

**A New In Vitro Method for the Study of Micro-
leakage of Dental Restorative Materials**

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ABSTRACT

Microleakage is an important topic in restorative dentistry. A large number of different techniques have been developed for the investigation of microleakage. However, these methodologies have been considered less reliable due to the nature of specimen preparation.

The major objective of this investigation was to introduce a non-destructive technique for the study of microleakage. This objective has been partly met with the use of micro-computed tomography. By scanning the whole restoration with high spatial resolution, microleakage could be detected non-destructively and three-dimensionally.

In order to detect microleakage by micro-computed tomography, an X-ray contrast dye solution was developed to reveal microleakage at the tooth/restoration interface. In addition, a suitable model of tooth/cavity complex was designed in order to gain the best resolution from micro-computed tomography. Finally, with the application of advanced image analysis software, three-dimensional analysis of microleakage was achieved quantitatively and qualitatively.

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and to the best of my knowledge and belief, contains no material previously published or written by another person except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Signed

Chin Nguyen

Date:

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