

Summary of: A comparison of the survival of fibre posts cemented with two different composite resin systems

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VERIFIABLE CPD PAPER

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Objectives To evaluate the outcomes of a fibre post cemented with two different luting agents. **Methods** A single type of tooth coloured fibre post (Fibre-White Parapost, Coltene Whaledent) was used along with two different types of luting cement. A total of 129 teeth were treated in this retrospective audit: 79 treated were luted with Calibra Aesthetic Dental Resin Cement (Dentsply) and 50 with Panavia F 2.0 (Kuraray). All teeth were treated by the same operator and had a minimum ferrule of 2 mm and a ParaCore (Coltene Whaledent) composite core placed over the post. Where Calibra Aesthetic Dental Resin Cement was used, all the restorations were undertaken between June 2002 and October 2003 and were reviewed for a period of 38 to 54 months. Where Panavia had been used, all restorations were placed between February 2004 and December 2005 and reviewed for a period of 28 to 50 months. **Results** The results for the Calibra cemented posts were: 64 returned for recall and of these 23 were classed as failed. The causes were: root fracture (2), decementation (3), fracture at post-core interface (6), endodontic failure (8) and marginal caries (4). The results for the Panavia cemented posts were: 44 returned for recall and 9 were classed as failed; the causes of failure were fracture at post-core interface (6), endodontic failure (1) and marginal caries (2). **Conclusions** For posts cemented with Calibra, a success rate of 64.1% was determined over a period of 38 to 54 months. The use of Panavia resulted in fewer post failures with a reported success rate of 79.5% over an evaluation period of 28 to 50 months. Mechanical failures by means of fractures occurring anywhere along the length of the post-core complex were the major cause of lack of success. Significantly higher failure rates were observed to occur in partially dentate patients, in those with parafunctional habits and also amongst anterior teeth. While the majority of the mechanical failures were amenable to repair, the latter mode of failure appears to be a major downfall when considering the routine use of fibre resin posts in restorative dentistry. The choice of cement appears to have a significant role in improving prognostic outcome.

EDITOR'S SUMMARY

In clinical practice as well as in the arena of research studies one fact comes through as strikingly obvious: that nothing we are able to provide as clinicians matches up to that with which nature endows us. The confluence of materials, techniques and altered biological tissues often seems to conspire to confound our best efforts to restore damaged hard tissues.

Thus it is that as we make gradual progress in moving from metal posts as a foundation to restore endodontically treated teeth, we also need to take account of the cements that we use to secure the fibre resin equivalents. This study provides some valuable information on the comparison of the medium-term success of two luting agents, indicating that

the choice of material can influence the prognostic outcome. What the study also highlights is the number of other factors that have to be considered not only in the meaningful study of the subject but also in contemplating the clinical situation. The causes of failure were associated with root fracture, decementation, fracture at the post-core interface, endodontic failure and marginal caries. In addition, significantly higher failure rates were observed to occur in partially dentate patients, in those with parafunctional habits and also amongst anterior teeth. A plethora of considerations around which to negotiate.

We would all like to be able to see into the future and predict which treatments work best for longest. Sadly we cannot

and our next best tool in this respect has to be research and extrapolation. The authors have provided us with some valuable indicators to guide our daily decision making based on observation, careful analysis and best practice. Only with the benefit of hindsight will we know with greater surety which method stood the test of time and function, in the interim we can reassure our patients that we are doing the best we can on the evidence we have.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 205 issue 11.

Stephen Hancocks,
Editor-in-Chief

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IN BRIEF

- Describes the results of 3-5 year audit on fibre resin posts used to restore endodontically treated teeth with the use of two differing resin luting agents.
- Highlights the importance of the appropriate choice of resin lute.
- Suggests that root fractures are seldom encountered with the use of FRPs but fractures occurring along the post-core interface appear to be a cause for concern.

COMMENT

Use of tooth coloured fibre posts is increasing but their clinical performance has been less extensively studied than use of metal posts. This study will, therefore, prove of interest to readers of the *British Dental Journal*. The significance of the choice of the two post luting agents is that one (Panavia F.2.0) has potential to chemically bond to the post while the other (Calibra) may not. A limitation of the study, fully admitted by the authors, is that it is a retrospective audit. Thus the review periods varied for each material and between materials, the time of placement using the two luting materials was consecutive rather than concurrent and the status of the dentition was not standardised, which could have impacted on the outcomes, as could the lack of standardisation of the distribution of groups of teeth in which posts were placed and the differences in sample sizes of the two groups evaluated.

The great strengths of the study, however, are that all posts and subsequent procedures were undertaken using a standardised technique and following manufacturer's instructions, by the same operator in the same general (private) practice. Unfortunately, again due to the nature of the audit, the assessment of failure or otherwise of the procedures was made by the operator and not a trained independent observer.

Correctly, in view of the nature of this study, no statistical analyses were attempted. Instead, descriptive statistics are provided. The relatively high

rate of fracture at the post/core interface identified in the study is of concern and is consistent with *in vitro* test results. The relatively low level of root fracture is consistent with *in vivo* studies and is a potential advantage over metal post systems.

While no firm conclusions can be drawn with regard to the choice of luting material, valuable areas for further studies are highlighted.

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AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

Fibre resin posts (FRPs) have been developed to provide more aesthetic, biocompatible, retrievable and conservative alternatives to their traditional metallic endodontic post counterparts. Additionally, it has been postulated that FRPs, on account of their mechanical properties, would overcome the well documented problem of root fracture frequently associated with the use of metal posts. To date, there have been relatively few clinical studies undertaken to assess the performance of FRPs and very little is known about the influence of the type of resin lute used to place FRPs within the post canal. The purpose of this audit was to gain further information relevant to everyday restorative dental practice. The audit was undertaken as part of the fulfilment of a post-graduate degree.

2. What would you like to do next in this area to follow on from this work?

Of what little data is available on the clinical outlook of endodontically treated teeth restored by means of fibre resin post systems, much is short- to medium-term in duration. The undertaking of a 10 year survival assessment would provide much sought after information on the long-term performance of such post systems. It would also be interesting to evaluate the effect on clinical survival with the use of fibre resin posts of differing chemical, mechanical and physical properties, as would be the impact of the influence of differing types of resin lute, in particular the new generation of 'smart cements' (7th generation bonding agents).