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# Clinical Characteristics of Periodontal Tissue Condition in the Field of Dental Implants

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**Relevance.** The problem of replacing dental rows with dental implants followed by prosthetics of patients using non-removable structures, especially metal-ceramic ones, is very relevant. Dental implantation has long been a routine practice, and the aesthetic properties of ceramics give patients a sense of comfort, inner satisfaction and confidence. At the same time, such structures are often the cause of periodontal tissue diseases, both supporting teeth and supporting dental implants. Pathological changes in periodontal tissues can occur as a result of the impact of the prosthesis material on the adjacent gum tissue, as a result of the interaction of the dental implant with the oral environment. The negative effect of non-removable dentures on periodontal tissue of supporting implants can be aggravated by the design features of the prosthesis, poor oral hygiene and other factors.

The aim of the study was to provide a clinical assessment of the condition of periodontal tissues in the field of dental implants after prosthetics with non–removable metal-ceramic structures.

Materials and methods of research. The examined patients had no allergic reactions or intolerance to metal alloys and ceramic mass from which the prostheses were made. In all patients of the main group, metal-ceramic orthopedic structures were fixed on screw dental implants installed no earlier than 1 year after surgery, i.e. all patients underwent delayed dental implantation surgery. The patients we examined had the following types of dentures in the oral cavity: solid–cast single crowns lined with ceramic - 185, bridge–shaped metal-ceramic dentures - 95. In total, 566 implants covered with crowns were installed in 105 patients with prosthetics with non-removable metal-ceramic structures, i.e., on average, 5.4 implants per patient were installed. The condition of the dentures was assessed based on cosmetic and functional data. From an aesthetic point of view, ceramic-metal dentures should mimic natural teeth in anatomical shape, color, and location in the dental arch. Basic requirements: functionally complete artificial crowns should fit snugly to the neck of the tooth, do not enter the gingival groove by more than 0.2–0.3 mm, and do not overestimate the bite. Bridges should be of high-quality quality, should not fit snugly to the gum and irritate it. Dentures and the condition of periodontal tissues were clinically assessed taking into account their cosmetic data and functional state. 59 (56.19%) people had orthognathic overbite, 16 (15.24%) had anomalous neutral overbite, 12 (11.43%) had direct overbite, 5 (4.76%) had prognostic neutral overbite, 3 (2.85%) had biprognatic neutral overbite, and 2 (1.9%) had prognostic overbite. distal, 1 (0.95%) had a progenic mesial bite, 3 (2.86%) had a deep bite, and 4 (3.81%) had a unilateral oblique bite. To objectively assess the condition of periodontal tissues, periodontal indices were used: papillary-marginal-alveolar index (PMA), periodontal index (PI). The degree of bleeding of the interdental papillae was determined by the value of the papillary bleeding index (PBI) Muchlemann-Son (1971). The Pisarev–Schiller test (D. Svraakov's iodine number, 1962) was used to determine the severity of the inflammatory process in periodontal tissues. The hygienic condition of the dental/implant row sections, prosthetics with non-removable MK structures, was assessed using hygienic indices (GI): simplified index of oral hygiene (OHI- S) J. C. Green, J. R. Vermillion (1964), the Silness-Loe hygiene index (1964, 1967), the plaque index on approximate sites or the interdental hygiene index – IHI (1999). Statistical processing of numerical data from the experimental part of the study was carried out using single–factor analysis of variance and multiple Newman-Keils comparisons in the Primer of Biostatistics 4.03 program for Windows. The differences were considered significant at $p<0.05$.

**The results of the study.** The patients did not complain about the condition of periodontal tissues, they came for a preventive examination. Objectively, the gum had a pale pink color, was moist, smooth, and shiny. The interimplant gingival papillae showed no signs of inflammation, were pointed in shape, and fitted snugly to the implants. The gingival margin also showed no signs of inflammation, the alveolar gum was pale pink in color with a granular surface. Bleeding was not detected. During the Pisarev–Schiller test, the gums acquired a straw-yellow color, i.e. The test was negative. The appearance of the gum corresponded to the condition of a clinically intact periodontal. In individuals with intact periodontitis, the Green–Vermillion plaque index (DI) of the supporting teeth of non-removable dental structures is lower than that of the control group. Despite the significant difference ($p<0.05$), the index values in both groups referred to a satisfactory level of hygiene. Tartar was not detected in patients of this group. The overall value of the Guy Green–Vermillion in this group corresponded to a satisfactory level. The magnitude of the GI Silness-Loe of the supporting teeth with intact periodontitis did not differ from the norm ($p>0.05$), the interdental GI had no significant differences from the control value – $p>0.05$. The results of rheoparodontography showed that in patients with prosthetic MK structures with intact periodontal support teeth, the rheographic index, vascular tone index, peripheral resistance index and vascular elasticity index are comparable with the values of these indicators in the control group. Pathological changes were revealed in the examination of periodontal tissues in 65 (64.7%) patients, in the area of 210 (58.99%) implants with single crowns and support implants with non-removable MK structures. 40 (35.29%) patients who had 157 (44.10%) support implants had chronic catarrhal gingivitis, 35 (29.41%) patients with 53 (14.89%) support implants had chronic periodontitis. Mild gingivitis was detected in 108 (30.34%) of the support implants. At the same time, the patients did not complain. Only upon careful examination did they indicate itching and bleeding in the area of inflamed gingival papillae, which rarely occur when brushing teeth. In 24 (96.0%) patients with periodontitis, symptomatic gingivitis had a catarrhal form: the gingival papillae were swollen, enlarged, loose, hyperemic, with a bluish tinge; the gingival margin was swollen, enlarged, roller-like thickened, hyperemic, with a cyanotic tinge. Gum retraction of 1.5–2 mm was detected in 6 (16.0%) patients. The alveolar gum is slightly swollen with loss of grain and slight discoloration. During probing, periodontal pockets with a depth of 3.0–4 mm were detected mainly at the approximal surfaces of the implants. The contents of the periodontal pockets were serous. A significant amount of soft plaque was observed, supragingival and subgingival hard deposits were detected. Moderate bleeding occurred after probing the periodontal pockets. The static disorder of dental implants was manifested by the absence of tight contacts along the implant-bone boundary. Radiologically, the expansion of the periodontal fissure in the cervical region of the supporting implants was determined, resorption of the cortical plate and the tip of the interplant septa of the affected areas of the alveolar processes up to 1/3 of the implant length was observed. In patients with periodontitis, the value of the Green–Vermillion plaque index (CI) of support implants exceeded the control value ($p<0.05$), but in both groups the indicators corresponded to a satisfactory level of hygiene. The value of the Green–Vermillion tartar index (CI) significantly differed from the value of the control group ($p<0.05$). The general significance of the GUY Green–Vermillion support implants in periodontitis patients corresponded to a poor level of hygiene. During the survey, patients explained this hygienic condition by the presence of pain and bleeding gums when brushing their teeth. The values of the Silness-Loe GI in periodontitis significantly exceeded the values in all groups of the examined, and the values of the interdental GI had no significant differences compared with the indicators of other groups. A comparative analysis of the periodontal tissue condition of support implants in patients with gingivitis and periodontitis, according to all periodontal indices, revealed significant differences: PMA index – 31.51 ± 2.83% and 52.54 ± 3.11% ($p<0.05$), PI – 0.98 ± 0.08 points and 2.20±0.12 points ($p<0.05$), Pisarev test – Shiller index – 1.53 ± 0.12 points and 2.74 ± 0.23 points ($p<0.05$), PBI index – 1.1 ± 0.1 points and 1.7 ± 0.1 points ($p<0.05$). The periodontal condition of the supporting implants of bridge-shaped MK prostheses and implants under single MK crowns varied depending on the number of cermet units in non-removable MK prostheses. Of the 30 patients with intact periodontal support implants, 23 (76.67%) had from 1 to 5 units of metal ceramics, 7 (23.33%) had 6 or more units of MC; of the 40 patients with chronic catarrhal gingivitis, 12 (30.0%)

had from 1 to 5 units of MC, 18 (45.0 %) – 6 or more MK units; Of the 25 patients with chronic periodontitis, 9 (25.7%) had support implants of non–removable MK structures in the oral cavity from 1 to 5 MK units, 14 (40.0%) had 6 or more MK units. According to the GUY Green–Vermillion plaque index, which belongs to the group of hygiene indices that determine the area of the tooth crown covered with soft plaque using a plaque revealer, the hygiene level of support implants in all the studied groups is satisfactory. As a result of the determination of the Silness-Loe GI, which belongs to the group of hygiene indices that assess the thickness of dental plaque using a probe, soft plaque was detected in the cervical region of the support implants. With intact periodontal support implants, the index value did not differ from the norm, with gingivitis and periodontitis it significantly exceeded the control indicator. The values of the interdental GI in all groups of the examined had no significant differences.

**Conclusion.** During the examination of 105 people with prosthetics with non-removable metal-ceramic structures, 55 (45.8%) of them had pathological changes in the area of 210 (37.1%) support implants. Chronic catarrhal gingivitis of mild to moderate severity was found in 30 (25%) patients who had 157 (27.7%) support implants, and chronic periodontitis of mild severity was found in 25 (20.8%) patients with 53 (9.4%) support implants. No visible changes were found in 30 (15%) patients who had 146 (25.7%) fixed MK support implants in the oral cavity.

**LITERATURE**

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