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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

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WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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TREATMENT OF SAGITAL ANOMALIES IN A MIXED DENTITION IN CHILDREN WITH SPEECH DISORDERS

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Introduction.

Violation of articulation is one of the important local factors for the occurrence of malocclusions [1,2]. A lot of authors point out that incorrect pronunciation is often a sign of disturbance of the central nervous system, as well as the result of incorrect development of hard and soft tissues of the oral cavity. A special role in the clarity of the pronunciation of sounds is played by such anomalies of the structure of the oral cavity, such as the shape of the palate, the position of the teeth, the shape and position of the tongue at rest, as well as other functions of the dentition system [3-8].

Disturbances of sound can be caused by two main groups of factors: anatomic abnormalities in the structure of the articulation apparatus and disorders of innervation of different parts of the apparatus of articulation (central or peripheral genesis) [9-12].

In all cases of mechanical dyslalia consultations and treatment are required from such specialists as the surgeon and the orthodontist. The earlier the pathology of the bite appeared, the greater the risk of persistent sound defects. The earlier a comprehensive work was carried out to eliminate defects in articulatory organs, impairments of sound speech and the development of phonemic perception, the faster and more efficiently positive results were found in the correction of organic dyslalia [13-16].

Therefore, dental anomalies are polyetiological in nature. Violation of pronunciation, its articulation side, can be considered as one of the important causative factors of pathology of the occlusion.

The aim of the study there is an improving the effectiveness of the treatment of sagittal dental anomalies, children with impaired speech during the mixed dentition through the use of orthodontic equipment, modified myo-gymnastics and face taping.

Materials and methods.

The first stage of the work was to determine the morpho-functional parameters of the dental-jaw system, children with speech disorders. Depending on the pathology of the bite, 59 patients aged 6 to 8 years with a mixed dentition, who had malocclusions in combination with dyslalia (fig. 1-3), were divided into two main study groups: A and B. Group A included children with distal bite, group B - with mesial.

The second stage of work was the orthodontic treatment of patients with speech disorders. According to the chosen method of orthodontic treatment, the patients of the experimental groups were further divided into 2 subgroups. In 1 subgroup of both main groups there were children, whose treatment was carried out according to the proposed method, to 2 subgroups - according to the standard one. The control group consisted

of 12 children with physiological bites of similar age without speech disorders, which served to control the effectiveness of the performed orthodontic treatment.



Figure.1. Frontal intraoral photo of patient K., 6 years old, before treatment.



Figure. 2. Lateral (right) intraoral photo of patient K., 6 years old, before treatment.

For the treatment of distal occlusion in 18 patients of 1 subgroup, orthodontic devices were applied to the upper jaw with Rudolf's screw and loops in combination with the complex of the proposed myo-gymnastic exercises and taping. In 11 patients of 1 subgroup with mesial occlusion, devices were applied to the upper jaw with a Bertoni screw. Also, a set of proposed gymnastic exercises and taping was applied (fig. 4, 5).



Figure. 3. Lateral (left) intraoral photo of patient K., 6 years old, before treatment.



Figure. 4. Photo of patient K., 6 years old, taping of the circular muscle.



Figure. 5. Photo of patient K., 6 years old, taping of the submandibular area.

As for the 20 patients of the 2nd subgroup with distal occlusion and 10 patients with mesial, their treatment was performed using the upper jaw with screw and Rudolf loops with distal occlusion and the upper jaw with Bertoni screw - with mesial, similar treatment patients 1 subgroup. My gymnastics and taping in patients in 2 subgroups were not used.

The pathology of the bite was evaluated according to the Engle classification (1898). The diagnosis of "mechanical dyslalia" was made by a speech therapist.

Transverse and sagittal jaw dimensions were measured using the Pont method (adjusted by H. Linder, G. Hart) and Korkhaus. Forms of dental arches of the upper and lower jaw were also determined.

Functional research methods included:

- palatography by the method of Smaglyuk L.V. and Trofimenko M.V.
- examination of articulatory motility
- state of speech: sound and speech breathing
- electromyographic study of the activity of the chewing muscles by means of a computer neuro-electromyograph M-Test produced by the DX system association (Kharkiv), with quantitative and qualitative indicators of the bioelectric activity of the chewing muscles
- occlusiographic examination by computerized analysis of T-Scan III (US) occlusion with quantitative and qualitative indicators.

The 2007 Microsoft Office package, in particular Excel 2007, was used for the statistical analysis of the obtained results. Evaluation of the statistical significance of the obtained data was performed using Student's t-test. The differences were considered statistically significant at $p < 0.05$.

Results and Discussion.

The polyetiology of the factors of dental anomalies has been proven by many domestic and foreign authors [2,6,7,9,12] and requires a comprehensive approach of both orthodontists and pediatricians, surgeons and non-medical specialists - speech pathologists, speech therapists. The interdependence of form and function lies in the physiological balance of the basic functions of the dental system with its anatomical structures. Violation of these functions is one of the key etiological factors in the occurrence of dental anomalies [1,3,4].

A number of domestic and foreign authors have studied the issue of the influence of anomalies and deformations of the maxillofacial area on speech function [2,6,13]. One of the most common causes of incorrect pronunciation is incorrect structure of the articulatory apparatus. At the same time, speech disorders and incorrect articulation, infantile type of swallowing, disorders of masticatory and facial muscle tone cause anomalies and deformations of the dental area [4,9,16].

The dental system, like other systems of the human body, is functional, capable of self-regulation and adaptation to changing external conditions. In most cases, speech pathologies are somehow associated with functional disorders due to the structure of the speech organs. Thus, abnormalities in the structure of the hard and soft palate disrupt the normal interaction of the oral and nasal resonators, which in addition to defects in the pronunciation of sounds leads to a disorder of vocal function. Improper distribution of muscle pressure when chewing, as well as impaired breathing, swallowing and speech are the main causes of most anomalies and deformities of the maxillofacial area. Anomalies and deformations of the maxillofacial area interfere with the normal articulation of sounds, contribute to the consolidation of habits of incorrect articulation and complicate its speech therapy correction. In children with occlusal anomalies, speech therapy disorders negatively affect the growth and formation of the dental apparatus [7,10,14].

My gymnastics is often used in orthodontics, but there is no emphasis on improving speech function, eliminating speech disorders. The use of vestibular plates in combination with articulation gymnastics by patients in the period of variable occlusion is also left out of the attention of domestic authors. Also, the issues of correction of the function of the muscles of the maxillofacial area are not sufficiently covered in the literature. According to world statistics, the number of speech disorders in children is growing, due to which the urgency of this problem is becoming global. The joint work of an orthodontist, speech therapist, pediatric dentist allows you to detect and correct myofunctional disorders at an early age [4,7,8,15].

Methods of orthodontic treatment of anomalies of the dental system and devices need to be improved taking into account the creation of conditions for speech therapy correction, this determines the novelty and relevance of this topic. In this regard, the authors have developed and systematized a set of articulatory myogymnastics in combination with taping of the maxillofacial area for children with speech disorders. The effectiveness of the proposed regimens of orthodontic and speech therapy was proved by clinical, anthropometric and functional indicators, which were determined before and at different times after the start of treatment. Clinical effectiveness of the orthodontic treatment was established by treatment period, normalization of articulation motility, normalization of anthropometric parameters, normalization of indicators of palatograms, indicators of functional activity of the dental maxillary system, normalization of occlusal ratios of dental rows.

The results confirmed the effectiveness of the treatment, which resulted in the restoration of both the normalization of all functions of the maxillofacial area and articulatory motility (fig. 6-8).



Figure 6. Frontal intraoral photo of patient K., 7 years old, after treatment.

The treatment time of the majority (50.8%) of patients in 1 subgroup ranged from 6 to 12 months. For the normalization of all functions of the maxillofacial area and for the correction of dental anomalies, 44.1% of patients needed more than 12 months, and less than 6 months - only 5.1% of the persons treated with the proposed method.



Figure 7. Lateral (right) intraoral photo of patient K., 7 years old, after treatment.



Figure 8. Lateral (left) intraoral photo of patient K., 7 years old, after treatment.

To eliminate the pathology of occlusion and speech disorders, the vast majority (79.3%) of the 1st subgroup took 6 to 12 months. It should be noted that in the period up to 6 months, the elimination of the pathology occurred in 10.4% of patients. The need for orthodontic treatment exceeded 12 months in the same way in 10.3% of people. The duration of treatment in children with distal and mesial occlusion was approximately the same and averaged 6 to 12 months. The elimination of bad habits occurred simultaneously with the elimination of malocclusions and the normalization of articulatory motility during the specified observation period. It took an average of 8-10 months to eliminate the dysfunction of the oral cavity, at the same time normalization of posture and position of the mandible and tongue at rest occurred at the specified observation period. Violations of the tone of the circular muscle and tongue were eliminated in about 6-8 months.

In the 2nd subgroups, the treatment duration was more than 12 months in 76.7% of children versus 10.3% in the 1st subgroup. And in the period up to 6 months the elimination of the pathology was not observed in any patient against 10.4% in the 1st subgroup.

If in the 1st subgroup the need for orthodontic treatment was 6-12 months in 79.3%, then in the 2nd subgroup - in 23.3%.

Table 1. Terms of treatment of patients.

№/gr.	Number of people	Term elimination of anomalies (months)	Results of treatment					
			A (distal bite)		B (mesial bite)		Total	
			abs.	%	abs.	%	abs.	%
1st subgr.	38	<6	1	1,7	2	3,4	3	5,1
		6-12	15	25,4	8	13,5	23	38,9
		≥12	2	3,4	1	1,7	3	5,1
2nd subgr.	21	<6	–	–	–	–	–	–
		6-12	4	6,8	3	5,1	7	11,9
		≥12	16	27,1	7	11,9	23	39,0
Total	59		38	64,4	21	35,6	59	100

The duration of treatment in children with distal and mesial malocclusion was also similar. Bad habits and dysfunctions were hard to remove, it took more than 12 months. It also took more time to correct circular muscle and tongue disorders (Table).

After 12 months of orthodontic correction, pathological forms of dental arches among persons with distal bite were found in 20% of children on the mandible, and with mesial - in 10% in the upper jaw and the lower jaw. Among the patients treated by the proposed method, pathological forms of dental arches after 12 months were not diagnosed in any person.

After 12 months of orthodontic treatment in patients of A2 subgroup, normal width and length of dental arch were diagnosed in 80.0% and 85.0%, respectively, and in A1 subgroup these indicators were 94.4%.

For patients of subgroup B1 after 12 months of orthodontic treatment, normal width and length of dental arches were diagnosed in 90.9% of persons, and in subgroup B2, normal width was 70.0% and length 80.0%.

After the treatment, normalization of the indexes of palatograms during pronunciation and swallowing in the subgroup A1 was observed in 88.9% of persons, in the subgroup A2 - in 75.0%, in the subgroup B1 - in 90.0%, and in B2 - in 70.0% patients.

At the end of treatment, articulatory motility corresponded to the norm in the subgroup A1 in 88.9% of persons, in A2 - in 70.0%, in B1 - in 81.8%, in B2 - in 60.0% of patients. And the indicators of the study of speech in the subgroup A1 in 88.9% of persons, in A2 - in 70.0%, in B1 - in 90.9%, in B2 - in 80.0% of patients.

The functional activity of the dento-jaw system in patients when applying the proposed method of orthodontic treatment was restored immediately after treatment, the average compression amplitude was in accordance with the right and left chewing muscles - $578 \pm 7,4 \mu\text{V}$ and $516 \pm 8,2 \mu\text{V}$ and practically corresponded to the control group, in the 2 subgroups similar indicators were $498 \pm 11,4 \mu\text{V}$ and $458 \pm 12,5 \mu\text{V}$, respectively.

Conducted occlusiographic study showed that the normalization of occlusal disorders in patients occurred in parallel with the normalization of functional activity of chewing muscles in all patients who underwent orthodontic treatment. However, both the qualitative and the quantitative indices of occlusiography in patients who have used the proposed orthodontic treatment have normalized much faster.

If before the beginning of orthodontic treatment in patients, the index of asymmetry of relative strength between the sides of the dental rows increased significantly and led to non-physiological

redistribution of loads compared to the control group due to mismatch of occlusal contacts and amounted to $23.2 \pm 2.7\%$, $21.6 \pm 4, 7\%$ against similar control indicators - $6.4 \pm 1.2\%$, respectively ($p \leq 0.05$). All patients had an increase in the time of onset of maximal number of dental contacts (0.57 ± 0.04 s) according to persons with distal occlusion compared to the control values - (0.24 ± 0.03 s) $p \leq 0.05$.

After 12 months of treatment, almost all patients who used the proposed method, disappeared premature occlusion contacts, normalized the direction of the trajectory of the total vector of occlusive load against the background of increasing the period of bioelectric activity and reducing the rest period and normalization of the coefficients of K. After 12 months standard occlusal time was 0.25 ± 0.04 s and 0.21 ± 0.06 s according to distal and mesial occlusion, respectively, while the same indices in A1 and B1 were 0.18 ± 0.03 s and 0.19 ± 0.03 s, respectively. Similar patterns were found in the study of the time of occurrence of the maximum number of dental contacts and the time of dysplasia.

Conclusions.

1. The proposed method allowed to shorten the time of treatment of patients: the treatment time was up to 6 months - 10.4%, 6 to 12 months - 79.3%, 12-18 months - 10.3%, when using the standard technique, 76.7% of patients used orthodontic equipment for up to 18 months.

2. In parallel with the normalization of clinical and radiological and anthropometric parameters, the application of the proposed method eliminated bad habits and restore articulatory motility.

3. The dynamics of all investigated parameters correlated with the terms of elimination of the pathology and indicated a greater effectiveness of treatment in the application of the proposed method, namely: among patients treated by the proposed method, pathological forms of dental arches after 12 months were not diagnosed in any person, however, in patients 2 group In 12 months of treatment, pathological forms of dental arches among persons with distal bite were found in 20% of children on the mandible, and with mesial - in 10% in the upper jaw and the lower.

4. Immediately after the end of treatment, the electromyographic indexes were normalized and the occlusion ratios were restored. Similar indicators in the persons treated by the standard method, although they showed positive dynamics, but differed from the indicators of the persons treated according to the proposed method, and from those of the control group and amounted to 78.8% ($p \leq 0.05$).

5. After 12 months of treatment, the application of the proposed method normalization of indicators of palatograms occurred in 89.4% of persons; in the subgroups treated by the standard method, the same indicators were 72.5% ($p \leq 0.05$).

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SUMMARY

TREATMENT OF SAGITAL ANOMALIES IN A MIXED DENTITION IN CHILDREN WITH SPEECH DISORDERS

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The purpose of the study was to prove the effectiveness of the proposed method of treatment children with sagittal dental anomalies and speech disorders in the mixed dentition.

Over the course of 2 years, we treated 59 children from 6 to 8 years of age with sagittal dental anomalies combined with organic dyslalia. Children who were treated according to the proposed procedure were included in 1 subgroup, and up to 2 subgroups included patients who were treated according to the conventional procedure. The control group included 12 children with physiological bites of the same age without speech impairment.

The proposed method allowed to shorten the time of treatment of patients: the treatment time was up to 6 months - 10.4%, 6 to 12 months - 79.3%, 12-18 months - 10.3%, when using the standard technique, 76.7% of patients used orthodontic equipment for up to 18 months. Immediately after the end of treatment, the electromyographic indexes were normalized and the occlusion ratios were restored. Similar indicators in the persons treated by the standard method, although they showed positive dynamics, but differed from the indicators of the persons treated according to the proposed method, and from those of the control group and amounted to 78.8% ($p \leq 0.05$). After 12 months of treatment, the application of the proposed method normalization of indicators of palatograms occurred in 89.4% of persons; in the subgroups treated by the standard method, the same indicators were 72.5% ($p \leq 0.05$).

Keywords. Malocclusions, speech disorders, orthodontic treatment, mixed dentition

РЕЗЮМЕ ЛЕЧЕНИЕ САГИТАЛЬНЫХ АНОМАЛИЙ ОККЛЮЗИИ В СМЕШАННОМ ПРИКУСЕ У ДЕТЕЙ С НАРУШЕНИЯМИ РЕЧИ

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Целью исследования была оценка эффективности предлагаемого способа лечения детей с сагитальными аномалиями окклюзии и речевыми нарушениями в смешанном прикусе.

В течение 2 лет было обследовано и принято на лечение 59 детей в возрасте от 6 до 8 лет с сагитальными аномалиями

