



EVALUATION OF ZIRCONIA-BASED BRIDGES IN UK GENERAL PRACTICE: SECOND-YEAR RESULTS

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INTRODUCTION

- Over 40 published handling evaluations, and clinical trials have been completed by the research group of UK GDP's (General Dental Practitioners) known as the PREP (Product Research and Evaluation by Practitioners) Panel^{1,2,3}, since it was established fifteen years ago. The panel presently has 31 members with a wide range of dental interests facilitating the assessment of a full range of products and techniques.
- 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 general dental practitioner members of the PREP panel with practices in Alness (Scotland), Buxton and Liverpool (England), and Coleraine (Northern Ireland) recruited patients complying with the protocol criteria.
- The practitioners recorded the pre-operative status of the gingival tissues adjacent to the tooth / 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 second anniversary of its placement by a trained calibrated examiner together with the clinician who had placed the restoration

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.

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

RESULTS

- To date 28 bridges (of mean age 24.1 months) in 25 patients (18 Female, 7 Male) have been reviewed at two-years.
- All the bridges were present with no secondary caries. (96% (n=27) were intact, with one additional veneering porcelain chip (one reported at one-year³) of the veneering porcelain detected. It was noted that access cavities, for successful endodontic treatment, had been prepared in the occlusal surface of molar retainers in 2 cases (7%) but that the Lava bridges were otherwise intact and performing well. The final composite restorations were optimal when examined using the same Ryge criteria as the Lava bridges.
- 25 (89%) of the Lava bridges were scored as optimal for marginal adaptation with no unacceptable scores.
- No pain or sensitivity was reported
- One (4%) of the bridges examined showed a slight shade mismatch, as reported at one-year³, 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.

	Baseline	One-Year	Two-year
Facial	85% 1, 15% 2	95% 1, 5% 2	92% 1, 4% 2 4% 3
Mesial	82% 1, 18% 2	100% 1	100% 1
Distal	85% 1, 15% 2	95% 1,5% 2	96% 1, 4% 2

Table 2 – Comparison of gingival health at Baseline and Two-year

At the two-year reviews the gingival tissues maintained the improvement in the scores for gingival health noted at one-year³ (Table 2).



Fig.1: 3-unit Lava bridge replacing UR1, at two-years

CONCLUSION

This report suggests the Lava™ Y-TZP bridges under investigation are performing well in UK general dental practice after 24 months. The bridges will continue to be reviewed annually for a further 36 months.

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REFERENCES

- Burke F J T, Wilson N H F. Introducing the PREP panel. Dent. Pract 1994; 32 (18): 30.
- Burke F J T, Crisp R J, et al. Two-year evaluation of restorations of a packable composite placed on UK general dental practices. Br.Dent.J 2005; 199: 293-296
- Crisp R J, Burke F J T. Evaluation of Zirconia-based bridges in UK general practice: First-year results. J. Dent. Res. 86 (Special Issue A): Abstract 903, 2007