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Changes in The Top of The Mouth When Using Non-Removed Metal-Free Ceramics Prosthesis

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Abstract: Measures to develop the medical profile system have become widespread in our country, in particular, to reduce the number of dental patients and their complications, as well as to provide qualified medical care to persons with this pathology and its changes. "...the purpose of expanding the mystery and guidelines for the effectiveness of medical care is to study the pool of a healthy lifestyle and the study of methods of technology in prevention, as well as the selection and support of patients, the use of standardization methods in medicine, the introduction of ways to improve the effectiveness of models of patronage and medical examination.

Keywords: Orthopedic, prosthetic structures, ceramic, fixed dentures, oral cavity.

Introduction: It is noted that there is a certain connection between metal dentures and various pathological conditions of the mucous membrane. Along with complications in the oral cavity, changes are noted in other organs and systems. The relevance of the pathogenesis of denture wear and the lack of scientific research, the large number of patients suffering from this phenomenon, the theoretical and practical importance of further research on this problem determined the choice of the topic of this dissertation work.Purpose: to determine the changes that occur in periodontal tissues, denture base and oral mucosa before and after orthopedic treatment when using metal-free ceramic dentures.

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 bonded dentures with and without ZDP TT have a number of technological shortcomings that manifest themselves during wearing.

In addition, the development of electrochemical-mechanical corrosion of metal prostheses leads to a change in the color and gloss of the above-mentioned places, which turns into extensive flatness defects that penetrate deep into the prosthesis. The insufficient service life of a stamped and, especially, stamped welded prosthesis, due to the variety of materials in its composition, leads to its perforation. Most often, perforation is localized on the occlusal surface of a pressed artificial coating - this is under the strong influence of all possible destructive factors - the mechanical action of chewed food, the aggressive chemical action 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 pressed and pressed welded structures, which leads to the weakening of the above-mentioned alloy structure due to the temperature or thermal processing of the alloy. The technologically necessary temperature for the application of ZDP TT is the material 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 by fusing the prosthesis parts. The fusing of 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 the cast and cast-welded prostheses was detected starting from 6 months after the prosthesis was inserted. For patients with CLPD, a marginal change in the color and gloss of the surface of the prostheses was observed in 11.4 and 22.9% of cases after 6 and 12 months after the prosthesis was inserted.

For the first time, in 8.8% of cases, we observed an insulating change in the color and gloss of the surface of the prostheses in patients with SC, which, in our opinion, was caused by the incompatibility of the alloy composition with which the electrochemical corrosion process began. The presented data showed that the composition of the cast and cast-welded prostheses showed a destabilizing-degrading effect on the structural materials, which is primarily due to the chemical heterogeneity of the structures of the ZDP TT, and secondly, due to the fact that the parts of the prosthesis are brought into a single state. At the same time, we found a wide range of color changes and the absence of darkening of the surface of the ZDP; the change in the marginal color and gloss was 28.6%. It should be noted that in patients with fully cast prostheses, the gloss and color changes of the metal coating surface were not observed even after 36 months.

At the end of the study (36 months after the prosthesis was placed), in the group of patients with CK, changes in the color and gloss of the prosthesis surface were 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 also did not change, but at the end of the study, changes in the color and gloss of the coating surface occurred in 34.3% of cases. The study results showed that 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, and in the cast and cast-fused prostheses group, the destruction process of the metal prosthetic material began. The fact that the color and gloss of the TQ prostheses did not change in the highly aggressive environment of the oral cavity indicates their high chemical and physical stability. On the other hand, the high rate of prosthesis destruction in ZDP TT prostheses indicates that they are not durable. In patients with TK and CLDP prostheses, no gaps, holes, or erosions were observed on the prosthesis surface throughout the study.

The marginal adaptation of the veneers was manifested in the appearance of a gap between the edges of the artificial veneer and the tooth tissue, through which the probe could penetrate. 6 months after the prosthesis was placed, these changes were typical for patients with CLDP and MC prosthetic designs; 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 reason for this movement is the escape of the edges of the abutment teeth and 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 TKA does not differ from the control group and is directly positively correlated with the length of the defect in patients with KTY. Thus, at a constant concentration of phosphates in the oral fluid of patients with TKA, a slight increase in the

concentration of Na, K, Ca, Mg, SG and Fe is observed, and in patients with KTY, on the contrary, 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 occurring on the gingival margin of the teeth. In our case, teeth covered with artificial veneers, including those that are 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 margin of the teeth. Thus, the prefabricated and prefabricated bonded prosthetic designs with and without ZDP TT have a significantly negative effect on the tissues of the gingival margin of the teeth of the prosthetic bed.

The RMA indices for patients with CLDP and MC dentures 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 dentures is explained by the effect of chemical elements in the form of ions released from these structures on the gingival tissues of the teeth. It should be noted that the differences in the RMA index values for CLDP dentures (26.95 ± 0.35%) confirm our previous conclusion about the negative effect of the PDP TT denture base on the gingival tissues of the teeth. .

The Russell index values for CLDP and MC prostheses 12 months after prosthesis placement 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 a negligible effect of CLDP and MC coatings on periodontal tissues. When examining the group of patients with CKD, it was found that there were moderate statistically significant changes in the concentration of Na+ in the oral fluid. After 0.5 months after prosthesis placement, the concentration of Na+ increased by 18.1 ± 0.3 mmol/l compared to the control group (17.53 ± 0.32 mmol/l); After 1 month, it reached 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-up visits - 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 prosthetic 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 the SK, an average increase in K+ concentration was observed, starting from 0.5 months after the 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 the 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. This fact, in our opinion, may be associated with the damaging effect of the SK prosthesis design on the marginal periodontium, which leads to a progressive course of periodontitis.

After 0.5 months after the prosthesis was inserted, an increase in the concentration of Mg2+ in the oral fluid of patients with SC was observed from 0.32± 0.01 mmol/l (control group) to 0.37±0.01 mmol/l; after 1 month - an increase to 0.4±0.02 mmol/l; this concentration does not change until 12 months after the prosthesis was inserted, by 24 months the Mg concentration increases to 0.43 ± 0.01 mmol/l and remains at this level until the end of the study.

It was found that after 0.5 months of prosthesis placement, patients had a slight increase in Fe3+ concentration in oral fluid - up to 24.55 ± 0.05 mmol/l and remained at this level up to 36 months (control 19.5 ± 0.32 mmol/l). The tendency for a gradual increase in Fe3+ concentration in oral fluid is probably associated with the processes of mechanical and electrochemical corrosion of the material of prosthetic structures.

Протез қўйилгандан 0,5 ой ўтгач, хлоридларнинг консентрацияси 31,85 ± 0,27 ммоль/л increased to 1.0, while the values of the control group were 25.43 ± 0.74 mmol/l and remained unchanged until the end of the study. Such a significant increase in the concentration of chlorides may be due to a parallel increase in the concentration of sodium ions and the presence of a direct positive correlation with the concentration of these ions in the oral fluid [10].

In the study group, the concentration of phosphates was 3.89 ± 0.04 mmol/l 1 month after the prosthesis was inserted, while in the control group, similar indicators were 3.48 ± 0.21 mmol/l and remained unchanged until 24 months after the prosthesis was inserted, when this value increased to 3.98 ± 0.02 mmol/l (control group 3.45 ± 0.02 mmol/l) and remained unchanged until the end of the observation.

The TK prosthesis designs led to an increase in Na+ concentration to 18.23 ± 0.35 mmol/l (control - 16.22 ± 0.03) after 3 months, and then it remained unchanged

at 16.52 ± 0.25 mmol/l from 12 to 36 months after prosthesis placement. When comparing the results obtained with the results of patients with CLPD, it is possible to clearly note a smaller change in the concentration of sodium ions in the oral fluid (from 16.82±0.21 mmol/l to 17.83±0.24 mmol/l after 36 months of prosthesis placement and from 16.85±0.23 mmol/l to 17.77±0.32 mmol/l after 1 month), which allows us to speak about the protective and protective effect of the ZDP TT. During the 36-month follow-up period, we did not obtain statistically significant data on the change in the concentration of Ca2+ and Mg ions in patients with a TK denture design. In addition, during the experiment, statistically significant data on changes in the concentration of chlorides and phosphates in the oral fluid of these patients during the entire observation period were not obtained.

Coating of complete cast prosthetic structures with titanium trinitride dust leads to a greater effect of such prosthetic structures on the parameters of oral fluid homeostasis compared to prostheses without ZDP TT - an average increase in the concentration of Mg2+ and phosphates in the oral fluid is observed (0.38 ± 0.02 and 3.8 ± 0.07).

CLDPs are characterized by the following changes:

- an increase in Na+ concentration from 0.5 months to 16.55 ± 0.22 mmol/l (control - 16.06 ± 0.16 mmol/l), after 1 month - to 16.82 ± 0.21 mmol/l, after 3 months - to 16.95 ± 0.24 mmol/l, after 6 months - to 17.12 ± 0.22 mmol/l, then the indicator begins to decrease and after 36 months after the prosthesis is inserted, it is equal to 16.85 ± 0.23 mmol/l, (Fig. 24);

- 0.5 months after the prosthesis was inserted, the K+ concentration increased to 18.42 ± 0.15 mmol/l (control - 16.37 ± 0.23 mmol/l) and remained at this level until 24 months after the prosthesis was inserted, by 36 months an increase in the concentration to 18.57 ± 0.41 mmol/l was observed.;

- From the 6th month of observation, a statistically significant increase in the Ca2+ concentration was observed to 1.87 ± 0.03 mmol/l (control - 1.77 ± 0.03 mmol/l), and 12 months after the prosthesis was inserted, the concentration increased to 1.89 ± 0.02 mmol/l. Starting from the 24th month of observation, the Ca2+ concentration began to decrease and at 36 months it reached 1.85 ± 0.03 mmol/l;

0.5 months after the prosthesis was inserted, the Mg~ concentration increased to 0.3 ± 0.01 mmol/l (control - 0.32 ± 0.07 mmol/l). These indicators remained unchanged until the end of the observation period;

- during the experiment, we were unable to obtain statistically reliable data on the change in the concentration of chlorides in the oral fluid for this type of prosthetic constructions during the 36-month observation period.

- the concentration of phosphates begins to increase from 0.5 months and reaches 3.78 ± 0.14 mmol/l (control - 3.55 ± 0.07 mmol/l), at 3 months - 3.81 ± 0.15 mmol/l and a maximum of -3.85 ± 0.41 mmol/l after 12 months of prosthesis insertion, decreasing to 3.8 ± 0.21 mmol/l by 36 months after prosthesis insertion.

Analyzing the results obtained, it can be assumed that the concentration of potassium ions in the oral fluid of the examined group of patients is due only to the presence of various prosthetic structures in the mouth and is not related to the chemical elements of the structural materials they secrete.

MK prostheses are characterized by the following changes:

- the Na+ concentration in the oral fluid increases from 0.5 months to an average of 17.38 ± 0.27 mmol/l (control - 16.06 ± 0.14 mmol/l); 1 month after the prosthesis is inserted, it increases to 17.82 ± 0.52 mmol/l, and by 3 months the Na+ concentration increases to 18.04 ± 0.25 mmol/l.

- the K+ concentration in this group changes after 0.5 months of observation and amounts to 17.98 ± 0.05 mmol/l (control - 16.37 ± 0.55 mmol/l) and remains at this level for 36 months;

- Ca concentration 0.5 months after prosthesis insertion is 2.24 ± 0.05 mmol/l (control - 1.76 ± 0.04 mmol/l); by 3 months it increases to 2.41 ± 0.03 mmol/l and remains so until the end of the study. We believe that the increase in Ca2+ concentration in the oral fluid of patients with MC prosthesis indicates the release of dental components of the enamel into the oral fluid, in which the mass fraction of calcium exceeds 37% [3]; - during the entire observation period, the Mg concentration changed insignificantly and by 36 months was 0.36 ± 0.02 mmol/l (control - 0.32 ± 0.03 mmol/l); - 0.5 months after placing the prosthesis, chloride concentration increased to 27.35 ± 0.15 mmol/l (control - 25.43 ± 0.57 mmol/l), after 1 month it increased to 27.95 ± 0.23 mmol/l, after 3 months - 28.14 ± 0.59 mmol/l and remained at this level until the end of the study;

- an increase in the concentration of phosphates in the initial stages after prosthetics, after 0.5 months to 3.95 ± 0.09 mmol/l (control 3.55 ± 0.04 mmol/l); After 1 month of prosthesis placement, the phosphate concentration increased to 4.23 ± 0.05 mmol/l, after 3 months - to 4.51 ± 0.07 mmol/l, and after 6 months - to 4.59 ± 0.01 mmol/l, which remained at this level until the end of the study. We attribute the dynamics of the

increase in phosphate concentration to the release of chlorides from the ceramic coating of MC prostheses into the oral fluid;

The MC prosthesis designs led to an average increase in the Fe3+ concentration in the oral fluid from 0.5 months after prosthesis implantation to 21.35 ± 0.31 mmol/l (control - 19.58 ± 0.14 mmol/l), after 1 month the Fe3+ concentration was 22.34 ± 0.4 mmol/l and remained at this level until the end of the study.

According to laboratory studies, the pH of the oral fluid in patients with CKD decreases 3 months after prosthesis implantation to 6.9 ± 0.08 (control - 7.22 ± 0.03), which is maintained throughout the study. A similar decrease in the pH of the oral fluid was observed in patients with CKD. At the same time, the decrease in the pH value of the oral fluid occurred later - 12 months after the prosthesis, and in patients with CK, the pH began to decrease 0.5 months after the prosthesis (7.05±0.02; control - 7.22±0.03) and after 12 months was 6.9 ± 0.02 and remained at this level until the end of the study. In our opinion, this difference in the dynamics of pH changes is due to the protective effect of the ZDP TT, which prevents the release of structural elements of the prosthesis into the oral fluid within 6 months after the prosthesis is inserted.

Thus, CKs are characterized by moderate erosion, poor marginal adaptation and a significant negative effect on the periodontal tissues of the abutment teeth and a moderate decrease in the pH of the oral fluid. This type of prosthetic construction leads to a moderate increase in the concentration of Na, Ca, Mg, SG and Fe and a slight increase in the concentration of Fe and phosphates.

Even in patients with CLDP prostheses, insignificant wear, good marginal adaptation are observed, they practically do not affect the periodontal tissues of the abutment teeth, they slightly reduce the pH of the oral fluid, without affecting the concentration of chlorides, and slightly increase the concentration of Na, K, Ca, Mg, phosphates and Fe.

In patients with MC dentures, which are practically not worn much, have a good limiting device and do not affect the periodontium of the abutment teeth, metal-ceramic denture constructions moderately increase the concentration of Ca and phosphates in the oral fluid, and slightly increase the concentration of Na+, K+, Mg2+, chlorides and Fe3+ ions. MC dentures increase the pH value of the oral fluid, which is the only prosthesis we have studied that has an alkalinization effect on the oral fluid.

CONCLUSION

1. Dentures lead to a change in the acid-base balance of the oral fluid, complete cast dentures without a protective-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).

4. 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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