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UŞAQLARDA ÇƏNƏ SİSTALARININ EPİDEMİOLOGİYASI VƏ STRUKTURU

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Məqalədə çənə sistalarının diaqnostikasını, müalicə seçimini və xəstələrə yanaşılmanı təkmilləşdirmək üçün onların epidemiologiyasını və strukturizasiyasını öyrənmək məqsədilə aparılmış tədqiqat işi haqqında məlumat verilmişdir. Çənə sistası olan və yaşı 4-dən 17-yə qədər olan 287 xəstənin xəstəlik tarixlərinin retrospektiv təhlili aparılmışdır.

Tədqiqat göstərmişdir ki, uşaqlarda çənələrin ən çox rast qəlinən sistalarına radikulyar və radikulyar-diş sistaları aiddir. 8-11 yaşlar arasında olan qızlara nisbətən eyni yaşlı oğlanlarda daha çox rast gəlinir və onlarda sistalar çox vaxt alt çənədə lokalizasiya edir. Radikulyar və radikulyar-diş tərkibli kistaların yaranmasına səbəb olan dişlər 50 % hallarda müalicə edilmiş azı dişlərdir; mənşəyindən asılı olmayaraq bütün sistaların klinik təzahürləri xəstələrin 50% qədərində selikli qişada yalnız kortikal lövhənin deformasiyası və nazikləşməsi şəklində təzahür edir.

Açar sözlər: *sistalar, çənə, radikulyar sistlər, follikulyar sistlər*

Ключевые слова*: кисты, челюсти, радикулярные кисты, фолликулярные кисты*

Keywords*: cysts, jaws ,radicular cysts, follicular cysts, children*

EPIDEMIOLOGY AND STRUCTURING OF JAW CYSTS IN CHILDREN

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The article provides information about a study to learn epidemiology and structuring of jaw cysts in children conducted to improve the approach to diagnosis, treatment selection, and patient management. A retrospective analysis of 287 case histories of patients with jaw cysts aged 4 to 17 years was conducted. The study showed that the most common cystic lesion of the jaws in children is radicular and radicular odontoid cyst, which are diagnosed more often in boys than in girls, aged 8-11 years with localization on the lower jaw. The causal teeth for the development of radicular, radicular tooth-containing cysts are temporary molars, which were treated in 50% of cases. Clinical manifestations of cysts of any origin in half of the cases of all cysts were only deformation and thinning of the cortical plate against the background of unchanged mucosa.

Introduction. Cysts of the jaws are one of the most common tumor-like neoplasms of the maxillofacial area in children. According to scientific and medical literature, about 7-12% of cases are cysts of the jaws from all diseases of the maxillofacial area [1]. Cysts of the jaws in children have their own characteristics, different from adults, which is related to histo- and organogenesis, age periods of development of teeth and bones. Considering the issue of gender, age aspect, localization, there is no clear dependence of cysts of the jaws with the criteria listed above. But most likely, these problems lie in the socio-economic plane. Therefore, the structuring of data on cystic lesions of the jaws in children will help in the approach to diagnosis, treatment selection and management of such patients.

Materials and methods. A retrospective analysis of 287 case histories of patients with jaw cysts aged 4 to 17 years who were treated at the

clinical base of the Department of Surgical Dentistry and Maxillofacial Surgery of Children's of Bogomolets National Medical University from January 2016 to December 2023. The analysis of patients' medical history was carried out according to the developed map (copyright №102334). Collected data from all groups were imported into Statistical Package for the Social Sciences (SPSS) for Windows software, version 23.0 (SPSS Inc., Chicago, IL, USA). Standard descriptive methods such as mean, standard deviation, median, frequency, minimum and maximum were applied to determine sample characteristics. The confidence interval was set at 95%, and $p < 0.05$ was considered statistically significant. When conducting the study, compliance with the principles of bioethics and patient rights was ensured in accordance with the Declaration of Helsinki and the Fundamentals of Ukrainian legislation on health care (1992).

The criteria for inclusion in the study were as follows - medical histories of patients with jaw cysts, complete clinical and radiological examination, pediatric patients, signed informed consent of the patient's parents or guardians for the use of data for scientific and educational purposes.

Exclusion criteria – age over 18 years, refusal of the patient's parents to participate in the study, children with systemic diseases, lack of complete documentation of the clinical case.

Results. A retrospective analysis of 287 case histories of patients with cystic lesions showed that radicular tooth-containing cysts were diagnosed in 35% (n=100), radicular - 35% (n=101), follicular - 15% (n=43), purulent cysts - 5% (n=13), residual - 7% (n=21), primary bone - 1% (n=4), polycystic - 2% (n=5) (Fig. 1).

In general, the average age of patients was 11 (±1.7) years, among them the average age of children with a diagnosis of radicular tooth-containing cyst - 8.96 (±0.14) years, radicular – 10.8 (±0.5), follicular – 11.1(±0.9), purulent – 8.8 (±1.03), residual – 10.6 (±0.1), primary bone – 13(±0.4), polycystic – 14 (±0,8).

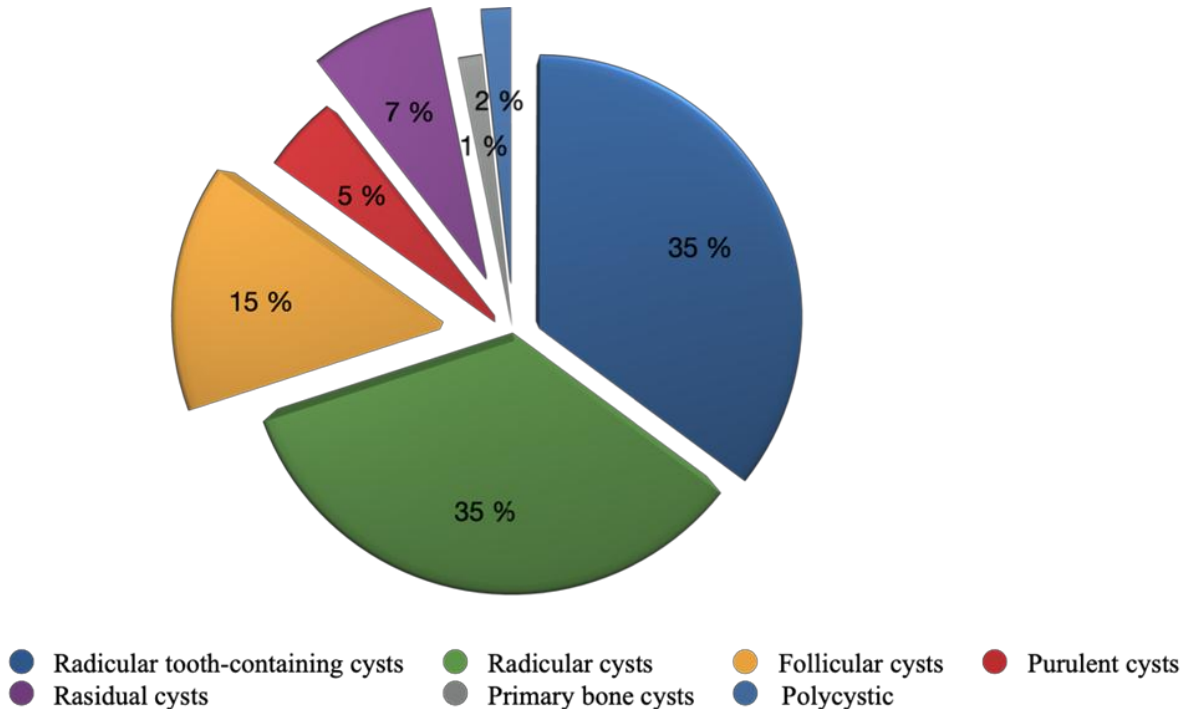


Fig. 1. The structure of cystic lesions of the children's jaws

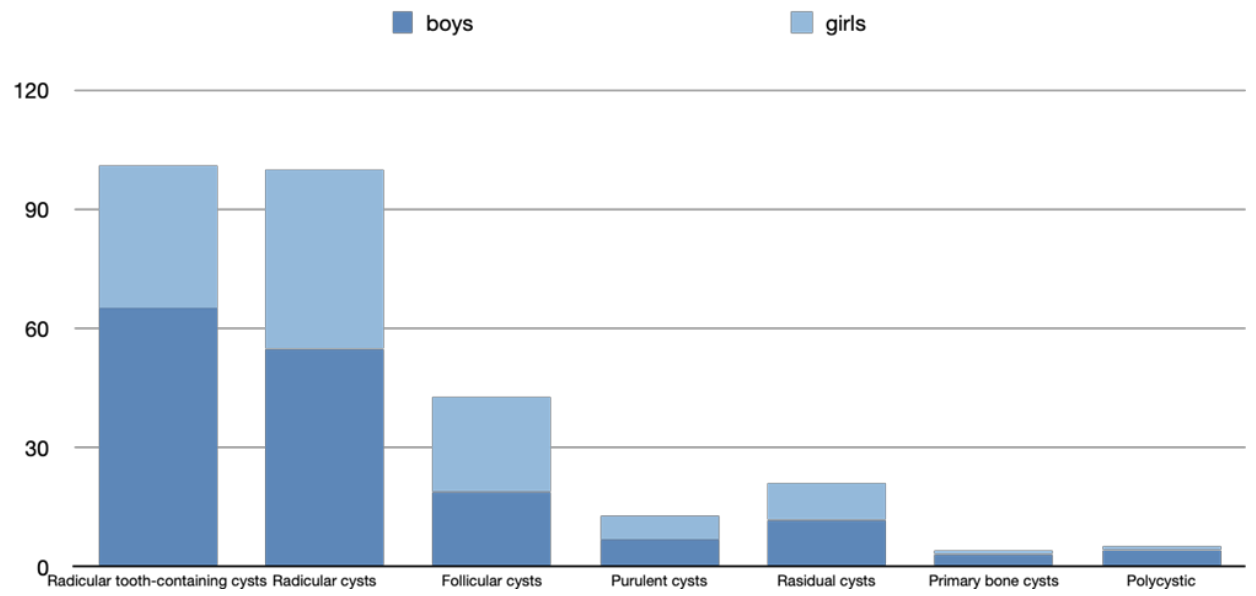


Fig. 2. Gender distribution of cystic lesions of the children's jaws

By gender, it was established that 57.5% (n=165) were boys, and 42.5% (n=122) were girls. Among radicular tooth-containing cysts, the ratio of boys and girls was 1.8:1 (65/36); radicular 1.2:1 (55/45); follicular 1:1.2 (19/24); purulent – 1.1:1 (7/6); residual – 1.3:1 (12/9); primary bone – 3:1 (3/1); polycystosis - 4:1 (4/1) (Fig. 2).

By place of residence, the majority of children lived in cities - 243 (84%), from villages - 44 (16%).

Cystic lesions in 74% of cases (n=212) were localized on the lower jaw, and on the upper jaw - 26% (n=75). Radicular tooth-containing cysts were located on the upper jaw in 17.8% (n=18) cases, on the lower jaw in 82.2% (n=83), which is 4.6 times more than on the upper jaw. Radicular cysts in 30% (n=30) of children were located on the upper and 70% (n=70) on the lower, which was in a ratio of 1:2.3; follicular - on the top in 41.8% (n=18), on the bott - in 58.2% (n=25) (ratio 1:1.3); purulent on the upper - in 7.6% (n=1) and on the lower - in 92.4% (n=12) - 1:12; residual in 28.5% (n=6) on the upper and in 71.5% (n=15) on the lower - 1:2.5; primary bone on the upper - in 25% (n=1) and on the lower in 75% (n=3) - 1:0.5; polycystic disease - on the upper jaw in 20% (n= 1), in 80% (n=4) - on the lower jaw (Fig. 3).

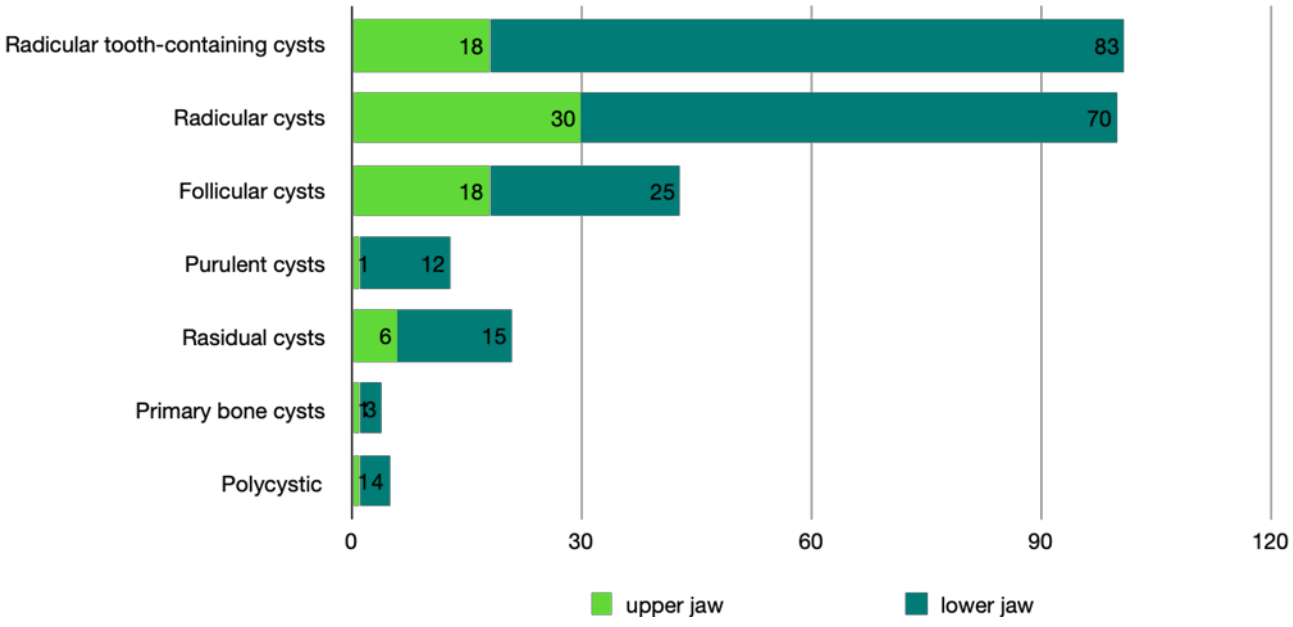
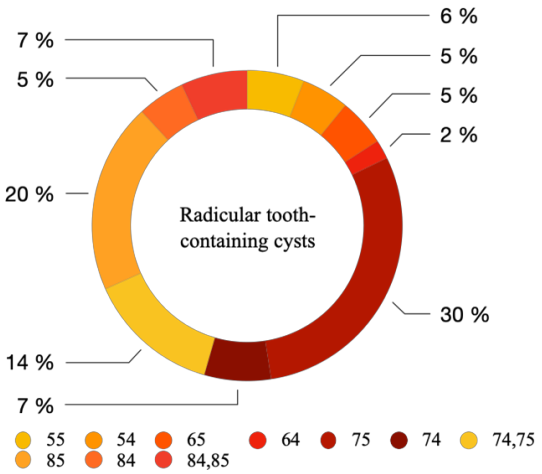
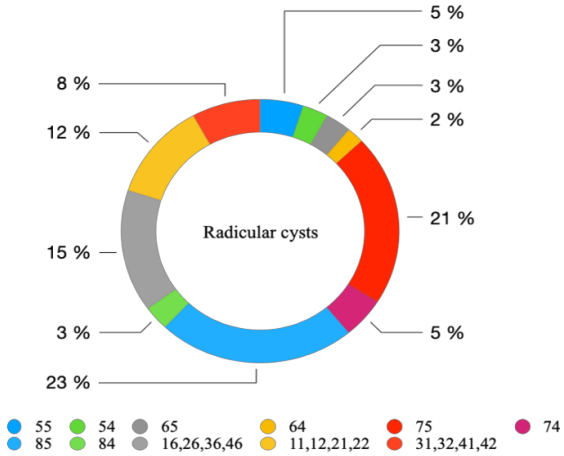


Fig. 3. Localization of cystic lesions of the jaws

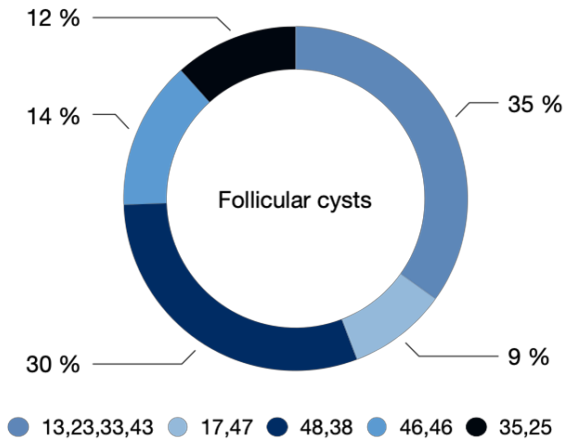
The causative teeth of radicular tooth-containing cysts were 75 teeth in 30% (n=30) of cases, simultaneously 74.75 teeth - in 14% (n=14), and 85 teeth - in 20% (n=20); in radiculars - 85 teeth in 23% (n=23), 75 teeth in 23% (n=21), 22, 21, 11, 12 teeth in 12% (n=12); 32,31,41,41 teeth in 8% (n=8). In follicular cysts, the beginnings of permanent canines in 35% (n=15), and 38,48 teeth - 30% (n=13) became the reason for the development of cysts; with purulent cysts, 75 teeth became in 38% (n=5) and 85 - 23% (n=3); of residual ones - 85 in 24% (n=5) and 75 in 19% (n=4) were removed (Fig. 4).



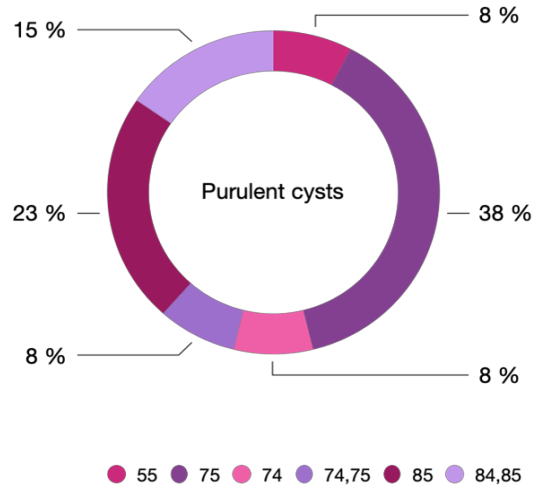
a - Radicular tooth-containing cysts



b - Radicular cysts



c - Follicular cysts



d - Purulent cysts =

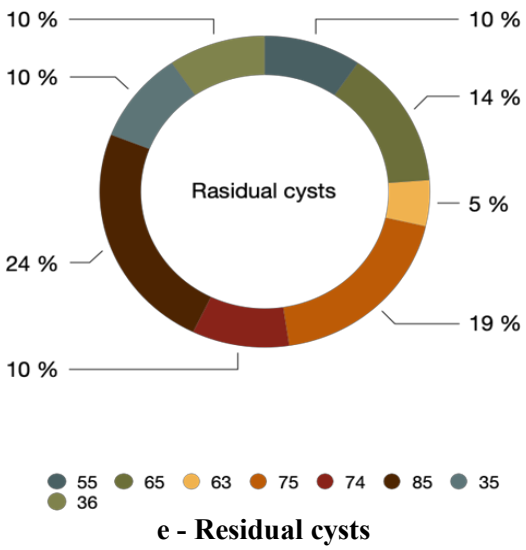


Fig. 4. Causative teeth: a – radicular tooth-containing; b – radicular; c – follicular; d – purulent; e – residual

In 221 (77%) appeals of parents and children to the dental surgeon were related to jaw deformity. Of them, 38% of parents (n=86) in the case of radicular tooth-containing cysts, 33% (n=74) – radicular, 14% (n=31) – follicular (in seven cases an additional complaint was the absence of a permanent tooth), 5% (n=13) – purulent, 6% (n=14) – residual, 1% (n=1) – polycystic and 3% (n=2) – primary bone.The causative teeth in 143 (49%) children were after treatment of caries and its complications, of which 50% (n=71) had radicular tooth-containing cysts, 42% (n=60) had radicular cysts, and 8% (n=12) – purulent.

Clinically thinned cortical plate ("Dupietren's symptom") was determined in 61% (n=175) of cases. Among them, 41% (n=73) of cases were registered with radicular tooth-containing cysts, 29% (n=51) – radicular, 21% (n=37) - follicular, 4% (n=8) – purulent, 2% (n=4) - residual, 1% (n=1) - polycystic and 1% (n=1) - primary bone.

Discussion. The issue of classification of jaw cysts in children is still inconsistent. To date, there is no single systematization of them that combines pathogenetic, clinical, and histological data. The latest classification of the World Health Organization (2022) divides cysts into two categories - malformations and cysts resulting from an inflammatory process [2]. This classification considers cysts only by pathogenesis. More extensive is the classification of R.Rajendrana/ B. Sivapathasundharam, where cysts are divided by pathogenesis, pathogistological structure and unclassified cysts [3]. The odontogenic factor that initiates the trigger for the development of jaw cysts is the main one today. Cysts are formed from epithelial elements under the influence of the irritating action of the chronic inflammatory process in the periodontium. The growth of the cyst, on the one hand, is due to the high pressure in its cavity, which is created due to the liquid produced by the shell [4,5,6]. On the other hand, under the influence of interleukin-6 and granulocytomacrophage colony stimulating factors, processes of bone tissue resorption are activated with an increase in the intensity of enzymes [7]. That is, the pressure created in the cyst cavity and the resorption of bone tissue are interrelated and determine the increase of the cyst cavity. It requires the selection of separate radicular tooth-containing cysts, which is due to a large (more than half) quantitative share and subsequent other treatment tactics.

The main number of cysts, according to our data, belongs to the group of children aged 8-11 years, which is consistent with the data of scientific sources [8]. This is explained by the condition and active change of

temporary teeth (TM), growth of permanent teeth (PM) and the jaw itself.

By gender, cysts predominated in boys, which is consistent with the statistical data of other studies, but the difference between these indicators varies within ± 10% [9]. Such data can be partially interpreted by the fact that girls and their parents pay more attention to the state of dental health than boys. It has been established that the lower jaw is the most frequent location of cyst lesions. The basis for this is that the temporary molars on the lower jaw erupt earlier than on the upper. Temporary molars are most often affected by caries. Its complications account for 19-20% of cases. In this aspect, the adequacy, timing, and volume of conservative treatment are of particular importance.

According to our study, the most common group of cystic lesions in children are radicular and radicular tooth-containing cysts from temporary teeth. Some authors refer to the latter as follicular, which are formed near a destroyed/treated temporary tooth and include the follicle of a permanent tooth. According to Yu.Y.Bernadskyi (1998), such cysts develop due to the presence of a chronic, intense inflammatory process around the roots of the temporary tooth, which act as a long-lasting bacterial irritant on the follicle of the permanent tooth [10]. They were localized mainly on the lower jaw (81.4%) and were diagnosed more often in boys (41%). The causative teeth were temporary molars (74, 75, 85 teeth). Parents of children in 35-37% of cases turned to the surgeon with complaints about the presence of jaw deformation, while in half of the cases the so-called symptom of parchment crunch was determined. The cyst, increasing in size, presses on the bone tissue, causes its resorption, which thins the cortical plate, which seems to "crunch" when pressed. If the size of the cyst exceeds the size of the anatomical area, bone deformation occurs.

The third most common among cysts was follicular. According to the pathogenesis of follicular cysts, they are classified as malformations of the tooth-forming epithelium. This can explain the close relationship with dystopian or overcomplete teeth. Such cysts were more often found in girls (almost 20%), with localization on the lower jaw in 62% of cases. The teeth that caused the development of cysts were permanent - canines and third molars. They are laid at the age of 5 and have the longest path to eruption, which causes difficult eruption and conditions are created for the development of cystic lesions of the jaw. Cysts were usually diagnosed by chance, but in 11% of cases, parents complained about jaw deformity and absence of the permanent tooth. A thinned cortical plate was diagnosed in a quarter of cases.

Residual cysts ranked fourth (7%) among all jaw cysts and in most cases were the result of untimely and inadequate treatment. The obtained data coincide with the data of the scientific literature and range from 5-11%. Our view on the causes of the residual cyst coincides with the views of foreign authors, namely, that during the removal of the PT or TT, the doctor does not pay attention to the release of cystic fluid, he did not previously conduct an X-ray examination of the tooth. The typical localization of residual cysts was the lower jaw. The causative teeth were previously removed temporary molars (85.75 teeth). In 7% of cases, there were complaints about the presence of deformation of the alveolar process, thinning of the cortical plate in a quarter of cases.

Multiple cystic lesions (polycystosis) of the jaws are usually a symptom of the following syndromes: Gorlin-Goltz, Noan, Morfan, Ehler-Danlos, Simson-Holaby-Behmel. Gorlin-Holtz syndrome occurs in boys and girls with the same frequency. In our study, the quantitative share of polycystic lesions of the jaws was 1%. Common manifestations are most often basal cell tumors, which are localized throughout the body; kyphoscoliosis, splitting of the ribs, the front part of the feet and bones, eye anomalies, etc. In the maxillofacial area, keratocysts of the upper and lower jaws are characteristic and one of the early diagnosed manifestations of this syndrome. These cysts are formed from the remains of the tooth-forming plate, as a developmental defect. Histologically, these cysts have a thin epithelial lining with a wrinkled surface, with the presence of keratinized scales, surrounded by a basal layer of cells. Their asymptomatic

clinical course complicates diagnosis and requires differential diagnosis with simple cysts and syndromes. The reason for the high frequency of recurrence of these cysts is that they are characterized by the presence of abducting additional buds, which are formed from the remnants of the cyst shell, as a result of incomplete extermination of the cyst.

Conclusions

1. The most common cystic lesions of the jaws in children are radicular and radicular tooth-containing cysts, with predominance on the lower jaw.
2. Cysts are diagnosed more often in boys than in girls aged 8-11 years.
3. Causative teeth in radicular, radicular tooth-containing cysts are temporary molars, which in half of the cases were after conservative treatment.
4. The main clinical manifestations of cysts of any origin are deformation and thinning of the cortical plate against the background of an unchanged mucous membrane.
5. Polycystic lesion of the jaws in children, which is a symptom of syndromes that require the development of individual diagnostic and therapeutic measures with extended periods of dispensation.

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Conflict of Interest. The authors declared that they have no conflict of interest.

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ЭПИДЕМИОЛОГИЯ И СТРУКТУРИЗАЦИЯ КИСТ ЧЕЛЮСТИ У ДЕТЕЙ

В.В.Ододюк

Кафедра хирургической стоматологии и челюстно-лицевой хирургии детского Национального медицинского университета имени А.А. Богомольца, Киев, Украина

В статье представлены результаты исследования, проведенного с целью изучить и структурировать кисты челюстей у детей с целью улучшения подхода к диагностике, выбору лечения и ведению пациентов. Проведен ретроспективный анализ 287 историй болезни пациентов с кистами челюстей в возрасте от 4 до 17 лет. Исследование показало, что наиболее распространенным

кистозным поражением челюстей у детей является радикулярная и радикулярная-зубосодержащая киста, которые диагностируются чаще у мальчиков, чем у девочек, в возрасте 8-11 лет с локализацией на нижней челюсти. Причинными зубами развития радикулярных, радикулярных-зубосодержащих кист являются временные моляры, которые в 50% случаев лечились. Клиническими проявлениями кист любого происхождения в половине случаев всех кист регистрировалась только деформация и утонченность кортикальной пластинки на фоне неизмененной слизистой.

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