

# Bridge design, part seven: adhesive bridgework

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## Paul Tipton discusses the advantages and shortcomings of resin-bonded prostheses in bridgework

An analysis of the literature regarding resin-bonded prostheses is more straightforward than that concerning conventional fixed partial dentures. Most resin-bonded prostheses are single-tooth replacements, and reported results are not as influenced by large prostheses as they are with conventional replacements.

The same criteria of bridge design apply equally to adhesive bridgework as conventional bridgework, such as retentional requirements, occlusion, and hygiene etc.

### FAILURE

Dislodgement is the overriding cause of failure of resin-bonded replacements (Al-Shammery, 1989; Hussey, 1991) and if double abutments are used this can lead to rapid caries (Figures 1 & 2). Results suggest that overall long-term retention may be unpredictable: failures ranged from 10% over 11 years (Barrack, 1993) to 54% over 11 months (Hansson, 1994). Creugers (1991) reported promising early results, but extended evaluations showed inconsistent success rates. Short-term data does not accurately predict actual long-term survival of these prostheses (Thompson, 1993).

Although combined long-term retention rates of resin-bonded prostheses appear problematic in many reports, certain selected variables show greatly improved success rates. Restorations placed on tooth preparations having definite guide planes, proximal grooves, and occlusal rests performed better than those with little or no preparation (Creugers, 1991). The original concept of reversible resin-bonded fixed prostheses must be reconsidered if predictable retention is to be achieved. Current design parameters require that retainers more closely resemble traditional partial coverage restorations retained by resin cement (Burgess, 1989). Luting agents and metal surface preparation techniques appear to have significant effects on retention rates. Panavia EX (Morita, Japan) coupled with aluminium oxide abraded retainers showed improved retention (Hussey, 1991; Barrack, 1993). Cement fatigue as noted by Wood and Thompson (1993) or cement washout as defined by Boyer (1993), might best explain unexpected long-term failure after short-term success.

### SUCCESS VARIABLES

Occlusal forces, enamel surface area, and isolation feasibility are factors that probably contribute to

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Figure 1: Rapid caries beneath the retainer



Figure 2: Carious exposures under the metal wings