

21226 | Fit accuracy qualitative assessment of Co-Cr and PEEK frameworks

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Abstract

A correct fit of the framework to the supporting structures is crucial for the clinical success of a removal partial denture (RPD) providing support, stability and retention. RPD frameworks are often fabricated from cobalt chromium (Co-Cr). However, for aesthetic and biocompatibility reasons, alternative materials such as Polyether-ether-keton (PEEK) are currently being search. The objectives of the present investigation were to evaluate and compare the fit accuracy of Co-Cr and PEEK frameworks, produced by digital technologies, in Kennedy class I and III situations. In this context, two study models (Kavo®, Germany) of a mandibular Kennedy class I and III modification 1 previously prepared were digitized and frameworks were digitally designed. For each study model two frameworks were produced, one in Co-Cr and other in PEEK, using an additive (Selective Laser Melting) and a subtractive (milling) technique, respectively. A qualitative assessment of the frameworks to the respective model was made on the occlusal and cingular rests, minor and major connectors, using three methods: M1) simple visual inspection; M2) clinical inspection with a Periodontal Williams probe; M3) clinical inspection with image amplification and an Endodontic Kerr file nr.50 (evaluation of the major connector) or an endodontic plugger nr.35 (evaluation of another components). Measurements were classified as absence or presence of a maladjustment according to the visualization of the space between the surfaces (M1) or the entry of the instrument into the space (M2 and M3). This evaluation showed that Co-Cr frameworks presented a better fit than PEEK on both Classes, being this difference more evident on Class III. In literature there are a few articles on this subject, but some report better fit of PEEK frameworks compared to Co-Cr, contrary to the results obtained. Although PEEK constitutes an aesthetic material that could be an alternative to Co-Cr, further studies are needed for its adequate clinical application.

968

Keywords: Removable Partial Denture; Framework; CAD-CAM; Digital; PEEK; Co-Cr; Fit accuracy.

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