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TITLE: Comparison of Different Diagnostic Techniques in Detecting Approximal Caries

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ABSTRACT BODY:

Objectives: The aim of this *in vitro* study was to evaluate the accuracy, sensitivity and specificity of DIAGNOdent pen, Vistacam ix and Bitewing radiography in caries detection of the approximal surfaces of primary molars.

Methods: For performing the study, 68 primary molars were selected and their approximal caries status was determined using these diagnostic techniques: DIAGNOdent pen, Bitewing radiography and Vistacam ix. The teeth were sectioned and directly assessed by a stereomicroscope as a gold standard. The cut-off points were determined at D1 and D3 according to the Downer histological classification system. The McNemar test was used to compare the sensitivity, specificity and accuracy among the methods.

Results: Regarding D1, as a cut-off point for histological assessments, sensitivity, specificity and accuracy of DIAGNOdent pen were 0.82, 0.75 and 0.8 respectively, while the values were 0.63, 1and 0.62 for Bitewing radiography and 0.56, 1 and 0.59 for Vistacam ix.

At the D3 level, as a cut-off point for histological analysis, Sensitivity, specificity and accuracy rates of DIAGNOdent pen were 0.71, 0.86 and 0.8 respectively while these values were 0.71, 0.73 and 0.72 for Bitewing radiography and 0.5, 0.78 and 0.67 for Vistacam ix.

DIAGNOdent pen showed the highest performance and accuracy to detect approximal caries lesions at both D1 and D3 levels among the three methods ($P<0.05$). Vistacam ix and Bitewing radiography showed significantly better performance at D3 compared to D1 while their performance was lower than DIAGNOdent pen.($P<0.05$)

Conclusions: DIAGNOdent pen is the preferred diagnostic technique in approximal caries detection at both the dentine and enamel levels in comparison to Vistacam ix and Bitewing radiography.

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