



A CASE REPORT: MASTOID ABSCESS IN AN ACUTE MASTOIDITIS PATIENT

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ABSTRACT Acute mastoiditis is an inflammation of the mastoid air cells in the temporal bone, commonly resulting from untreated or inadequately treated acute otitis media. If untreated, it can lead to severe complications. This study includes a case study of a 7-month-old female with acute mastoiditis, detailing her presentation, diagnostic findings, and treatment plan. Specific surgical interventions, such as myringotomy with or without tympanostomy tube insertion or mastoidectomy, are recommended based on the severity and progression of the infection.

KEYWORDS : Acute Mastoiditis, Acute Otitis Media, Complications, Mastoidectomy

INTRODUCTION:

Mastoiditis is the inflammation of a portion of the temporal bone referred to as the mastoid air cells. The mastoid air cells are epithelium lined bone septations that are continuous with the middle ear cavity. As children are more susceptible to middle ear infections, they are at increased risk of developing acute mastoiditis when compared to adults. Most commonly, acute mastoiditis is a complication of acute otitis media. With the advent of antibiotics, the development of acute mastoiditis and progression to dangerous sequela is unlikely. However, if left untreated, mastoiditis can result in life-threatening sequela, including meningitis, intracranial abscess, and venous sinus thrombosis. Despite advanced imaging techniques, antibiotics, and microsurgical procedures, the mortality of mastoiditis sequela in children remains 10%. [1]

Mastoiditis can subdivide into three different categories based on the mechanism of infection, as detailed below:

- **Incipient Mastoiditis:** Infection of the mastoid air cells alone with no continuation with the middle ear cavity.[1]
- **Acute Coalescent Mastoiditis** (most common presentation): Inflammation of the epithelial lining with erosion through the bony septations of the mastoid air cells. This erosion can progress to intracavity abscess formation, which can extend further to adjacent structures.[1]
- **Subacute Mastoiditis:** Persistent middle ear infection or recurrent episodes of acute otitis media with inadequate antimicrobial therapy lead to persistent infection of the middle ear and mastoid air cells resulting in erosion of bony septations between mastoid air cells. [1]

Case Report:

A 7-month female was brought to Out-Patient ENT Department in MGM Hospital with complaints of painful swelling behind left ear for 10 days which was acute in onset, gradually progressive in nature and was not relieved on taking medications. Patient's mother also gave history that the patient had Upper Respiratory Tract Infection 20 days back and was associated with Otagia. The Patient was immunised as per age.

Patient was afebrile and on examination, left Pinna was displaced downwards and forwards with a 2cm x 1.5cm swelling present in the left post auricular region. The skin over the swelling was red with no discharging sinus. On palpation, there was local rise in temperature, the swelling was tender, soft and non-fluctuant. The Tympanic Membrane on left side was congested and bulging. Facial nerve examination was normal. Pus from the swelling was aspirated which was sent for Culture-Sensitivity, Acid-Fast Bacilli and CBNAAT tests. A HRCT Temporal Bone was advised which showed ill-defined hypodense sub periosteal collection involving left retro auricular region communicating with the left mastoid air cells through a cortical defect in the lateral mastoid wall of temporal bone with adjacent inflammatory changes. No intracranial extension was seen with

normally enhancing cerebral venous sinuses. Patient underwent Left Cortical Mastoidectomy with Myringotomy under GA. Intra-operatively, there was Pus with glue present in the mastoid which was drained and sent for Culture-Sensitivity and Acid-Fast Bacilli Tests. Granulation tissue and edematous mucosa were present in the mastoid antrum and aditus which were removed and sent for HPE. Glue present in the middle ear cavity was drained.

Post-Operatively, Intravenous Antibiotics were continued as per Culture Report. Pus culture and sensitivity showed organism isolated Streptococcus pneumoniae, sensitive to antibiotics Augmentin, Penicillin, Ciprofloxacin, Tetracycline, Cefazolin and Cefuroxime. Histopathology report was suggestive of Reactive Inflammatory Tissue from mastoid antrum. Patient tested negative for Acid Fast Bacilli and CBNAAT test was Negative.



Fig 1. Left Post-Auricular Swelling

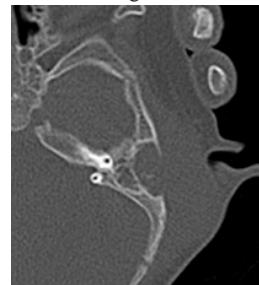
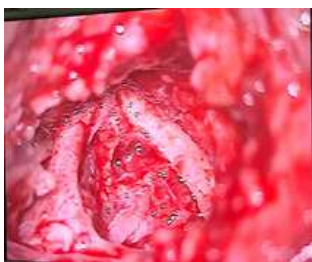


Fig. 2a: Cortical Erosion seen



Fig. 2b: Fluid present in Middle Ear and Mastoid**Fig. 3:** Granulations present in the Mastoid Antrum**Fig. 4:** 3 Months Post Op**DISCUSSION:**

Acute mastoiditis (AM) is a severe bacterial infection of the mastoid bone that typically arises as a complication of acute otitis media (AOM). The middle ear communicates with the mastoid through the aditus ad antrum. Consequently, the term "otomastoiditis" accurately encompasses all forms of otitis involving the mastoid. AM represents a significant complication of AOM, often triggered by the obstruction of the aditus ad antrum due to swelling or granulation tissue, which obstructs the drainage of purulent material from the mastoid air cells [2]. AOM progresses to mastoid air cell infection with bone destruction, occasionally extending through the periosteum to cause periostitis and subsequent involvement of adjacent structures, notably neurological and vascular ones. Consequently, complications of AM can be challenging to manage and may pose lethal risks if not promptly and effectively treated. Over the past two decades, there has been a notable increase in AM incidence among children, even in developed countries [3]. This trend is attributed to the emergence of antibiotic-resistant bacterial strains, often due to inappropriate antibiotic use or overuse [4,5,6].

Children are particularly vulnerable to mastoid involvement due to anatomical, immunological, and infectious factors, especially during early childhood. Compared to adults, children have more pneumatized mastoid bones with thinner trabeculae and narrower aditus ad antrum, predisposing them to secretions build-up and osteitic infections. Groth et al. observed distinct clinical evolutions of AM across different age groups, noting more rapid and severe symptoms in young children compared to adults [7].

Untreated AM can lead to serious extracranial and intracranial complications, such as subperiosteal abscesses, which develop as inflammation progresses. This can trigger periostitis, cytokine release promoting osteoclast activation, and subsequent bone decalcification and resorption (coalescent mastoiditis) [2]. Other extracranial complications, like facial nerve palsy, labyrinthitis, or vascular issues such as internal jugular vein thrombosis or periphlebitis of the sigmoid or lateral sinus, result from mastoid involvement of neurological or vascular structures.

Streptococcus pneumoniae is recognized as the primary pathogen causing AM in children, implicated in acute and complicated cases. It has been identified in both middle ear effusions and purulent collections, while other bacteria like *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Hemophilus influenzae* are found less frequently [8].

Despite Vaccinations available as per the Immunisation Schedule [9] in 6th week and 14th week and a booster dose between 9-12 months, AM remains a concerning condition, particularly due to increasing antibiotic resistance. Interestingly, despite this decline in pneumococcal infections, there has been no corresponding decrease in the overall incidence of AOM following vaccination, likely due to the

emergence of other pneumococcal serotypes that are not covered by the vaccine. Nonetheless, vaccination against pneumococcus is strongly recommended for young children to mitigate the risk of recurrent AOM, a common complication of the disease.

Vigilant clinical monitoring and prompt intervention are crucial when managing severe cases of AM, especially in young children exhibiting severe symptoms. Early diagnosis and effective treatment are essential to prevent life-threatening complications. Treatment typically involves antibiotic therapy tailored to the specific pathogens identified through middle ear cultures. Surgical intervention, such as myringotomy with or without tympanostomy tube insertion, is recommended in cases of AM without spontaneous tympanic membrane perforation, particularly in young children or those with recurrent AOM or chronic otitis media with effusion. While conservative approaches with antibiotics and drainage may suffice for less severe cases, more aggressive surgical procedures like mastoidectomy are necessary for complicated cases involving intratemporal, intracranial, or vascular structures [10].

CONCLUSION:

Despite advancements in antibiotic and vaccination, Acute Mastoiditis remains a concerning illness, particularly as it appears to be on the rise among children due to increasing antibiotic resistance. Vaccination, especially against pneumococcus, is highly recommended for young children to reduce the risk of recurring Acute Otitis Media. Early, targeted, and well-structured antibiotic therapy is crucial for resolving the disease and preventing complications, which often necessitate surgical intervention.

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