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Results of structural assessment of the clinical and hygienic condition of periodontal tissues in patients with anatomical and functional disorders of the mucogingival complex

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Abstract

AIM. Conduct the structuration of clinical and hygienic condition of nearteeth tissues beside patients with anatomist-functional disorders of mucous-gingival complex.

MATERIALS AND METHODS. The clinical and epidemiological study of dentistry status was organized for achievement of the delivered problems, in which have took part 498 patients with caries and parodontal pathology. From the common amount of examined patient beside 167 (33,5%) of them diagnosed anatomist-functional disorders of mucous-gingival complex, which were divided into 3 groups. In first clinical group 64 (38,3%) patient were enclosed with average threshold of oral cavity, II type of the correlation division free and attached games, average and get fat biotype of the gums, II type of the correlation division free and attached games, II type of the fastening bridle lips, without clinical symptoms needs thresholds, bridles or lateral bridle of mucous oral cavity in correction. In second group entered 57 (34,1%) patient with small threshold of the oral cavity, which had a correlation division free and attached games on II type, fine and average biotype of the gums, and II type of the fastening bridle lips or mucous shell of oral cavity, as well as their hypertrophy, with positive symptom's needs enumerated anatomical structures in correction. In third group entered 46 (27,6%) patient with afore-mentioned anatomist-functional disorders, discovered in second group, as well as are discovered recession games III, but coronal comparatively apical to border of vestibule recession.

RESULTS. Amongst examined patient with average threshold of the oral cavity factors of the index hygiene on Fedorov–Volodkin beside 25 (34,3%) patients corresponded to good level, beside 29 (39,7%) patients they corresponded to satisfactory level, beside 13 (17,8%) patients level hygiene was estimated as unsatisfactory, but beside 6 (8,2%) patient as bad.

CONCLUSIONS. Factors of the hygienic condition of oral cavity beside patient with anatomist-functional disorders of mucous-gingival complex in greater degree were indicative of insufficient satisfactory level, that can be the full-fledged moving conditioned by impossibility of the performing the toothbrush when cleaning teeth.

Keywords: hygiene of oral cavity, teeth, parodont, mucous-gingival complex, bridles of the lips, thresholds of oral cavity

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Результаты структурной оценки клинико-гигиенического состояния околозубных тканей у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса

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Резюме

ЦЕЛЬ ИССЛЕДОВАНИЯ. Провести структуризации клинико-гигиенического состояния околозубных тканей у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса.

МАТЕРИАЛЫ И МЕТОДЫ. Для достижения поставленных задач было проведено клинико-эпидемиологическое исследование стоматологического статуса, в котором приняли участие 498 больных с кариесологической и пародонтологической патологией. Из общего количества обследованных пациентов у 167 (33,5%) из них диагностированы анатомо-функционального нарушения мукогингивального комплекса, которые были разделены на 3 группы. В первую клиническую группу были включены 64 (38,3%) пациентов со средним преддверием полости рта, II типом соотношения отделов свободной и прикрепленной десны, средним и толстим биотипом десны, II типом прикрепления уздечек губ, без клинических симптомов нуждаемости преддверия, уздечки или бокового тяжа слизистой полости рта в коррекции. Во вторую группу вошли 57 (34,1%) пациентов с мелким преддверием полости рта, которые имели соотношение отделов свободной и прикрепленной десны по II типу, тонким и средним биотипом десны и II тип прикрепления уздечек губ или тяжей слизистой оболочки полости рта, а также их гипертрофия, с положительными симптомами нуждаемости перечисленных анатомических структур в коррекции. В третью группу вошли 46 (27,6%) пациентов с вышеперечисленными анатомо-функциональными нарушениями, обнаруженными во вторую группу, а также обнаружены рецессии десны III, но корональнее относительно апикальной границе вестибулярной рецессии.

РЕЗУЛЬТАТЫ. Среди обследованных пациентов со средним преддверием полости рта показатели индекса гигиены по Федорову-Володкиной у 25 (34,3%) пациентов соответствовали хорошему уровню, у 29 (39,7%) пациентов они соответствовали удовлетворительному уровню, у 13 (17,8%) пациентов уровень гигиены расценивался как неудовлетворительный, а у 6 (8,2%) пациентов как плохой.

ВЫВОД. Показатели гигиенического состояния полости рта у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса в большей степени свидетельствовали о недостаточном удовлетворительном уровне, что может быть обусловлено невозможностью выполнения полноценных движений зубной щетки при чистке зубов.

Ключевые слова: гигиена полости рта, зуб, пародонт, мукогингивальный комплекс, уздечка губ, преддверия полости рта

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INTRODUCTION

Diseases of periodontal tissues remain a pressing issue in dentistry due to their high prevalence among the population, which creates prerequisites for tooth loss, dysfunction of the dentoalveolar system, and pathological processes in the gastrointestinal tract [1–3]. Inflammatory and destructive processes in periodontal tissues, as chronic sources of oral infection, can contribute to the onset and progression of systemic diseases associated with focal infections [4–6]. Therefore, a structural assessment of the clinical and hygienic condition of periodontal tissues in patients with anatomical and functional disorders of the mucogingival complex is of significant importance in dentistry.

AIM

To structurally evaluate the clinical and hygienic condition of periodontal tissues in patients with anatomical and functional disorders of the mucogingival complex.

MATERIALS AND METHODS

To achieve the objectives, a clinical-epidemiological study of dental status was conducted, involving 498 patients with carious and periodontal pathologies. Among the total number of patients examined, 167 (33.5%) were diagnosed with anatomical and functional disorders of the mucogingival complex and were divided into three groups.

First clinical group: Included 64 patients (38.3%) with an average vestibule depth (up to 10 mm), Type II ratio of free (*F*) and attached (*A*) gingiva (size of free gingiva exceeding attached gingiva), medium and thick gingival biotype, Type II frenulum attachment (high attachment in the mandible and low attachment in the maxilla, frenulum width equal to 2 mm), and no clinical symptoms requiring correction of the vestibule, frenulum, or lateral bands of the oral mucosa.

Second group: Comprised 57 patients (34.1%) with a shallow vestibule (depth up to 5 mm), a Type II ratio of free and attached gingiva ($F > A$), thin and medium gingival biotypes, and Type II frenulum attachment (width less than 2 mm) or mucosal bands, as well as their hypertrophy. These patients exhibited positive indications for the need for correction of the listed anatomical structures.

Third group: Consisted of 46 patients (27.6%) with the anatomical and functional disorders described in the second group, along with gingival recessions classified as Type III (characterized by the loss of height of the interdental papillae and/or interdental bone septa apically to the cementoenamel junction), but coronally relative to the apical border of the vestibular recession.

The results were analyzed using parametric (Student's *t*-test, Mann-Whitney test, Fisher's exact test) and non-parametric methods (Spearman correlation analysis). Differences were considered statistically significant at $p < 0.05$. All calculations were performed using the Statistica 7.0 software package.

RESULTS

Out of the total number of patients with anatomical and functional disorders of the mucogingival complex (167 individuals), 97 (58.1%) were diagnosed with chronic localized gingivitis. Among these, a mild form of the pathology was observed in 29 patients (29.9%), a moderate form in 56 patients (57.7%), and a severe form in 12 patients (12.4%) (Fig. 1).

In patients with structural disorders of the mucogingival complex, out of the total number of examined individuals, 70 (41.9%) were diagnosed with chronic localized periodontitis. Among these patients, a mild form of the disease was observed in 44 individuals (62.9%), a moderate form in 18 patients (25.7%), and a severe form in 8 patients (11.4%) (Fig. 2).

The participants of the initial clinical-epidemiological study of dental status (498 individuals) were further divided into four separate groups based on the initial condition of their mucogingival complex. The first group (control group) included 331 individuals with a normal structural condition of the vestibular area and dental arches.

In patients with a normal condition of the mucogingival complex, the average hygiene index value according to the Fedorov-Volodkina scale was 1.39 ± 0.15. Among these patients, 186 individuals (56.2%) demonstrated hygiene index values corresponding to a good level of hygiene, 66 individuals (19.9%) had satisfactory hygiene levels, 50 cases (15.1%) showed unsatisfactory hygiene levels, and 29 cases (8.8%) corresponded to poor hygiene levels.

Among the individuals with a normal condition of the mucogingival complex, the average value of the Papillary-Marginal-Alveolar (PMA) index was 0.2 ± 0.07%, the vestibule depth was 9.4 ± 0.8 mm, and the gingival attachment height was 3.2 ± 0.8 mm (Table 1).

The second observation group included 29 patients (17.4%) with anatomical and functional disorders of the mucogingival complex, characterized by dental crowding in the anterior segment of the mandible. In this group, a shallow oral vestibule was observed in 19 individuals (11.4%), and a short lower lip frenulum was diagnosed in 48 patients (28.7%). The average hygiene index according to the Fedorov-Volodkina scale in this group was 1.80 ± 0.21. Specifically, in 16 cases (55.2%), the index corresponded to a good hygiene level, in 7 cases (24.1%) to a satisfactory level, in 4 patients (13.8%) to an unsatisfactory level, and in 2 patients (6.9%) it was considered poor. Signs of chronic localized gingivitis were detected in 11 patients (37.9%) within this group. The average PMA index, vestibule depth, and gingival attachment height in the second group were 14.7 ± 0.8%, 8.6 ± 0.6 mm, and 3.0 ± 0.7 mm, respectively.

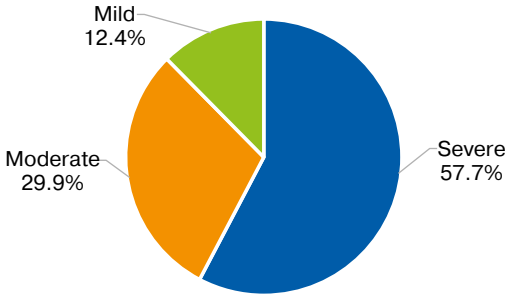

Fig. 1. Prevalence of chronic localized gingivitis amongst patient with anatomist-functional disorders of muco-gingival complex

Рис. 1. Распространенность хронического локализованного гингивита среди пациентов с анатомо-функциональными нарушениями мукогингивального комплекса

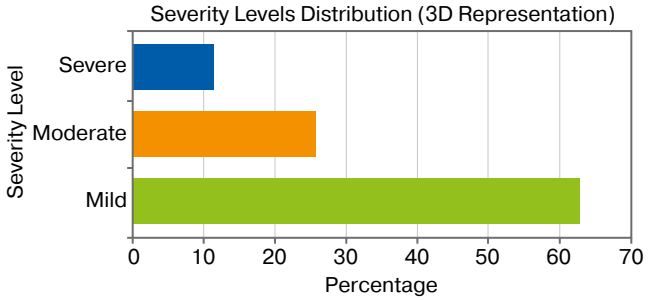

Fig. 2. Frequency meeting of gravity local forms parodontitis beside patient with anatomist-functional disorders of muco-gingival complex

Рис. 2. Частота встречаемости тяжести очаговой формы пародонтита у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса

The third observation group included patients with anatomical and functional disorders of the mucogingival complex who were diagnosed with an average or shallow oral vestibule. This group comprised 73 patients with an average vestibule and 46 with a shallow vestibule, representing 43.7% (vestibule depth up to 10 mm) and 27.5% (vestibule depth up to 5 mm), respectively.

The fourth group consisted of 19 patients with a short frenulum of the lips. Among them, 6 patients (31.6%) had a short frenulum on the lower lip, while 13 patients (68.4%) had a short frenulum on the upper lip. Structural evaluation within this group revealed that patients with an orthognathic bite exhibited a combination of short frenula on the upper and lower lips in 4 cases (21.1%). In patients with a deep bite, this combination was observed in 5 cases (26.3%), in those with a straight bite in 3 cases (15.8%), and in patients with an open bite in 7 cases (36.8%).

In this group, the hygiene index indicated a good hygiene level in 7 patients (36.8%), a satisfactory level in 4 patients (21.1%), an unsatisfactory level in 3 patients (15.8%), a poor level in 2 patients (10.5%), and a very poor level in 3 cases (15.8%) (Fig. 3).

In this group of patients, the average hygiene index was 1.91 ± 0.13, while the mean values of the PMA index, vestibule depth, and gingival attachment height were 21.3 ± 0.5%, 6.2 ± 0.4 mm, and 1.9 ± 0.2 mm, respectively. Chronic localized gingivitis was diagnosed in 15 patients (78.9%) within this group.

During the structural analysis of anatomical and functional disorders of the mucogingival complex, it was found that inflammatory periodontal diseases were most frequently observed in patients with a shallow oral vestibule in all observed groups (Fig. 4).

In the study of age characteristics of patients with mucogingival disorders, it was found that among the total number of examined individuals with this condition (167 patients), cases with a shallow oral vestibule were most frequently observed in the 30–39 age group, accounting for 83 cases (49.7%). In the 40–49 age group, the frequency was 25.2% ($n = 42$), in the 20–29 age group 10.2% ($n = 17$), and in the age group of 50 years and older 25 cases (14.9%) (Fig. 5).

Table 1. Factors of the estimation of condition parodontal tissues and thresholds to oral cavity amongst observed patient

Таблица 1. Показатели оценки состояния тканей пародонта и преддверия ротовой полости среди наблюдаемых пациентов

Parameters of the Vestibule	Hygiene Index	PMA Index, %	Vestibule Depth, mm	Gingival Attachment Height, mm
Control	1.39 ± 0.15	0.2 ± 0.07	9.4 ± 0.8	3.2 ± 0.8
Crowding	1.80 ± 0.21	14.7 ± 0.8*	8.6 ± 0.6	3.0 ± 0.7
Average Vestibule	1.93 ± 0.14*	23.9 ± 0.9*	2.8 ± 0.3*	1.7 ± 0.3*
Shallow Vestibule	2.12 ± 0.17*	28.8 ± 0.8*	3.2 ± 0.4*	1.5 ± 0.2*
Short Lip Frenulum	1.91 ± 0.13*	21.3 ± 0.5*	6.2 ± 0.4	1.9 ± 0.2

Note: * Significance of Differences from the Control ($p < 0.05$).
Примечание: * достоверность различий с контролем ($p < 0,05$).

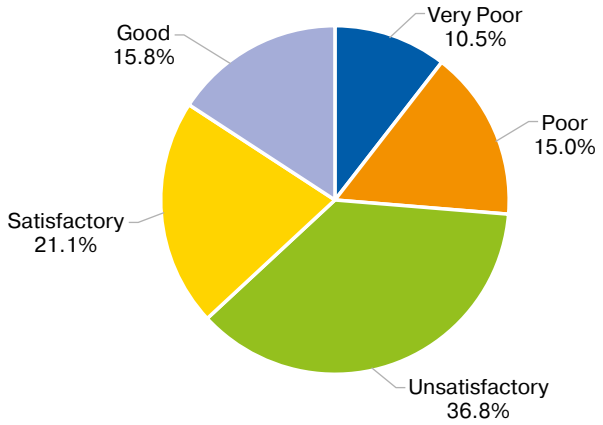

Fig. 3. Feature of the condition hygiene oral cavity beside patient with anatomist-functional disorders of muco-gingival complex

Рис. 3. Характеристика состояния гигиены ротовой полости у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса

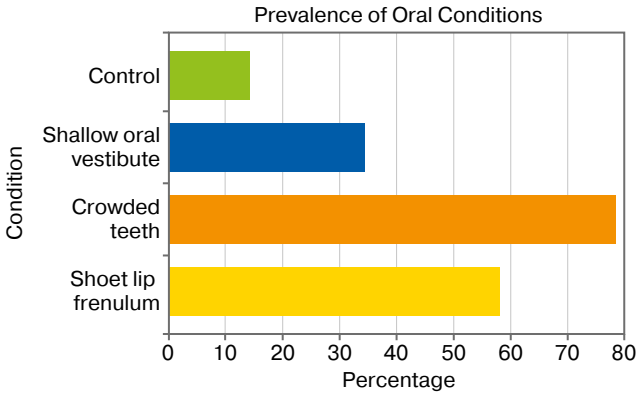

Fig. 4. Frequency meeting inflammatory diseases of parodont beside patient with anatomist-functional disorders of muco-gingival complex

Рис. 4. Частота встречаемости воспалительных заболеваний пародонта у пациентов с анатомо-функциональными нарушениями мукогингивального комплекса

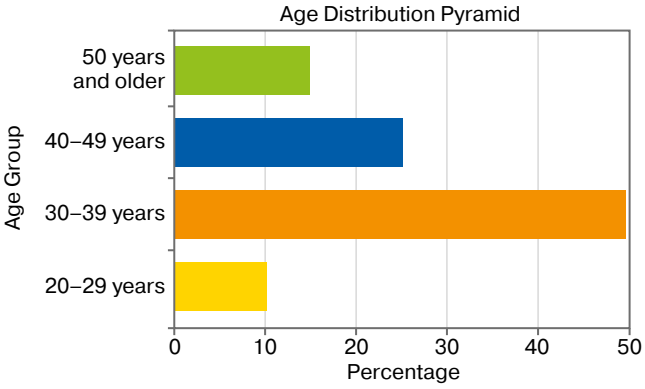

Fig. 5. Distribute the small threshold of oral cavity in depending of the age factor

Рис. 5. Распределение мелкого преддверия полости рта в зависимости от возрастного фактора

DISCUSSION

Among the examined patients with an average vestibule depth (73 individuals), the Fedorov-Volodkina hygiene index indicated a good level of hygiene in 25 patients (34.3%), a satisfactory level in 29 patients (39.7%), an unsatisfactory level in 13 patients (17.8%), and a poor level in 6 patients (8.2%). The average hygiene index in this group was 1.93 ± 0.14. Chronic localized gingivitis was diagnosed in 34 patients (46.6%) in this group, while chronic localized periodontitis of mild severity was diagnosed in 5 patients (6.9%). The average values of the PMA index, vestibule depth, and gingival attachment height in this group were 23.9 ± 0.9%, 2.8 ± 0.3 mm, and 1.7 ± 0.3 mm, respectively.

Among the patients with a shallow vestibule (46 individuals), the Fedorov-Volodkina hygiene index indicated a good level of hygiene in 9 patients (19.6%), a satisfactory level in 7 patients (15.2%), an unsatisfactory level in 22 patients (47.8%), and a poor level in 8 patients (17.4%). The average hygiene index in this group was 2.12 ± 0.17. Chronic localized gingivitis was diagnosed in 36 patients (76.1%), while chronic localized periodontitis of mild severity was diagnosed in 6 patients (13.0%). Among these patients, the average values of the PMA index, vestibule depth, and gingival attachment height were 28.8 ± 0.8%, 3.2 ± 0.4 mm, and 1.5 ± 0.2 mm, respectively.

CONCLUSIONS

1. The oral hygiene status of patients with anatomical and functional disorders of the mucogingival complex largely indicated an insufficient or unsatisfactory level of hygiene, which may be attributed to the inability to perform full brushing movements due to anatomical limitations. Correlation analysis of the results revealed a relationship between the size of the attached gingiva and the depth of the vestibule.

2. Among patients with anatomical and functional disorders of the mucogingival complex, a significant proportion of inflammatory periodontal diseases was observed in individuals with a shallow vestibule and a short lip frenulum, which correlates with their oral hygiene status.

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