

## ESTIMATION ADVANTAGES OF ENDOSCOPY IN DIAGNOSTICS OF CHRONIC EXUDATIVE OTITIS MEDIA

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✓ *Resume,*

*The aim of this study was to conduct an endoscopic analysis of the state of the structures of the nasopharynx in children with exudative otitis media. The work is based on the results of clinical observations and treatment of 56 children with exudative otitis media aged from 3 to 18 years for the period from 2016 to 2020. The study showed that, on the one hand, diseases of the nasal cavity, paranasal sinuses, otitis media, allergic background in 26.7% of children, and on the other hand, anatomical and functional changes in the structures of the nasopharynx led to disturbances in the ventilation, drainage and evacuation functions of the auditory tube, contributing to development of exudative otitis media. Endoscopic examination is an additional research method in the diagnosis of exudative otitis media.*

*Key words: exudative otitis media, endoscopic examination, acoustic impedance measurement, tympanometry.*

## ОЦЕНКА ЭФФЕКТИВНОСТИ ЭНДОСКОПИИ В ДИАГНОСТИКЕ ХРОНИЧЕСКОГО ЭКССУДАТИВНОГО СРЕДНЕГО ОТИТА

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*Целью данного исследования явилось проведение эндоскопического анализа состояния структур носоглотки у детей с экссудативным средним отитом. В основу работы положены результаты клинических наблюдений и лечения 56 детей с экссудативным средним отитом в возрасте от 3-х до 18 лет за период с 2016 по 2020 годы. Исследование показало, что с одной стороны, заболевания полости носа, околоносовых пазух, отиты, аллергический фон у 26,7% детей, а с другой - анатомические и функциональные изменения в структурах носоглотки приводили к нарушениям вентиляционной, дренажной и эвакуаторной функциям слуховой трубы, способствуя развитию экссудативного среднего отита. Эндоскопическое исследование является дополнительным методом исследования в диагностике экссудативного среднего отита.*

*Ключевые слова: экссудативный средний отит, эндоскопическое исследование, акустическая импедансометрия, тимпанометрия.*

## СУРУНКАЛИ ЭКССУДАТИВ ЎРТА ОТИТНИ ТАШХИСЛАШДА ЕНДОСКОПИЯ САМАРАДОРЛИГИНИ БАҲОЛАШ

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*Ушбу татқиқотнинг мақсади экссудатив ўрта отит билан касалланган болаларда бурун-ҳалқум тузилмалари ҳолатини эндоскопик таҳлил қилишдан иборат. Татқиқот 2016-2020 йиллар мобайнида 3 ёшдан 18 ёшгача бўлган бо'лган экссудатив ўрта отит билан касалланган 56 нафар болаларни клиник кузатувлари ва даволаш натижаларига*

*асосланган. Татқиқот натижаларига кўра, бир томондан, бурун ва бурун ёндош бўйлиқлари касалликлари ўрта отит, 26,7% болаларда аллергия фон касалликлари, бошқа томондан бурун-ҳалқум тузилмаларидаги анатомик ва функционал ўзгаришлар эшитиш найчасининг вентилизацияси, дренаж ва эвакуатор функцияси яларининг бузилишига олиб келди ва экссудатив ўрта отит ривожланишига сабаб бўлди. Эндоскопик текшириш усули экссудатив ўрта отит таъхислаида қўшимча текшириш усули бўлиб ҳисобланади.*

*Калит сўз: экссудатив ўрта отит, эндоскопик текшириш, акустик импедансометрия, тимпанометрия.*

### Relevance

The number of patients with hearing impairments is growing steadily. In 2002, there were about 240 million people in the world with hearing impairments, by 2030, the World Health Organization predicts an increase in the number of people with socially significant hearing impairments by more than 30% [1, 4, 8]. In the general problem of chronic otitis media, the problem of chronic catarrhal inflammation of the mucous membrane of the middle ear now comes out on top [2, 3, 10].

One of the forms of chronic otitis media is exudative otitis media (EOM). In recent years in our country, there has been an increase in the number of patients suffering from conductive and mixed forms of hearing loss, in particular, as a result of the postponed EOM from 17.9% in 2001 to 38.7% in 2005 [3, 6, 9] ... In the literature, ESS is known as serous otitis media, secretory otitis media, tubotympanitis, otoscleritis, exudative catarrhal otitis media, pharyngotubotympanic disease [4, 5, 7]. In the Anglo-American literature, the term "glue ear" - "sticky ear", which denotes exudative otitis media with a viscous, sticky content in the tympanic cavity, has taken root. Such a variety of names for the same disease, according to Russian scientists, is explained by the different views of the authors on its etiology and pathogenesis, as well as by the variegated clinical picture, which largely depends on the stage of development of the disease. In recent years, more and more attention has been paid to this disease in domestic and foreign literature [2, 6, 12].

Despite a fairly large number of works devoted to the problem of ESP, many questions remain unclear [5, 11].

It is known from the scientific literature that in patients with EOM, special attention should be paid to the state of the pharyngeal opening of the auditory tubes and the anatomical structures bordering on this area, since it is their pathological changes that most often lead to the development of the disease [7, 12]. At the same time, to this day, various variants of hypertrophy of the lymphoid tissue of the nasopharynx in

patients with EOM and the features of the topographic and anatomical structure of the structures of the lateral wall of the nasopharynx that contribute to the disease have not been described.

According to the literature, the development of a pathological process in the mucous membrane of the upper respiratory tract (URT) and middle ear is associated with disorders of mucociliary transport (MCT) [10, 11]. However, the question of an objective assessment of the function of the MCT of the mucous membrane of the nasopharynx and the pharyngeal opening of the auditory tube during EOM remains unresolved.

Despite the fact that clinical and audiological examination makes it possible to diagnose secretory otitis media with a high probability, the nature of the exudate can be determined only with tympanopuncture or tympanotomy [4, 7]. Currently, there is no characteristic of the cytological picture of exudate, depending on the stage of the disease and the cause that caused it, which complicates the clinical and instrumental diagnosis of the features of the ESP.

Among the reasons contributing to the increase in non-purulent diseases of the middle ear, the following can be noted: insufficiently active tactics of ENT doctors in the treatment of acute otitis media, immune and hormonal disorders, inadequate antibacterial therapy, peculiarities of the architectonics of intranasal structures, impaired ventilation function of the auditory tube, an increase in diseases of the upper respiratory tract allergic genesis [3, 5, 8, 12].

The aim of this study was to conduct an endoscopic analysis of the state of the structures of the nasopharynx in children with exudative otitis media.

### Material and methods

The work is based on the results of clinical observations and treatment of 56 children with exudative otitis media aged from 3 to 18 years for the period from 2016 to 2020. In the Bukhara Regional Children's Multidisciplinary

Center, the clinical examination of children included: clarifying complaints, taking anamnesis, conducting rhinoscopy, pharyngoscopy, otoscopy (including video otoscopy and endoscopy), lateral projection of the nasopharynx x-ray, endoscopic examination of the nasal cavity and nasopharynx using rigid and flexible optical systems, if necessary, an X-ray examination of the paranasal sinuses and temporal bones was carried out according to the methods of Schüller and Mayer to determine the degree of pneumatization of the mastoid process of the temporal bone.

### **Result and discussion**

In the period from 2016 to 2020, 56 patients aged 3 to 14 years with exudative otitis media were examined. Unilateral exudative otitis media was observed in 18 patients (32.2%), the diagnosis of bilateral exudative otitis media was made in 38 patients (67.8%). Thus, exudative otitis media most often had a two-sided nature of the course and was twice as common in patients as a one-sided process.

Diagnosis of exudative otitis media included otoscopy (including endoscopy), in which the color, transparency, retraction or bulging of the tympanic membrane, position and severity of its identification contours were assessed; the presence or absence of exudate behind the eardrum with the level of fluid, scars; the presence of retraction pockets, endoscopic examination of the nasal cavity and nasopharynx, which made it possible to assess in detail the condition of the nasal mucosa, turbinates, nasal septum; examine the lymphoid structures of the nasopharynx, establish their exact location relative to each other, visually assess the state of the elements of the pharyngeal opening of the auditory tube when performing functional tests of Toynbee and Valsalva, observe the process of catheterization and blowing the auditory tubes, when assessing the dysfunction of the pharyngeal opening of the auditory tube, we used the working classification proposed [1], which identifies 3 main types of dysfunction of the pharyngeal orifice of the auditory tube: 1) obstructive, 2) reflux - dysfunction, 3) gaping auditory tube, tone threshold audiometry and acoustic impedance measurement with determination of the function of the auditory tube.

It should be noted that for the first time we, on the basis of complaints, anamnesis and examination, revealed exudative otitis media in 27 children (48%). The study of auditory function and treatment of this group of patients

were not carried out before contacting us. In 21 patients (37%) admitted to our clinic, the diagnosis of chronic exudative otitis media was not made for the first time, which confirms the persistent course of the disease for a long time and the low level of effectiveness of the methods of conservative or previously performed surgical treatment of exudative otitis media. During our examination, all these children had conductive hearing loss of I-II degrees during the course of tonal threshold audiometry; when performing acoustic impedance measurements, the tympanogram type "B" or "C" was determined. The auditory function also did not recover in 21 patients after adenotomy. In addition, 8 patients (19%) had previously undergone tympanic shunting with the installation of Teflon and ceramic shunts, but after removal of the ventilation tube and closure of the perforation hole during audiological examination, persistent conductive hearing loss of the 1st degree remained.

Complaints of older children were about hearing loss, noise of various nature and a feeling of stuffiness in the ears. Parents of patients in the younger age group also noted hearing loss, complained about the child's inattention, and frequent questioning. From the anamnesis it was found that children often suffered from acute medium catarrhal and purulent otitis media, which had a tendency to protracted or recurrent course, acute adenoiditis, rhinosinusitis. The main otoscopic sign in all age groups was the determination of the exudate behind the tympanic membrane, as well as retraction of the tympanic membrane, indicating a decrease in pressure in the tympanic cavity, smoothing of its contours, color change and deformation of the light reflex. In children with cicatricial processes in the region of the pharyngeal opening of the auditory tube, retraction pockets of the tympanic membrane were more often determined. With an abundant amount of exudate in the tympanic cavity, a swelling of the tympanic membrane was noted. Simultaneous endoscopy and blowing of the auditory tubes according to Politzer with transnasal endoscopic control made it possible to diagnose cicatricial changes in the tympanic membrane, revealing the limitation of its mobility; this indicated adhesive phenomena in the tympanic cavity. Audiometric indices revealed hearing loss in all patients examined by us.

When conducting tonal threshold audiometry, the largest number of children with conductive hearing loss of I-II degrees was

found in the age group from 3 to 7 years. Grade III conductive hearing loss was detected much less frequently, and the predominant age of children was from 7 to 12 years.

The study of the auditory function by the method of acoustic impedance measurement made it possible to determine the presence of exudate in the tympanic cavity. When performing acoustic impedance measurements in the majority of children (50 ears), tympanograms corresponded to type "C" (46%). At the age of 3 to 7 years, the prevailing number of children were with type B tympanograms (6 ears). If we trace the age composition of patients, then the number of pathological tympanograms decreases with age, but the type of tympanograms "B" (22.8%) and "C" without an acoustic reflex (23%) in the age group from 12 to 14 years old remains quite stable, despite for ongoing conservative treatment. In the course of our examination, it was found that 92 ears (38%) corresponded to type B tympanogram, 74 ears (31%) - type C tympanogram without an acoustic reflex, 36 ears (15%) - type C tympanogram with acoustic reflex and 38 ears (16%) - corresponded to the norm, type "A".

All 120 patients underwent a study of the function of the auditory tube. Lack of patency of the auditory tube was found in all patients with type B tympanograms (60 people) and in 20 patients with type C tympanograms without recording an acoustic reflex.

According to endoscopic examination of the nasopharynx, only 7 patients (8%) aged 12 to 14 years had grade I adenoids. During visual examination of the nasopharynx, the most common types of obstruction of the pharyngeal orifices of the auditory tubes with adenoid vegetations of the II degree were found in 26 (29%) of 42 children (47%), aged 3 to 13 years. And in 16 people (18%) grade II adenoids had predominantly horizontal growth, did not cover the mouths of the auditory tubes, but fit tightly to the tubal ridges. Hypertrophy of the tubal rolls was found in 7 children. Grade III adenoid vegetations were observed in 40 patients (45%) aged 3 to 12 years, while in 33 people (37%), they took part in the obstruction of the pharyngeal opening of the auditory tube. In addition, they penetrated into the choanae, occupying 1/3 of the posterior parts of the nasal cavity. In 4 children (5%) out of 40 (45%), the adenoids moved to the choanas only when swallowing, which coincided with the opening of the auditory tube, blocking the flow of air into it at that moment. In 3 (3%) of 40 patients

(45%) grade III adenoid vegetations were mixed vertically without affecting the auditory tube. At the age of 12 to 14 years, we detected, as a rule, a slight increase in adenoid vegetation, and in some cases their presence was associated with a relapse of the disease. Endoscopic examination of the nasopharynx made it possible to correlate the size of the pharyngeal tonsil and distribute patients of different age groups according to the degree of adenoid hypertrophy.

In children with exudative otitis media, obstructive dysfunction of the auditory tube predominated according to the proposed working classification. According to the results of endoscopic examination of the nasopharynx in children with grade I-II adenoid vegetations, horizontal growth of the pharyngeal tonsil prevails, overlapping the pharyngeal orifices of the auditory tubes.

Nasal breathing in such patients is slightly difficult. In children, grade II-III adenoids occupy almost the entire volume of the nasopharynx, cover the pharyngeal orifices of the auditory tubes, prolapse into the posterior parts of the nose, thereby significantly complicating nasal breathing. On the basis of a carefully collected anamnesis and data of endoscopic examination of the nasal cavity and nasopharynx in the group of children studied by us, the main role in the block of the pharyngeal opening of the auditory tube in exudative otitis media at the age of 3 to 12 years is played by adenoid vegetations, hypertrophy of the tubal tonsils and tubal ridges, the course of acute and chronic adenoiditis, as well as postponed acute otitis media. In children aged 12 to 14 years, the main etiological factors in the development of exudative otitis media were often acute rhinosinusitis and curvature of the nasal septum, which led to a violation of the viscosity of the secretion, changed the movement of mucus in the nose, creating prerequisites for the reflux of secretions into the pharyngeal orifices of the auditory tubes. According to our data, the cause of exudative otitis media can also be cicatricial changes in the region of the pharyngeal opening of the auditory tube, a significant number of which occur at the age of 7 to 12 years (12 children), this group of patients has repeatedly undergone adenotomy without endoscopic control, has not been performed allergological examination.

Thus, it follows that, on the one hand, diseases of the nasal cavity, paranasal sinuses, otitis media, allergic background in 26.7% of children, and on the other hand, anatomical and functional changes in the structures of the

nasopharynx led to disturbances in the ventilation, drainage and evacuation functions of the auditory tubes, contributing to the development of exudative otitis media. Endoscopic examination is an additional research method in the diagnosis of EOM.

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