

Mouret's abscess as a complication of acute otitis media in a pregnant woman – case report and literature review

Ropień Moureta jako powikłanie ostrego zapalenia ucha środkowego u kobiety w ciąży – opis przypadku i przegląd literatury

Authors' Contribution:

A – Study Design

B – Data Collection

C – Statistical Analysis

D – Manuscript Preparation

E – Literature Search

F – Funds Collection

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ABSTRACT:

Introduction: Due to the widespread use of antibiotics and the facilitated diagnostic path, complications of otitis media are now a much smaller problem in the practice of otolaryngologists. However, we must remember that certain groups of patients, due to chronic concomitant diseases or a different physiological condition, may be more prone to develop such complications.

Case report: Below we present the case of a woman in the 21st week of pregnancy who, as a result of not following the recommended treatment, developed a complication of acute otitis media in the form of a Mouret abscess with progression towards the skull base, and who required surgical intervention for this reason.

KEY WORDS:

extracranial complications, Mouret's abscess, otitis media, pregnancy

STRESZCZENIE:

Wprowadzenie: Powikłania zapalenia ucha środkowego, dzięki powszechnemu stosowaniu antybiotyków oraz ułatwionej ścieżce diagnostycznej, stanowią obecnie dużo mniejszy problem w praktyce lekarzy-otolaryngologów. Pewne grupy pacjentów, ze względu na przewlekłe choroby towarzyszące lub odmienny stan fizjologiczny, mogą być bardziej narażone na rozwinięcie takich powikłań.

Opis przypadku: Poniżej przedstawiamy przypadek kobiety w 21. tygodniu ciąży. U pacjentki, na skutek zaniechania proponowanego leczenia, rozwinęło się powikłanie ostrego zapalenia ucha środkowego w postaci ropnia Moureta z progresją w kierunku podstawy czaszki. Z tego powodu chora wymagała interwencji chirurgicznej.

SŁOWA KLUCZOWE: ciąża, powikłanie zewnątrzczaszkowe, ropień Moureta, zapalenie ucha środkowego

ABBREVIATIONS

CT – computed tomography

FDA – Food and Drug Administration

HIV – human immunodeficiency virus

INTRODUCTION

At the beginning of the 20th century, all cases of otitis media led to mastoiditis. Easier access to broad spectrum antibiotics in the fifth decade of the previous century has reduced the occurrence of this complication to 0.4% [1]. Currently, complications of ear infections in adults affect about 25 per 10 million people, of which

about 83% is mastoiditis. This problem is much more widespread among children and young adults, and in children before the age of 2, the incidence is estimated at 6 out of 100,000. Meningitis is the most common of intracranial complications [2].

The most frequent symptoms of mastoiditis include: relapse or prolonged ear pain, purulent discharge, fever, and increased levels of inflammatory markers in laboratory testing of the blood. A particular concern is latent mastoiditis which, despite scanty symptoms, may lead to the spread of the inflammatory infiltrate and the development of further complications. Mastoid inflammation most often spreads in postauricular direction, to the *planum mastoideum*, leading to formation of an abscess in that area (*abscessus subperiostalis*) [2]. Other directions of the spread of

the inflammatory infiltrate include: inferior direction, to the fascial spaces of the sternocleidomastoid as a Bezold abscess; anterior-superior direction, to the wall of the external auditory canal and further under the temporal muscle, forming Luc's abscess; towards the posterior part of the mastoid process and further between the mastoid and the occipital bone – Citella abscess; medially and downwards –parapharyngeal/retropharyngeal abscess; in the direction of the insertion of the posterior belly of the two-bellied muscle with progression towards the skull base or the parapharyngeal space as a Mouret abscess [3]. The pathogens most frequently identified in complications of otitis media are *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Haemophilus influenzae*, as well as *Proteus mirabilis* and *Pseudomonas aeruginosa* [2, 4].

CASE REPORT

A 33-year-old woman, 21 weeks pregnant, reported to the Emergency Room due to a headache and neck pain on the right side that had persisted for over a week. The patient reported a right ear infection accompanied by pain and otorrhea approx. 3 months earlier; however, due to her pregnancy she did not start the recommended antibiotic therapy. Anamnesis demonstrated that the otorrhea resolved spontaneously, while pain in the right ear and hearing loss had persisted since the infection. The patient denied vertigo, and she did not observe any asymmetry in her face, nor did she feel feverish. Furthermore, anamnesis did not reveal the presence of any accompanying chronic diseases, including gestational diabetes.

Physical examination in the Emergency Room revealed a dull, thickened eardrum of the right ear, pain on palpation or percussion of the mastoid and the neck on the right side, and mild swelling of the surrounding tissues. There were no signs of paralysis of facial nerve. In the setting of the Emergency Room, paracentesis was performed using a microscope, obtaining a moderately intense outflow of seropurulent contents.

Ultrasound shows the mastoid projection at a depth of 10 mm, revealing a reservoir of dense, non-uniform content with dimensions of 38 x 21 x 41 mm with no vasculature that could act as a reservoir of purulent content. Laboratory testing of the blood showed a CRP elevated to 40 mg/l, other than that there were no deviations.

After the patient was admitted to the Department of Otolaryngology, Head and Neck Surgery at the Medical University of Warsaw, a head and neck magnetic resonance imaging scan without contrast was performed (Figs. 1., 2.). An extensive, heterogeneous infiltrate showing signs of abscess was found, penetrating medially to the occipital base of the skull and in the paravertebral region at CC2 level, with dimensions of 33 x 51 x 40 mm, connecting in the upper part with the infiltrate localized within the middle ear and the mastoid. Pure-tone audiometry showed mild conductive hearing loss in the right ear. Parenteral antibiotic therapy was started with Ceftriaxone at a dose of 1g every 8 hours, and the patient was qualified for surgical treatment, after the safety of the patient and the fetus was confirmed by the obstetrician.

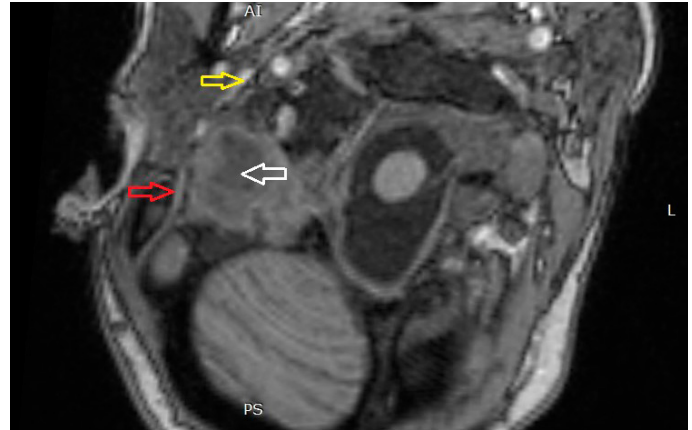


Fig. 1. MRI – transversal cross-section. The arrows show: red color – insertion of the posterior belly of the right two-bellied muscle; yellow – right occipital artery; white – abscess cavity.

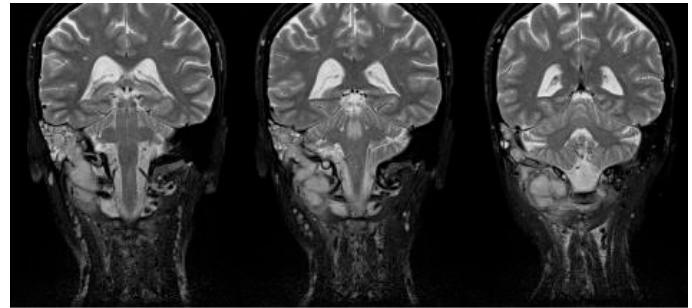


Fig. 2. MRI – extensive, heterogeneous infiltration showing signs of abscess penetrating to the cranial base and paravertebrally at C2 level on the right side.

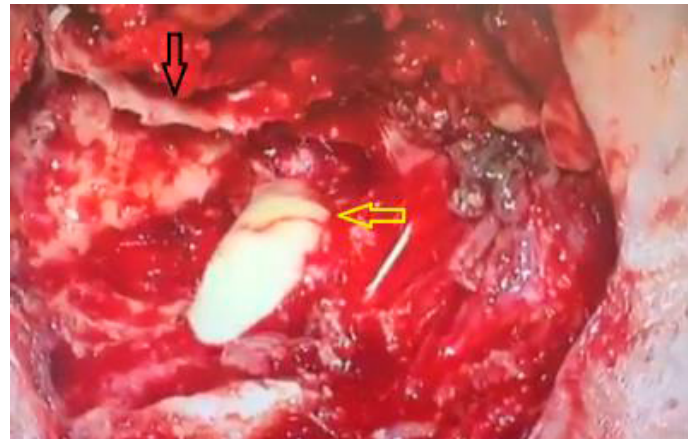


Fig. 3. Purulent content outflowing from the fistula. Black arrow: posterior wall of the external auditory canal, yellow arrow: apex of mastoid, opening of fistula with purulent content.

Antromastoidectomy was performed under general anesthesia and revealed the mastoid cover, the sigmoid sinus and the facial nerve. A posterior tympanotomy was performed.

The tympanic cavity was degranulated and the passage to the tympanic cavity – aditus ad antrum – was cleared. Strings of mastoid air cell, filled with granulation tissue and pus, were radically resected. Bony destruction of the mastoid apex and the fistula penetrating into the soft tissues of the neck were visualized. An outflow of

purulent contents under pressure from the area of the insertion of the posterior belly of the right two-bellied muscle was found. By extending the incision to the neck, the abscess cavity extending posteriorly and medially towards the cranial base was located. A test sample was collected for microbiological examination, and after repeated rinsing of the abscess cavity with hydrogen peroxide and saline, the operating cavity was closed, with the drain remaining in the posterior segment.

The postoperative period progressed correctly. In view of the lack of growth of pathogens, the current parenteral antibiotic therapy was continued in the microbiological test. The postoperative cavity was rinsed with a Ceftriaxone solution through the drain, which was then removed on the 3rd postoperative day. The patient was discharged home on the 5th postoperative day in good general and local condition with instructions to continue antibiotic therapy: Cefuroxime 500 mg every 12 hours. During follow-up in the 7th postoperative day, there was correct healing of the wound. The patient did not report any pain nor did she complain about a reduced sense of hearing. The stitches were removed, and the continuation of oral antibiotics was recommended until the 10th day after surgery.

DISCUSSION

Extracranial complications of otitis media are increasingly rare. They should be considered in each case of acute otitis media assisted by symptoms such as intensified pain in the ear and deep structures of the neck, paresis or paralysis of the facial nerve, trismus, torticollis, fever. The circumstances supporting the occurrence of complications include: coexistence of diabetes mellitus, immunosuppressive therapy, HIV infection, and previous radiation therapy to the head and neck [3].

Unlike Bezold's abscess, Mouret's abscess usually develops without any recognizable external symptoms. Deep localization rarely gives rise to swelling of the superficial tissues, therefore patients report diffused or deeper pain rather than typical extraauricular pain. In many cases, the advanced progression of inflammation along the two-bellied muscle to the parapharyngeal space produces alarming symptoms requiring further diagnosis [5].

Apart from a complete ENT examination, with detailed microscopic examination of the ears, neck ultrasound and CT of the head and neck should be performed.

Ultrasound may be a quick method to differentiate an inflammatory infiltrate or the presence of reactive lymph nodes from a reservoir of fluid. On the other hand, CT completes the clinical picture by detecting possible bony destruction within the temporal bone. The administration of contrast during CT examination provides opportunity of assessing the reservoir boundaries in relation to other soft tissues [3]. When planning a surgical intervention, CT examination helps in taking decisions about surgical access and the extent of surgery. In the above case, due to the pregnancy, an MRI of the head and neck was performed without contrast. Good

imaging of inflammatory changes within soft tissues was obtained, indirectly indicating the direction of bony destruction and the route of transmission of the inflammatory process.

Surgical treatment is indicated as the most appropriate management in the case of extracranial complications of otitis media [1, 3, 5, 6]. The first stage of surgical treatment should always be antromastoidectomy with opening of communication between the mastoid and the tympanic cavity, at least in the aditus ad antrum, and conditionally also by a posterior tympanotomy. At the same time, drainage of the abscess in soft tissues is performed. Although there are reports of drainage of Luc's abscess without mastoidectomy, the success of such treatment is only about 20% [5].

Therefore, all cases of otitis media with extracranial complications, including patients without concomitant bony destruction within the temporal bone, should be qualified for emergency surgery, each time with antromastoidectomy. It is imperative to implement broad-spectrum antibiotic therapy. After obtaining the results of microbiological examination of the material collected during surgery, medication and doses should be adjusted.

The state of pregnancy should be taken into account when planning both diagnosis and treatment. Head and neck CT should be excluded from diagnostic tests in favor of magnetic resonance imaging. Gadolinium-based contrast has been recognized by the European Society of Urogenital Radiology as safe for use during pregnancy, while the use of iodine-based contrast requires more attention in the assessment of thyroid function in newborns [7]. Among the antibiotics used in treatment of complications of otitis media, according to the FDA group B includes: cephalosporins and penicillin, including amoxicillin with clavulanic acid and ampicillin with sulbactam [8]. Rapid surgical intervention to remove the source of infection from the mastoid and drainage of the abscess are essential for a quick recovery of the patient.

CONCLUSIONS

A decision to treat patients with extracranial complications of otitis media should be based on the results of clinical and imaging studies, the patient's condition and the presence of coexisting factors. Surgery should be performed in emergency mode.

A Mouret abscess is a rare complication of otitis media. The treatment of such complications in pregnant women is a diagnostic and therapeutic challenge. MRI of the head and neck without contrast may be a sufficient imaging method to take a decision concerning the surgical treatment and its scope. In each case, surgical treatment is necessary – full antromastoidectomy, opening communication with the tympanic cavity and simultaneous drainage of the abscess cavity.

Treatment of patients with inflammatory complications in the head and neck should be carried out in cooperation with a specialist in gynecology and obstetrics in order to ensure maximum safety while maintaining treatment standards.

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