

MAXILLARY SINUS CYST (LITERATURE REVIEW)

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Abstract

A review of current problems in otorhinolaryngology is made, in particular cysts of the nasal adnexa, which develop among the most complex non-purulent processes. Cysts are mainly incidental abnormalities in the diagnosis of paranasal diseases. The work presents modern data on the etiology, pathogenesis, health characteristics, methods of diagnosis and treatment of cysts of paranasal diseases using the latest scientific achievements. The developed minimally invasive methods of surgical treatment, these principles, reduce the risk of developing postoperative complications and shorten the treatment time for patients. However, despite this, the question of the advantages and principles of various methods for removing cysts of accessory teeth, which have not yet been replaced by traditional solutions, remains controversial.

Keywords: paranasal sinuses, cyst, inflammation.

Introduction

In the clinical practice of otorhinolaryngologists, paranasal sinus cysts of various origins are quite common. In most cases, cystic formations form in the maxillary sinuses (MSS). According to the classification recognized by experts, cysts are divided into four types:

- true (retention, secretory);
- false (cyst-like formations, lymphangiectotic, hydrocele, non-secretory pseudocysts);
- odontogenic;
- embryogenic (congenital). In the SNP, false cysts are much more common, but the overwhelming majority of published

Forged works of domestic and foreign authors are devoted to the etiopathogenesis and surgical methods of treatment of retention, odontogenic and embryogenic cysts.

SNP cysts account for 3.9% in the structure of general ENT pathology and 12.6% of all chronic lesions of the SNP. In terms of the frequency of cystic lesions, the maxillary sinus is in first place (93.3%), followed by the sphenoid (4.3%) and frontal (2.4%) [1,14]. They are detected in 8–10% of healthy individuals [16, 62, 75].

According to the localization of the cysts of the upper jaw are divided into the following groups:



– located on the posteroinferior wall, in the area of its upper 2/3; – located in the lateral sections of the sinus, in the area of its zygomatic bay; – located in the upper wall and in the area of the natural anastomosis;

– located on the anterior, medial walls, in the lower 1/3 of the posteroinferior wall, i.e. in the alveolar bay [1]. Studies conducted by G. P. Zakharova [17] showed that in 98% of cases, false cysts originated from the lower wall of the upper jaw, only in 2% of cases did they originate from the upper, medial and lateral walls. Moreover, in 96% of cases the false cysts were single, in 4% there were from 2 to 3 similar cysts located in one ICP.

According to the materials of A.I. Vasiliev [5], out of 50 patients operated on for upper sinus cysts, 28 had false cysts, 10 had retention cysts, 5 had solitary polyps, and 7 had chronic inflammation of the sinus. M.I. Kadymova [28] operated on 100 patients with intracranial cysts, of which only in 9 cases the cysts were retentional, and in the rest they were false. Of all the cysts of the upper jaw, according to E. M. Pokrovskaya [51], 90% of individuals had false cysts, and according to the materials of I. S. Guryev and A. A. Dolzhikov [13], false cysts account for 87%, retention - new – 13%.

Etiology and pathogenesis of false cysts

In the etiology of false cysts, some authors attach importance to the allergic factor, others to the infectious factor. It should be emphasized that the older generation of domestic otorhinolaryngologists gives preference to the infectious factor, while the younger (modern) generation gives preference to the allergic factor.

V. G. Ginzburg and M. I. Volkovich [12] believe that the basis of the etiology of pseudocysts of the upper jaw is swelling of the mucous membrane, which can arise from various reasons, mainly due to neurovascular disorders, intoxication, metabolic disorders in tissues. F.A. Kherobyanyan [57, 58] believes that false cysts are an accumulation of serous fluid in the subepithelial space in a certain area of the sinus mucosa. However, the author does not explain the reason for the accumulation of fluid in a certain area of the mucous membrane.

The question of the pathogenetic role of the infectious factor in the formation of false cysts remains controversial. Some authors [12, 53, 56] believe that pseudocysts are a consequence of an infectious-inflammatory process, without the participation of an allergic factor, others [34, 35, 55] also consider infection to be such an effect, which under certain conditions can become a sensitizing factor.

A number of researchers indicate the possibility of the formation of false cysts without a previous inflammatory process in the sinus [2, 52].

B. S. Preobrazhensky [52] considers false cysts as a manifestation of a local allergic reaction, which is based on impaired vascular permeability of the sinus mucosa, leading to the transfer of fluid from the vessels into the tissue and the formation of cyst-like cavities and polyps. Edematous hyperplasia of the mucous membrane of the upper sinus, he believes, is a morphological expression of allergic sinusitis. A number of other authors adhere to a similar point of view [5, 11, 22, 23, 28, 39].

In her works devoted to lymphangiectatic cysts of the upper jaw, M. I. Kadymova [26, 28] explains the mechanism of formation of such formations as follows. When on-accumulation of mediator



substances such as histamine, acetylcholine, etc. in the mucous membrane, the permeability of capillary walls is disrupted and fluid passes from the vessels into the tissue with the formation of edema of the mucous membrane, which subsequently leads to the appearance of a cyst-like formation. However, this theory does not explain the reason for the formation of cysts only in a single area of the sinus, while the pathogenetic factors cited by the author occur throughout the entire territory of the mucous membrane of the sinus.

In the etiology of false cysts of the upper respiratory tract, according to A. Kh. Lamkova [37], an increase in the number and exposure of allergens, an unfavorable environmental situation (a significant increase in the permissible limits of concentration in the air of industrial gases, industrial dust and other pollutants of human activity) are of great importance. .

In the formation of cyst-like formations, G. P. Zakharova [18], E. M. Pokrovskaya [51] attach great importance to the immunopathological mechanism, which manifests itself in the suppression of cellular immunity and an imbalance of humoral immunity. I. S. Guryev and A. A. Dolzhikov [13] attach a certain importance in the development of cyst-like formations to background factors and disruption of the aerodynamics of the nasal cavity.

Clinic

One of the main clinical manifestations of false cysts of the upper jaw is headache [24, 27, 46], which occurs in more than 80% of patients. More often it is dull, not intense, worsening after overwork in the evening. The headache is localized in the forehead, and with unilateral cysts it is mainly on the side of the cyst, with bilateral cysts - in the middle of the forehead [28]. Patients also present a number of complaints characteristic of allergic lesions of the nasal cavity and SNP: alternating blockage of one and then the other half of the nose; difficulty in nasal breathing, caused not by a cyst, but by swelling of the nasal turbinates or the presence of concomitant intranasal anomalies. In their complaints, patients also note malaise, weakness, fatigue, irritability, sleep and appetite disturbances [24, 28]. According to recent and other authors [4, 70], cysts of the upper jaw can proceed hidden for a long time, without headaches. According to M.I. Kadymova [27], out of 140 examined patients, 32 had no headache.

Diagnostics

As criteria for diagnosing false cysts of the upper jaw, in addition to subjective signs of the disease, many paraclinical examination methods are used [6, 25, 30, 36, 45, 61]. In case of cyst-like formations, it is considered advisable to prescribe a puncture of the maxillary sinus [59, 60] and radiography of the sinus, including contrast [5, 23, 31, 36]. A. S. Lopatin [41] does not recommend puncture of the upper jaw and contrast radiography of the emergency department as diagnostic procedures.

According to M. Kh. Fayzullin [56], since with cervical cysts there may be no objective signs of the disease, an x-ray examination is advisable. When contrasting the sinus, the author does not recommend administering more than 2–3 ml of iodlipol, since when a large amount of the drug is administered, it is not possible to obtain a relief pattern of the mucous membrane, and the cyst “sinks” in the contrast mass. In order to improve the quality of diagnosis and reduce the risk of



“masking” a cyst of the upper jaw, a group of authors [50] proposed their own recipe for a contrast agent: a water-soluble polymer-based contrast agent, diluted with distilled water.

In unclear cases, to clarify the topic of the cyst and resolve the issue of a surgical approach to the pathological focus, examination methods such as ultrasound echolocation of the SNP, computed tomography, magnetic resonance imaging, multispiral computed tomography are used [1, 3, 17, 41, 44, 49, 78].

Histomorphology of the mucous membrane of the maxillary sinus under physiological conditions and with cyst-like formations. According to the materials of M. I. Kadymova [28], Yu. B. Iskhaki [24], G. P. Zakharova [17], the normal mucous membrane of the upper jaw consists of three layers:

- superficial, represented by multirow ciliated epithelium with an admixture of goblet cells and located on the basement membrane;
- the mucous membrane itself, consisting of loose connective tissue containing vessels, nerves and mucous glands;
- mucoperiosteal layer, consisting of soft fibrous connective tissue.

The superficial layer contains lymphoid cells, in small quantities plasmatic and polymorphonuclear cells, leukocytes and histiocytes. In the middle section of the mucous membrane there are alveolar-tubular glands.

Microscopic examination of the walls of cyst-like formations revealed that the epithelial cover is represented by ciliated columnar epithelium [5, 17, 27, 51]. The epithelium may be subject to metaplasia or proliferation with areas of desquamation and the formation of polypous structures [17, 24, 51]. In the covering epithelium of the mucous membrane of false cysts, a large number of goblet cells in a state of hypersecretion are often found [24]. The stroma of cysts is represented by connective tissue with pronounced swelling of the interstitial tissue and the presence of pronounced lymphostasis [24, 27, 71, 77]. Depending on the age of formation of false cysts, the connective tissue of the stroma can be dense or loose [24, 28]. According to most authors, a characteristic histomorphological manifestation of false cysts is pronounced stromal edema with many inflammatory cells - eosinophils, mast and plasma cells, lymphocytes, polynuclear cells [14, 17, 24, 28, 55].

According to I. S. Guryev [14], the main manifestation of histomorphological changes in false cysts is disorganization of connective tissue. The presence of significant changes in the walls of blood vessels in the form of loosening, swelling or alteration is also typical [17, 24]. In the vascular epithelium, swelling and discomplexation are observed with the release of blood cells from the lumen of the vessels [13, 24, 51]. In some cases, cholesterol crystals and protein impregnation are found in the wall of the false cyst [5, 24, 28, 29].

The timing of the clinical course of false cysts is histomorphologically manifested by the fact that in the wall of the formation, in some cases, pronounced stromal edema predominates, in others, fibrosis is noted, and some cyst-like formations are of a mixed nature [14, 17, 28].

An electron microscopic study revealed a violation of the ultrastructure of the cilia of the ciliated epithelium and signs of destruction of the cellular elements of the epithelium and the connective



tissue layer of the mucous membrane of the wall of the false cyst of the upper lip cyst, and with increasing duration of the disease, the number and nature of destructive changes increase [17, 21]. False cysts are more often formed against the background of a hyperplastic mucous membrane; polyps are often found in addition to cysts [22, 52]. According to these authors and other researchers, polyps are found in those patients who have had a severe allergic reaction of the body. It is known that with allergic inflammation of the mucous membrane of the upper respiratory tract there are three stages. The first stage is characterized by thickening of the mucous membrane with the presence of infiltration, consisting mainly of lymphocytes and eosinophils. The second stage is characterized by thickening of the epithelial cover, hyalinization of the basal membrane and pronounced hyperplasia of the mucous membrane with an increase in the number of lymphoid and plasma cells, eosinophils. The third stage – the formation of polyps and (or) cysts occurs [11, 24, 26, 52, 65, 73].

Thus, analysis of the information presented on pathohistological changes in the tissues of false cysts gives grounds to recognize that the characteristic morphological signs are: edema with a massive cellular infiltrate consisting of plasma cells, lymphocytes, polynuclear cells, eosinophils, mast cells; various stages of allergic vascular damage (fibrinoid swelling, sclerosis, necrosis). Similar histomorphological changes were found in the hyperplastic mucous membrane of the upper jaw [24, 28, 52, 72, 76, 79].

Based on an analysis of clinical, laboratory, morphohistochemical and immunological studies in patients with pseudocysts of the upper jaw, modern authors have come to the conclusion that allergic and immunopathological factors play a significant role in their genesis [14, 18, 51].

Conservative treatment of false cysts. In connection with the established opinion about the predominant

Due to the significant importance of the allergic factor in the genesis of false cysts of the upper respiratory tract, the program of their treatment includes hyposensitizing drugs. Thus, A.I. Vasiliev [5], A.G. Likhachev [38] recommends using adrenocorticotrophic hormone (ACTH) and cortisone for these purposes. Treatment was carried out according to the following scheme: 5 units of ACTH 4 times a day intramuscularly for 2 weeks; 2.0 ml of cortisone intramuscularly for 2 weeks. On the 3rd–4th day of treatment, patients noted an improvement in nasal breathing, a decrease in nasal discharge, which was also confirmed by objective data - a decrease in swelling of the nasal mucosa. On control radiographs of the ED in most patients 1 month after the start of treatment, the marginal shadow of the thickened mucous membrane noticeably decreased, and the transparency of the previously darkened sinuses improved. The shadows of false cysts disappeared in some patients, and decreased in volume in others.

M.I. Kadymova [27], Yu.B. Iskhaki [24] recommend antihistamines: suprastin, diazolin, pipolfen for 2–4 weeks. M.I. Kadymova [27] analyzed the results of treatment of patients with false cysts who were prescribed suprastin and pipolfen. Of 134 patients, improvement in general condition occurred in 50.7%, improvement in nasal breathing in 48.2%, headache disappeared in 30.7%, and decreased in 49.8%. The shadows of false cysts on radiographs disappeared in 22.7%, in 19.4% they decreased in size, in 8.2% they increased, and in 49.7% of cases they remained unchanged.



In case of weak positive dynamics or its absence, the author recommends repeated courses of treatment with the same drugs.

The results of immunomorphological and immunochemical studies of tissues of false cysts, as well as determination of the state of cellular and humoral immunity showed an imbalance in the immune complex system [17, 51]. In this regard, it is advisable to include immunocorrective drugs in the treatment program for false cysts. In particular, G.P. Zakharova [18] used plantain juice in the form of nasal inhalations for 1 month in complex therapy of false cysts with good effect. E. M. Pokrovskaya [51] in the postoperative period recommends prescribing the immunotropic drug Xymedon 0.25–0.5 g 4 times a day orally for 1 month, and within 5 days after the operation intranasal administration of 5% a solution of the same drug. Positive immediate results were achieved in all patients.

Developing and deepening the thesis about gentle and effective methods of conservative treatment of false cysts, a number of authors use the method of specific immunotherapy (SIT). With a diagnosis of allergic (atopic) rhinosinusitis, verified by an otorhinolaryngologist and allergist, under the supervision of G. A. Gadzhimirzaev et al. [7–10] included 194 children aged 7 to 15 years and 114 adult patients. During X-ray and CT examination of the SNP, cyst-like formations were detected in 47 (24.7%) children, in adults - in 32 (28%) cases ; on one side of the upper jaw – in 58 patients, on both sides – in 21 patients. All patients with cyst-like formations received specific immunotherapy (SIT). Under the influence of such treatment, in parallel with the favorable dynamics of mucociliary clearance of the nasal mucosa and immunological data, the airiness of the upper nasal cavity was fully or partially restored. X-ray examination of the ED, performed after completion of the SIT course, and their comparison with the data of the initial examination showed that in 28 (58.8%) children and 14 (43.7%) adults there were no shadows of false cysts and the pneumatization of the upper quadrant was completely restored . In 7 observations in children and in 5 adult patients, rounded shadows were not detected, but low-intensity, inhomogeneous darkening of the upper quadrant remained. The immediate favorable results obtained in the treatment of allergic rhinosinusitis with cyst-like formations using the SIT method allowed the authors to recommend it for introduction into widespread clinical practice as a pathogenetically substantiated, gentle and very effective method of conservative therapy.

Domestic authors dealing with the problem of treating patients with false cysts of the upper jaw recognize the dominant importance of the allergic factor in their origin, however, in the literature there are isolated reports on modern antiallergic methods of their treatment. As a number of authors rightly point out [14, 54], there are disappointingly few reports on modern conservative methods of treating false cysts. This problem is actually

is not discussed by authors from the Far Abroad. Suffice it to note that in the magazine From 2001 to 2011, the International and European Associations of Rhinologists “Rhinology” did not publish a single article on false cysts and their treatment.

In foreign countries, the main attention is paid to odontogenic, embryogenic and secretory cysts [64, 67, 69, 74].

Surgical methods of treatment. Surgical treatment for a cyst is not necessary if it does not manifest itself clinically, that is, it does not cause headaches or difficulty in nasal breathing [14,



41]. It should be emphasized that impaired nasal breathing in the vast majority of patients is not associated with the presence of an upper nasal cyst, but with concomitant rhinitis or structural abnormalities of the nasal cavity [41]. The literature contains cases of the disappearance of pseudocysts after the elimination of the inflammatory process in the upper quadrant [46].

B. S. Preobrazhensky [52] points out that in practical work, some doctors allow excessive activity in prescribing surgical intervention for intracranial pseudocysts. An analysis of the results of surgical treatment of false cysts shows that their removal in most cases does not eliminate the pathological condition of the mucous membrane that “gave birth” to the cyst [14, 29].

Modern researchers [1, 14, 23, 26, 32, 48, 54] allow the removal of false cysts in case of persistent headache, an increase in the size of the cyst in the dynamics of observation, as well as in the absence of effect from conservative, including antiallergic, treatment. According to S.A. Allakhverdiev and A.S. Lopatin [I], for small cysts located in the alveolar bay, a wait-and-see approach should be followed even in cases where they are combined with pathology in the nasal cavity requiring surgical correction.

Most rhinosurgeons in our country traditionally use external access – the classic Caldwell-Luc method – or its sparing variants when operating for upper jaw cysts [14, 17, 24, 31, 29, 43]. Various options have been proposed for penetration into the upper nasal sinus using a special instrument - a cystotome, inserted into the sinus through the lower nasal meatus, followed by biting off the cyst shell [42]. Methods have also been proposed for extranasal microsurgery on the maxillary sinus using endoscopic equipment and video technology [19, 33, 47], as well as extranasal microsurgery with replacement of a removed area of bone tissue with an implant made of porous titanium nickelide [20]. Combined (endo- and extranasal) methods of cyst removal [41], ultrasonic disintegration of the cyst shell [15], and evaporation of the cyst with a surgical laser [54] are used. M.I. Kadyмова [28] believes that with lymphangiectatic cysts complete removal is not necessary; biting or partial removal of a round formation protruding above the mucous membrane of the sinus is sufficient, which in some cases can easily be carried out endonasally.

After the introduction into practical rhinology of new methods of surgical treatment of diseases of the nose and urinary tract using endoscopic technology and video equipment, radical classical operations of the Caldwell-Luc type for false cysts are practically not performed in modern conditions, this is especially true in childhood, since - such an intervention can lead to impaired growth of bone tissue and mucous membrane. According to I. S. Guryev [14], in pediatric practice it is advisable to use an surgical cystectomy, which allows you to open the sinus, aspirate the contents and remove the cyst through the lower nasal passage.

To date, there is no consensus on the method of surgical endoscopic intervention for intracranial cysts, and the issue of the advantages and disadvantages of various options (modifications) remains controversial. According to A. S. Lopatin and his collaborators, the issue of choosing the optimal surgical approach to the upper quadrant is decided depending on the location of the false cyst. Endonasal access is indicated for the removal of cysts attached to the upper 2/3 of the posteroinferior and on the upper walls in its lateral sections, as well as in the area of the natural anastomosis. For cysts located on the anterior and medial walls, as well as in the alveolar bay, endonasal access makes it possible to remove the cyst only in half of the cases [1, 40].



Surgery in the area of the middle nasal meatus is the most physiological and gentle option for surgery for chronic inflammation of the upper nasal cavity, including cyst-like formations [32].

In recent decades, an opinion has emerged about the advantages of endonasal functional interventions for various pathological processes in the ED. However, it remains unclear how technically possible it is to completely remove cysts using the endonasal approach. The frequency of cyst recurrences when using various surgical techniques has not been studied. The question of the advantages and disadvantages of various methods remains controversial, especially since each of them has a number of disadvantages. A number of authors reflect on these and other controversial and unresolved issues [I].

Disadvantages and advantages of various surgical approaches

It is known that opening of the upper jaw through the anterior wall according to Caldwell-Luc is often accompanied by paresthesia and postoperative neuralgia of the branches of the trigeminal nerve. In order to minimize these adverse reactions, a number of authors recommend a vertical incision under the lip between the 3rd and 4th or 4th and 5th teeth [17]. The work of V.V. Lonsky [40] emphasizes that gentle opening of the upper jaw through the anterior wall is effective in conditions when the natural anastomosis is well passable and the sinus is effectively drained after surgery. In cases where changes are detected in the area of the natural anastomosis (polyp, scar tissue), the author removes the pathologically changed tissue, and if these measures were not enough, the anastomosis is expanded from the side of the sinus or from the side of the nasal cavity. Most domestic and foreign authors believe that endonasal access to the upper sinus for the purpose of cyst removal is less likely to be complicated by neuralgia, practically does not produce reactive swelling of the soft tissues of the face, and provides reliable drainage of the operated sinus [1, 41, 66, 75]. Giving preference to endonasal opening of the intracranial joint, a number of authors [1, 41, 16] believe that endonasal removal of a small cyst located in the anteromedial sections of the intracranial joint presents certain technical difficulties.

In these cases, gentle opening of the upper jaw through the anterior wall is more justified. Depending on the topical location of false cysts of the upper jaw, there are various options for combinations of intranasal and external approaches, which allow combining the advantages of both methods [1, 14].

M. Mazeraut [75] conducted a comparative analysis of two methods for removing cervical cysts. After endoscopic operations, complaints of pain and discomfort in the cheek area were absent in 84.2% of patients. Among those who underwent Caldwell-Luc surgery, there was no pain after surgery in only 5.4%, and discomfort in the cheek area was present in 78.4% of cases.

Conclusions

Thus, the information available in the literature indicates the advantages of gentle access for the removal of intracranial cysts. At the same time, indications for specific methods of gentle access to the upper nasal cavity (through the anterior wall, through the middle meatus, through the lower nasal meatus) need clarification and justification.

According to the literature, surgical treatment does not always relieve a patient with a false cyst from the resumption of symptoms of the disease, since allergic inflammation is difficult to respond



to surgical treatment methods. In this regard, conservative methods should be used more widely with the inclusion of the latest hyposensitizing methods of therapy in the treatment program, and only in conditions of a pronounced clinical picture of the disease and the absence of effect from repeated courses of treatment, resort to surgical methods.

References:

1. Нурмухамедова Ф. Б. Клинико-иммунологическое исследование влияния различных видов терапии на течение аллергического ринита у больных с паразитозами //Медико-фармацевтический журнал «Пульс». – 2018. – Т. 20. – №. 4. – С. 109-114.
2. Нурмухамедова, Ф., & Хамракулова, Н. (2023). Показатели качества жизни пациентов с хроническим гнойным средним отитом после тимпаноластики . Журнал биомедицины и практики, 1(4), 96–100. <https://doi.org/10.26739/2181-9300-2021-4-14>
3. Нурмухамедова Ф. Б., Бекназарова С. З. КАЧЕСТВО ЖИЗНИ ПАЦИЕНТОВ ПОСЛЕ ТИМПАНОПЛАСТИКИ //Multidiscipline Proceedings of Digital Fashion Conference. – 2021. – Т. 1. – №. 1.
4. Нурмухамедова Ф. Б., Даминова Ф. У. СЛУХОВЫЕ АППАРАТЫ И ИХ ВЛИЯНИЕ НА КАЧЕСТВО ЖИЗНИ //Multidiscipline Proceedings of Digital Fashion Conference. – 2021. – Т. 1. – №. 1.
5. Nurmukhamedova F. B., Karibaev E. E. SENSENEURAL HEARING LOSS AND ITS INFLUENCE ON THE QUALITY OF LIFE //Multidiscipline Proceedings of Digital Fashion Conference. – 2021. – Т. 1. – №. 1.
6. Egamberdieva Z. D. CLINICAL AND PATHOGENETIC ASPECTS OF INTOXICATION SYNDROME IN ACUTE AND CHRONIC TONSILLITIS OF STREPTOCOCCAL ETIOLOGY //International journal of conference series on education and social sciences (Online). – 2021. – Т. 1. – №. 2.
7. Nurmukhamedova, F. B., Goziev, N. E. ogli, Kulboyeva, N. S. qizi, Gaybillaeva, G. U. kizi, & Abdurakhmonov, S. B. (2021). Influence of Depressive Disorders on the Results of Surgical Treatment in Patients with Chronic Suppurative Otitis Media. Advances in Clinical Medical Research, 2(4), 11–16. <https://doi.org/10.48112/acmr.v2i4.25>
8. Нурмухамедова Ф. Б., Амонов А. Ш. ОТОРИНОЛАРИНГОЛОГИЯ. ВОСТОЧНАЯ ЕВРОПА //ОТОРИНОЛАРИНГОЛОГИЯ. – 2022. – Т. 12. – №. 3. – С. 287-294.
9. Нурмухамедова Ф. Б. ПОКАЗАТЕЛИ КАЧЕСТВА ЖИЗНИ ПАЦИЕНТОВ ПРИ ХРОНИЧЕСКОМ СРЕДНЕМ ОТИТЕ //Вестник национального детского медицинского центра. – 2022. – №. 3. – С. 32-37.
10. Эркинова К. Ф., Амонов Ш. Э., Нурмухамедова Ф. Б. Клинико-лабораторная характеристика детей с аденоидной вегетацией и аллергическим ринитом //Молодые ученые-медицине. – 2022. – С. 206-212.
11. Ergashevich A. S. et al. CLINICAL COURSE OF ALLERGIC RHINITIS COMBINED WITH ADENOID VEGETATION AND RHINOSINUSITIS IN CHILDREN //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2023. – Т. 8. – №. 2.
12. Karabaev H. et al. Vasomotor rhinitis in children //Scientific Collection «InterConf+». – 2023. – №. 39 (179). – С. 308-316.



13. Egamberdieva Z. et al. Efficiency of surgical treatment methods for chronic tonsillitis in a comparative perspective //Scientific Collection «InterConf+». – 2023. – №. 39 (179). – С. 298-307.
14. Джаббаров К. Д., Нурмухамедова Ф. Б., Маматова Т. Ш. Диагностика и комплексное лечение аллергического ринита с паразитарной инвазией у детей //Врач-аспирант. – 2009. – Т. 37. – №. 10. – С. 860-864.
15. Nurmukhamedova F. B., Khamrakulova N. O., Ismatova KA N. D. A. Assessment Of Patients' Quality Life With Chronic Purulent Otitis After Tympanoplasty //European Journal of Molecular & Clinical Medicine. – 2020. – Т. 7. – №. 07. – С. 2020.
16. Нурмухамедова Ф., Хамракулова Н. Показатели качества жизни пациентов с хроническим гнойным средним отитом после тимпаноластики //Журнал биомедицины и практики. – 2021. – Т. 1. – №. 4. – С. 96-100.
17. Носирова Х. У. Иной подход к лечению аллергического ринита у детей //Forcipe. – 2021. – Т. 4. – №. S1. – С. 650-650.
18. Nurmukhamedova F., Egamberdieva Z. D., Norova S. M. Laboratory and instrumental analysis of indicators in chronic tonsillitis combined with hyperkinetic ticks //ScienceAsia. – 2022. – Т. 48. – С. 645-651.
19. Джаббаров К. Д., Нурмухамедова Ф. Б., Маматова Т. Ш. Диагностика и комплексное лечение аллергического ринита с паразитарной инвазией у детей //Врач-аспирант. – 2009. – Т. 37. – №. 10. – С. 860-864.
20. DD A. S. E. A. et al. Treatment optimization of Chronic odontogenic maxillary Sinusitis //European Journal of Molecular & Clinical Medicine ISSN. – С. 2515-8260.
21. AMONOV S. et al. Treatment optimization of chronic odontogenic maxillary sinusitis //European Journal of Molecular & Clinical Medicine. – 2020. – Т. 7. – №. 2. – С. 2419-2422.
22. Нурмухамедова Ф. Б., Махмудова Ш. И. ВЛИЯНИЕ СЛУХОВЫХ АППАРАТОВ НА КАЧЕСТВО ЖИЗНИ //Multidiscipline Proceedings of Digital Fashion Conference. – 2021. – Т. 1. – №. 1.
23. Nurmukhamedova F. B. et al. ASSESSMENT OF THE QUALITY OF LIFE OF PATIENTS WITH A MILD DEGREE OF SENSORINEURAL HEARING LOSS //Asian journal of pharmaceutical and biological research. – 2021. – Т. 10. – №. 1.
24. Нурмухамедова Ф. Б. АДЕНОИДНАЯ ВЕГЕТАЦИЯ У ДЕТЕЙ С АЛЛЕРГИЧЕСКИМ РИНИТОМ //SCIENTIFIC IDEAS OF YOUNG SCIENTISTS. – 2021. – С. 30.
25. Тошпулатова Д., Нурмухамедова Ф. Качество жизни пациентов при легкой степени нейросенсорной тугоухости //Перспективы развития медицины. – 2021. – Т. 1. – №. 1. – С. 527-528.
26. Ниёзов Д., Нурмухамедова Ф. Качества жизни пациентов с хроническим гнойным средним отитом до хирургического лечения //Перспективы развития медицины. – 2021. – Т. 1. – №. 1. – С. 187-188.
27. Нурмухамедова Ф. Б., Амонов А. Ш. Показатели качества жизни после слухопротезирования при легкой степени сенсоневральной тугоухости //Оториноларингология. Восточная Европа. – 2021. – Т. 11. – №. 3. – С. 314-320.



28. Нурмухамедова Ф. Б., Амонов А. Ш. Показатели качества жизни после слухопротезирования при легкой степени сенсоневральной тугоухости //Оториноларингология. Восточная Европа. – 2021. – Т. 11. – №. 3. – С. 314-320.
29. Nurmukhamedova F. B. Clinical review of allergic rhinitis in children with parasitic infestation. – 2018.
30. Хасанов У. С., Нурмухамедова Ф. Б. КЛИНИЧЕСКАЯ ХАРАКТЕРИСТИКА АЛЛЕРГИЧЕСКОГО РИНИТА У ДЕТЕЙ С ПАРАЗИТАРНОЙ ИНВАЗИЕЙ //Журнал теоретической и клинической медицины. – 2016. – №. 4. – С. 102-104.
31. Нурмухамедова Ф. Б. ХРОНИЧЕСКИЙ СРЕДНИЙ ОТИТ И ЕГО ВЛИЯНИЕ НА КАЧЕСТВО ЖИЗНИ ПАЦИЕНТОВ.
32. НУРМУХАМЕДОВА Ф. Б., ХАМРАКУЛОВА Н. О. SSQ САВОЛНОМАСИНИ ЎЗБЕК ТИЛИДА ТАСДИҚЛАШ //Т [a_XW [i [S US S_S^[ÿe YfcS^. – С. 83.
33. Нурмухамедова Ф. Б. клинические аспекты аллергического ринита у детей с Паразитарной инвазией //Саратовский научно-медицинский журнал. – 2018. – Т. 14. – №. 1. – С. 76-80.
34. Egamberdieva, Z. D. (2021, December). CLINICAL AND PATHOGENETIC ASPECTS OF INTOXICATION SYNDROME IN ACUTE AND CHRONIC TONSILLITIS OF STREPTOCOCCAL ETIOLOGY. In International journal of conference series on education and social sciences (Online) (Vol. 1, No. 2).
35. Ражабов, А. Х., Иноятова, Ф. И., & Амонов, Ш. Э. (2012). Особенности клинического течения хронического тонзиллита у детей, больных хроническим гепатитом В. Российская оториноларингология, (6), 132-136.
36. Амонов, Ш. Э. (2011). Эндоскопическая септопластика при деформациях носовой перегородки у детей. Оториноларингология. Восточная Европа, (4), 34-37.
37. Амонов, Ш., Каршиев, Х., Эназаров, Д., & Нормуминов, Ф. (2021). Лечебная тактика больным с постковидными гнойно-воспалительными осложнениями челюстно-лицевой области. Stomatologiya, 1(1 (82)), 92-95.
38. Мухитдинов, У. Б., Амонов, Ш. Э., & Усманхаджаев, А. А. (2016). НЕКОТОРЫЕ АСПЕКТЫ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ПРИ ХРОНИЧЕСКОМ ГНОЙНОМ СРЕДНЕМ ОТИТЕ В СТАДИИ РЕМИССИИ. Знание, (1-3), 106-111.
39. Амонов, Ш. Э., & Саидов, С. Х. (2011). Эффективность хирургической коррекции патологии носа и носоглотки в комплексной терапии острого экссудативного среднего отита у детей. Врач-аспирант, 47(4), 79-82.
40. Эгамбердиева, З. Д. (2021, February). АНАЛИЗ МЕТОДОВ ДИАГНОСТИКИ И ЛЕЧЕНИЯ ОБСТРУКТИВНОГО АПНОЭ СНА У ДЕТЕЙ. In The 6th International scientific and practical conference “World science: problems, prospects and innovations”(February 23-25, 2021) Perfect Publishing, Toronto, Canada. 2021. 792 p. (p. 756)

