91.

Trace Element (TE) Release from Two Different Base Alloys Under Conditions Imitating Oral Saliva

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Electrochemical conditions in the oral cavity lead to a release of metal ions into the patient's saliva. The aim of this study was to examine and compare the types andquantities of metal ions released from two base alloys: Co-Cr-Mo alloy (WironitR, Bego, Germany) and Ni-Cr alloy (Wiron 99, Bego, Germany) under in vitro conditions imitating artificial saliva. We soaked ten sets of each alloy having 497 mm^2 exposure surface for 1, 2, 3, 4, 5, 6, 7, 14, 21 and 30 days (six pieces each set) in phosphate buffered saline (pH 6.0). TE in the phosphate buffered saline (saliva) were assessed by ICP-AES (JY 50P, Jobin-Ywon, France) with the detection limit of 10 mg/L. We found detectable amounts (mg/L) of TE (Mean SD) released from Co-Cr-Mo alloy (Mean SD): Co 337 (170), Fe 21 (15) Zn 87 (56), Ni 41 (68), and Cr 49 (42) and detectable amounts of TE released from Ni-Cr alloy (Mean SD): Co 265 (300), Fe 247 (256) Zn 92 (46), Ni 542 (668), and Cr 396 (410). The manufacturer did not indicate the presence of Fe, Zn, and Ni in the Co-Cr-Mo alloy and the presence of Fe, Co and Zn, in the Ni-Cr alloy. A significantly higher amount of Fe, Ni and Cr was released from Ni-Cr alloy ($p<0.05$), and a considerably higher amount of Co was released from Co-Cr-Mo alloy, although it did not reach a statistically significant level ($p>0.05$), while there was no significant difference between the two alloys for Fe ion release ($p>0.05$). We must keep in mind that the amount of the released TE may be much higher than the reported values in this study, after the laboratory procedures (casting, polishing, etc.) and allergenic essential TE Cr, Co, and Ni may be present locally in a considerably higher amount.

92.

Comparative Investigation of Dynamic Loading Resistance of Teeth with Prefabricated and Cast Metal Posts and Cores

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Loss of a part or complete clinical crown of tooth results in functional and aesthetic impairment of dental arch and complete stomatognathic system. Such teeth, as well as endodontically treated teeth, during reconstructive prosthodontic therapy need to be treated with posts and cores.

The aim of the investigation was to measure and compare the dynamic loading resistance of endodontically treated teeth with cast metal and prefabricated posts and cores, under dynamic loading fatigue of 800N-1000N, with specific regard to variable root preparation width.

The investigation included 48 human lower second premolars of similar dimensions, divided in 4 groups according to type of post and core system (each 6mm long) which they received. 1) prefabricated narrow post and core (Maillefer Switzerland, Size 1) 2) prefabricated wide post and core (Maillefer Switzerland, Size 3B) 3) cast metal narrow post and core 4) cast metal wide post and core. Modified Voss & Meiners dynamic loading tests were performed within a field of 800N-1000N in high frequency pulsator.

Teeth with prefabricated narrow posts demonstrated the highest average dynamic loading resistance of 9.050.622 cycles under 800N until fracture, while teeth with cast metal wide posts demonstrated the lowest average dynamic loading resistance of 3.522.611 cycles under 1000N until fracture. Significant influence of root preparation width on dynamic loading resistance for all types of posts was determined by ANOVA ($p<0.05$), with narrow posts demonstrating more fracture resistance.

Prefabricated posts and cores demonstrate stable dynamic loading resistance and better intraradicular retention than cast metal posts and cores.