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FUNCTIONAL STATE OF THE DENTOFACIAL SYSTEM OF CHILDREN AFTER ADENOTOMY FROM AN ORTHODONTIC POINT OF VIEW

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Annotation

Myofunctional disorders and dentoalveolar anomalies in children after surgery for adenoid hypertrophy are an important problem. There is information in the literature that the most common dentoalveolar anomaly in children with adenoid hypertrophy is distal occlusion. In the presence of distal occlusion, it is necessary to study the state of the dentoalveolar system after adenotomy and identify myofunctional disorders.

The purpose of this study: to analyze the condition of children after adenotomy from an orthodontic point of view.

Materials and methods: We examined 80 patients with distal occlusion who required orthodontic dental care after surgery for adenoid hypertrophy.

Results: The diagnostics (functional tests and X-ray examination) revealed that the majority of patients had myofunctional disorders, including oral or mixed breathing, and a dentoalveolar anomaly, specifically a distal bite.

Discussion: The results of our studies are of significant scientific and practical interest and require further in-depth study. The authors hope that the above will facilitate the early diagnosis of myofunctional disorders and dentoalveolar anomalies in children after adenotomy for specialists of various profiles.

Conclusions: The study of the condition of children after adenotomy from the orthodontic point of view revealed the predominance of distal bite (2 skeletal class, posterior position of the apical base of the lower jaw (along the sagittal plane) relative to the anterior segment of the base of the skull) and oral or mixed breathing. The conducted studies will contribute to the development of a comprehensive, interdisciplinary approach to managing patients with such conditions.

Keywords: *dental system, distal occlusion, myofunctional disorders, mouth breathing, infantile type of swallowing, adenotomy, orthodontics.*

Introduction

Today, the prevalence of such a disease as adenoid hypertrophy (hereinafter – AH) is a pathology with a tendency to increase. Several authors believe that the increase in the prevalence of AH is facilitated by an increasing antigen load, as well as environmental and other factors [1-4]. However, despite the variety of causes for AH, another problem that requires close attention of the world medical community is myofunctional disorders and dentoalveolar anomalies (hereinafter – DA) in children after surgery for AH. Such disorders and anomalies primarily include mouth breathing, infantile swallowing, and other pathological changes, such as muscle-induced patterns, and, often, their consequence – dentoalveolar, jaw, and facial anomalies, as well as deformations.

At present, the concept of «myofunctional disorders» is quite new for a wide range of specialists. According to DD Kilinc and D Mansiz, myofunctional disorders are muscle-mediated functional disorders of the maxillofacial region that can affect the structures and function of the stomatognathic system, leading to changes in bite, temporo-

mandibular joint diseases, and other dental system problems [5]. Some sources use the term orofacial myofunctional dysfunctions, considering them complex disorders of the oral and facial muscles that interfere with the normal growth, development, and /or functioning of the orofacial structures [6-8]. Orofacial myofunctional disorders can result from a complex interaction of acquired behavioral patterns, physical and structural factors, genetic predisposition, and environmental influences. Most authors include so-called "bad oral habits" in the group of myofunctional disorders. Oral habits are repetitive patterns of behavior that negatively affect the dental system (sucking fingers, hair, pencils; biting the lip, tongue, cheek; placing the tongue between the dental arches; lack of occlusal reflex; bruxism [9-11]. Additionally, myofunctional disorders of the maxillofacial region encompass infantile swallowing, oral or mixed breathing (utilizing both the nose and mouth), weak chewing, incorrect tongue positioning, and impaired sound pronunciation [12].

According to AO Yetekbaeva, in the structure of dental morbidity in children, dentoalveolar, jaw anomalies and deformations occupy the third place after dental caries and periodontal diseases. Moreover, the most common anomalies are those in the relationship of the dental arches (33.7 %), among which distal occlusion prevails (31.8 %) [13].

There is information in the literature that most often, in children with AH, dentoalveolar anomalies such as a distal bite occur [14-16].

To eliminate distal occlusion, it is necessary to perform adenotomy in a hospital setting with subsequent examination of the state of the dentoalveolar system and identification of myofunctional disorders. This approach will enhance orthodontic treatment and contribute to the development of a comprehensive, interdisciplinary approach to monitoring and treating such patients.

Materials and methods

The study involved male patients aged 6 and above who were diagnosed with distal occlusion and came with their legal representatives to the «Best Dental» dental clinic and the clinic at the Department of Dentistry for orthodontic dental care. All patients had previously undergone surgery for AH at City Clinical Hospital No. 5 in Almaty. The total of 80 study participants was divided into 2 groups:

Group 1 (main) – 40 children after orthodontic treatment under the observation of an otolaryngologist after adenotomy;

Group 2 (comparison) - 40 children purely under the observation of an otolaryngologist after adenotomy.

This study is part of a controlled clinical trial and was approved by the Local Ethics Committee of the Kazakh-Russian Medical University (protocol No. 26/149, dated September 17, 2024). Randomization was not carried out, since patients were informed that, according to the study protocol (within which the state of the cerebral cortex and myofunctional disorders in children after adenotomy was studied), they would be randomly distributed into two study groups, according to the inclusion and exclusion criteria (the same for both groups).

The criteria for inclusion in the study were as follows: written consent from the patient's parents (guardians) to participate in the study, good cooperation from the child and parent (guardian), patients aged 6 years or older, males, who had undergone adenotomy with distal occlusion.

The exclusion criteria were: patients with severe immunodeficiency, oncological diseases, blood diseases, endocrine diseases, neuropsychiatric disorders, cardiovascular diseases, congenital malformations of the maxillofacial region, inadequate oral sanitation, poor oral hygiene, and other conditions, as well as distocclusion and dentofacial anomalies. Absence of supporting teeth (teeth 5.5, 6.5), extensive sensitivity of supporting teeth (teeth 5.5, 6.5), allergy to orthodontic material, low discipline of the parent/guardian and/or the child, poor communication with the child and/or their legal representative.

The children included in the study were examined by an orthodontist. During the examination, the orthodontist studied the functional state of the maxillofacial region and diagnosed, if any, myofunctional disorders and/or DA. For this purpose, the following clinical tests were used: breathing tests, a water sip test, a chewing test, and a speech test. An analysis of the orthopantomography (hereinafter – OPTG), teleradiography (hereinafter – TRG) in the lateral projection of patients was also performed.

Breathing tests. Breathing tests consisted of several stages, described below.

The first test was a mirror test. The doctor held a two-sided mirror to the child's philtrum, and the fogged-up side determined the type of breathing. If both sides of the mirror fogged up, then the breathing was mixed. If one side fogged up more, then one of the two types of breathing–oral or nasal–was predominant [17].

The second test was a cotton wool test, which involved alternately bringing a piece of cotton wool with lint closer to the right and left nostrils and tracking its vibrations. If nasal breathing was impaired, the cotton wool movement was minimal or absent entirely. With physiological nasal breathing, the vibrations were significant.

The third breathing test consisted of the following: the orthodontist asked the child to breathe through the nose, noting the change in the nostril lumen. With habitual mouth breathing, the child loses control over the nasal muscles, and the lumen of the nostrils remains unchanged or changes only slightly. With physiological nasal breathing, active participation of the nasal muscles, and constant narrowing and widening of the nostrils were observed.

The fourth test was designed to assess breathing function, specifically using the Stange and Genchi test. The Stange test consisted of the following: the orthodontist asked the child to inhale deeply and hold his breath, while pinching the wings of the nose to make breathing impossible. The time of possible breath holding was recorded (normally, in the Stange test, the child should be able to hold his breath for 30-60 seconds). The Genchi test was similar to the Stange test, but with maximum exhalation. Registration of a possible breath hold is normally 20-30 seconds. A decrease in breath-holding time indicated a problem with the child's nasal breathing.

The water test method consisted of the following: the child took 30 ml of water into the oral cavity and held it. In cases of chronic nasal breathing disorder, the child, as a rule, was unable to breathe normally through the nasal cavity; holding water in the mouth was a feasible task for the child.

The functional speech test consisted of the subject pronouncing several sounds («o», «i», «s», «z», «p», «f»), and the position of the tip of the tongue and the degree of bite disengagement were studied.

The functional chewing test, developed at the Department of Orthodontics of the Belarusian State Medical University by Professor I. V. Tokarevich and assistant Yu. Ya. Naumovich [18] was carried out using silicone impression material of type 0 viscosity according to ISO (C-type material Zetaplus (Zhermack)), designed in the form of tablets of a given size. During the functional chewing test, the chewing index was determined.

X-ray examinations included OPTG and TRG.

- *OPTG*, a layered planar image of the spherical contours of the maxillofacial skeleton, was chosen as a method that allows for a full study of the size of the body of the jaw bones, branches and angles of the lower jaw, to identify possible asymmetry of the facial skeleton, and the relationship of the dental arches. The location of the elements of the temporomandibular joint and the condition of the maxillary sinuses were studied. Particular attention was paid to the presence and location of the rudiments of permanent teeth, supernumerary teeth, and impacted teeth.

- *TRG* was performed on patients to determine the skeletal class, the position of the upper and lower jaw relative to the plane of the anterior base of the skull, the size of the upper and lower jaw, and the location of the teeth relative to each other. TRG was decoded using the Schwarz method, employing the TRGSmart program, which facilitated the minimization of diagnostic errors.

Results

Conducting breathing tests in the study groups revealed that when using the mirror test, measuring the lumen of the nostrils, and the Genchi test, mouth breathing prevailed in both groups compared to nasal breathing. However, when conducting the cotton wool test and the Stange test, the results were opposite: when conducting the cotton wool test, mouth breathing was detected more often in the main group than in the comparison group; when conducting the Stange test, on the contrary, mouth breathing was more common in the comparison group. The results of the breathing tests are presented in Table 1.

Table 1. Results of breathing tests

Groups	Mirror test		Cotton wool test		Nostril Lumen Measurement Test		Stange test		Genchi test	
	Mouth or mixed breathing	Nasal breathing	Mouth or mixed breathing	Nasal	Oral or mixed	Nasal	<30 s	≥30 s	<20 s	≥20 s
Main (40)	35 % (28)	15 % (12)	17,5 % (14)	32,5 % (26)	38,75 % (31)	11,25 % (9)	22,5 % (18)	27,5 % (22)	31,25 % (25)	18,7 % (15)
Comparisons(40)	31,25 (25)	18,75 % (15)	36,25 % (29)	13,75 % (11)	33,75 % (27)	16,25 % (13)	30 % (24)	20 % (16)	32,5 % (26)	17,5 % (14)
All patients (n=80)	66,25 % (53)	33,75 % (27)	53,75 % (43)	46,25 % (37)	72,5 % (58)	27,5 % (22)	52,5 % (42)	47,5 % (38)	63,75 % (51)	36,25 % (29)
* *Note: percentage calculation - from the total number of all patients*										

Source: compiled by the authors

Based on Table 1, most patients had nasal breathing disorders. In particular, the mirror test revealed that oral (mixed) breathing was prevalent in 35 % of patients in the main group and 31.25 % of patients in the comparison group. Nasal breathing was observed in 15 % of children in the main group and 18.7% of children in the comparison group. When conducting the cotton wool test, breathing disorders were found in both groups. Moreover, oral (mixed) breathing was more prevalent in the comparison group, at 36.25 %, whereas in the main group, this figure was 17.5 %. Nasal breathing was observed in 32.5 % of the main group and 13.75 % of the comparison group.

Conducting a test to measure the lumen of the nostrils yielded the following results: in the main group, most subjects had oral or mixed breathing (38.75 %), and 11.25 % of patients had nasal breathing. In the comparison group, the oral and mixed types of breathing also prevailed (33.75 %), with 16.25 % of patients exhibiting the nasal type of breathing.

The Stange test yielded the following results: in the main group, the breath-holding time predominantly exceeded 30 seconds, corresponding to nasal breathing (27.5 %), and 22.5 % of the participants demonstrated a result of <30 seconds (mouth or mixed breathing). In the comparison group, the results were the opposite: the majority of the observed – 30 % showed a breath-holding time of <30 seconds, which corresponded to mouth or mixed breathing. Normal nasal breathing was observed in 20 % of the subjects. Additionally, according to the Genchi test, in the main group, the majority of subjects (31.25 %) had a breath-holding time of less than 20 seconds, indicating the presence of a nasal breathing disorder (mouth or mixed breathing). Only 18.7 % of the participants in the main group held their breath for 20 seconds or longer, which corresponded to nasal breathing. In the comparison group, oral or mixed breathing also prevailed (32.5 %), and the Genchi test demonstrated normal nasal breathing in 17.5 % of the observed patients.

The obtained results indicate the need to conduct these functional tests during the initial examination and at the stage of orthodontic treatment. The implementation of functional tests is accessible, they are simple and convenient to perform, and are informative for improving and assessing the effectiveness of orthodontic treatment.

The results obtained by patients during the test with water are presented in Table 2.

Table 2. Results of the water test

Groups	Water retention time in the oral cavity <60 sec.	Water retention time in the oral cavity ≥60 sec.
Main group (40)	35 % (28)	15 % (12)
Comparison group (40)	41,25 % (33)	8,75 % (7)
All patients (n=80)	76,25 % (61)	23,75 % (19)
** Note: percentage calculation - from the total number of all patients*		

Source: compiled by the authors

According to Table 2, the majority of subjects (76.25 %, or 61 patients) were unable to hold water in their mouths for an extended period. This indicates that nasal breathing disorders are highly prevalent among children who underwent adenotomy, despite the previous surgical intervention. 23.75 % (19 people) were able to hold water in their mouths for more than 60 seconds, which indicated that these patients had normal nasal breathing. Both in the main group and in the comparison group, the water retention time in the mouth was below 60 seconds (35 % and 41.25 %, respectively). Water retention time in the mouth exceeded 60 s. in 15 % of subjects in the main group and 8.75 % in the comparison group.

As a result of the chewing test, data were obtained on the average value of the chewing efficiency index, the median of particles, and the area of the occlusal contact surfaces of the teeth (Table 3).

Table 3. Results of the chewing test

	Average value of chewing efficiency index, %				Median of particles, mm²			Area of occlusal contact surfaces of teeth, mm²			
Categories	64-65 %	66-67 %	68-69 %	70-71 %	30-31	32-33	34-35	21-22	23-24	25-26	27-28
Main Group (40)	0	5 % (4)	42,5 % (34)	2,5 % (2)	5 % (4)	33,75 % (27)	11,25 % (9)	6,25 % (5)	42,5 % (34)	1,25 % (1)	0
Comparison Group (40)	1,25 % (1)	7,5 % (6)	41,25 % (33)	0	3,75 % (3)	36,25 % (2)	10 % (8)	7,5 % (6)	38,75 % (31)	2,5 % (2)	1,25 % (1)
All patients (n=80)	1,25 % (1)	12,5 % (10)	83,75% (67)	2,5 % (2)	8,75 % (7)	70 % (56)	21,25 % (17)	13,75 % (11)	81,25 % (65)	3,75 % (3)	1,25 % (1)
** Note: percentage calculation - from the total number of all patients*											

Source: compiled by the authors

According to the presented data, in most of the studied children, the average value of the chewing efficiency index corresponds to a value of 68-69 %; the median particle size is equal to 69.77 mm² ± 1.50 %; and the area of occlusal contacting surfaces of teeth is on average 23.47 ± 1.77 mm². YuYa Naumovich (2013) indicated the corresponding indicators in patients of the same age with a neutral relationship of the dentition [19]. Based on the data of Yu. Ya. Naumovich, the average value of the chewing efficiency index should be at the level of 88.31 ± 0.49 %, with a median particle size of 12.68 ± 0.28 mm². The area of occlusal contacting surfaces of the teeth is 36.32 ± 1.09 mm². The patients we examined showed a decrease in all three indicators, which allows us to conclude that chewing efficiency has decreased, which is a sign of both myofunctional disorders and a dentoalveolar anomaly.

The results of the functional speech test are presented in Figure 1.

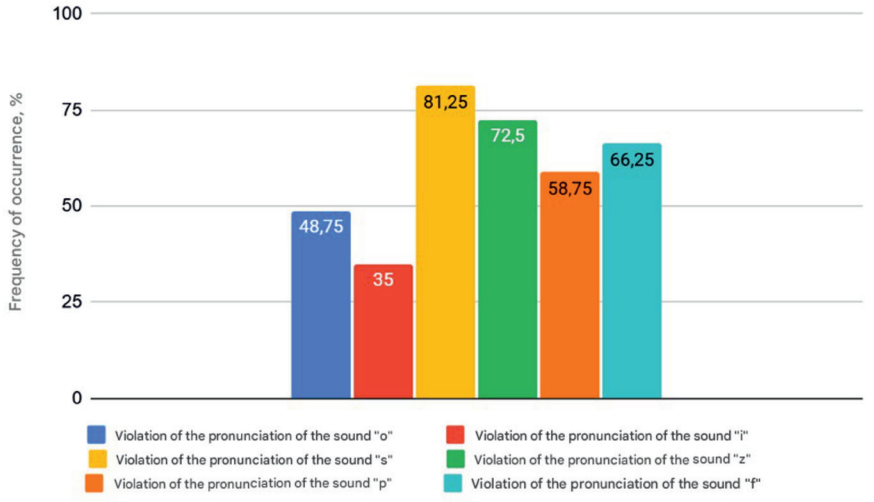

Figure 1. Frequency of occurrence of pronunciation disorders

Source: compiled by the authors

Based on the diagram data, the most common pronunciation disorder is the sound «s» (81.25 %), followed by «z», and then in descending order: «f», «p», «o», and «i». The obtained results indicate that the frequency of occurrence of articulation disorders in the studied patients is high.

The conducted analysis of OPTG was necessary to study the radiological signs of nasal breathing disorders and assess the overall state of the cerebral arteries. The results of the analysis conducted on OPTG are presented in Table 4.

Table 4. Results of the conducted analysis of OPTG

Groups	Narrowing of the nasal passages	Deviated nasal septum	Convergence of the roots of the upper permanent incisors	Lack of space for permanent teeth to erupt
Main group(40)	46,25 %(37)	25 %(20)	32,5 %(26)	55 %(44)
Comparison group(40)	43,75 %(35)	33,75 %(27)	33,75 %(27)	45 %(36)
All patients (n=80)	90 %(72)	58,75 %(47)	66,25 %(53)	100 %(80)
** Note: percentage calculation - from the total number of all patients*				

Source: compiled by the authors

Based on the above table, the absolute majority of subjects had a space deficit for the eruption of permanent teeth to varying degrees. Narrowing of the nasal passages was found in 90 % of subjects, convergence of the roots of the upper permanent incisors in more than 66 %, and curvature of the nasal septum in 58.75 %. Comparative analysis of the groups yielded the following results: narrowing of the nasal passages in the main group was 2.5 % more common than in the comparison group. To the contrary, the curvature of the nasal septum was more prevalent in the comparison group, 33.75 % compared to 25 % in the main group. The results of the OPTG analysis for the convergence of the roots of the upper permanent incisors were as follows: 32.5 % in the main group and 33.75 % in the comparison group, indicating that this parameter was 1.25 % more prevalent in the comparison group. The deficit of space for the eruption of permanent teeth, on the contrary, prevailed in the main group (55 % versus 45 % in the comparison group).

These results let us conclude that all patients exhibited radiographic signs of myofunctional disorders, specifically nasal breathing disorders.

The data obtained as a result of the TRG analysis in the lateral projection are presented in Table 5.

Table 5. Average values of TRG parameters among patients

Parameter, unit of measurement	Average value
L SNA	79,15 ±0,52
L SNB	75,23 ±0,48
L ANB	5,66 ±0,65
L SNMP	32,88±3,43
L SN-NL	8,70±0,33
L i-Sn	108,92±6,12
L i-MP	94,35±3,55
L II	124,71±7,16

Source: compiled by the authors

terior section of the apical basis of the upper jaw in the sagittal plane relative to NS and determines upper prognathism and retrognathia. We assume that the retroclination of the upper jaw, which most often occurred, had an adaptive value, being a consequence of the retroposition of the lower jaw.

Based on the data in the table, all patients (80 people) exhibited a decrease in the SNB angle, indicating retroposition of the lower jaw in the anterior section (distal position). This suggests that skeletal class 2, the posterior position of the apical basis of the lower jaw (along the sagittal plane) relative to the anterior segment of the skull base, predominates in children after adenotomy.

The average value of the interincisal angle was (124.71±7.16), which indicates the prevalence of incisor protrusion in the subjects.

A comparative analysis of the data obtained from the TRG analysis in the lateral projection for the two groups (the main and comparison) was not conducted due to a significant spread in the data range.

Based on the data obtained, most subjects had retroclination of the upper jaw, a posterior position of the apical base of the lower jaw, and protrusion of the incisors.

Discussion

Our analysis of the dental system condition in children after adenotomy shows that the prevalence of dental anomalies and myofunctional disorders among such children is high. We found that the absolute majority of examined patients have a skeletal form of bite anomaly - the distal ratio of the dental arches of the upper and lower jaws. This may confirm that a long-term state of impaired nasal breathing due to AH causes a violation of the growth of the dental system skeleton. This indicates the importance of AH's timely diagnosis by an otolaryngologist and an orthodontist.

According to Table 5, the average value of the SNA angle among patients was 79.15 ± 0.52. The SNA angle characterizes the position of the an-

The data from the functional tests showed that all subjects experienced a decrease in chewing efficiency, indicating the presence of both myofunctional disorders and dental anomalies. The study findings indicate a significant reduction in the quality of life of children after surgery for AH due to the disruption of a crucial dental system function, which is chewing.

It is important to note that the frequency of articulation disorders in the subjects was high, and the most common was the pronunciation disorder of the sound «s» (81.25 %), then «z», and then in descending order – «f», «p», «o», «i». This suggests that patients after adenotomy require comprehensive rehabilitation, including restoration of speech function, specifically the elimination of speech defects.

Conclusion

Myofunctional disorders and DA among patients who have undergone adenotomy have a huge impact on the quality of life, since their presence worsens the condition of the dentoalveolar system and the child's performance of such important functions as breathing, chewing, and speech. In addition, AH, which the examined patients experienced for a long time, deteriorated their cephalometric indicators, subsequently affecting the morphological structure of the human maxillofacial region, the biting state, the face structure, and, consequently, the patients' psychological state and self-esteem.

The results of our studies are of significant scientific and practical interest and require further

in-depth study. Thus, our study highlights the importance of examining the functional state of children's dental systems after adenotomy from an orthodontic perspective.

The authors hope that the above will help specialists of various profiles (dentists, otolaryngologists, pediatricians, speech therapists) in the early diagnosis of myofunctional disorders and DA in children after adenotomy. The authors express hope that the conducted studies will contribute to the development of a comprehensive, interdisciplinary approach to managing such patients.

References

1. Корнова Н. В., Солодовник А. В., Биджиев А. С., Рябенко Ю. И., Коркмазов А. М., Киселева Е. О., Клепиков С. В. Немедикаментозные методы воздействия на глоточную миндалину в комплексной терапии хронического аденоидита // Consilium Medicum. – 2024. – Т. 26. – № 3. – С. 153-158.
2. Коркмазов М. Ю., Дубинец И. Д., Ленгина М. А., Солодовник А. В. Локальные концентрации секреторного иммуноглобулина а у пациентов с аденоидитом, риносинуситом и обострением хронического гнойного среднего отита на фоне применения в комплексной терапии физических методов воздействия // Российский иммунологический журнал. – 2021. – № 24(2). – С.297-304.
3. Коркмазов М. Ы., Дубинец И. Д., Ленгина М. А. Отдельные показатели иммунологической реактивности при хирургической альтерации ЛОР-органов // Российский иммунологический журнал. – 2022. – №. 25(2). – С. 201-206.
4. Heimroth R. D., Casadei E., Salinas I. Molecular drivers of lymphocyte organization in vertebrate mucosal surfaces: Revisiting the TNF superfamily hypothesis // Journal of Immunology. – 2020. – Vol. 204, No. 10. – P. 2697-2711.
5. Kilinc D. D., Mansiz D. Myofunctional orofacial examination tests: a literature review // BMC Oral Health. – 2023. – Vol. 23(1). – С. 350.
6. Миронова С. Л., Геча В. В. Психология и физиология орофациального здоровья // Вестник Московской международной академии. – 2023. – № 2. С. 90-94.
7. Лабутина Н. В., Геча В. В. Принцип подбора упражнения при работе с миофункциональными орофациальными нарушениями // Педагогика, психология и экономика: вызовы современности и тенденции развития. – 2024. – С. 270.
8. Чебыкина Ю.В. Комплексный подход в работе логопеда при формировании моторной базы речи // Наука третьего тысячелетия. – 2020. – С. 903-908.
9. Marsha E, Kiswanjaya B, Bachtiar-Iskandar H. Comparison of positioning errors on panoramic radiographs in Indonesian children, adults, and elderly patients // Journal of Stomatology. – 2023. – Vol. 76(3). – P. 175-181.
10. Rodriguez-Olivos L. H. G., Chacon-Uscamaita P. R., Quinto-Argote A. G., Pumahualcca G., Pérez-Vargas L. F. Deleterious oral habits related to vertical, transverse and sagittal dental malocclusion in pediatric patients // BMC Oral Health. – 2022. – Vol. 22(1). – P. 88.
11. Giannini L, Galbiati G, Cressoni P, Esposito L. Bad oral habits: a review of the literature // J Biol Regul Homeost Agents. – 2021. – Vol. 35(1). – P. 403-406.
12. Курманбеков Н. О. Распространенность и етиопатогенез ретенции зубов (обзор литературы) // Евразийское Научное Обьединение. – 2020. – № 12-3(70). – С. 187-191.
13. Етекбаева А. О. Вопросы профилактики дистального прикуса у детей //Фундаментальная наука и клиническая медицина. – 2021. – С. 536-537.14.
14. Sonawane V. et al. Adenoid Facies – Can Orthodontists Help? // Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal. – 2023. – Vol. 12(1). – P. 163-168.
15. Li H., Wang H., Hao H., An H., Geng H. Influences of airway obstruction caused by adenoid hypertrophy on growth and development of craniomaxillofacial structure and respiratory function in children // Computational and Mathematical Methods in Medicine. – 2022. – Vol. 2022. – P. 1-8.
16. Васильева М. Б., Гусейнов Н. А. Адаптационные возможности языка при использовании ортодонтических аппаратов // Вестник Российского университета дружбы народов. Серия: Медицина. – 2023. – Т. 27. – № 1. – С. 101-109.
17. Арсюкова О. К. Ротовое дыхание как фактор формирования зубочелюстных аномалий // Авиценна. – 2017. – № 10. – С. 29-31.
18. Токаревич И. В., Кипкаева Л. В., Эль Ш. М. М. Анализ состояния жевательных и височных мышц у детей с миофункциональными наруше-

ниями в возрасте 7-8 лет и оценка эффективности их ортодонтической коррекции // Стоматологический журнал. – 2015. – Т. 16, № 3. – С. 204-207.
19. Наумович Ю. Я. Комплексная оценка жевательной эффективности с применением автоматизированных систем у пациентов с нарушениями прикуса: автореф. дис. ... канд. мед. наук: 14.01.14 / Белорус. гос. мед. ун-т. – Минск, 2013. – 22 с.

References

1. Kornova, N. V., Solodovnik, A. V., Bidzhiev, A. S., Ryabenko, Yu. I., Korkmazov, A. M., Kiseleva, E. O., & Klepikov, S. V. (2024). Non-drug methods of affecting the pharyngeal tonsil in the complex therapy of chronic adenoiditis. Consilium Medicum, 26(3), 153-158.
2. Korkmazov, M. Yu., Dubinets, I. D., Lengina, M. A., & Solodovnik, A. V. (2021). Local concentrations of secretory immunoglobulin A in patients with adenoiditis, rhinosinusitis and exacerbation of chronic purulent otitis media against the background of physical therapy. Russian Journal of Immunology, 24(2), 297-304.
3. Korkmazov, M. Y., Dubinets, I. D., & Lengina, M. A. (2022). Some indicators of immunological reactivity during surgical alteration of ENT organs. Russian Journal of Immunology, 25(2), 201-206.
4. Heimroth, R. D., Casadei, E., & Salinas, I. (2020). Molecular drivers of lymphocyte organization in vertebrate mucosal surfaces: Revisiting the TNF superfamily hypothesis. Journal of Immunology, 204(10), 2697-2711.
5. Kilinc, D. D., & Mansiz, D. (2023). Myofunctional orofacial examination tests: A literature review. BMC Oral Health, 23(1), 350.
6. Mironova, S. L., & Gecha, V. V. (2023). Psychology and physiology of orofacial health. Bulletin of the Moscow International Academy, 2, 90-94.
7. Labutina, N. V., & Gecha, V. V. (2024). Principle of exercise selection in working with orofacial myofunctional disorders. In Pedagogy, Psychology and Economics: Challenges of Modernity and Development Trends, 270.
8. Chebykina, Yu. V. (2020). Comprehensive approach in the work of a speech therapist in the formation of the motor base of speech. Science of the Third Millennium, 903-908.
9. Marsha, E., Kiswanjaya, B., & Bachtiar-Iskandar, H. (2023). Comparison of positioning errors on panoramic radiographs in Indonesian children, adults, and elderly patients. Journal of Stomatology, 76(3), 175-181.
10. Rodriguez-Olivos, L. H. G., Chacon-Uscamaita, P. R., Quinto-Argote, A. G., Pumahualcca, G., & Pérez-Vargas, L. F. (2022). Deleterious oral habits related to vertical, transverse and sagittal dental malocclusion in pediatric patients. BMC Oral Health, 22(1), 88.
11. Giannini, L., Galbiati, G., Cressoni, P., & Esposito, L. (2021). Bad oral habits: A review of the literature. Journal of Biological Regulators and Homeostatic Agents, 35(1), 403-406.
12. Kurmanbekov, N. O. (2020). Prevalence and etiopathogenesis of tooth retention: A literature review. Eurasian Scientific Association, 12-3(70), 187-191.
13. Etekbaeva, A. O. (2021). Issues of prevention of distal bite in children. Fundamental Science and Clinical Medicine, 536-537.
14. Sonawane, V., et al. (2023). Adenoid facies – Can orthodontists help? Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal, 12(1), 163-168.
15. Li, H., Wang, H., Hao, H., An, H., & Geng, H. (2022). Influences of airway obstruction caused by adenoid hypertrophy on growth and development of craniomaxillofacial structure and respiratory function in children. Computational and Mathematical Methods in Medicine, 2022, 1-8.
16. Vasil'eva, M. B., & Guseinov, N. A. (2023). Adaptive capabilities of the tongue when using orthodontic appliances. Bulletin of Peoples' Friendship University of Russia. Series: Medicine, 27(1), 101-109.
17. Arsyukova, O. K. (2017). Oral breathing as a factor in the formation of dentoalveolar anomalies. Avicenna, 10, 29-31.
18. Tokarevich, I. V., Kipkaeva, L. V., & El' Sh. M. M. (2015). Analysis of the condition of the masticatory and temporal muscles in children with myofunctional disorders aged 7–8 years and evaluation of the effectiveness of their orthodontic correction. Stomatological Journal, 16(3), 204-207.
19. Naumovich, Yu. Ya. (2013). Comprehensive assessment of masticatory efficiency using automated systems in patients with malocclusion [Author's abstract of Cand. Med. Sci. diss., Belarusian State Medical University]. Minsk, 22 p.

ОРТОДОНТИЯЛЫҚ КӨЗҚАРАС БОЙЫНША АДЕНОТОМИЯДАН КЕЙІНГІ БАЛАЛАРДЫҢ ТІС-ЖАҚ СҮЙЕК ЖҮЙЕСІНІҢ ФУНКЦИЯЛЫҚ ЖАҒДАЙЫ

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Аңдатпа

Аденоид гипертрофия операциясынан кейінгі балалардағы миофункционалдық бұзылулар және тіс-альвеолярлы аномалиялар маңызды және өзекті мәселе болып табылады. Әдебиеттерде аденоид гипертрофиямен ауыратын балаларда жиі кездесетін тіс-альвеолярлы аномалия дистальды окклюзия екені туралы ақпарат бар. Дистальды окклюзия болған жағдайда аденотомиядан кейінгі тіс-альвеолярлық жүйенің жағдайын зерттеу және миофункционалдық бұзылыстарды анықтау қажет.

Мақсаты: ортодонтиялық тұрғыдан аденотомиядан кейінгі балалардың жағдайын зерттеу.

Материалдар мен әдістер: «Дистальды окклюзия» диагнозы бар, бұрын тіссіздігімен ауырған және ортодонтиялық стоматологиялық көмекке жүгінген 80 науқасқа сауалнама жүргізілді.

Нәтижелер: Жүргізілген диагностика (функционалдық сынақтар және жақ-бет аймағының рентгендік зерттеуі) пациенттердің көпшілігінде миофункционалдық бұзылыстар – ауызша немесе аралас тыныс алу, ал тіс-альвеолярлы аномалия - дистальды окклюзия бар екенін көрсетті.

Талқылау: Біздің зерттеулеріміздің нәтижелері айтарлықтай ғылыми және практикалық қызығушылық тудырады және одан әрі терең зерттеуді қажет етеді. Авторлар жоғарыда аталғандар әртүрлі сала мамандары үшін аденотомиядан кейінгі балалардағы миофункционалдық бұзылулар мен тіс-альвеолярлық аномалияларды ерте диагностикалауды жеңілдетеді деп үміттенеді.

Қорытынды: Аденотомиядан кейінгі балалардың жағдайын ортодонтиялық тұрғыдан зерттеу кезінде дистальды окклюзияның (2 қаңқалық класс, бас сүйегінің негізінің алдыңғы сегментіне қатысты төменгі жақтың апикальды негізінің артқы орналасуы (сагиттальды ось бойымен)) және ауызша немесе аралас тыныс алудың басым болуы анықталды. Жүргізілген зерттеулер мұндай науқастарды басқарудың біртұтас, жан-жақты, пәнаралық көзқарасын дамытуға ықпал етеді.

Түйін сөздер: *тіс жүйесі, дистальды окклюзия, миофункционалды бұзылыстар, ауызбен тыныс алу, жұтылудың нәрестелік түрі, аденотомия, ортодонтия.*

ФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ ЗУБОЧЕЛЮСТНОЙ СИСТЕМЫ ДЕТЕЙ ПОСЛЕ АДЕНОТОМИИ С ОРТОДОНТИЧЕСКОЙ ТОЧКИ ЗРЕНИЯ

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Аннотация

Миофункциональные нарушения и зубочелюстные аномалии у детей после оперативного вмешательства по поводу гипертрофии аденоидов являются важной и актуальной проблемой. В литературе имеются сведения, что чаще всего у детей с гипертрофией аденоидов возникает такая зубочелюстная аномалия, как дистальный прикус. При наличии дистального прикуса необходимо после проведения аденотомии изучить состояние зубочелюстной системы и выявить наличие миофункциональных нарушений.

Цель: изучить состояние детей после аденотомии с ортодонтической точки зрения.

Материалы и методы: Было проведено обследование 80 пациентов с диагнозом «Дистальный прикус», ранее перенесших аденотомию и обратившихся за ортодонтической стоматологической помощью.

Результаты: Проведенная диагностика (функциональные пробы и рентгенологическое изучение челюстно-лицевой области) показала, что у преобладающего количества пациентов наблюдались миофункциональные нарушения – ротовое или смешанное дыхание, и зубочелюстная аномалия - дистальный прикус.

Обсуждение: Результаты проведенных нами исследований представляют значительный научный и практический интерес и требуют дальнейшего глубокого изучения. Авторы надеются, что вышеизложенное облегчит специалистам различных профилей раннюю диагностику миофункциональных нарушений и зубочелюстных аномалий у детей после аденотомии.

Выводы: Изучение состояния детей после аденотомии с ортодонтической точки зрения выявило преобладание дистального прикуса (2 скелетный класс, заднее положение апикального базиса нижней челюсти (по сагиттали) относительно переднего отрезка основания черепа) и ротовое либо смешанное дыхание. Проведенные исследования будут способствовать разработке целостного комплексного междисциплинарного подхода в ведении таких пациентов.

Ключевые слова: *зубочелюстная система, дистальный прикус, миофункциональные нарушения, ротовое дыхание, инфантильный тип глотания, аденотомия, ортодонтия.*

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