4. Analiza complianței electroacustice este cea mai sensibilă și permite depistarea chiar și a reacțiilor inflamatorii minime în urechea medie la copiii, care se alimentează în poziție orizontală.

5. Aplicarea metodei noastre de interpretare a rezultatelor timpanometriei ne permite să precizăm unele particularități patogenetice ale otilor medii la copiii mici.

Bibliografie

CLINICAL, FUNCTIONAL AND MORPHOLOGICAL CORRELATIONS IN OTITIS MEDIA IN CHILDHOOD
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Summary
We described and compared the clinical, functional data and surgical findings in children suffering from Chronic Otitis Media with Effusion, Recurrent Acute Otitis Media and Adhesive Otitis Media who underwent Myringotomy and Tympanostomy. As a result, we found, that the impedance audiometry is the most precise objective method for appreciation of the middle ear status. Clinical forms – chronic otitis media with effusion and recurrent acute otitis media are different stages of evolution of the common inflammatory process in the middle ear, which may lead to adhesive otitis media or chronic purulent otitis media. Functional changes, indicating the presence of otitis media for more than 6 months are the basis for comprehensive treatment,
including surgery (myringotomy with tympanostomy). The physiotherapy and adenoidectomy without surgical control of the tympanic cavity does not stop the development of inflammatory process in chronic otitis media with effusion and recurrent otitis media, and in some cases leads to faster formation of adhesion, which clinically will be manifested by partial temporal improvement of hearing and latent gradual formation of morphological substrate of chronic pathology.

**Rezumat**

**Corelațiile clinice, funcționale și morfologice ale otitei medii în copilărie**

Am comparat datele clinice, funcționale și descoperirile intraoperatorii la copiii cu otită medie cronnică exudativă, otită medie recidivantă și otită medie adezivă, care au suportat miringotomie și timpanostomie. Ca rezultat, am constatat, că impedansmetria este metoda cea mai precisă de apreciere obiectivă a stării urechii medii. Formele clinice - otită medie cronica exudativă și otită medie recidivantă sunt diferite stadii de evoluție a procesului inflamator comun în urechea medie, care duce la dezvoltarea otitei medii adzeive și oită medii cronic supurate. Durata prezenței modificărilor funcționale, caracteristici pentru oită medie, de 6 luni se află la baza indicației tratamentului complex, inclusiv chirurgical (miringotomie cu timpanostomie). Fizioterapia și adenotomia fără control chirurgical al cavității timpanice nu oprește dezvoltarea procesului inflamator în oită medie cronică exudativă și oita medie recidivantă, dar, în unele cazuri, duce la formarea mai rapidă a aderenților. Acest proces se manifestă clinic prin îmbunătățirea auzului parțială și temporală și formarea latentă și treptată a substratului morfologic al patologiei cronice.

**Introduction**

Otitis media (OM) is the group of the most common diseases in childhood which permanently remains in the focus of pediatricians and otorhinolaryngologists [1,3,5,6]. Some anatomical and functional features of middle ear in childhood create predisposition to frequent affection of the organ and to latent course of the disease. Asymptomatic beginning and gradual development cause difficulties of timely diagnosis. Lack of precise diagnosis and adequate treatment of acute forms contribute to further progress of OM, and its transformation into a recurrent OM, chronic OM with effusion (COME) and, in some cases, leads to the formation of stable adhesive changes, chronic inflammation, and cholesteatoma genesis [2,4,9].

The importance of the middle ear state for the child's development and unclear criteria for the diagnosis and differential diagnosis of various forms of otitis media causes a large variety of types and methods of treatment. "Watchful waiting and monitoring" tactics, long lasting antibiotic therapy, antibiotic prophylaxis, local physiotherapy in combination of auditory tube catheterization and insufflation, adenoidectomy etc., according to some authors, lead to clinically positive results [1,3,4,6,9]. Existing methods of treatment influence on the evolution of the inflammatory process in the middle ear in varying degrees, clinically improving hearing. But long-term results do not always correlate with initial clinical positive changes.

Evaluation of the middle ear’s objective characteristics (clinical, otoscoical, functional) and comparison of it with the state of the middle ear tissue at all stages of otitis media development is necessary both to clarify the pathogenesis of otitis media evolution, and to determine the feasibility of many therapeutic activities conducted in this pathology [5,9,10].

The **Purpose** of our research is to describe and compare the surgical findings in children suffering from different forms of OM who underwent Myringotomy with Tympanostomy tubes insertion after different types of conservative treatment.
**Material**

Our research was carried out in ORL Clinic, Republican Hospital for children “Em. Cotaga”. The study involved 93 patients at the age from 1 to 18 years with different forms of otitis media. The main including criteria was the presence of ear pathology during at least 6 mo.

The first group contained children with chronic otitis media with effusion (OME) - the presence of otoscopic and functional changes characteristic for the middle ear fluid for at least 6 months with no any acute general or local manifestations (121 ears of 67 patients). In the second group we included children who had recurrent acute otitis media (RAOM) - suffered from three bouts of acute otitis media (AOM) for the last 6 months or 4 episodes over the past year (46 ears of 24 patients). The third group consists of 2 patients (2 ears) with adhesive otitis media (AdOM) - visible detecting adhesions of TM, which developed on the basis of RAOM (2 ears – 1.18 %).

Additional conditions for inclusion in the group were: 1. absence of genetic abnormalities of ear and facial skeleton, 2. the absence of acute middle ear disease and urgent indications for surgical intervention, 3. absence of acute exacerbation of chronic diseases and from other organs and systems.

Depending on the previously conducted treatment, patients were divided into 4 subgroups: group A consisted of children who have not received any treatment previously, but with a disease duration of at least 6 mo. Group B included children who have received antibiotic treatment, the group III consisted of children who underwent adenoidectomy more than 6 mo ago, patients from group D received a course of various physical treatments in outpatient basis before examination at our clinic.

**Methods**

The work up included anamnesis, routine ENT examination, pneumatic otoscopy before surgery, otomicroscopy during surgery, functional exam in dynamics - conventional audiometry, impedance audiometry, otomicroscopy and revision of tympanic cavity during surgery, analysis of surgical findings and morphological changes.

Otoscopical examination was designed to obtain otoscopical profile for each child. The portable “Carl Storz” set was used. The items covered in each of the examinations included the most important characteristics of tympanic membrane (TM) appearance (color, contour, luster, translucence, transparency, dullness, opacity, thickness, visibility of light reflex, landmarks, presence of retraction pockets, thin-film adhesion, its localization and size, etc). These points were evaluated by otoscopy before surgery and otomicroscopy during the surgery.

Impedance Audiology. An Impedance Audiometer sets (portable and clinical) were used for impedance audiometry. Tympanograms were evaluated according to classification by Jerger, (1970) in modification by M. Tos.

Surgical procedure - Myringotomy was made with general anesthesia (endotraheal anesthetic).

Tympanic cavity (TC) changes (presence and character of effusion – serous, mucous, purulent, changes of mucosa - color, thickness, presence of granulation tissue, polyps), etc. were evaluated by otomicroscopy during the surgery.

**Results**

The majority of patients in all groups were at the age of the first 6 years of life with the absolute prevalence at the age from 2 to 4 years (P<0.01). Bilateral ear pathology was found in the majority of cases (81.7%), 17 patients had unilateral OM.

**ORL examination.**

All children had recurrent or chronic pathology of the nose and pharynx. The adenoid hypertrophy and adenoiditis were registered practically in all cases. Sinusitis was the most frequent ENT pathology in anamnesis (65 % in group I, 74 % in group II and in both children in group III). Chronic tonsillitis and hypertrophy of tonsils were found in 35 % of group I patients and 28 % of group II patients.
Otoscopy
In all of the groups (COME and RAOM in remission and AdOM) TM was relatively intact during conventional otoscopy (color slightly changed from grey to grey-rose or grey-yellow, dullness, opacity, thickness of TM, low visibility of main points, changes of the light reflex shape and position, retraction of the TM).

Audiometry
The mean hearing level before surgery in Group I was 35 dB (SD 4) and in Group II – 39 dB (SD 6), in group III 40 dB in both patients.

Impedance audiometry
Type B of tympanogram was registered in 87 % of ears from Group I and 72 % of ears from Group II, Type $C_2$ - in 13 % and 28 % accordingly. In group III in 1 ear we found type B, in 1 ear – type $C_2$. No any acoustical reflex was registered. Type $C_2$ was detected more often in groups IC, ID, IIC and IID (P <0,05).

Otomicroscopy
Otomicroscopy during surgery revealed more changes: enlargement of vessels, changes in transparency and visibility of main points, retraction pockets and thin-film adhesion. Retraction pockets were found in 14 % of ears from Group I, in 45 % of ears from Group II, and both ears from group III. Thin-film adhesion to Promontory presented in 5 % of cases from Group I, 9 % of cases from Group II, and 2 cases from group III.

We analyzed the area and size of the retraction pockets in these three groups. In 85 % of cases from Group I the retraction pockets were mild and situated in the anterior part of the TM; the same data from Group II showed 48 % of affected ears. Total retraction of the tympanic membranes was found in relatively equal percentage of both groups (12 % and 15 %). Severe retraction pockets involving the posterior superior quadrant of the tympanic membrane, was noted in 3 % of affected ears in Group I and in 7 ears of Group II.

Analyzing the previous treatment we found, that a thin-film adhesion to the Promontorium was recorded in groups IC, ID, IIA, IID (P <0,01). Simple retraction pockets were noted in groups IIA and IID (P <0,05).

Tympanic cavity contents
Effusion was presented practically in all ears. Thick, glue-like effusion was found in the majority of cases (97 % in group I, 89 % in group II, and both ears in group III). Sero-nucous liquid was aspirated in 3 % of ears from Group I, 9 % of ears from Group II, and 2 ears from group III, purulent effusion was noted in 2 % of cases from Group II. Granulation tissue, polyps were noted in 11 % of cases from Group I and in 33 % of ears from Group II, and 2 ears from group III. Cholesteatoma-like formations were removed from 1 % of ears from Group I and from 7 % of ears from Group II, and 2 ears from group III. All these patients were older than 6 years of age.

Cytological analysis of the surgical findings showed relatively high polymorphism of the changes: the presence of a viscous fluid (mucus or mucopurulent). In all cases in both groups revealed fibrotic bands and an increasing number of proteins - changes that are responsible for the viscosity of secretions.

On cellular composition the exudate was of two types. The first type was characterized by a small number of cells (<100 in the field of view with increasing X400), with a predominance of lymphocytes and histiocytes and a small number of polymorphonuclear leukocytes. Exudate of the second type features a large number of cells (> 1000 in the field of view with increasing X400), with the dominance of polymorphonuclear leukocytes and the relatively small number of lymphocytes and histiocytes.

In most cases, the ears of the group I contained exudate of the first type (62%) in Group II dominated changes of the second type (69%).

Histological examination of the mucous membrane found thickening, swelling and redness of the epithelium (65% of cases), hyperplasia, and granulation tissue (26% of the ears). Histological examination revealed mucosal hyperplasia, proliferation in the submucosal layer of
Goblet cells, ciliated cells, infiltration of the subepithelial layer of leukocytes (mostly mononuclear cells). The mucous membrane is thickened by proliferation of fibrous tissue, which frequently impairs movement of the ossicles, resulting in conductive hearing loss, the condition is more common in those who have had recurrent acute or chronic otitis media with effusion or atelectasis of TM. The bacteria, bacterial products, enzymes, and inflammatory mediators present in the unresolved OM contribute to progression of local disease and eventually to irreversible changes associated with chronic suppurative otitis media (CSOM).

Large number of vessels and granulation tissue, fibroblasts, polymorphism of cells presented in this tissue (macrophages, polymorphonuclear leukocytes, mast cells, lymphocytes), threads of fibrin were found histologically. Were also found, that such changes were more often characteristic for the patients from group IIA (p <0,05). Relative pallor of the mucous in the presence of proliferative processes, the appearance of collagen fibers with a relatively small number of vascular and glandular structures are identified, mainly in patients ID, IIC and IID groups (p <0,05).

Discussion

The age of OM onset in our patients was first 3 years of life. The disease developed on the base of nasopharyngeal pathology: hypertrophy of adenoids, adenoiditis, sinusitis, tonsillitis, etc. This middle ear inflammation manifests with only one single symptom – mild, sometimes undulating, hearing loss. These hypoacusis is not evident for the child and his parents because of early age of the child.

Summarizing the clinical and functional data and comparing them with the results of surgical and cyto-histological studies have established the following clinical and morphological correlations. Natural evolution of otitis media observed in the absence of treatment depends on many factors: age of the child, the pathology of the nose, sinuses, throat, gastrointestinal tract, etc. and present progressive development of pathological changes in the middle ear, which may clinically manifest by disease staging from chronic otitis media with effusion to recurrent otitis media, which is resulted in formation of an adhesive or chronic purulent otitis media. The disease beginning during the first two years in most cases leads to earlier transition from OME to recurrence of acute otitis media and formation of granulation tissue. The luck of adequate treatment contributes to the transformation of granulation-adhesive process. At this stage, the use of physical treatments and adenoidecctomy does not stop the further development of chronic adhesive and purulent otitis media.

Conclusions

1. Clinical forms – chronic otitis media with effusion and recurrent acute otitis media - are different stages of evolution of the common inflammatory process in the middle ear, which may lead to adhesive otitis media or chronic purulent otitis media.
2. Pathological changes in the middle ear depend on the child's age, duration and dynamics of the process, the adequacy of ongoing medical interventions.
3. Functional changes, indicating the presence of otitis media for more than 6 months are the basis for comprehensive treatment, including surgery (tympanotomy with timpanostomiey) in order to complete the evacuation of pathological changes.
4. The physiotherapy and adenoidecctomy without surgical control of the tympanic cavity does not stop the development of inflammatory process in chronic otitis media with effusion and recurrent otitis media, and in some cases leads to faster formation of adhesion, which clinically will be manifested by partial temporal improvement of hearing and latent gradual formation of morphological substrate of chronic pathology.

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ANALIZA COMPARATIVĂ A REZULTATATELOR AMIGDALECTOMIEI PRIN METODA CLASICĂ, CU FOLOSIREA LASERULUI CO2 ȘI PLASMA ABLAȚIA
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Summary
A total of 40 tonsillectomy were made with a «PEAK Surgical PULSAR Generator» plasma surgery system. This method permitted to avoid intraoperative bleeding and reduce the frequency of hemorrhage in the postoperative period. Moreover, pain syndrome was virtually absent and reactive processes in soft tissues were rare. Taken together, these effects accounted for the lower rate of postoperative complications, faster patients' recovery, and shorter hospitalization time.