

# Hearing Status following Acute Mastoiditis without and with Cortical Mastoidectomy

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## Abstract

**Objectives:** To evaluate the risk of sensorineural hearing loss (SNHL) after mastoidectomy in patients with acute mastoiditis (AM) and compare patients who received surgical versus conservative treatment. **Methods:** A retrospective cohort study of medical records of all patients who were diagnosed with AM at Soroka medical center between the years 2005-2020 and had an available hearing test. Data included demographics, clinical characteristic, comorbidities, and a pure tone audiometry conducted in our institution after recovery. Hearing loss (HL) was defined as a decrease of 15 dB or more in a given frequency. HL was categorized as mild (25-40 dB decrease), moderate (41-70) or severe (71db<). Frequencies range was categorized as Low (<500 Hz), middle (501-2000 HZ) or high (>2001) pitch. We divided the patients to two groups; patients who received conservative treatment and patients who underwent surgery. **Results:** A total of 24 patients met the inclusion/exclusion criteria, 12 underwent surgery (mean age 20.2 m) and 12 received conservative treatment (mean age 20.1 m). A definite CHL of 10 to 20 dB could be diagnosed in 3 of the 5 patients in each group, who had bone conduction thresholds measured. SNHL was not observed in any of the patients old enough to have bone conduction tested **Conclusions:** This is the first study to examine HL of children following AM. From our limited study it seems that the disease itself as well as mastoidectomy is not a risk factor for developing SNHL later in life.

Management and outcomes of acute mastoiditis (AM) have been clearly defined in a systematic review of 19 studies. We are often asked by concerned parents- what are the hearing prospects for the long run. Yet, to the best of our knowledge, the issue of future hearing has not been addressed.

We hypothesized that children could remain with conductive hearing loss (CHL) and possibly, develop sensorineural hearing loss (SNHL) due to the disease process itself, or from the drilling in the mastoid bone.

We performed a cross-sectional study and describe the audiometry results of children admitted for AM, among conservatively treated (group 1) and those who underwent a cortical mastoidectomy and insertion of a VT (group 2).

Between 2010 and 2020 we treated 280 children with AM. Twenty- four had an available audiogram, 12 in each group, performed on average 20 months after presentation with AM. Audiograms were performed either for suspicion of hearing loss or as a follow- up exam, after extrusion of the ventilation tube and there were no abnormal otoscopic findings.

A definite CHL of 10 to 20 dB could be diagnosed in 3 of the 5 patients in each group, who had bone conduction thresholds measured. SNHL was not observed in any of the patients old enough to have bone

conduction tested. Among the younger patients, examined with free field testing, all had normal thresholds. A CHL of 10dBs was seen in the contralateral ear in one of the patients in group 1 and in 3 from group 2.

*Fig: Hearing in patients after AM- surgical vs. non- surgical group*

	Surgical (Group 1) N=12	Conservative (Group 2) N=12
Gender- male (%)	8 (66%)	7 (58%)
Age at audiometry (months)	40.4	45.2
Age at disease (months)	20.2	20.1
Abnormal bone conduction (SNHL) *	0/5	0/5
CHL in affected ear in children with BC thresholds	3/5	3/5
CHL in contralateral ear in children with BC thresholds	1/5	3/5
Abnormal free field exam	0/5	0/4

\*Among children who could be assessed

The limitation of this study is the relatively small number of patients so p values were not calculated. Results show some cases of CHL, but also in the contralateral ear. There was no evidence for SNHL, in either group. Our results could be an overestimation of CHL since many of the patients were with suspicion of hearing loss.

This preliminary evidence for conserved hearing after AM can be important in reassuring worried parents.

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Anne S, Schwartz S, Ishman SL, Cohen M, Hopkins B. Medical Versus Surgical Treatment of Pediatric Acute Mastoiditis: A Systematic Review.(Report). *Laryngoscope* 2019;129(3):754