Abstrakt

Indroduction

Acute mastoiditis is the most common complication of acute otitis media in children. It is an inflammatory process involving the mastoid air cells, leading to inflammation of the periosteum and bone. Due to the close anatomical proximity of the mastoid process to important anatomical structures, the inflammatory process may spread to surrounding tissues, leading to the development of intratemporal and intracranial complications. Intratemporal complications develop within the temporal bone and include mastoiditis, facial nerve palsy, labyrinthitis, petrositis and perilymphatic fistula. Intracranial complications of mastoiditis develop within the cranial cavity and include otogenic meningitis, venous sinus thrombosis, epidural and subdural abscess, brain abscess and otitic hydrocephalus.

Aim

The aim of this study was to evaluate the correlation between intraoperative findings, radiological findings and clinical presentation in children with intratemporal and intracranial complications of acute mastoiditis.

Material and methods

A retrospective analysis included patients hospitalized between 2016 and 2024 in the Department of Pediatric Otolaryngology at the Medical University of Warsaw for acute mastoiditis. The diagnosis was based on the clinical presentation and temporal bone computed tomography findings. According to the accompanying clinical findings, the patients were divided into two groups: those with intratemporal complications and those with intracranial complications. Clinical findings and selected laboratory parameters were compared. Microbiological and radiological assessments were performer, along with an evatuation of the intraoperative findings.

Results

The study included 200 patients who were admitted emergently with acute mastoiditis. On average, 23 to 26 children were hospitalized per year. In the study group, girls accounted for 34,5%, while boys accounted for 65,5%. Acute mastoiditis occurred on the left side in 54,0% of cases and on the right side in 46,0% of cases. The highest number of acute mastoiditis cases

was recorded in February, while the lowest number was observed in August. The mean age of the study population was 3,65 ± 3,22 years (range: 0,11 – 18 years). In the entire study group, elevated PLT values were found in 59,8% of patients, elevated APTT values in 21,9% and elevated INR values in 12,4%. The most frequently isolated pathogens were *Streptococcus pneumoniae* (24,5%), *Streptococcus pyogenes* (15,5%) oraz *Staphylococcus aureus* (5,0%). In 53% of children, no pathogen was identified. A subperiosteal abscess was observed in 15,5% of children with intratemporal complications and in 25,0% of children with intracranial complications. Abducens nerve palsy was reported in 6,0% of patients with intracranial complications. Facial nerve palsy was observed in 2,8% of children with intratemporal complications. The most frequent intracranial complication was sigmoid sinus thrombosis (75,0%), followed by internal jugular vein thrombosis (33,3%) and transverse sinus thrombosis (25,0%). Computed tomography findings included postauricular soft tissue swelling (89,0%), subperiosteal abscess (29,4%), complete opacification of the tympanic cavity (99,4%), erosion of the bony septa within the mastoid proces (71,2%), erosion of the outer and inner cortical plates of the temporal bone (50,9%, 27,0%), ossicular chain erosion (3,7%), lateral semicircular canal erosion (1,2%) and mastoid tip erosion (3,1%). Temporal bone erosion was analyzed in both study groups.

Conclusions

1. The incidence of acute mastoiditis decreases with age. The highest rate of occurrence is observed in children under 3-years of age.
2. Intratemporal complications occurred significantly more frequently than intracranial complications in children under 3 years of age.
3. The most common complication of acute mastoiditis was a subperiosteal abscess.
4. Abducens nerve palsy (n. VI) occurred significantly more frequently in children with intracranial complications, primarily cerebral venous sinus thrombosis.
5. Analysis of laboratory parameters revealed a statistically significant correlation between a prolonged activated partial thromboplastin time (APTT) and elevated procalcitonin levels in the entire study group.
6. An elevated INR was significantly more common in the group of children with intracranial complications.
7. Fibrinogen levels were statistically significantly elevated in the group of children with intracranial complications.

8. *Streptococcus pneumoniae* was a statistically significantly more common pathogen in children under 3 years of age.
9. No correlation was found between the causative pathogen and the occurrence of temporal bone erosion.
10. Erosion of the inner table of the temporal bone overlying the sigmoid sinus was not significantly correlated with the occurrence of sigmoid sinus thrombosis.
11. Cortical bone erosion of the temporal bone was significantly more common in patients with intratemporal complications.
12. High sensitivity and specificity values indicate the high diagnostic value of CT in assessing erosive changes of the temporal bone. A statistically significant association was demonstrated between the presence of erosion of the outer and inner tables of the temporal bone on CT and the intraoperative findings.