

# Evaluation of Zirconia-based Bridges in UK General Practice: Five-year results

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## INTRODUCTION

This practice-based multi-centre observational study evaluated the five-year performance of fixed-fixed 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 of 4 UK general dental practitioners (GDPs).

## METHOD

Following Ethics Committee approval, four GDPs members of the UK-wide practice-based research network - The PREP (Product Research and Evaluation by Practitioners) Panel, with practices in Alness, Buxton, Liverpool and Coleraine recruited patients complying with the protocol criteria. After preparation, impressions were sent to one designated laboratory where dies and 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 baseline assessment forms completed (Table 1). Each bridge was reviewed, using modified Ryge criteria, within 3 months of the first, second, third and fifth anniversary of its placement by a trained calibrated examiner together with the clinician who had placed the restoration. The first, second and third-year results have been reported<sup>1,2,3</sup>.

Table 1 - Criteria for baseline evaluation

<b>Margin adaptation</b>	O=Optimal, 1=slight deficiency
<b>Colour match</b>	O=Optimal, 1=Slight mismatch, 2=Gross mismatch
<b>Gingival health</b>	1 = Healthy gingivae. 2= Mild inflammation – slight colour change, slight oedema, no bleeding on probing. 3= Moderate inflammation – redness, oedema 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™ is a self-adhesive, dual cure resin-based material.

## RESULTS

Of the 41 bridges placed at baseline, 33 bridges (mean age 62mths) in 28 patients (17 Female and 11 Male) were reviewed (Recall rate - 80%). Three were of 4-units & the rest 3-units. 33% (n=11) of the bridges were anterior (incisor & canine pontics) and 88% (n=29) were maxillary. All of the bridges were present, with no secondary caries detected and no sensitivity reported.

No further endodontic treatments had been carried out in addition to those reported at Year 3<sup>3</sup>. Of the bridges examined, two (3%) of the total of 66 abutments had been endodontically treated. In addition to the 2 chipping cases reported earlier<sup>3</sup>, 6 further incidences of chipping were detected at year-five. Five had not been noticed by the patient and were considered restorable by re-contouring & polishing. One case involved a highly visible mesio-incisal angle of a central incisor (Fig 1) and this bridge was replaced as a successful repair could not be guaranteed.



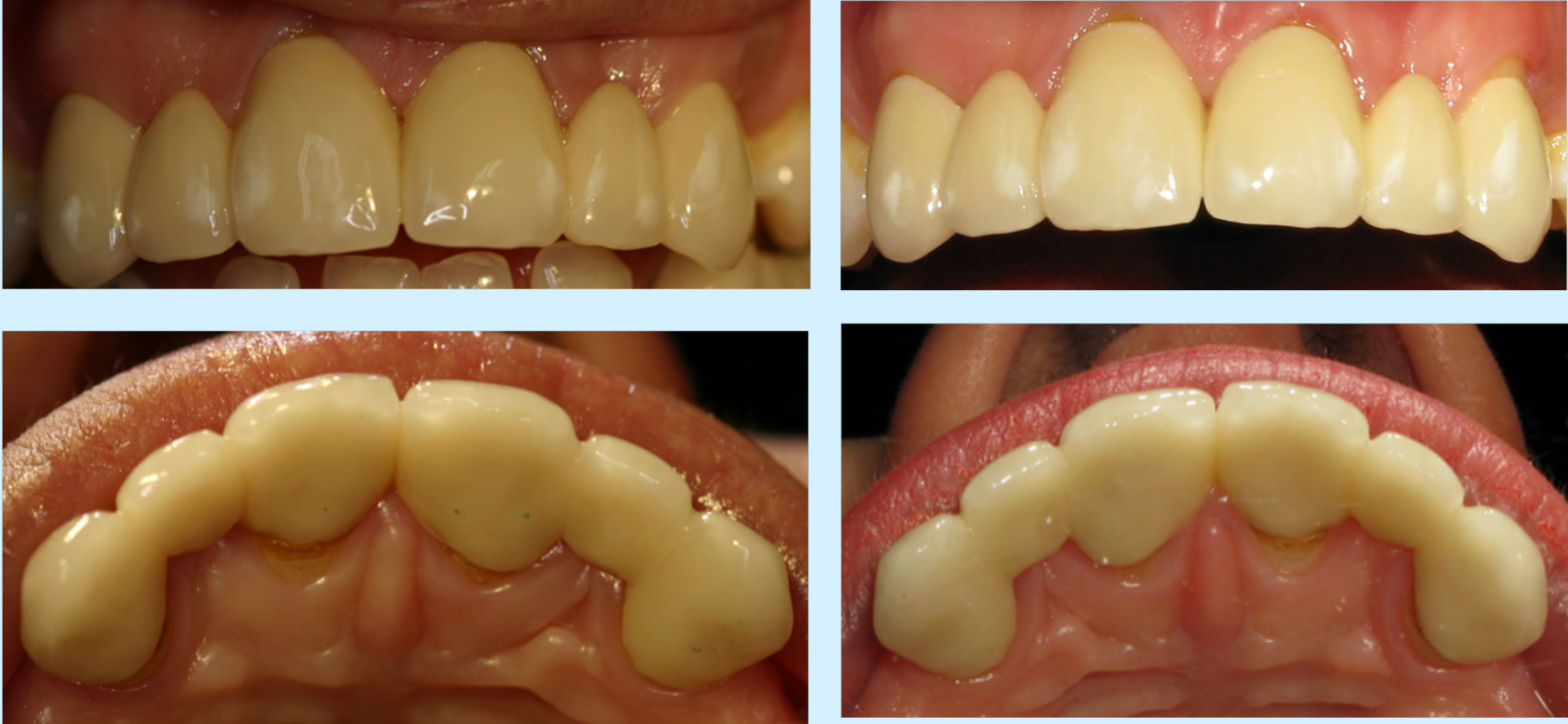
Fig. 1  
Mesial-incisal

91% (n=30) of the bridges were scored as optimal for margin integrity with no unacceptable scores recorded. Table 2 indicates that the high number of optimal scores for gingival health was maintained at the Year 5 reviews.

Table 2 - Gingival health: Baseline to Year 5

	Baseline	One-year	Two-years	Three-years	Five-years
Facial	1. 85%	1 95%	1 92% 2 4%	1 94%	1 94%
	2. 15%	2 5%	3 4%	2 6%	2 6%
Mesial	1 82%	1 100%	1 100%	1 100%	1 97%
	2 18%				2 3%
Distal	1. 85%	1 95%	1 96%	1 100%	1 97%
	2. 15%	2 5%	2 4%		2 3%

Fig. 2: Two Anterior Bridges at a) Two and b) Five-years



## DISCUSSION

The incidence of chipping reported is comparable to similar recent studies over five-years but newer framework design software now provides for greater support to the veneering porcelain.

## CONCLUSION

This report suggests the Lava™ Y-TZP bridges under investigation continue to perform well in UK general dental practice after 5 years.

## ACKNOWLEDGEMENT

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## References

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