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Orthopedic Treatment When Using Non-Metal Ceramic Prosthesis

YAKUBOVA Sarvinoz Rakhmonkulovna

Doctor of Philosophy medical sciences (PhD), Samarkand State Medical University, Uzbekistan

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Abstract: Objective: To determine the changes that occur in periodontal tissues, prosthetic bed and oral mucosa before and after orthopedic treatment when using metal-free ceramic prostheses.

Methods: During the study, general clinical, laboratory, biochemical, functional, instrumental and statistical methods were used. The object of the study was 185 patients with partial edentia aged 25-60 years were selected, 95 of whom were men and 90 were women, and the control group consisted of 20 healthy people.

Results: The wear of non-removable prostheses during wearing is manifested in the following pathological changes in the condition of the prostheses and the tissues of the prosthetic bed. Stamped and stamped welded prostheses with and without ZDP TT have a number of technological shortcomings, which are manifested during wearing.

Conclusions: Dentures lead to a change in the acid-base balance of oral fluid, complete cast dentures without a protective and decorative coating have the least effect on it ((pH 7.2±0.03, from 12 months after denture insertion to the end of the study), metal-ceramic dentures have a small effect (pH 7.39±0.02 from 12 months after denture insertion to the end of the study).

Keywords: Orthopedic, prosthetic construction, ceramics, non-removable dentures, oral cavity.

Introduction: Wide-scale measures are being implemented in our country to develop the system of the medical field, in particular, to reduce dental diseases and their complications, as well as to provide qualified medical care to patients suffering from this pathology, and the following tasks have been defined. "...in order to increase the quality and convenience of the effectiveness of medical care, it is necessary to introduce high-tech methods for the implementation of a healthy lifestyle and prevention of diseases, as well as diagnosis and treatment, standardization methods in medicine, and the implementation of the effectiveness of patronage and dispensary models..."

The purpose of the study: to determine the changes that occur in periodontal tissues, prosthetic bed and oral mucosa before and after orthopedic treatment when using metal-free ceramic prostheses.

The object of the study was selected 185 patients with partial edentia aged 25-60 years, 95 of whom were men and 90 were women, the control group consisted of 20 healthy people.

The results of the study: wear of non-removable dentures during wearing is manifested in the deterioration of the condition of the dentures and the following pathological changes in the tissues of the denture base. Stamped and stamped welded dentures with and without ZDP TT have a number of technological shortcomings that manifest themselves during wearing.

In addition, the development of the electrochemical-mechanical corrosion process of the metal prosthesis leads to a change in the color and gloss of the above-mentioned areas, which turns into extensive flatness defects that penetrate deep into the prosthesis. The sufficient service life of stamped and, especially, stamped welded dentures is limited by the variety of materials in their composition, which leads to its

perforation. Often, perforation is localized on the occlusal surface of a crushed artificial coating - it is under the strong influence of all possible destructive factors - the mechanical effect of chewed food, the aggressive chemical effect of oral fluid, and electrochemical processes. corrosion, which increases the effect of the first two factors on the alloy.

ZDT TT contributes significantly to the deterioration of the operational characteristics of cast and cast welded structures, which leads to the weakening of the above-mentioned alloy structure due to the thermal process of the alloy or the alloy. The technologically necessary temperature for the application of ZDP TT is the material, which is heated to 600-800 degrees, followed by slow cooling of the prosthesis.

Prolonged cooling by local exposure to high temperatures on the prosthesis gives an analytical effect on the welding of the prosthesis parts. Welding, which unites the prosthesis parts, increases the chemical diversity of the prosthesis, thereby facilitating and enhancing the occurrence of galvanic corrosion.

In our study, a marginal change in the color and gloss of the surface of cast and cast welded prostheses was detected starting from 6 months after the prosthesis was inserted. In patients with CKD, changes in the color and gloss of the surface of the prosthesis were observed in 11.4 and 22.9% of cases after 6 and 12 months of prosthesis placement, respectively.

For the first time, in 8.8% of cases, we observed an insulating change in the color and gloss of the surface of the prosthesis in patients with CKD, which, in our opinion, was caused by the incompatibility of the alloy composition with the onset of electrochemical corrosion. The presented data showed that the composition of the cast and cast-welded prostheses, the destabilizing-decomposing effect of the structural materials was determined, which is primarily due to the chemical heterogeneity of the structures of the cast and cast-welded prostheses, and secondly, due to the chemical heterogeneity of their structures as a result of the fusion of the prosthesis parts into a single whole. At the same time, we found a wide range of color changes and the absence of darkening of the CKD surface; The change in the marginal color and gloss was 28.6%. It should be noted that in patients with complete cast prostheses, the gloss and color change of the metal coating surface was not observed even after 36 months.

At the end of the study (36 months after the prosthesis was inserted), in the group of patients with SC, the change in the marginal color and gloss of the prosthesis surface was detected in 11.8% of cases, and no large-scale changes were observed. During the study, the color and gloss of the coating surface of the TQDP did not change, but at the end of the study, the change in the marginal color and gloss occurred in 34.3% of cases.

The study found that in patients in the TQDP group, the color and gloss of the coating surface changed due to friction of the prosthesis surface with the ZDP TT surface and mechanical abrasion of the coating, while in the cast and cast-fused prosthesis group, the destruction process of the metal prosthetic material began. The non-change in the color and gloss of the TQ prostheses in the highly aggressive environment of the oral cavity indicates their high chemical and mechanical stability. On the other hand, the high percentage of prosthesis destruction of the ZDP TT prostheses indicates their lack of durability. In patients with TQ and CLDP prostheses, the appearance of gaps, holes or erosions on the prosthesis surface was not observed throughout the study. The marginal adaptation of the coatings was manifested in the appearance of a gap between the edges of the artificial coating and the tooth tissues, through which the probe could penetrate. After 6 months of prosthesis placement, these changes were typical for patients with CLDP and MC prosthetic designs, and no marginal adaptation of the veneers was observed during the entire study. We attribute such marginal adaptation of the veneers to the imperfection of the manufacturing technology and the installation of pressed veneers. In this situation, the insufficient bending strength of the pressed veneers under the influence of chewing pressure and the change in the dimensional characteristics of the bridge-like dentures associated with this parameter play an important role, the cause of which is the displacement of the abutment teeth and the edges of the abutment veneers from the hard tissues of the teeth.

Occlusal contact erosion was observed in 8.6% and 2.6% of patients with CLDP and MC prostheses, respectively, 6 months after prosthesis insertion. By the end of the study, occlusal contact erosion was observed in 8.6% and 2.6% of patients with CLDP and MC prostheses, respectively. Also, 36 months after prosthesis insertion, perforation of the occlusal surfaces of the pressed-in veneers and complete obliteration of the occlusal relief of the hard elements of the prosthetic structures were observed in 8.7% of patients with SC, respectively. The number of defects on the occlusal surface in the group of patients using prostheses with ZDP TT was higher than in patients using prostheses without ZDP TT, which confirms our conclusion about the negative effect of ZDP TT on the mechanical strength of prostheses.

Comparing the concentrations of Na, K, Ca, Mg, SG, phosphates, Fe in the oral fluid of patients with a diagnosis of TKTN 1-2, TKTN 3-5, KTY 1-2 and KTY 3-4

Fr, it is possible to draw conclusions about the influence of localization in a certain area of the teeth and the volume of TKTN and KTY on the above-mentioned qualitative indicators of oral fluid. In the case of TKTN, a slight increase in the concentration of Na+, K+, Ca2+, Mg2+, SG and Fe3+ is observed, which has a direct positive correlation with the number of affected teeth. In the case of KTY, the concentration of Na+, K+, Ca2+, Mg2+, SG and Fe3+ decreases slightly; in this case, the correlation with the length of the defect is also directly negative. The concentration of phosphates in the oral fluid of patients with CKD does not differ from the control group and is directly positively correlated with the length of the defect in patients with CKD. Thus, in patients with CKD, a slight increase in the concentration of phosphates in the oral fluid is observed, while in patients with CKD, a slight decrease in the concentration of Na, K, Ca, Mg, Sg and Fe, as well as an increase in the concentration of phosphates, is observed. Our experimental data are consistent with the literature [41, 42].

The change in the RMA index characterizes the inflammatory processes present at the gingival margin of the teeth. In our case, teeth covered with artificial veneers, including those that were part of a bridge prosthesis, were examined. When comparing the values of the RMA index for identical prosthetic designs that differ only in the presence of ZDP TT, we can note a larger value of the RMA index for ZDP TT prostheses, which allows us to draw a conclusion about the harmful effect of ZDP TT on the gingival margins of teeth. Thus, both cast and cast composite prosthetic designs with and without ZDP TT have a significant negative effect on the gingival margins of the denture base.

The RMA indices for patients with CLDP and MC prostheses reached 26.95 ± 0.35 and 28.63 ± 0.31% 1 month after the prosthesis was inserted and remained at this level until the end of the study. A slight increase in the RMA index for patients with CLDP and MC prostheses is explained by the effect of chemical elements in the form of ions released from these structures on the periodontal tissues of the teeth. It should be noted that the differences in the RMA index values for CLDP of prostheses (26.95 ± 0.35%) confirm our previous conclusion about the negative effect of the PDP TT prosthetic base on the periodontal tissues of the teeth. .

12 months after the prosthesis was placed, the values of the Russell index for CLDP and MC prostheses were 0.67 ± 0.04 and 0.64 ± 0.04, respectively, and remained at this level until the end of the study. These indicators indicate an insignificant effect of CLDP and MC coatings on periodontal tissues.

When examining the group of patients with SC, it was found that there were statistically significant changes in the concentration of Na+ in the oral fluid. 0.5 months after the prosthesis was inserted, the Na+ concentration increased by 18.1 ± 0.3 mmol/l compared to the control group (17.53 ± 0.32 mmol/l); after 1 month, it decreased to 18.35 ± 0.56 mmol/l, after which the indicators stabilized at a low level of 17.91 ± 0.41 mmol/l and remained at all subsequent follow-ups - 3, 6, 12 and 24 months after the prosthesis was inserted. By 36 months, this indicator decreased to 17.27 ± 0.35 mmol/l. In our opinion, such dynamics of Na+ concentration is characteristic of the process of adaptation of the maxillofacial system to the prosthesis design and is associated with an increase in the secretion of sodium ions into the oral fluid due to increased excitability of the central nervous system during adaptation. (Fig. 19).

For SC, an average increase in K+ concentration is observed, starting from 0.5 months after prosthesis insertion to 18.1 ± 0.21 mmol/l compared to 16.37 ± 0.27 mmol/l in the control group, which remained at this level until the end of the study.

1 month after prosthesis insertion, the Ca2+ concentration increased from 1.85 ± 0.03 to 2.31 ± 0.03 mmol/l compared to the control group and remained at this level until the end of the study.

CONCLUSIONS

1. Dentures lead to a change in the acid-base balance of the oral fluid, complete cast dentures without a protective and decorative coating have the least effect on it ((pH 7.2±0.03, from 12 months after the prosthesis is placed until the end of the study), metal-ceramic dentures have a small effect (from 12 months after the prosthesis is placed until the end of the study H 7.39±0.02).

2. Complete cast dentures have a minimal effect on the periodontal tissues of the abutment teeth (Russell index 36 months after the prosthesis is placed 0.66±0.03 in the control - 0.5±0.02), metal-ceramic and dentures have a smaller effect on the periodontal tissues. (Russell index 36 months after the prosthesis is placed 0.64±0.04 and 0.67±0.04, respectively).

3. Titanium Patients with metal-ceramic and full-cast dentures without a protective and decorative coating with trinitride showed minimal changes during wear 36 months after prosthesis placement. Complete cast dentures protected with titanium trinitride and with a decorative coating did not show significant changes, but marginal changes in surface color were detected in 34.3% of cases.

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