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Accuracy and Reliability of Methods to Measure Marginal Adaptation of Crowns and FDPs: A Literature Review

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Abstract: Abstract Purpose To review methods used to investigate marginal adaptation of crowns and fixed dental prostheses (FDPs), and to discuss testing variables employed and their influence on results. Methods Online libraries including PubMed, Scopus, and Ovid were searched for articles evaluating the marginal adaptation of crowns and FDPs using a combination of the keywords: ?marginal accuracy,? ?marginal fit,? ?marginal gap,? ?marginal discrepancy,? ?fitting accuracy,? ?crown,? and ?FPD.? Peer-reviewed publications in English in the period 1970 to December 2011 were collected, evaluated by their abstract, and included if they met the inclusion criteria. The criteria involved studies evaluating marginal adaptation of crowns and FDPs through clear experimental protocols. Exclusion criteria involved longitudinal prospective and retrospective clinical evaluations, studies using subjective tactile sensation, and other predefined criteria. Results A total of 277 papers were identified; only 183 met the inclusion criteria. Direct view technique was used by 47.5% of the articles followed by cross-sectioning (23.5%), and impression replica (20.2%) techniques. The marginal gap values reported by these techniques varied among individual crown systems and across different systems because of variations in study type (in vivo vs. in vitro), sample size and measurements per specimen, finish line design, and stage at which the marginal gap was measured. Conclusion There was a substantial lack of consensus relating to marginal adaptation of various crown systems due to differences in testing methods and experimental protocols employed. Direct view technique was the most commonly used method of reproducible results. Also, conducting an experimental set-up of testing a minimum of 30 specimens at 50 measurements per specimen should produce reliable results. Additionally, using a combination of two measurement methods can be useful in verification of results.