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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.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

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 ВИНИТИ 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.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

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. Корректура авторам не высылается, 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 compu-ter-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 საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ 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 შეღებვის 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 ფჩხილებში 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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CLINICOROENTGENOLOGICAL PECULIARITIES OF THE CONGENITAL AND ACQUIRED CRANIOFACIAL ANOMALIES

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Abstract.

Aim: The aim of the research was to study the relationship between the X-ray changes in the bones of the skull, the structure of the upper respiratory tract and concomitant general somatic diseases in patients with congenital and acquired craniomaxillofacial anomalies.

Materials and methods of the research: The study included 52 patients aged 1 to 3 and 3 to 7 years, with congenital and acquired lower micrognathia in 19 (36.53±5.3) % and upper micrognathia in 33 (63.46±5.3) %. There were used clinical methods (questioning, examination, palpation), instrumental methods (multispiral computer tomography, X-ray cephalometric analysis of the bones of the facial skeleton, oropharynx, and bony pharynx).

The results of the study: The obtained results of the clinical and radiographic examination made it possible to assert that among the patients with congenital defects of the jaws, not only changes in the facial skeleton dominate, mostly in the form of upper micrognathia and, to a lesser extent, lower micrognathia, but also the presence of somatic developmental defects in the form of disorders of the nervous system, pathologies of ENT-organs and ophthalmic defects. The identified malformations caused the violations of a number of important functions: breathing, swallowing, chewing, and speech formation. This connection was followed in particular in patients with syndromic craniosynostosis, namely, underdevelopment of the skull base combined with upper micrognathia and retroposition of the maxillary complex in the skull.

Conclusions: The frequency and spectrum of concomitant somatic pathology depended on the nature of dentofacial anomalies. All patients with upper micrognathia had craniostenosis with the deformations of the brain skull and eye sockets. Among the patients with lower micrognathia, all those examined were found to have disorders of the development of the ENT-organs.

Key words. Craniosynostosis, upper micrognathia, lower micrognathia, congenital malformations, upper respiratory tract.

Introduction.

According to a number of scientists' data, the prevalence of dentofacial anomalies ranges from 35% to 75% among all the pathologies of the dentofacial system [1-4]. Scientists emphasize various ethiopathogenetic chains in the development of anomalies and deformations. Among the endogenous factors that cause congenital anomalies of the dentofacial system are the disorders of intrauterine development of the child and genetic malformations [5-7]. Among the exogenous factors, there are bad habits, disorders of chewing, swallowing, breathing, injuries, previous inflammatory processes of the bones of the facial skeleton [8-13]. Special attention is paid to the condition of the upper respiratory tract in the development of anomalies of the facial skeleton [14]. When diagnosing dentofacial anomalies, it should be taken into account that the upper jaw is the part of the middle facial complex and takes a direct part in the formation of the nasopharyngeal section, the pathology of which can lead to the development of apnea or respiratory failure. A detailed study of the peculiarities of skull morphology in congenital anomalies, analysis of the condition of the upper respiratory tract in combination with the study of accompanying pathologies can provide the specialist with additional information regarding timely diagnosis and optimal treatment tactics.

Without modern diagnostic methods, it is not always a simple task to determine what type of anomaly the patient has. Often, specialists need additional radiological examinations, which is associated with two-dimensional flattening, variable magnification of various anatomical structures of the facial skull, and limitation due to the total overlap [15,16].

Today, we can replace 2D diagnostics with multispiral computed tomography. 3D cephalometry makes it possible to assess the exact topological location of the anatomical structures of the facial skull, and to help the specialist avoid diagnostic errors [17].

The aim of the study was to investigate the relationship between X-ray changes in the skull bones, the structure of the upper respiratory tract and concomitant general somatic diseases in patients with congenital and acquired craniomaxillofacial anomalies.

Materials and methods.

Of the examined 52 patients with congenital forms of jaw anomalies, there were 19 (36.53±5.3) % of patients with LM (lower micrognathia) and 33 (63.46±5.3) % of children with UM (upper micrognathia). The age of the examinees ranged from 1 to 3 and from 3 to 9 years.

The study of early childhood patients with congenital and acquired craniomaxillofacial anomalies was performed for 12 years. The study was conducted both in patients and with the use of archival data of computed tomography and medical documentation based on the Regional Children's Hospital in Ivano-Frankivsk. There were used clinical methods (questioning, examination, palpation), instrumental methods (multispiral computed tomography, X-ray cephalometric analysis of the bones of facial skeleton, oropharynx, and bony pharynx). All patients were consulted by a pediatrician, an intensivist-anesthesiologist, an otolaryngologist, and a geneticist.

X-ray methods included examination of the patient using a TOSHIBA Aquilion PRIME 160-slices MODEL TSX-302A/1C multispiral computed tomography scanner. The scanning range included the facial and cerebral parts of the skull.

Three-dimensional cephalometric analysis of the facial skeleton and upper respiratory tract, namely the lumen of

the nasopharynx, bony pharynx, was performed in computer reconstructions in the SimPlant Pro 11.04 software, SurgiCase module. It was based on the techniques of cephalometric and stereotopometric analysis of the skull according to E. Martin, D. Bunn, P. Turner, Gwen R.J. Swennen, Filip Schutyser, Jarg-Erich Hausamen, which is described in detail in the thesis [18].

During the cephalometric analysis, depending on the pathology, the patients were divided into 2 groups. Due to the indications for reconstructive surgical interventions on the facial skeleton, the largest number of tomographic studies of the entire skull was performed for the patients aged 3 to 9 years. All syndromic forms of craniosynostosis combined with upper micrognathia were included into group I. Instead, other patients with unilateral or bilateral underdevelopment of the lower jaw, regardless of the type of disease, were included into group II.

Group I – 23 patients with craniosynostosis accompanied by UM, upper retrognathia.

Comparison group II – 19 patients with congenital and acquired anomalies accompanied by LM.

Cephalometric indices were also compared with the use of archival data of spiral computed tomography of 30 control group patients with pathologies that did not affect the development of the facial skeleton.

The STATISTICA 10 program was used for statistical processing of the results obtained. All quantitative data obtained in the study, were first checked for the type of their distribution using the Shapiro-Wilk's W-test. To describe the central tendency of the quantitative data that corresponded to the normal Gaussian law, the interval (M±m) was used: the arithmetic value (Mean) ± standard error (SE). To assess the reliability of the differences of the obtained results in comparison with the control group, the parametric t-test (Student's test) was used. A value of $p<0.05$ was considered probable.

Results and Discussion.

The results of the survey of patients with upper and lower micrognathia and their parents indicated a certain spectrum of complaints, the nature and frequency of which are shown in the Table 1.

Table 1. *Character and frequency of complaints of patients with congenital and acquired anomalies of the jaws in subgroups with lower, upper micrognathia.*

Nature of complaints	**Frequency of complaints, abs. (%)**	
	Patients with lower micrognathia, n=19 (100) %	**Patients with upper micrognathia, n=33 (100) %**
Chewing disorder	19 (100)	33 (100)
Speech disorder	19 (100)	10 (30.30±5.1)
Swallowing disorder	19 (100)	10 (30.30±5.1)
Breathing disorder	9 (47.36±5.54)	23 (69.69±5.1)
Frequent headaches	-	33 (100)
Frequent vomiting	-	33 (100)
Hearing impairment	10 (52.63±5.54)	-
Presence of convulsions	-	33 (100)

Among the complaints listed above, in patients with pathology of the lower jaw, disturbances in the function of chewing, speech and swallowing were most often observed, in comparison with the other clinical group, where the highest percentage was due to disturbances in chewing and breathing.

When examining patients with congenital upper and lower micrognathia, the presence of somatic pathology was determined. According to the examination data represented in Table 2, numerous somatic pathologies were detected in patients with congenital anomalies of the jaws, such as the presence of glossoptosis, impaired development of the auricle and external auditory canal, the presence of pathology in the central nervous system and cardiovascular system, the presence of ophthalmic pathology, non-union of hard and soft palates, presence of aspiration pneumonia, protein-energy deficiency, generalized lymphadenopathy and hemorrhagic disease of the gastrointestinal tract.

Table 2. *Character and frequency of somatic pathology of patients with congenital and acquired anomalies of the jaws in subgroups with lower and upper micrognathia.*

Nature of accompanying pathology	**Frequency of complaints, abs. %**	
	Patients with lower micrognathia, n=19 (100) %	**Patients with upper micrognathia, n=33 (100) %**
Pathology of ENT-organs - glossoptosis - disorder of the development of the auricle - disorder of the development of the external auditory canal	 9 (47.36±5.54) 10 (52.63±5.54) 10 (52.63±5.54)	 - - -
Pathology of the CNS - cerebral cysts - intracranial hypertension	 6 (31.57±5.16)	 - 33 (100)
Pathology of the cardiovascular system	11 (57.89±5.48)	-
Ophthalmic pathology - exorbitism - subatrophy of optic nerve discs	 - -	 23 (69.69±5.1) 23 (69.69±5.1)
Presence of non-union of the hard and soft palate	2 (10.52±3.4)	10 (30.30±5.1)
Presence of aspiration pneumonia	5 (26.31±4.89)	-
Presence of protein-energy deficiency	9 (47.36±5.54)	10 (30.30±5.1)
Presence of generalized lymphadenopathy	-	5 (15.15±3.98)
Presence of hemorrhagic disease of the gastrointestinal tract	2 (10.52±3.4)	-

The analysis of patients in the clinical group with syndromic craniosynostosis showed the presence of ophthalmic pathology in the form of exorbitism and subatrophy of optic nerve discs in combination with pathology of the central nervous system. The latter one was manifested in the form of hydrocephalus-hypertensive syndrome, which indicated the presence of preterm fusion of the sutural joints of the cerebral part of the skull in combination with its deformation.

During an objective examination of the dentofacial area of patients with the congenital anomalies of the jaws, 52 patients had facial disproportionality. At the same time, among the

examinees of the subgroup I, 19 (100) % patients had the shortening and backward displacement of the lower third of the face. There were observed symmetric configuration violations in 9 (47.36±5.54) % of patients, and unilateral configuration violations were observed in 10 (52.63±5.54) % of patients. During the examination, 10 (52.63±5.54) % of patients had a decrease in one half of the face, deformation, or the presence of a rudiment of the auricle, the middle line of the chin was shifted to the side. The temporomandibular joints and external auditory canal was completely absent in all the cases we've studied. In 9 (47.36±5.54) % of patients, there was noted the symmetrical shortening of the lower third of the facial skeleton, which formed the so-called "bird" type of the face, the symmetry of the face was not disturbed. Such changes indicated a symmetrical violation of the development of the lower jaw.

During an objective examination, 33 (100) % of patients with malformations of the upper jaw were found to have: correct body structure, reduced nutrition (retardation in growth, weight). 23 (69.69±5.1) % of patients had facial expression as "adenoid" one, nasal breathing was difficult. When examining the head, 33 (100) % of patients were noted to have skull deformation. Thus, in this group of patients there were noted: acrocephaly in (39.13±5.42) %, oxycephaly in (8.69±3.12) %, trigonocephaly in (4.34±2.26) %, turicephaly in (13.04±3.74) %, and brachycephaly in (34.08±5.26) % of cases. In the remaining 10 (30.30±5.1) % of patients, non-union of the hard and soft palates was noted in combination with upper micrognathia and deformation of the cerebral part of the skull.

In order to make a final diagnosis, the clinical data of patients with congenital malformations of the jaws, are supplemented with radiographic characteristics of these forms of anomalies. A detailed roentgenographic examination of a group of 33 (100) % of patients with the congenital upper micrognathia and skull deformities, has revealed such types of brain skull deformities as trigonocephaly, acrocephaly, oxycephaly, turicephaly, and brachycephaly. These types of pathologies belong to the class of symmetrical orbital-cranial dimorphism. Thus, trigonocephaly (brachycephalic metopic synostosis) occurred in (4.34±2.26) % patients of the examined group. Acrocephaly in the contingent studied by us, was (39.13±5.42) %.

During the X-ray examination of these patients, in all the cases observed by us, the deformation of the skull was accompanied by craniosynostosis of the coronary, frontal-lattice, frontal-sphenoid and zygomatic-sphenoid sutures. Oxycephaly among all the examined patients was in (8.69±3.12) %. When studying patients with oxycephaly, craniosynostosis of the coronary, sagittal, frontal-lattice, frontal-sphenoid and zygomatic-sphenoid sutures was observed. These patients were also noted a brain herniation in the parietal region. Turicephaly among all the examined was in (13.04±3.74) %. On the three-dimensional reconstruction, deformation of the skull was observed with a characteristic "overlap" of the frontal area onto the parietal area, its elevation above the vault of the skull in the form of a tower overhanging the facial skeleton. Craniosynostosis of the coronary, sagittal, frontal-lattice, frontal-sphenoid and zygomatic-sphenoid sutures is present. Brachycephaly among all the examined was in (34.08±5.26) % of patients. There is craniosynostosis of the coronary, frontal-lattice, frontal-sphenoid and zygomatic-sphenoid sutures. The base of the skull is reduced in size; the front cranial fossa is very shortened. The above-mentioned changes in 23 (100) % of the examinees were combined with hypoplasia of the upper jaw in combination with its retroposition and hypoplasia of the zygomatic bones with shortening of zygomatic arches, which was confirmed by a decrease in the length of the face base Mart.40. The lower jaw was without visible pathological changes. There was an angle bite anomaly, class III (Figure 1).

These changes were confirmed by 3D cephalometric analysis data (Tables 3, 4 and 5).

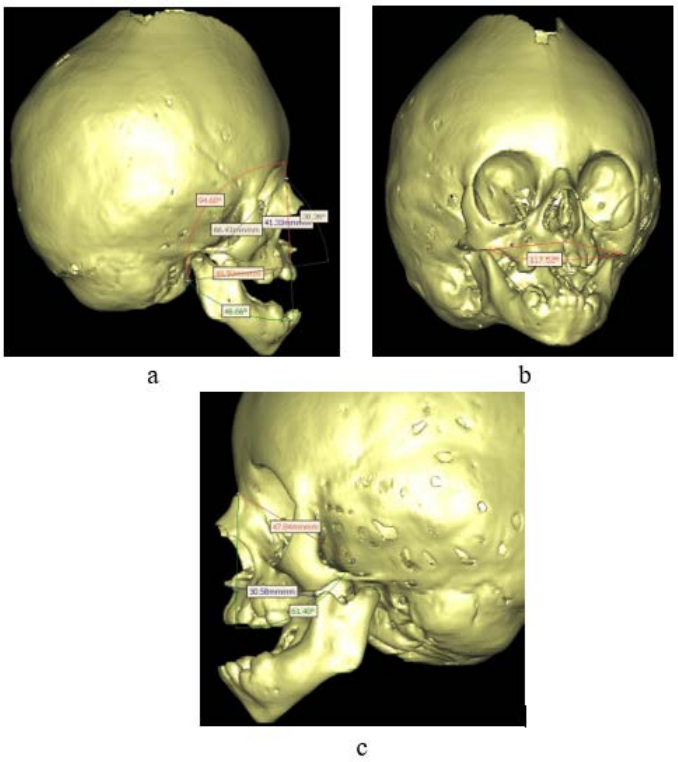

Figure 1. *Roentgenographic data of the patient M. 3 years old. Oxycephaly, upper micrognathia. Indices of parameters of the facial triangle (a), zygomaxillary angle (b), alveolar process (c).*

The high arched palate, which was determined by the Mart.63 Biom G2 index, and the base of the upper jaw according to the parameter (ns) or VPOK – (pns) were respectively shortened. Underdevelopment of the base of the upper jaw was combined with a decrease in the length of the alveolar arch Mart.60. The above-mentioned parameters were also confirmed by the remaining indices of the facial triangle. Thus, the parameter Mart.48 Biom.G'H of the upper face height was shortened, as well as Mart.5 (skull base length).

When analyzing the upper respiratory tract on sagittal reconstructions and axial sections, a decrease in nasopharyngeal dimensions was observed. Thus, there was a decrease in the depth of the nasopharynx, which was measured by the PNS - ppw index and the length of the bony pharynx. The above-

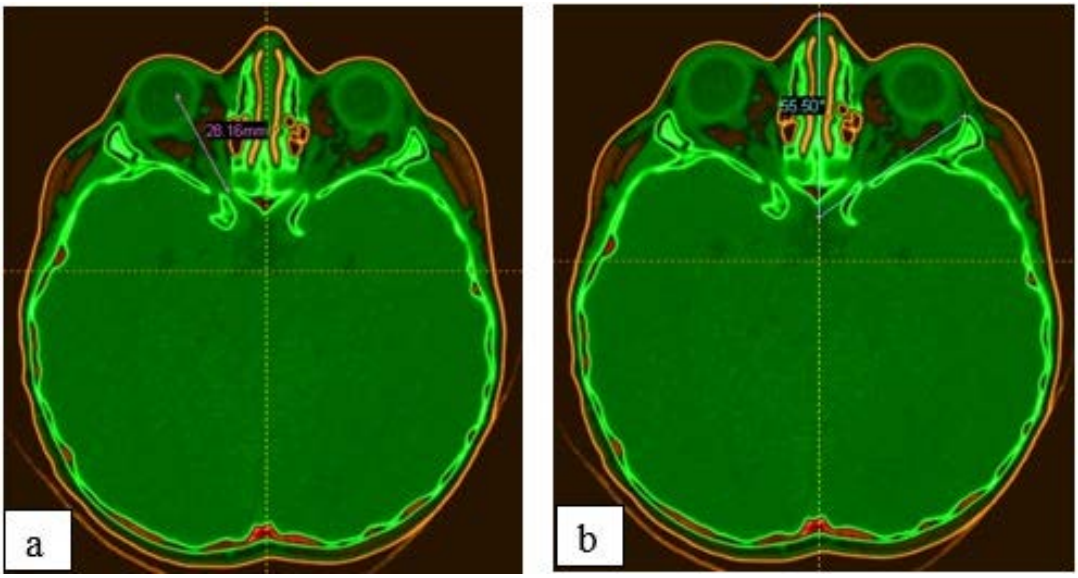

Figure 2. *X-ray data of the three-year old patient R. with craniosynostosis, hypoplasia of the middle zone of the facial skeleton and shortening of the depth of the orbit: a – analysis of the depth of the orbit; b – analysis of the position of the walls of the orbit.*

Table 3. *Comparison of cephalometric indices of patients of the groups I and II aged from 3 to 9 years with the control group.*

№	Measured index	Studied pathology		
		Upper micrognathia	**Lower micrognathia**	**Norm**
1.	N – Se	52.66±1.613	58.37±0.905	58.73±0.828
		P<0.05	P>0.05	
2.	Mart.63 Biom G2	22.60±1.252	25.77±0.683	25.93±0.585
		P<0.05	P>0.05	
3.	The distance between the palatal openings	22.44±0.987	25.45±0.764	25.90±0.593
		P<0.05	P>0.05	
4.	(ns) or VPOK – (pns)	33.39±0.87	37.03±0.921	37.32±0.913
		P<0.05	P>0.05	
5.	The position of the upper jaw in the skull from the point “0”	Y=34.89±1.189	Y=38.13±0.476	Y=38.13±0.623
		P<0.05	P>0.05	
6.	The position of the upper jaw in the skull from the point “S”	Y=41.73±1.299	Y=47.20±0.527	Y=47.06±0.556
		P<0.05	P>0.05	
7.	The position of the point “0”	Y=7.0±0.636	Y=9.06±0.462	Y=9.26±0.462
		P<0.05	P>0.05	
8.	PNS – ppw	6.33±0.584	11.66±0.682	12.34±0.622
		P<0.05	P>0.05	
9.	Ba – PNS	27.89±1.043	36.90±0.899	37.27±0.850
		P<0.05	P>0.05	
10.	T1	13.62±0.600	14.32±0.40	15.11±0.544
		P>0.05	P>0.05	
11.	P2	5.35±0.504	8.48±0.478	9.40±0.663
		P<0.05	P>0.05	
12.	P3	6.21±0.481	12.34±0.80	13.76±0.815
		P<0.05	P>0.05	
13.	T2	22.53±0.548	24.59±1.09	25.23±0.876
		P<0.05	P>0.05	
14.	V	23.20±1.209	29.02±1.112	28.51±1.115
		P<0.05	P>0.05	
15.	N – SpP (Mx – Pl)	29.56±0.958	39.18±1.153	38.73±1.155
		P<0.05	P>0.05	

Table 4. *Comparison of cephalometric indices of patients of the groups I and IIaged from 3 to 9 years with the control group.*

№	Measured index	Studied pathology		
		Upper micrognathia	**Lower micrognathia**	**Norm**
1.	Mart.60	31.52±1.094	39.03±0.904	38.87±1.197
		P<0.05	P>0.05	
2.	Mart.61	49.84±1.603	52±0.974	51.66±0.945
		P>0.05	P>0.05	
3.	Mart.55.Biom NH'.	28.63±0.987	36.5±1.216	36.45±1.447
		P<0.05	P>0.05	
4.	Mart.54.Biom NB.	18.06±0.797	20.06±0.434	20.26±0.591
		P<0.05	P>0.05	
5.	Mart.43(1) Biom IOW.	86.97±3.13	81.87±1.242	80.32±1.409
		P>0.05	P>0.05	
6.	Nasion height (N) above the line connecting the points fmol та fmor	17.44±0.961	15.68±0.653	14.54±0.985
		P<0.05	P>0.05	
7.	Mart.51a Biom O1'L.	33.97±0.844	33.32±0.477	32.98±0.528
		P>0.05	P>0.05	
8.	Mart.49a Biom DC.	20.46±1.132	18.06±0.569	18.43±0.814
		P>0.05	P>0.05	
9.	Eye socket depth	32.91±1.171	36.12±0.53	35.49±0.694
		P<0.05	P>0.05	
10.	Determination of symmetry of the medial edge of the orbit	10.23±0.547	8.66±0.307	8.36±0.420
		P<0.05	P>0.05	
11.	Mart 52.Biom.O2L.	33.40±0.818	31.54±0.596	30.24±0.751
		P<0.05	P>0.05	
12.	Mart.46.Biom GB.	66.65±1.782	67.80±1.343	68.03±1.666
		P>0.05	P>0.05	
13.	Mart.40	57.73±2.007	73.97±1.556	74.21±1.603
		P<0.05	P>0.05	
14.	Mart.48. Biom.G'H.	45.88±1.466	54.41±1.48	54.37±1.597
		P<0.05	P>0.05	
15.	Mart.5	74.20±2.053	86.71±1.553	87.19±1.632
		P<0.05	P>0.05	
16.	Mart.68.Biom Cp1.	48.50±1.997	42.64±1.490	49.41±1.541
		P>0.05	P<0.05	
17.	Biom. pg go straight length from the angles	58.50±2.245	52.22±2.884	59.46±1.913
		P>0.05	P<0.05	
18.	Length of the body of the lower jaw (teleroentgenolographic)	45.50±1.903	41.27±1.365	46.82±1.382
		P>0.05	P<0.05	

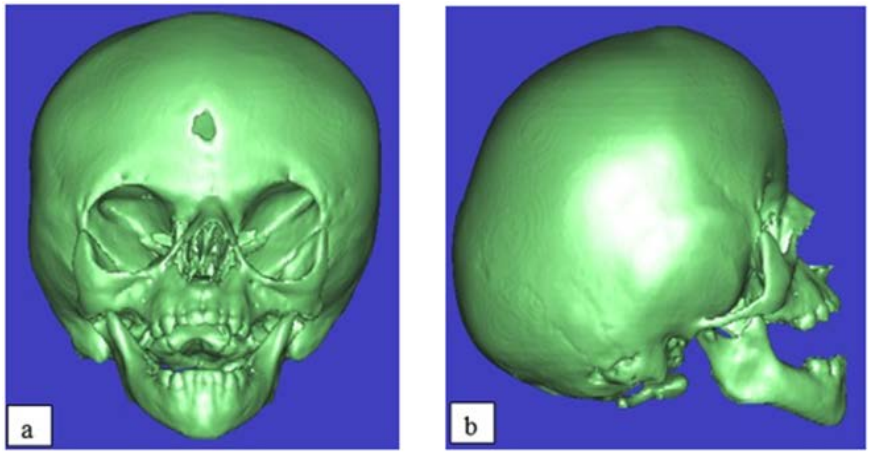

Figure 3. *Roentgenographic data of the three-year old patient L. with brachycephaly and hypoplasia of the middle zone of the facial skeleton: a – frontal projection; b – lateral projection.*

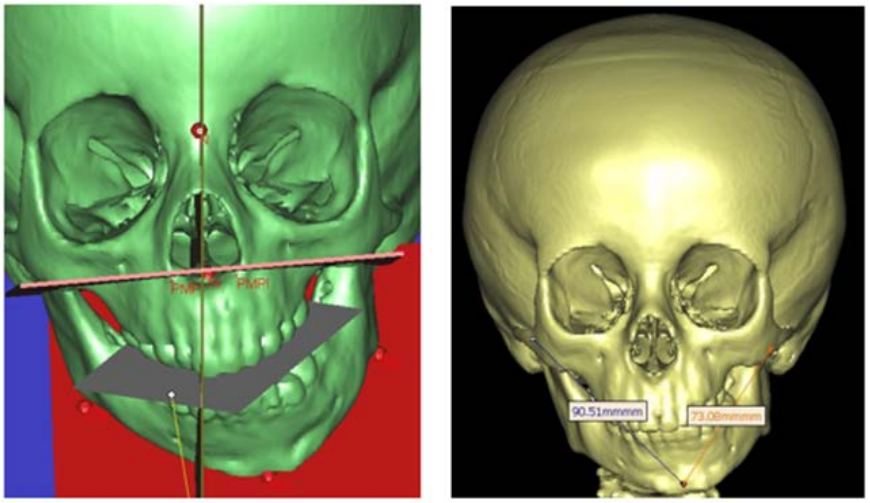

Figure 4. *Computer 3D reconstruction of the skull with the parameters: a – degree of inclination of the upper jaw base in the transverse plane; b – full mandibular length.*

Table 5. *Comparison of cephalometric indices of patients of the groups I and II aged from 3 to 9 years with the control group.*

№	Measured index	Studied pathology		
		Upper micrognathia	**Lower micrognathia**	**Norm**
1.	Mart.70.Biom. Rl.	33.93±2.045	28.94±1.641	35.02±2.0744
		P>0.05	P<0.05	
2.	The distance from the distal point of the fragment to the projection of the articular fossa	The ramus of the mandible is present	The ramus of the mandible is present	The ramus of the mandible is present
3.	Height of the branches of the lower jaw MT2 (teleroentgenolographic)	33.66±2.067	34.84±1.592	33.47±2.143
		P>0.05	P>0.05	
4.	Full mandibular length	80.19±3.037	72.37±3.561	81.54±2.679
		P>0.05	P<0.05	
5.	The distance from Pg to the projection of the articular fossa	The ramus of the mandible is present	The ramus of the mandible is present	The ramus of the mandible is present
6.	PNS – ppw (teleroentgenolographic)	5.81±0.481	12.55±1.333	12.48±1.267
		P<0.05	P>0.05	
7.	Ba – PNS (teleroentgenolographic)	27.46±1.106	34.81±0.895	34.83±0.783
		P<0.05	P>0.05	
8.	T1 (teleroentgenolographic)	12.67±0.674	12.83±0.528	12.53±0.507
		P>0.05	P>0.05	
9.	P2 (телерентгенографічна)	5.82±0.411	9.07±0.672	9.33±0.664
		P>0.05	P>0.05	
10.	P3 (teleroentgenolographic)	6.34±0.238	10.83±1.272	10.80±1.162
		P<0.05	P>0.05	
11.	T2 (teleroentgenolographic)	20.76±0.829	23.99±0.985	23.51±0.960
		P<0.05	P>0.05	
12.	V (teleroentgenolographic)	21.14±0.919	28.38±0.906	27.10±0.898
		P<0.05	P>0.05	
13.	N – SpP (Mx – Pl) (teleroentgenolographic)	28.59±1.158	38.86±1.079	38.52±1.228
		P<0.05	P>0.05	

Table 6. *Nature and frequency of somatogenetic syndromes in patients with congenital and acquired upper and lower micrognathia.*

Congenital anomalies			
Anomalies accompanied by lower micrognathia		**Abs. amount**	**Number of patients %**
1.	Bilateral temporomandibular joints ankylosis	9	9 (47.36±5.54)
2.	Goldenhar syndrome (hemifacial microsomia)	10	10 (52.63±5.54)
	Total	19	100
Anomalies accompanied by upper micrognathia			
1.	Crouzon's syndrome	9	(27.27±4.94)
2.	Apert syndrome	13	(39.39±5.42)
3.	Pfeiffer's syndrome	11	(33.33±5.23)
	Total	33	(100)

mentioned changes were combined with a decrease in the length of the base of the face Mart.40. Respectively, the decrease in the indices of the upper respiratory ways P2 and P3 is due not only to the retroposition of the upper jaw in the skull, but also due to the superposition of its base, the position of which is caused by the shortening of the middle zone of the face. This is confirmed by the decrease at 18.63% of the interval between the posterior part of the base, the pituitary fossa, the decrease of the height of the nose at 21.46% and the upper height of the face Mart.48. Biom.G'H. at 15.62%.

Analysis of the position of the eyeballs in the orbit showed the presence of exophthalmos, exorbitism due to the shortening of the depth of the orbits (Figure 2).

Due to the pronounced lateralization of the orbits and shortening of their depth, the lateral wall of the orbits formed an obtuse angle in relation to the sagittal plane. In (33.3±5.23) % of patients of this group, orbital hypertelorism of the 1st degree was observed; it was confirmed by an increase in the dacryal width Mart.49a Biom DC. In the remaining patients (66.7±5.23) % of this group, the interorbital interval is within the normal range. Synostosis of the sphenoethmoidal suture and premature closure of the frontal-sphenoidal synchondrosis were observed. The above-mentioned roentgenographic changes of the skull are also represented in Figure 3.

When analyzing the middle zone of the facial skeleton in patients of the group II with unilateral lower micrognathia, only compensatory deformation of the alveolar process of the upper jaw was observed in the transverse projection. These changes were reflected in the inclination of the occlusal plane and the plane of the base of the upper jaw in the transverse direction at 5.47+0.6120, the rotation of the Zml, Zmr, ANS planes at 4.35+0.450, and the change in the position of the sagittal plane to the point A at 3.23+0.5590. The numerical indices given above reflected only violations of symmetry (Figure 4).

Comparative analysis of the parameters of the facial skeleton, represented in Table 3, in patients with congenital lower micrognathia showed the presence of numerous defects in the development of its lower third. The pronounced dysmorphia mainly concerned developmental disorders of one side and symmetrically both sides of the lower jaw. In the first case, significant underdevelopment of the branch of the lower jaw was combined with thinning and underdevelopment of the articular heads in combination with flattening and absence of articular pits on the affected side. In the second case, significant symmetrical shortening of the branches of the lower jaw was combined with bilateral fibrous and bony ankylosis of the temporomandibular joints. Common to both categories was the index of the height of the ramus of the lower jaw Mart.70. Biom. Rl, which was smaller on the affected side, compared to the control group (35.02±2.0744mm (P<0.04)). The shortening of the last index in all cases was combined with a violation of the development of the lower jaw body, which was reflected in a decrease of the projection length index up to 42.64±1.490mm from the angles of Mart.68.Biom Cp1 and shortening up to 52.22±2.884mm Biom. pg go of straight length from the angles. The indices of the full mandibular length from the chin to the articular heads have changed proportionally; it was reflected in its decrease up to 72.37±3.561 mm.

Based on the complaints of the patients or based on the words of the parents of these patients, the data of an objective examination, the history of the disease, roentgenographic examination, guiding by the conclusion of physicians-internists (medical geneticists, cardiologists, neurosurgeons, therapists, ophthalmologists, otolaryngologists), based on the data of the life anamnesis, characteristic pathological changes in the dentofacial area were found; that gave us the opportunity to determine a clinical diagnosis for 33 (100%) patients with congenital forms of upper micrognathia and 19 (100)% patients with congenital and acquired of lower micrognathia (Table 6).

The obtained results of the clinical-radiographic examination made it possible to think that among the contingent of patients with congenital defects of the jaws, not only changes in the facial skeleton dominate, mostly in the form of upper micrognathia and, to a lesser extent, lower micrognathia, but also there is a presence of somatic developmental defects in the form of disorders of the nervous system, pathologies of ENT-organs and ophthalmological defects. The identified malformations have led to violations of a number of important functions: breathing, swallowing, chewing, and speech formation. In addition, the presence of somatogenetic syndromes with disorders of development and metabolic processes significantly aggravated the condition of patients, which requires an optimal and multisided approach to rehabilitation measures.

According to the complaints received, the data of a detailed X-ray study reveals a close relationship between the nature of the deformations, the morphology of the bones of the facial skeleton,

the peculiarity of the structure of the upper respiratory tract, and the data of clinical observations. This close relationship was followed in patients with syndromic craniosynostosis, namely, a shortened anterior cranial fossa combined with a complete synostosis of the coronary sutures of the skull and retroposition of the maxillary complex in the skull. However, as it is known, in patients with non-syndromic craniosynostosis, the middle zone of the facial skeleton may remain unchanged; that means that the base of the skull may not be shortened [7]. This mechanism can be explained by the preterm closure of synchondroses of the base of the skull in syndromic forms of anomalies and, as a result, the lack of development of the skull base, which would push the maxillary complex forward. However, it is possible that not only the position of the maxillary complex plays a significant role, but also the sutural connections of the upper jaw. As for the causes of such changes in the cranial sutures, scientists suggest a violation of fibroblast growth factors (FGFR, FGFR2, L1CAM-FGFR) [6,7]. A complex of such disorders is also indicated by the shortening of the depth of the eye sockets, which has led to exorbitism.

Based on the above data, it should be taken into account that the upper jaw is the part of the middle facial complex and takes a direct part in the formation of the upper respiratory tract, which is ultimately reflected in the peculiarities of their development. Thus, a decrease in the parameters of the nasopharynx, bony pharynx and P3 is associated with retroposition of the upper jaw in the skull and shortening of the height of the nose.

As for the pathology of the mandibular complex, there was noted the relationship between the underdevelopment of the lower jaw and the absence of the temporomandibular joint in Goldenhar syndrome. In our opinion, this fact could be related to the absence of a growth zone of the lower jaw. The disproportion of the development of the lower jaw in combination with the violation of articulation in turn, has led to chewing disorders and, as a result, the disproportionate development of the masticatory muscles, which in turn has led to compensatory deformation of the ramus of the lower jaw on the opposite side from the pathology and the alveolar process of the upper jaw in the transverse direction.

Conclusion.

1) The results of the clinical-radiographic examination of patients with congenital and acquired dentofacial anomalies, have determined the changes in the facial skeleton mostly in the form of upper micrognathia in 33 (63.46±5.3) % and, to a lesser extent, lower micrognathia in 19 (36.53±5.3) % of patients.

2) The frequency and spectrum of concomitant somatic pathology depended on the nature of dentofacial anomalies. All patients with upper micrognathia had craniostenosis with deformations of the brain skull and eye sockets. Among the patients with lower micrognathia, all those examined were found to have disorders of the development of the ENT-organs. In addition, 11 (57.89±5.48) % of patients with congenital dentofacial anomalies had organic defects of the cardiovascular system and 6 (31.57±5.16) % – had cerebral cysts in the caudothalamic areas of the brain.

3) The identified developmental defects have led to violations of a number of important functions: breathing, swallowing, chewing and speech formation. These types of jaw dysmorphia were combined with the presence of somatogenetic syndromes and impaired development of metabolic processes.

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РЕЗЮМЕ

КЛИНИКО-РЕНТГЕНОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВРОЖДЕННЫХ И ПРИОБРЕТЕННЫХ ЧЕРЕПНО-ЧЕЛЮСТНО ЛИЦЕВЫХ АНОМАЛИЙ

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Целью исследования было изучить взаимосвязь рентгенологических изменений костей черепа, строения верхних дыхательных путей и сопутствующих общесоматических заболеваний у пациентов с врожденными и приобретенными черепно-челюстно-лицевыми аномалиями.

Материалы и методы исследования. Исследование проходило на 52 пациентах в возрасте от 1 до 3 и от 3 до 7 лет с врожденными и приобретенными нижними микрогнатиями 19 (36,53±5,3)% и верхними микрогнатиями 33 (63,46±5,3)%. Были использованы клинические методы (опросы, осмотр, пальпация), инструментальные (мультиспиральная компьютерная томография, рентгенцефалометрический анализ костей лицевого скелета, ротоглотки и костной глотки).

Результаты. Полученные результаты клинического и рентгенологического обследования позволили утверждать, что среди контингента пациентов с врожденными пороками челюстей доминируют не только изменения лицевого скелета, в большинстве в виде верхней микрогнатии и, в меньшей степени, нижней микрогнатии, но и наличие соматических пороков развития в виде нарушений нервной системы, патологии ЛОР-органов и офтальмологических пороков. Выявленные пороки развития обусловливали нарушение ряда важных функций: дыхание, глотание, жевание, а также речи. Такая связь наблюдалась в частности у пациентов с синдромальными краниосиностозами, а именно, недоразвитие основания черепа сочеталось с верхней микрогнатией и ретропозицией верхнечелюстного комплекса в черепе.

Выводы. Частота и спектр сопутствующей соматической патологии зависели от характера зубочелюстных аномалий. У всех больных с верхней микрогнатией наблюдались краниостенозы с деформациями мозгового черепа и глазниц. Среди больных с нижней микрогнатией у всех обследованных определяли нарушения развития ЛОР-органов.

Ключевые слова: краниосиностозы, верхняя микрогнатия, нижняя микрогнатия, врожденные пороки развития, верхние дыхательные пути.