2,3} (Table 2).

Fig 1: A molar 3-unit bridge at one-year, two-years and three-years



Fig 2: Two anterior 3-unit bridges at two-years and three-years



CONCLUSION

This report suggests the Lava™ Y-TZP bridges under investigation continue to perform well in UK general dental practice after 36 months. The bridges will be next reviewed at age 60 months.

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References

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