Editorial

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Amazing zinc phosphate cement.

In the course of putting *Dental Outlook* together it is customary to review literally hundreds of articles per issue to ensure that everything is accurate and well presented.

One of the almost subliminal occurrences has been the consistently good results obtained clinically and in the laboratory with zinc phosphate cement.

For example, in a recent head-to-head clinical comparison with the resin cement, **RelyX Unicem** (3M Espe), zinc phosphate cement performed just as well over the 3-year study period. [1]

An earlier examination of 1,314 cast-gold inlays placed 1 to 52 years previously and luted with zinc phosphate cement found a 94.1% survival rate for restorations that had been in place for more than 40 years. [2]

It performed well as a luting agent for gold posts and cores in a 25-year evaluation. [3]

Results of laboratory studies have also been surprising. Push-out tests of fibre posts luted with zinc phosphate cement showed it performed better than some of the well-known resin luting cements. [4]

A test was undertaken to see how long it took to loosen a cast-metal post from a root canal with ultrasonic vibration. It took 1 minute for posts luted with glass-ionomer cement as against 3 minutes for those luted with zinc phosphate cement. [5]

The effectiveness of zinc phosphate cement in luting cast posts and cores was confirmed in another laboratory study: in that case it was better than **Panavia F** (Kuraray). [6]

The question arises then: why is zinc phosphate cement, which has been around for over 100 years, still so good?

Certainly, its low pH allows for excellent wetting of the tooth surface and the development of micro-mechanical interlocking between cement and tooth.

However, it is possible that two Chinese researchers may have come across another answer. [7]

They found that when zinc phosphate cement is put under pressure, as with seating a casting, the crystals formed are orientated differently to those when the material is allowed to set in bulk.

Under pressure the crystals fan out radially and grow as the material sets. In the process of growing they push against each other *and the cement expands*.

This forces the cement into micro irregularities on the tooth surface and the fitting surface of the cast post, inlay or crown. The end result is improved retention.

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