



Conservative management of acute mastoiditis in children

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KEYWORDS

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Acute mastoiditis;
Myringotomy;
Mastoidectomy

Summary

Objective: To review the current management of acute mastoiditis with critical emphasis on the role of myringotomy.

Design: A retrospective chart review.

Setting: Tertiary-care, university affiliated children's hospital.

Patients: One hundred and forty-four consecutive children hospitalized for acute mastoiditis between the years 1991 and 2002.

Interventions: All children were treated with parenteral antibiotics (conservative management). Myringotomy was performed at the discretion of the otolaryngologist on-call.

Main outcome measures: Comparing outcomes of children with or without myringotomy regarding hospital stay, complications and the need for surgical interventions.

Results: Myringotomy was performed in 34.6% of episodes. The children who underwent myringotomy were found to be significantly younger (22.4 compared to 28.8 months, $p = 0.028$) and had more complications ($n = 17$ vs. $n = 8$, $p < 0.001$). Complications overall occurred in 16.3% of episodes. Performing myringotomy had no significant effect on the duration of hospital stay. Children pretreated with antibiotics underwent significantly less myringotomies $p = 0.027$. There were no significant differences between children who underwent myringotomy and those who did not with regard to WBC count, or ESR.

Conclusions: These findings suggest that myringotomy may not be required in all cases of acute mastoiditis. Parenteral antibiotics is sufficient in most cases. Criteria for myringotomy may include a younger age. Conservative management resulted in good outcomes in this series.

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1. Introduction

Acute mastoiditis (AM) is considered a complication of acute otitis media (AOM) [1]. Otitis media can progress to AM through the following stages: hyperemia of the mucosa of the middle ear cleft; exudation of the middle ear cavity and periosteitis; exudate becomes purulent and spontaneous perforation of the tympanic membrane may occur; pus accumulates due to inflamed mucosa and then cytokine release contributes to decalcification and bone resorption. This process evolves into coalescent mastoiditis. The appearance of postauricular tenderness, erythema and edema occurs when the inflammatory exudate accumulates. At any point during the progression from otitis media to mastoiditis further complications can arise [2]. Acute mastoiditis can develop with or without a background of recurrent acute otitis media [3]. In one series AM occurred after a single episode of AOM in 38.5% of the cases [4].

The incidence of AM has declined during the post-antibiotic era but is currently on the rise [5]. The incidence of AM in children less than 14 years old is estimated between 1.2 and 4.2 per 100,000 per year in developed countries [6]. This rise in occurrence of AM could be attributed to the new management of withholding antibiotics for otitis media, to resistance of pathogens to antibiotics or to the masking effects that antibiotics may have on the symptoms of AM [5]. Another factor to be considered is the increased exposure of young children to day care, contributing to a higher incidence of upper respiratory tract infection and acute otitis media [1].

In recent years the standard first line treatment of AM in uncomplicated cases has been intravenous antibiotic treatment and myringotomy [1,7–9]. Complicated cases may warrant further surgical interventions (ventilation tube insertion, abscess drainage, and mastoidectomy) depending on the response to antibiotics and presence of other complications [10,11]. The rate of surgical intervention varies from one series to another, and is anywhere between 12% and 98% [6].

The aim of this study is to review the outcome of conservative management of AM and to examine the specific role of myringotomy in the treatment of AM. A retrospective case series in a tertiary-care pediatric hospital was performed to review the diagnosis and management of AM. In our institution children with AM were treated either with intravenous antibiotics or with a combination of intravenous antibiotics and myringotomy.

2. Patients and methods

The medical records of all children admitted to Dana Children's Hospital, Tel-Aviv Medical Center for AM from 1991 to 2002 were reviewed. The medical files in the databases by the keywords acute mastoiditis, and mastoidectomy were screened. The criteria for diagnosis of AM were protruding ear and/or postauricular erythema and edema combined with tenderness over the mastoid area and fever, as well as signs of acute otitis media (redness, thickening, and bulging of the tympanic membrane or acute purulent discharge). Exclusion criteria were AM due to chronic ear disease and postauricular cellulitis secondary to external otitis.

A computed tomography (CT) scan was obtained for patients with high clinical suspicion of a subperiosteal abscess or for patients who failed to improve under treatment. CT was also indicated when neurological signs existed and an intra-cranial complication was considered.

Ear culture specimens were collected directly through the myringotomy with a sterile suction cannula, or by a swab from pus revealed during mastoidectomy and drainage of abscess. Specimens from spontaneous perforation were collected by a swab from pus draining into the external ear canal.

Statistical analysis was performed utilizing SPSS software. (SPSS Inc., Chicago, IL). Categorical variables were compared via the Chi-square test and continuous variables were compared using a *t*-test. Alpha level was set at 0.05.

3. Results

The study included 144 children, 94 (65.3%) boys and 51 (35.4%) girls with AM. Ages ranged from 2 months to 132 months. Mean 26.9 months, median 18 months (Table 1).

Three children had two episodes of AM and three other children experienced three episodes of AM.

Table 1 Age distribution of children with AM

Age (months)	Number of children	Cumulative percentage
<6	5	3.3
7–12	28	21.6
13–18	45	51
19–24	29	69.9
25–30	13	78.4
31–36	2	79.7
37–48	11	86.9
>49	20	100

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