

**Republic of Iraq
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College of Dentistry**



**Assessment of different techniques for
detection secondary carious lesion
around amalgam restoration**

Thesis

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By

Noor Musa Kadhim

B.D.S

Supervised by

Prof. Dr. Ban Ali Salih

B.D.S, M.Sc.

1436 A.H

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Abstract

Background: Secondary caries is a disease that occurs on the tooth after the dental restoration has been in place for a period of time. It has been reported as the main reason for restoration replacement. Therefore detection of secondary caries in its early stages is important for prevention and control of dental caries.

Aims of study: The aim of this invitro-study was to evaluate different techniques (Visual inspection, Laser pen (DIAGNOdent), Bitewing radiograph, Tactile examination) for detection secondary caries around to amalgam restorations.

Materials and methods: Sixty extracted primary molars with class I and class II amalgam restorations were collected from children, then divided into four groups, each group contains fifteen teeth. Group A consists of fifteen teeth of class (I) examined fifteen surfaces. Group B and C consist of fifteen teeth for each group of class (II) MO and DO which examined thirty surfaces. Finally, Group D consists of fifteen teeth of class (II) MOD examined forty five surfaces. Furthermore, 120 surfaces adjacent to amalgam restoration which examined (60 = occlusal surfaces ; 60 =proximal surfaces) through visual inspection using mirror and light only, followed by laser pen (DIAGNOdent) 655 nm wavelength, after that bitewing radiographs were taken using film holders and interpreted on a backlit screen without magnification. and lastly tactile examination using blunt probe.

Results: The results of this study showed that the best cut-off points for the sample were found by a Receiver Operator Characteristic (ROC) analysis, and the area under the ROC curve , sensitivity, specificity and accuracy of the techniques were calculated for enamel (D1) and dentine

(D2) thresholds. These parameters were found for each techniques and then compared by the Cochran's Q test. The visual inspection and tactile examination presented the fair techniques for detecting secondary caries at enamel thresholds for both occlusal and proximal surfaces than bitewing radiograph. Whereas, bitewing radiograph was good technique at dentin threshold than visual inspection and tactile examination. DIAGNOdent presented good technique at enamel and excellent at dentin thresholds.

Conclusions:DIAGNOdent offered the best performance for detecting enamel and dentin secondary caries in primary teeth restored with amalgam. On the other hand at dentin better than at enamel threshold. Visual inspection and tactile examination represented the best performance for detecting enamel secondary caries. While, Bitewing radiograph represented the best performance for detecting dentin secondary caries.

Keywords: Secondary caries, Amalgam, Visual inspection, Laser pen, DIAGNOdent, Bitewing radiograph, Tactile examination.