



EVALUATION OF ZIRCONIA-BASED BRIDGES IN UK GENERAL PRACTICE; FIRST-YEAR RESULTS

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INTRODUCTION

- 1993 saw the establishment of a group of practicing dental practitioners, the PREP (Product Research and Evaluation by Practitioners) Panel¹, prepared to complete evaluations of new materials and techniques in the practice environment. To date, over 40 published handling evaluations, and clinical trials^{2,3,4} have been completed. The PREP panel presently has 28 members, with a UK-wide distribution, and 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 three-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 first 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™ is a self-adhesive, dual cure resin-based material indicated for the luting of all inlays (ceramic, composite & metal), onlays, crowns and bridges as well as cast and fibre posts.

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 (at 3 sites: facial, mesial & distal)
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 39 bridges (of mean age 12.3 months) in 34 patients (22 Female, 12 Male) have been reviewed at one-year.
- All the bridges were present with no secondary caries. 97% (n=38) were intact, with one small polishable chip 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 3 cases (8%) 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.
- 36 (92%) of the Lava bridges were scored as optimal for marginal adaptation with no unacceptable scores. .
- Four patients (10%) reported dull pain or sensitivity from the abutment teeth. Three cases (noted above) were, after investigation, successfully endodontically treated. The remaining patient had generalized mild sensitivity.
- At the one-year review the gingival tissues showed an improvement in the scores for gingival health (Table 2).

Table 2: Comparison of gingival health at Baseline and One-year:

	Baseline	One-Year
Facial	85% 1, 15% 2	95% 1, 5% 2
Mesial	82% 1, 18% 2	100% 1
Distal	85% 1, 15% 2	95% 1,5% 2

- Two (5%) of the bridges examined showed a slight shade mismatch but it was of no concern to the patients. No staining was noted on any of the Lava bridges examined and all the bridges scored optimal for anatomic form.

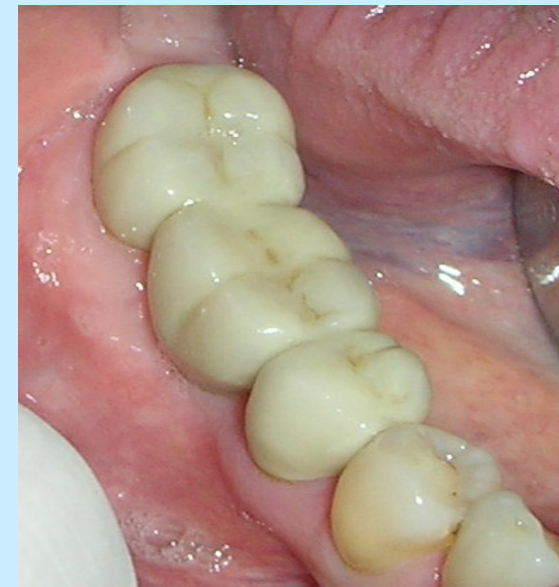


Fig. 1: 3-unit Lava bridge replacing 46, at one-year

CONCLUSION

This initial report suggests the Lava™ Y-TZP bridges under investigation are performing well in UK general dental practice after 12 months. The bridges will continue to be reviewed annually for a further 24 months.

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