

The patient is given detailed information about the operational intervention. He several times explained the breathing technique during the completion of the drainage (in particular, the Valsalva maneuver and Müller) to the complete mastery of the material.

The patient is transferred to a sitting position and raises his hand above his head on the side of the procedure of tubular thoracostomy. Place the introduction of drainage is cleaned with disinfectants. After opening the seam above the drainage of the loose ends of the threads are strongly pulled up. Drainage gently extends outward. When approaching the last opening (approximately 4 cm), the procedure is suspended and the patient is offered to perform the necessary respiratory maneuver. After that, the drainage is rapidly removed and the seams are tied. The wound is disinfected, after which it is applied a dry swab. After removing the tube on the 6th and 24th hours, the condition of patients is assessed by pulmonary schedules.

Results. The study involved 27 male patients and 13 female patients, the average age was 38.5 years.

On pulmonary graphs taken after the end of tubular thoracostomy, one patient in each group with the completion of the procedure at the end of the inhalation and exhalation and two patients in each group during maneuvers Muller and Valsalva found expansion defect. In General, from 40 patients in 6 (15%) there was an expansion defect after removal of the tube. These patients underwent oxygenation therapy of 3l / min, control x-ray examination, after which they were discharged home within two days. After the end of tubular thoracostomy with the use of various methods between them in the number of identified complications we found no statistically significant differences ($p=0.85$). The incidence of expansion defect in the applied techniques was approximately the same in both groups of surgical patients.

Conclusion. Expedient completion of the procedure, the tubular thoracostomy conventional techniques familiar to persons engaged in the modern practice of surgery.

Key words: thorax, tubular thoracostomy, Valsalva and Müller maneuvers.

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MAGNETIC RESONANCE IMAGING IN DIAGNOSTIC OF MASTOIDITIS

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The analysis of scientific literature on the diagnosis and differential diagnosis of mastoiditis and otitis media showed that this problem has not lost its relevance at present, which is primarily due to high morbidity, high specific gravity of the diseases of the mastoid, which is not reduced by the frequency of recurrence of mastoiditis and inflammation transitions into chronic forms [1,2,3]. The frequency of acute otitis media in the structure of otolaryngologic diseases is 15-20%, and among the diseases of the ear it reaches 65-70%. According to the WHO data, annually in the world 51000 people die before the age of 25 from illnesses, one way or another associated with acute otitis media or chronic suppurative otitis media. Despite the fact that the clinic and the course of complicated otitis media in our era of empirical antibiotic therapy of a wide range of effects have undergone significant changes, the relevance of the problem of diagnosis and treatment of various forms of mastoiditis leaves no doubt [4]. The importance and social significance of this type of pathology is in the fact that it has unfavorable not only functional, but sometimes also life forecast, as it can often cause the development of severe local and intracranial complications [5]. Insufficient efficiency of treatment of mastoidites, apparently, is also associated with unsatisfactory procedures of differential diagnostics, which is a very relevant

object for the research work that, in turn, allowed to determine what the next issue would be [4].

The most commonly occurring form is secondary mastoiditis, due to otogenic spread of infection from the middle ear tympanic cavity [5,6]. Its pathogens could be presented by pneumococci, streptococci, staphylococci, and others. The transition of the infection from the middle ear cavity contributes to a violation of its drainage during a late breakthrough of the tympanic membrane, untimely paracentesis, too small opening in the tympanic membrane or its closure with granulation tissue.

In some cases, there is a mastoiditis, which has developed as a result of hematogenous penetration of the infection to the mastoid due to sepsis, secondary syphilis, tuberculosis. Primary mastoiditis occurs when traumatic lesions of the cells of the mastoid occur due to a stroke, a gunshot wound, a craniocerebral trauma. A favorable environment for the development of pathogenic microorganisms in such cases is the blood that has sprouted in the appendix as a result of the injury [2-5].

The emergence of mastoiditis contributes to increased virulence of pathogenic microorganisms, weakened state of general and local immunity in chronic diseases (diabetes mellitus, tuberculosis, bronchitis, hepatitis, pyelonephritis, rheumatoid arthritis, etc.) and pathologies of the nasopharynx (chronic rhinitis, phar-

ngitis, laryngotracheitis, sinusitis), presence changes in the structure of the ear in connection with the diseases previously transmitted (ear injuries, external otitis media, adhesive otitis media etc) [7,8,9].

The beginning of mastoiditis is characterized by inflammatory changes in the mucous layer of the cells of the mastoid with the development of periosteum and the accumulation of fluid in the cavity cells [10-12]. Due to the expressed exudation, this stage of mastoiditis is called exudative [10]. Inflammatory swelling of the mucous membrane leads to the closure of openings that connect the cells to each other, as well as the holes connecting the mastoid prosthesis with the tympanic cavity, this stage is better visualized with MRI [11,12]. As a result of a violation of ventilation in the cells of the mastoid, internal pressure drops. Through the pressure gradient, transudates from the enlarged blood vessels begin to enter the cell. The cells are filled with serous, and then serous-purulent exudate. The duration of the first stage of mastoiditis in adults is 7-10 days, in children more often 4-6 days. Eventually, the exudative stage of mastoiditis, each cell has the form of empyema- filled with pus of the cavity [5,13].

Next, mastoiditis passes into the second stage - proliferative-alterative, in which purulent inflammation extends to the bone walls and septum of the mastoid with the development of osteomyelitis - purulent melting of the bone. At the same time, granulation tissue is formed. Gradually the partitions between the cells collapse and are formed one large cavity filled with manure and granulation. So as a result of mastoiditis there is an empyema of the mastoid. The breakthrough of pus due to the damaged walls of the mastoid leads to the spread of purulent inflammation on adjacent structures and the development of complications of mastoiditis [12].

Depending on the cause of the occurrence in the otorhinolaryngology distinguish primary and secondary, otogenic, hematogenous and traumatic mastoiditis. During the inflammatory process, mastoiditis is classified as exudative and true (proliferative-alterative) [5,6].

There are allocated a typical and atypical clinical forms of mastoiditis. Atypical (latent) form of mastoiditis is characterized by a slow and sluggish course of events without a pronounced characteristic of mastoiditis symptoms. Separately stand out a group of apical mastoidites, which include Bezold's mastoiditis, Orleansky's mastoiditis and Moore's mastoiditis [11].

The main methods of radiodiagnosis of mastoiditis are the aiming radiography of the skull and MSCT of the temporal bones [5,7].

The method of magnetic resonance imaging has not been so widespread until recently, due to its low prevalence and inaccessibility. In connection with the advent of modern powerful magnetic resonance imaging, it became possible to conduct such a technique as magnetic resonance tomography of the bridge-cerebellary angles [8,14].

An important feature of the method is the absence of radiation load and high sensitivity to the diagnosis of inflammation of the mucous membranes, which is espe-

cially important in conducting research in the dynamics and in patients with a risk group.

The aim of the study was to evaluate the possibility of magnetic resonance imaging in the diagnosis of mastoiditis, to improve the quality and efficiency of diagnosis of patients with inflammatory and dystrophic events in mastoid by developing the necessary differential diagnostic criteria for the origin of mastoiditis and other inflammatory diseases of the middle ear and mastoid are based on a comprehensive analysis.

Object and methods. With the help of the magnetic resonance imaging method, we examined patients at the following locations:

1. Department of Radiation Diagnostics, Radiation Therapy and Radiation Medicine, ONMedU.

2. Center for reproductive and rehabilitation medicine (University Clinic) Odessa National Medical University.

80 surveys were conducted prior to operative and conservative treatment. We performed 102 MRI studies. Males accounted for 52,9% (54 patients), women 47,1% (48 patients). The patient's age ranged from 18 to 90 years whereas average age was 43,3±3,6 years.

Surveys of bridge-cerebellary angles on 1.5 T Magnetic Resonance Tomograph Magnetom Avanto, manufactured by Siemens (Germany), using ultra-thin sections. Scan parameters: scanning in 3 planes, thickness 0.6 mm to 5 mm. The patient's head is fixed to exclude dynamic artifacts. When analyzing an MRI image, T2, T2 TRUFI, T1-MPRAGE, and FLAIR intensive sequences are used in three planes. The ability of magnetic resonance imaging allows us to distinguish tissue of mastoid, to detect reactive changes of the mucous membrane of the mastoid.

Also MRI studies of bridge-cerebellar angles using ultrathin sections allows installation spreading inflammation of the brain structure, detect inflammatory changes in the mucosa and the presence of pathological content in the cells of the mastoid process of the temporal bone that may be predictive of spread of the middle ear and the brain membrane in patients with mastoiditis (**Fig. 1**).

Statistical processing was done by frequency analysis using software MS Excel (Microsoft Inc., USA).

Research results. All 102 patients examined by magnetic resonance imaging were divided into 6 groups (**Table**). Than all patients were divided into subgroups according to the duration of the inflammatory process.

The first group included 11 patients (10.8%) with acute mastoiditis.

The second group included 67 patients (65.7%) with chronic mastoiditis.

The third group included 1 patient (1.0%) with post-traumatic mastoiditis.

There were formed two groups with complications of mastoiditis. The fourth group included 14 patients (13.7%) with external cranial complications: labyrinth, hearing impairment, paralysis of the facial nerve. The fifth group included 3 patients (2.9%) with intracranial complications: the spread of infection into the cranial cavity, which causes meningitis, encephalitis, abscess of different parts of the brain, phlegmons in the neck.

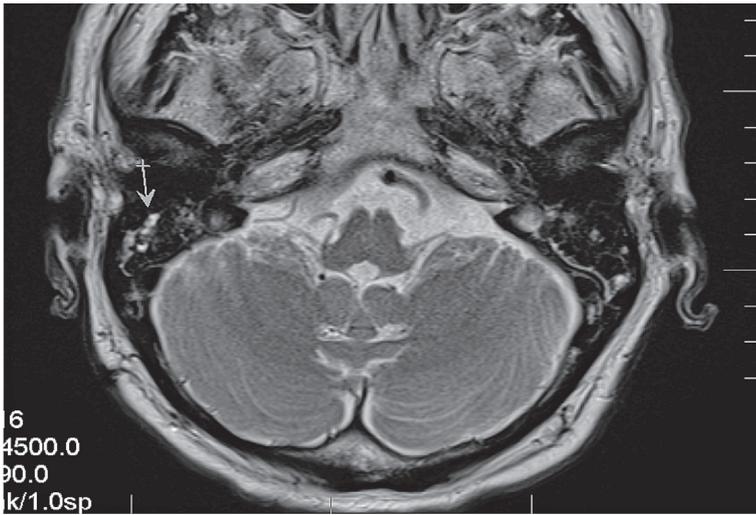


Fig. 1. MRI of the brain. Axial reconstruction. The cells of the right mastoid are filled with hyperintense T2 content of inflammatory nature. Left mastoid - no changes.

of the mastoid, the absence of content and inflammation of the mucous membrane in the cells of the mastoid.

In the analysis of images obtained by magnetic resonance imaging, the level of hyperintense content and hyperintense signal in T2, T2 TRUFI, FLAIR programs and thickening of the mucous membrane of the cells of the mastoid was detected in the cavity of the erythematosus sphincter during the verification of mastoiditis.

As a result obtained data allowed to choose tactics of conservative or surgical treatment. The monitoring of patients in the dynamics contributed to the assessment of the quality and effectiveness of the treatment.

Possibility of magnetic resonance imaging allows us to distinguish the tissues of the mastoid, to detect reactive changes in the mucous membrane of the mastoid and to extend the process to the membranes and other structures of the brain that is the most informative in patients with chronic mastoiditis, with external and intracranial complications of mastoiditis, and also for control repeated inspections due to the absence of radiation load. The use of magnetic resonance imaging will help to timely diagnose mastoid pain, which will contribute to the timely treatment and prevention of complications.

There are some clinical cases illustrating statements provided above.

Clinical Case 1.

Patient N., 63 years old, turned to a otorhinolaryngologist with complaints of headache and stroke in the

Results of MRI diagnostics

Table.

Group No.	Group	Number of patients	%
1.	Acute mastoiditis	11	11
2.	Chronic mastoiditis	67	65
3.	Posttraumatic mastoiditis	1	1
4.	External cranial complications	14	14
5.	Intracranial complications	3	3
6.	Control	6	6

Sixth group (control) included 6 persons (6%). The control group was formed from patients who were sent for examination and found to be healthy. The evaluation criteria were sufficient pneumatization of the cells

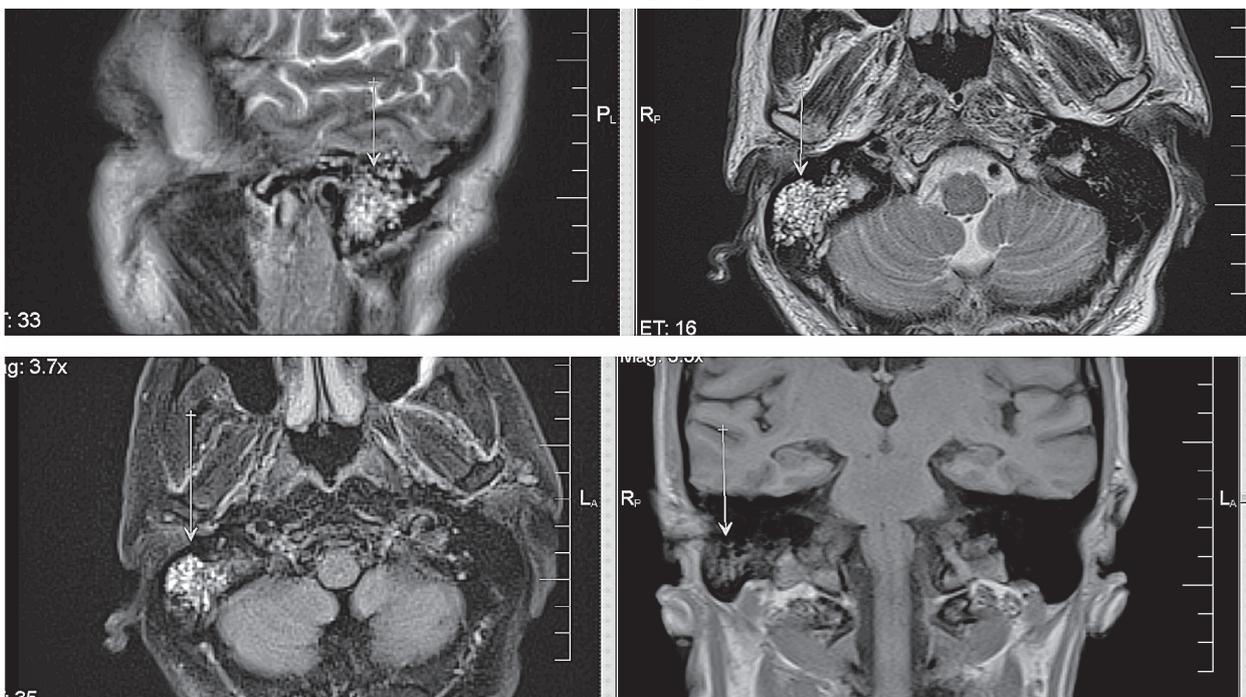


Fig. 2. Frontal, sagittal and axial reconstruction, T2, FLAIR and T1 modes. The MRI of the bridge-cerebellary angles. The cells of the right mastoid are filled with hyperintense T2 content of inflammatory nature. Left mastoid - no changes.

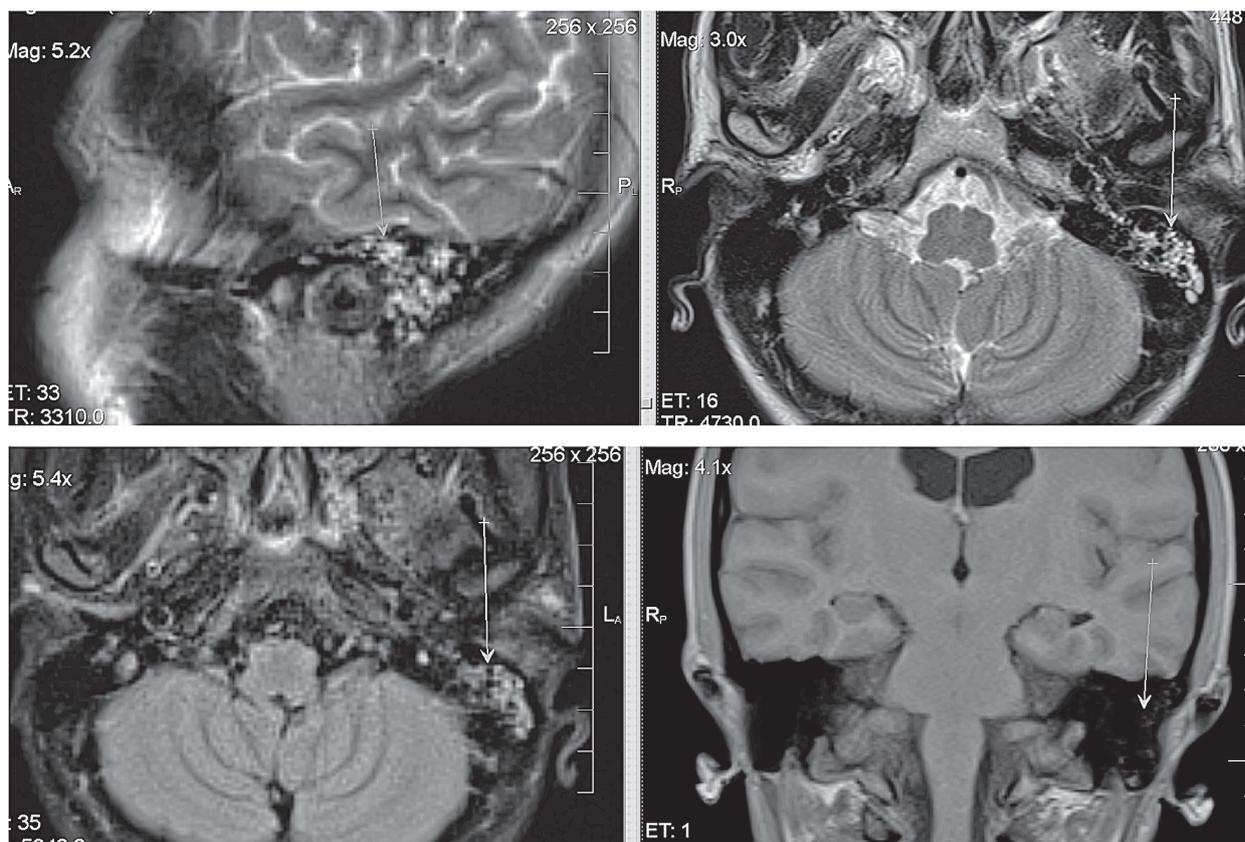


Fig. 3. Frontal, sagittal and axial reconstruction, T2, FLAIR and T1 modes. The MRI of the bridge-cerebellary angles. The cells of the left mastoid are filled with hyperintensive T2 content of inflammatory nature. Right mastoid - no changes.

temporal area of the case for 1 month. After MRI scanning the following images were received (Fig. 2).

Clinical Case 2.

Patient K., 43 years old, was turned to a neurologist with complaints of headache in the temporal area lasting for 2 weeks (Fig. 3).

Clinical Case 3.

Patient P., 20 years, turned to a consultation with an otorhinolaryngologist with complaints of headache and hearing loss for 2 months (Fig. 4).

Conclusion. Magnetic resonance imaging is an informative diagnostic method for the detection of mastoiditis, the possibility of magnetic resonance imaging

allows us to distinguish between tissues of the mastoid and to detect reactive changes in the mucous membrane of the mastoid.

The accompanying software allows the treating physician to independently analyze the three-dimensional qualitative image of the area of interest.

Features of magnetic resonance imaging allow to obtain qualitative image of hard and soft tissues of temporal area.

Possibility of magnetic resonance imaging allows us to distinguish the tissues of the mastoid, to detect reactive changes in the mucous membrane of the mastoid and to extend the process to the membranes and

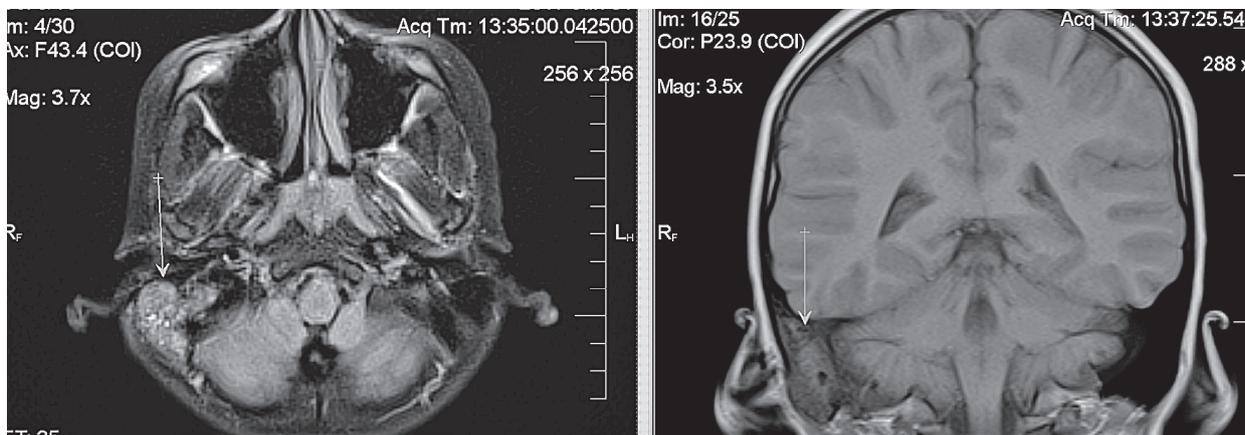


Fig. 4. Frontal, sagittal and axial reconstruction, T2, FLAIR and T1 modes. The MRI of the bridge-cerebellary angles. The cells of the right mastoid are filled with hyperintensive T2 content of inflammatory nature. Left mastoid - no changes.

other structures of the brain that is the most informative in patients with chronic mastoiditis, with external and intracranial complications of mastoiditis, and also for control repeated inspections due to the absence of radiation load. The use of magnetic resonance imaging will help to timely diagnose mastoid pain, which will

contribute to the timely treatment and prevention of complications.

The perspectives of further researches are associated with the development of clinical tools for diagnostics of mastoiditis.

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МАГНІТНО-РЕЗОНАНСНА ТОМОГРАФІЯ В ДІАГНОСТИЦІ МАСТОЇДИТІВ

Шармазанова О. П., Демидова О. О., Суїссі Хамза

Резюме. При проведенні обстежень на 1,5Т магнітно-резонансному томографі Magnetom Avanto, виробництва Siemens, Німеччина, вдалося отримати високоякісне зображення твердих тканин і слизової оболонки соскоподібного відростка, визначити локалізацію патологічних утворень. Висока резолююча здатність та високоякісні трьохвимірні реконструкції дозволили оптимально та у короткі терміни вибрати оптимальну схему консервативної терапії, визначити та спланувати об'єм і спосіб оперативного втручання. Метод магнітно-резонансної томографії є найбільш інформативним у пацієнтів з хронічним мастоїдитом, із зовнішньочерепними та внутрішньочерепними ускладненнями мастоїдиту, а також для контрольних повторних обстежень у зв'язку з відсутністю променевого навантаження. Обстеження, які були виконані в динаміці, допомогли визначити ефективність консервативної терапії та хірургічного втручання, запобігли виникненню ускладнень. Застосування магнітно-резонансної томографії допоможе своєчасно діагностувати мастоїдити, що буде сприяти своєчасному лікуванню та попередженню ускладнень.

Ключові слова: мастоїдит, МРТ, діагностика.

МАГНІТНО-РЕЗОНАНСНАЯ ТОМОГРАФИЯ В ДИАГНОСТИКЕ МАСТОИДИТОВ

Шармазанова А. П., Демидова А. А., Суисс Хамза

Резюме. При проведении обследований на 1,5 Т магнитно-резонансном томографе Magnetom Avanto, производства Siemens, Германия, удалось получить высококачественное изображение твердых тканей и слизистой оболочки сосцевидного отростка, определить локализацию патологических образований. Высокая разрешающая способность и высококачественные трехмерные реконструкции позволили оптимально и в короткие сроки выбрать оптимальную схему консервативной терапии, определить и спланировать объем и способ оперативного вмешательства. Метод магнитно-резонансной томографии является наиболее информативным у пациентов с хроническим мастоидитом, с внечерепными и внутричерепными осложнениями мастоидита, а также для контрольных повторных обследований в связи с отсутствием лучевой нагрузки. Обследование, которые были выполнены в динамике, помогли определить эффективность консервативной терапии и хирургического вмешательства, предотвратили возникновение осложнений. Применение магнитно-резонансной томографии поможет своевременно диагностировать мастоидиты, что будет способствовать своевременному лечению и предупреждению осложнений.

Ключевые слова: мастоидит, МРТ, диагностика.

MAGNETIC RESONANCE IMAGING IN DIAGNOSTIC OF MASTOIDITIS

Sharmazanova O. P., Demidova O. O., Suissi Hamza

Abstract. The aim of the study was to evaluate the possibility of magnetic resonance imaging in the diagnosis of mastoiditis, to improve the quality and efficiency of diagnosis of patients with inflammatory and dystrophic events in mastoid by developing the necessary differential diagnostic criteria for the origin of mastoiditis and other inflammatory diseases of the middle ear and mastoid are based on a comprehensive analysis.

80 surveys were conducted prior to operative and conservative treatment. We performed 102 MRI studies. Males accounted for 52,9% (54 patients), women 47,1% (48 patients). The patient's age ranged from 18 to 90 years whereas average age was $43,3 \pm 3,6$ years.

Scan parameters: scanning in 3 planes, thickness 0.6 mm to 5 mm. The patient's head is fixed to exclude dynamic artifacts. When analyzing an MRI image, T2, T2 TRUFI, T1-MPRAGE, and FLAIR intensive sequences are used in three planes. The ability of magnetic resonance imaging allows us to distinguish tissue of mastoid, to detect reactive changes of the mucous membrane of the mastoid.

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There were formed two groups with complications of mastoiditis. The fourth group included 14 patients (13.7%) with external cranial complications: labyrinth, hearing impairment, paralysis of the facial nerve. The fifth group included 3 patients (2.9%) with intracranial complications: the spread of infection into the cranial cavity, which causes meningitis, encephalitis, abscess of different parts of the brain, phlegmons in the neck.

Sixth group (control) included 6 persons (6%). The control group was formed from patients who were sent for examination and found to be healthy. The evaluation criteria were sufficient pneumatization of the cells of the mastoid, the absence of content and inflammation of the mucous membrane in the cells of the mastoid.

High resolution and high-quality three-dimensional reconstruction allowed optimally and in a short time to choose the optimal scheme of conservative therapy, to determine and plan the volume and mode of surgical intervention. The method of magnetic resonance imaging is the most informative in patients with chronic mastoiditis, with intracranial and intracranial complications of mastoiditis, as well as for repeated repeated examinations due to the absence of radiation load.

Surveys that were performed in a dynamic, helped to determine the effectiveness of conservative therapy and surgical intervention, prevented the occurrence of complications.

Absence of radiation load allows for numerous repeated researches, helps to be sure of the successful treatment at different stages of the rehabilitation period, and evaluate the result. The use of magnetic resonance imaging will help to timely diagnose mastoid pain, which will contribute to the timely treatment and prevention of complications.

The perspectives of further researches are associated with the development of clinical tools for diagnostics of mastoiditis.

Key words: mastoiditis, MRI, diagnostics.

Рецензент — проф. Ткаченко І. М.

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ПОРІВНЯЛЬНА ХАРАКТЕРИСТИКА ФІЗИКО-МЕХАНІЧНИХ ВЛАСТИВОСТЕЙ

КАЛЬЦІЙТЕРМІЧНОГО ЦИРКОНІЮ ТА ТИТАНУ

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Зв'язок публікації з плановими науково-дослідними роботами. Робота є фрагментом комплексної ініціативної теми кафедри пропедевтики ортопедичної стоматології Вищого державного навчального закладу України «Українська медична стоматологічна академія» «Нові підходи до діагностики та лікування вторинної адентії, уражень тканин пародонту та СНЩС у дорослих», (№ державної реєстрації 0117U000302).

Вступ. Сучасний розвиток стоматологічної імплантології базується на широкому застосуванні нових досягнень у матеріалознавстві; фізико-хімії, біомеханіці, плазмової техніки і технології наплення біоінертних і біоактивних матеріалів. У стоматології найширше застосування знайшли матеріали у вигляді металів, сплавів, кераміки, полімерів і композитів з різного роду покриттям [1,2,3,4,5,6]. Запропоновані матеріали для виготовлення імплантатів мають позитивні і негативні властивості [7,8,9,10,11].