ISSN 2181-3187

HEMODYNAMIC CHANGES IN THE MUCOUS MEMBRANE OF THE ALVEOLAR RIDGE OF THE LOWER JAW WITH PARTIAL DEFECTS OF THE DENTITION

Tashpulatova K.M., Safarov M.T., Ruzimbetov H.B.
Department of Hospital Orthopedic Dentistry, TSSI.

Abstract. According to many researchers, it is one of the main causes of the development of periodontal diseases [1, 4, 9, 17, 28].

Dental defects lead to damage to the alveolar apparatus. In addition to a decrease in chewing efficiency, in most cases, secondary deformation of the dentition occurs, leading to displacement of the teeth in various directions, which violates the integrity of the dentition and overloads the periodontal tissue of the teeth adjacent to the defect. Destructive and inflammatory processes associated with overload of the supporting periodontal tissues can occur with abnormal occlusion, premature loss of molars, after the removal of a large number of teeth, and with bruxism [13,18,19].

In all patients, intraosseous screw implants were installed as supports for prostheses. Microcirculation of periodontal tissues was studied by laser Doppler flowmetry using a capillary blood flow analyzer LAKK-01 (NPP "Lazma"). Periodontal tissue with intact teeth was considered normal. Dynamic observation of the microcirculatory state of the gingival tissue was carried out in the missing areas of the dentition after 1, 3 and 6 months.

It is known that functional overload of periodontal tissue has a detrimental effect on hemodynamics, leading to changes in hydrostatic blood pressure in the vessels, changes in blood and lymph flow, impaired vascular permeability and, ultimately, to the development of tissue hypoxia. As a result of these disorders, the fixing function of the collagen and elastic fibers of the periodontal ligament is inhibited, which leads to disorder and pain of the teeth when biting. Subsequently, the inflammatory-destructive process leads to resorption of the interdental bone, resulting in atrophy of the alveolar bone [9, 11, 14,20,21].

The study of hemodynamic parameters for dental defects is an objective criterion for assessing the condition of periodontal tissues for planning further orthopedic treatment.

Key words: mucous membrane, dentition defects, intact bite, microcirculation.

Introduction. There are two types of dentition defects: inclusion defects and terminal defects. Inclusionary defects are defects that are surrounded on both sides by healthy teeth, while terminal defects are defects that occur only in the anterior portion.

ISSN 2181-3187

Dental defects can be congenital or acquired. Defects usually occur in childhood (bad bite or tooth position) and can be the result of trauma or the ravages of carious lesions.

The dental arch is altered by missing teeth, especially missing teeth. The chewing function of the teeth is immediately impaired. As a result of progressive loss, one side of the jaw becomes completely useless for chewing food, and the other becomes "overworked." This leads to difficulty speaking, facial asymmetry and further displacement of teeth. If tooth loss is not addressed in the early stages, periodontal disease and TMJ dysfunction may develop.

Occlusion is one of the most common dental disorders. The term "occlusion" refers to the connection of the teeth of the lower and upper jaws during various movements of the lower jaw.

The lower jaw is very mobile, and the general range of movements that the lower jaw can make in relation to the upper jaw is called occlusion. Occlusion is unique to each individual. This is due to the special position of the lower jaw and the different contacts between the teeth.

There are several types of occlusion

Anterior bite. In this case, the lower jaw moves forward, and the lower row of teeth partially hides the upper row of teeth.

Central occlusion. A bite in which the lower jaw is located exactly in the center of the skull. The central position of the teeth is determined by their arrangement as follows. The teeth are fixed to each other, and lateral movements of the lower jaw are possible.

Lateral occlusion of teeth. This type of occlusion occurs when the lower jaw moves to the right or left.

Posterior occlusion of teeth. This type of occlusion occurs when the mandible moves backward or forward from its central position. In this position, lateral movement of the lower jaw is impossible.

Defects in the structure of the teeth cause malocclusion: Pathologies such as the absence of one or more teeth or the incorrect placement of teeth in the alveolar bone cause malocclusion, in which the closed teeth do not have correct contact in one or all types of occlusion. Serious dental defects can make it difficult to close the jaws, causing discomfort and pain.

The bite is formed when the teeth are completely closed in central occlusion (the upper and lower teeth fit tightly to each other). There are different types of occlusion due to different positions of the teeth in central occlusion.

A proper bite is a bite in which the lower incisors and upper incisors are in contact with each other. The overlap between the upper and lower incisors is approximately one-third the size of the lower incisors. However, the type of bite varies from person

ISSN 2181-3187

to person and depends on the size and shape of the teeth, the number of teeth in the mouth, and the size of the jawbone.

When a patient begins to develop dental defects, their bite may become distorted. The main types of malocclusion are

Open bite - when the dentitions close, a vertical space is formed between the teeth;

Counterbite - the central bite is disrupted, which leads to facial asymmetry, limited lateral movement of the lower jaw, decreased chewing function and overload of supporting dental tissues; And

deep bite - with this type of bite, the maxillary incisors overlap the mandibular incisors by more than one third and can overlap them completely.

An incorrect bite significantly increases the load on teeth when eating. Over time, teeth with a malocclusion can shift, exposing the necks of the teeth, causing pain in the chewing muscles and even headaches. Therefore, treatment is necessary to avoid future health problems, even if they don't look their best.

Materials and methods: Comparative characteristics of hemodynamic changes in the mucous membrane of the alveolar ridge of the mandible with various dental defects.

We examined 90 patients without somatic diseases aged 25-61 years, who were divided into three groups:

Group 1:30 patients with unilateral small included defect of the dentition; Group 2: 20 patients with bilateral small included defect; Group 3: 40 people with traditional bridge prosthetics.

In patients of the first and second groups, intraosseous screw implants were installed as supports for prostheses. The study of microcirculation of periodontal tissues was carried out using laser Doppler flowmetry using a capillary blood flow analyzer LAKK-01 (NPP "Lazma"). Intact periodontal tissues were considered normal. Dynamic observation of the microcirculatory state of gum tissue was carried out after 1, 3 and 6 months in dentition defects.

Results and discussion

The level of capillary blood flow and microvascular vasomotor activity in the gum tissues of mandibular molars and premolars was 19 units. and 12% respectively. Analysis of the amplitude-frequency characteristics of LDF-grams showed that the level of vasomotor tissue blood flow in the gingival tissues of mandibular molars and premolars (A_LF/□) was 15%, while the high-frequency variation of tissue blood flow was 73% (A_HF/□), and the pulse variation was 43 % (A_CF/□).

This was evidenced by a decrease in the level of capillary blood flow by 16%, their density by 7% and vasomotor activity of microvessels by 42%, i.e. decreased tissue trophism.

ISSN 2181-3187

In patients of group 3, changes in microcirculation were more pronounced in partial defects of the mandibular dentition in the lateral region. Thus, the level of blood flow decreased by 14%, its density by 37%, and vasomotor activity of microvessels by 38%, which indicates a decrease in blood perfusion to tissues.

Analysis of blood microcirculation parameters showed that the level of microcirculation in the gum tissues with partial dentition defects was significantly reduced. The results of amplitude-frequency analysis of LDF-grams of the state of microcirculation in the gingival tissue of partial dentition defects showed changes in the hemodynamic mechanisms of regulation of tissue blood flow.

Analysis of the amplitude-frequency characteristics of LDF-grams showed that the vasomotor level of tissue blood flow (A_LF/□) in the gum tissues of partially missing anterior teeth decreased by 26% compared to intact teeth and by 52% in the absence of lateral teeth, which indicates a decrease in active regulation of tissue blood flow Active regulation of tissue blood flow decreased. The level of high-frequency oscillations (A_HF/□) of tissue blood flow in the gingival tissue decreased by 23% in the 2nd group with dental defects in the anterior region and by 44% in the 3rd group with dental defects in the lateral region, which indicates a decrease in passive regulation tissue blood flow compared to an intact tooth. The level of pulsatile tissue blood flow (A_CF/□) increased with the location of the tooth defect. Thus, in patients of the 3rd group this indicator was 5-6% higher than in patients of the 2nd and 1st groups, which indicates venous stasis in the microcirculatory tracts of the gum tissue. In the tissues of the mucous membrane in the partially missing areas of the teeth of patients in groups 2 and 3, more pronounced vasoconstriction was observed than in intact teeth.

Vascular tone increased by 22% in the absence of anterior teeth and by 43% in the presence of lateral defects; The Flaxmotion Index (FMI) showed that the efficiency of regulation of tissue blood flow in the microvessels of the defect was reduced by 12% in group 2 and by 21% in group 3 (Table).

The indicator of microcirculation in dental defects explains the intensification of the process of bone tissue atrophy in dental defects. Pronounced venous stasis and increased intravascular resistance observed in areas of the teeth adjacent to the defects indicate overload of the periodontal tissues of these teeth.

According to the data obtained, when planning orthopedic interventions in the area of the teeth adjacent to dentition defects, the reserve capabilities of the periodontal tissues of the supporting teeth should be taken into account.

This is due to a decrease in myogenic activity of microvessels (37-42%) and impaired microcirculation. As a compensatory reaction, an increase in the neurogenic component of microvascular regulation and tone was observed (22-43% decrease). Suppression of active mechanisms of tissue blood flow regulation was accompanied

ISSN 2181-3187

by a decrease in the role of passive regulation (A_LF/□ decreased by 26-52%, A_HF/□ decreased by 23-44%) and was associated with inhibition of venous outflow in the microvasculature of the gums (A_CF/□ increased by 5 -6%). A comparative analysis of the indicators of patients of the 2nd and 3rd groups showed significant changes in the rhythmic structure of tissue blood flow, objectively reflected in the dynamics of the flaxmotion index, which decreased by 12-21%.

Conclusions. 1. The level of microcirculation in the mucous membrane of the alveolar process of partially missing teeth was significantly lower than in intact teeth. Vasoconstriction was more pronounced: the increase in vascular tone in group 2 was 22%, and in group 3 - 43%.

2. 2. The vasomotor level of tissue blood flow in the gingival tissue was lower by 26% in group 2 and by 52% in group 3, indicating a decrease in the active regulation of tissue blood flow.

3. The main parameters of LDF-grams of teeth adjacent to defects - the development of venous stasis and an increase in intravascular resistance - indicate that the periodontal tissues of these teeth were overloaded 1.23 times more than normal.

Unilateral and bilateral defects (partial absence of teeth) are treated with braces, and missing teeth are “closed” with dentures. Larger defects are treated with implant-supported bridges.

Minor irregularities in the shape of the teeth or the position of the alveolar process are eliminated with the help of veneers (ceramic plates fixed to the front teeth). Dental defects can also be corrected using inlays or crowns (metal, metal-ceramic or all-ceramic).

Treatment of dental defects requires compliance with oral hygiene. All diagnosed oral diseases, caries, plaque and tartar are treated, and teeth and gums are strengthened. If necessary, teeth that cannot be treated are removed. The clinic offers a full range of services in the field of prevention and treatment of diseases of teeth and gums.

References:

1. Akopyan G.V. Rational planning for the treatment of partial edentia using the dental implantation method
1. //Dentist. - 2004. - No. 4. - P. 47-51.
2. Belokopytova V.V. Criteria for assessing the degree of microcirculatory disorders in periodontal diseases: Abstract of thesis. dis....
3. Ph.D. honey. Sci. – M., 2002.
4. Belousov A.V. The state of capillary blood flow in gum tissues in conditions of a sharply continental climate according to LDF data // Proceedings of the conference on microcirculation. - Moscow-Yaroslavl, 1997.-P. 127-129.
5. Burkel X., Vasiliev A., Buraki K. et al. Clinical implantology and dentistry.
- St. Petersburg. - 1998.-P.18-22.

6. Volkova T.I. Assessment of the condition of soft tissues surrounding implants in patients after prosthetics // Vseros. conference Prevention of major dental diseases: Proc. report All-Russian conf. - M., 2003. - pp. 31-32.
7. Volozhin A.I., Surazhev B.Yu. The state of some indicators of LDF in normal conditions and in chronic inflammation of periodontal tissues // Application of LDF in medical practice: materials of the 2nd All-Russian Federation. symp. - M., 1998. – P. 37-38.
8. Ginali N.V., Evnevich E.P. Use of LDF to assess microcirculatory blood flow in the gums with a small vestibule of the oral cavity and true adentia in children. II All-Russian symposium “Application of LDF in medical practice” M. 1998; 41-42
9. Efanov O.I., Sukhanova Yu.S. Laser Doppler flowmetry in the diagnosis of periodontitis // Application of LDF in medical practice: 2nd All-Russian. symp. - M. 1998. – P. 44-45.
10. Kozlov V.I., Krechina E.K. The state of hemocirculation in periodontal tissues during periodontitis // New in dentistry. – 1993.
- No. 4. – P. 31-36.
11. Kozlov V.I., Krechina E.K., Terman O.A. Laser Doppler flowmetry in the diagnosis of microcirculatory disorders in therapeutic dentistry // Application of LDF in medical practice: Materials of the 1st All-Russian. symp. M., 1996. – P. 3-11.
12. Kozlov I.V., Morskov V.F., Kishko V.I. et al. Laser Doppler method for studying capillary blood flow // Izvestia AN. Ser. physical 1995. - T. 59, No. 6. - P. 179 – 182.
13. Kozlov V.I., Terman O.A. The effect of laser activation on microcirculation under ischemic state. Int of Clinical and Experimental Microcirculation. Abs: 18th European Conference on Microcirculation. – 1994.- N.- Vol. 14, No. 1. – R. 230.
14. Koryakin G.N. Distribution of functional load in the peri-implant zone // Nizhegorod. honey. magazine – 2003. – P. 176-178 (add.)
15. Krechina E.K. Disturbance of microcirculation in periodontal tissues: abstract. dis. ...Dr. med. Sci. - M., 1996. – 43 p.
16. https://smile4you.ru/blog/ispravlenie-prikusa/defekty-zubnyh-ryadov/
17. Tashpulatova K. et al. Technique for eliminating traumatic occlusion in patients using Implant-supported bridges //European Journal of Molecular & Clinical Medicine. – 2020. – T. 7. – No. 2. – pp. 6189-6193. https://scholar.google.ru/scholar?hl=ru&as_sdt=0,5&cluster=13445885160712362881
18. Safarov.M.T. Technique for eliminating traumatic occlusion in patients using Implant-supported bridges //European Journal of Molecular & Clinical Medicine. – T. _ 7. – no. 02. – S. 2020.https://scholar.google.ru/scholar?hl=ru&as_sdt=0,5&cluster=13445885160712362881
19. Сафаров, М., Мусаева, К., Шарипов, С. (2017). Олинмайдиган кўприксимон тиш протезларининг оғиз бўшлиғи микробиологик ҳолатига таъсири. Stomatologiya, 1(2(67), 51–54. извлечено от https://inlibrary.uz/index.php/stomatologiya/article/view/2600

20. Safarov M. T., Akhmadzhonov M., Ruzimbetov A. Study of microbiological status in patients with perimplantitis in the area of bridges // Conferences. – 2022. – P. 138-138.
21. Maratovna TK, Tashpulatovich SM, Bazorboyevich RK Evaluation Of The Effectiveness Of Fixed Prosthetics On Dental Implants At Different Periods Of Observation //Impact Factor: 4.9. – S. _ 22. https://pure.spbu.ru/ws/files/73036736/_.pdf#page=22
22. Safarov MT, Asemova SA Prospects Of Using Mathematical Modeling In Dentistry (A Review) // Ozbek Tibbyot magazines tahririy maslahat kengashi editorial advice Uzbek medical Editorial Board of the Uzbek medical journal. – S. _ 19.
23. Musaeva K. A. et al. Biomechanics Of Fixed Full-Arc Prostheses With Implants Support // Conferences . – 2023. – P. 370-372.
24. Khabilov NL MT Safarov et al. Characteristics Of The Erasability Of Hard Dental Tisues And The Effect On Subsequent Orthopedic Treatment //British View. – 2022. – T. 7. – no. 1.
25. Safarov M. The influence of fixed dentures of various designs on microbiological and immunological parameters of the oral cavity // Stomatologiya . – 2014. – T. 1. – No. 1 (55). – pp. 18-23.
26. Safarov M., Musaeva K., Sharipov S. Olinmaydigan kupriksimon hush prosthetic laryngeal oғiz bushligi microbiologist holatiga tasiri // Stomatologiya . – 2017. – T. 1. – No. 2 (67). – pp. 51-54.
27. MT Safarov, KM Tashpulatova, KB Ruzimbetov… Permanent prosthetics on dental implants - Eurasian Journal of Otorhinolaryngology-Head and …, 70-74/ 2023
28. Safarov, M., & Tashpulatova, K. (2022). Study Of The Microflora Of The Oral Cavity In Patients Using Dental Bridges With Dental Implants For Peri-Implantitis. Conferences, 172–173. извлечено от https://journals.scinnovations.uz/index.php/aposo/article/view/78
29. Safarov M.T., Ro’zimbetov X.B., Tashpulatova K.M., Safarova N.T. (2023). Tish Implantatlarida To’liq Yoyli Protezlarning Biomexanikasi. Conferences, 35–36. извлечено от https://journals.scinnovations.uz/index.php/aposo/article/view/1030
30. Maratovna T. K., Tashpulatovich S. M., Bazorboyevich R. K. Evaluation Of The Effectiveness Of Fixed Prosthetics On Dental Implants At Different Periods Of Observation //Impact Factor: 4.9. – C. 22.