

## OBJECTIVE VISUALIZATION IN ASSESSING THE CONDITION OF THE TYMPANIC CAVITY IN CHRONIC OTITIS MEDIA

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As you know, for practical otorhinolaryngology, inflammatory diseases of the middle ear are of particular relevance, as the most common and reflecting the social aspect. Chronic diseases of the middle ear, such as chronic purulent otitis media, exudative otitis media, adhesive otitis media, including retraction pockets, make up a significant part in the structure of ENT diseases.<sup>[1]</sup> As a rule, chronic otitis media is a consequence of untreated acute otitis media in a timely manner. The duration and chronization of the otitis media process causes complications and is manifested by persistent hearing loss. The incidence of chronic otitis media in children according to the authors is 37 -42% of the entire ear pathology. Hearing loss, in turn, in children leads to impaired speech and psychoemotional development, which subsequently affects the learning outcomes of the child, determining the level of his intellectual development.<sup>[7, 9-12]</sup>

For us, practical ENT doctors, it is particularly difficult to diagnose chronic otitis media in children, especially to objectify the condition of the middle ear, in particular the eardrum. As a rule, the main inspection method is otoscopy. But as we know, it does not give that desired scale of visualization, moreover, taking into account the age characteristics and behavior of the child (anxiety, whim, crying), it is not always possible to obtain a complete otoscopic picture. Advances in scientific and technological progress have brought endoscopic imaging techniques into the field of medicine. One of such achievements is digital otoendoscopy with video fixation, which allows more objective and detailed information on the condition of the middle ear.

**The purpose of study:** to assess the condition of the middle ear (tympanic cavity, tympanic membrane) in children with chronic kidney disease and to determine the method of tympanoplasty from the data obtained.

### MATERIALS AND RESEARCH METHODS

In total, 45 children aged 1 year to 18 years were examined. All studies were conducted in the Department of Congenital and Acquired ENT Diseases at Republican Specialized Scientific Practice Medical Center of Pediatrics. Otendoscopy of older children was not difficult. Young children are preferably carried out in a state of natural sleep. This study was conducted on the basis of the TELEPACKX endoscopic video system unit using a flexible probe with Telecam 1-Chip camera heads, a built-in 50W Hi-Lux light source, 15LCD screen, Germany. At the same time, attention was paid to the following signs: the condition of the eardrum, the cognitive contours of the eardrum, the swelling of the

eardrum, the presence of perforation and its localization, impaired mobility of the eardrum or its remnants during the Valsalva test, the condition of the eardrum (presence of retraction pockets, retraction, thickening sites and atrophy, adhesion to the medial wall), pathological contents behind the eardrum, the condition of the mucous membrane of the tympanic cavity (the presence of granulations, cholesteatoma, scarring).



**Fig. 1: Installation of the endoscopic video system TELEPACKX using a flexible probe with Telecam 1.**

### RESULTS

Thus, otoendoscopy revealed the absence or smoothed contours and identifying signs of the eardrum in the case of an unperforated ear in children from 1 year to 3 years in 12 children (26.6%), which indicated the insufficiency

of the auditory tube function and the possibility of the development of exudative otitis media. In the case of perforation with dry perforated otitis media, the perforation itself was closely studied directly using an otendoscope. So, for example, damage to the eardrum in the epitympanum was visualized in 98% of cases. The detection of mesotympanic perforation, which is also available with classical otoscopy, was not particularly difficult. However, when deciding on the feasibility of reconstructive otosurgical manipulation, in particular tympanoplastics, there is always a question about the functional state of the eardrum, namely its mobility. It is at such moments that digital videoendoscopy demonstrates great diagnostic value, so it makes it possible to monitor in real time the mobility of the eardrum during the Valsalva test.

Of course, only children over 5 years old could carry out this diagnosis.

In the age group of children of current school age (from 7-12 years), during initial examination and otoscopy, the signs of ESR were identified in 42%, while digital videotoscopy made it possible to visualize and diagnose ESO in 88% of cases, which also indicates the high information content of this method.



**Fig. 2: Otoendoscopic picture of the eardrum with exudative otitis media.**

In cases when the pathological contents behind the eardrum in newborns and infants during otoscopy were determined on average in 35-38% of cases, otoendoscopy in the study group in this age group revealed these indicators in 78% of cases.

Significant informativeness was given by digital videotoscopy in assessing the condition of the eardrum in chronic non-purulent diseases of the middle ear.

Visualization of retraction pockets with a conventional otoscope is usually detected only in 20% of cases in children aged 3–7 years, in 50% of cases in patients 7–17 years of age. In this case, the cohesion of the eardrum with the medial wall and the areas of thickening and

atrophy are determined using an otoscope in less than 50% of cases. In the case of digital otoendoscopy, similar pathological changes in the structure of the tympanic membrane were detected in 62% of cases.

It should be noted that digital video otoscopy with granularity made it possible to obtain additional information about the presence of granulations in 68%, cholesteatomas in 79%, which are often not visualized upon examination by an otoscope, but are subsequently confirmed by radiation diagnostic methods.



**Fig 3: Otoendoscopic picture of the tympanic membrane in chronic otitis media.**

## CONCLUSIONS

1. Digital otoendoscopy is a highly informative imaging method in assessing the condition of the outer and middle ear.
2. In cases where it is impossible to obtain a complete otoscopic picture, digital video endoscopy increases the effectiveness of the diagnosis of exudative otitis media by 42% in both young and older children.
3. Detailed visualization obtained by digital otoendoscopy allows to differentiate and select the most effective therapeutic and surgical tactics for middle ear disease.

## LITERATURE

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