

Electrochemical corrosion of metals in the oral cavity

When choosing metals for the production of dental prostheses, you need to think about electrochemical corrosion. It is caused by saliva and acids produced by the breakdown of food. However, these agents alone would not have sufficient strength, chemical corrosion is associated with electrochemical phenomena. Saliva in the mouth acts as electrolytes, the metal immersed in the electrolyte acts as an electrode. The phenomenon in which the metal tries to oxidize the electrodes and ions into the electrolyte is called the electrolytic dissolution pressure of metals. The phenomenon in which the ions try to reduce and exclude themselves at the electrode is called the osmotic pressure of the ions. Both phenomena take place simultaneously and the whole process is completed by reaching a chemical dynamic equilibrium. The difference between the two mentioned pressures creates a potential difference. Each metal is characterized by a certain electrical potential. If the difference between the two electric potentials of the two metals in the oral cavity is large, a weak galvanic current is created, which is the cause of electrochemical corrosion. This manifests itself in changes in the properties of metals, but also in the patient's subjective feelings and changes in the soft tissues in the mouth, such as thickening, redness of the mucosal surface, gray coatings, leukoplakia.

Metal	Electric potential
Zinc	-0,76
Iron	-0,43
Cobalt	-0,29
Nickel	-0,22
Lead	-0,12
Platinum	0
Quicksilver	+0,79
Silver	+0,8
Gold	+1,3

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Sources

- NAVRÁTIL, Leoš a Jozef ROSINA, et al. *Medicínská biofyzika*. 1. vydání. Praha : Grada, 2005. 524 s. ISBN 80-247-1152-4.
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