

Characteristics of Patients Who Underwent Mastoidectomy: A Two Years Experience

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Abstract

Background: Mastoidectomy is a surgical procedure to remove an infected portion of the bone behind the ear called mastoiditis when medical treatment is not effective. Patients with chronic suppurative otitis media (CSOM) complications mostly need this surgery in order to maintain the normal function of hearing. Chronic mastoiditis and cholesteatoma are the most common indications of CSOM. This study was conducted to identify the characteristics of patients who underwent mastoidectomy at Dr. Hasan Sadikin General Hospital, from 2012– 2013.

Methods: A descriptive study using total sampling method was conducted. Data were collected from medical records of 41 patients who underwent mastoidectomy at Dr. Hasan Sadikin General Hospital from 2012–2013. Inclusion criteria were medical records of patients who underwent mastoidectomy, and consisted of variables studied, such as age, gender, chief complaint, main etiology, method of surgery, and presence of abnormalities in the structure of middle ear. Incomplete medical records were excluded. The collected data were presented using percentage.

Results: Age ranged from 15–64 years (85.37%), male patients were higher (65.9%) compared to female patients (34.1%). Otorrhea (70.73%) was the main chief complaint and infection (100%) was the main cause. Majority of patients had canal wall down (CWD) surgery (63.41%) and many abnormalities were found in the inner ear structure during the surgery.

Conclusions: Infection is the only cause and otorrhea is the main indication for mastoidectomy. Most patients have been operated with CWD technique.

Keywords: Ear infection, inner ear structure abnormalities, mastoidectomy

Introduction

It has been known that chronic otitis media (COM) has become one of the most common pediatric infectious diseases in this new era. Incidence of chronic suppurative otitis media (CSOM) is high in developing countries, with the highest prevalence of complications such as deafness and death.¹ Even though the exact occurrence of CSOM is still unclear, a previous study states that 25% of patients visiting clinics in Indonesia are CSOM patients.² According to information taken from patients' medical records at a Public Hospital in South Sumatera from 2008 to 2009, 7424 patients are with CSOM.²

According to a study conducted by

Wisnubroto in Harmadji³, approximately 31.2% shows complications of CSOM seldom occurred. Even though antibiotics are widely used in order to treat the complications of CSOM; the number of cases with uncompleted treatment is high. In such situations mastoidectomy is necessary to maintain the normal function of hearing. Chronic mastoiditis and cholesteatoma are the two most common indications of CSOM.^{3,4}

Mastoidectomy is a surgical procedure to remove an infected portion of the bone behind the ear when medical treatment is not effective.⁴ This study was conducted to identify the frequency and clinical characteristics of patients who had undergone mastoidectomy at Dr. Hasan Sadikin General Hospital Bandung from 2012 to 2013.

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Table 1 Gender Distribution

Sex	Frequency	Percentage (%)
Male (M)	27	65.9
Female (F)	14	34.1
Total	41	100

Table 2 Age Distribution

Age	Frequency	Percentage (%)
Younger age (0–14 year)	6	14.63
Middle age (15–64 year)	35	85.37
Older age (\geq 65 year)	0	0
Total	41	100

Methods

This study used descriptive method and data were collected from medical records of patients who had undergone mastoidectomy at Dr. Hasan Sadikin General Hospital Bandung from 2012–2013. Samples were obtained using the total sampling method. The inclusion criteria were medical records of patients who had undergone mastoidectomy and consisted of variables studied, such as age which was divided into 3 categories: younger age or is not productive (0–14 years), middle age or productive (15–64 years), and older age or non-productive (\geq 65 years), gender, chief complaint (otorrhea, hearing loss, vertigo, facial nerve palsy, otalgia, retroauricular abscess and headache), main etiology, method of surgery such as Canal Wall Down (CWD) or Canal Wall Up (CWU), presence of abnormalities in the structure of middle ear, such as antrum mastoid, tegmen tympani, sigmoid sinus, semicircular canal, facial canal, aditus ad antrum, auditory ossicles, tympanic

cavity and canalis acusticus externus (CAE). Incomplete medical records were excluded.

A total of 41 patient's medical records were obtained. Then, the collected data were analyzed using computer software. This study was approved by the Health Research Ethics Committee, Faculty of Medicine, Universitas Padjadjaran and Dr. Hasan Sadikin General Hospital.

Results

The frequency of male patients was 27 (65.9%) and frequency of female patients was 14 (34.1%). This showed, frequency of male patients was much more higher compared to the frequency of female patients (Table 1).

Out of 35 patients who underwent mastoidectomy were from middle age, while only 6 patients were from younger age. There was no patient from older age so far in the past two years (Table 2).

Furthermore, the most common chief complaint was otorrhea which recorded

Table 3 Chief Complaints

Chief Complaints	Frequency	Percentage (%)
Otorrhea	29	70.73
Hearing loss	3	7.32
Vertigo	2	4.88
Otalgia	3	7.32
Retroauricular abcess	3	7.32
Headache	1	2.43
Total	41	100

Table 4 Types of Surgery

Types of Surgery	Frequency	Percentage (%)
CWU	5	12.2
CWD	26	63.41
Tympanoplasty	0	0
CWU and tympanoplasty	7	17.07
CWD and tympanoplasty	3	7.32
Total	41	100

Notes: CWU= Canal Wall Up; CWD= Canal Wall Down

29 patients (70.73%), followed by hearing loss, otalgia and retroauricular abscess. The occurrence of symptoms were caused by infections. No other etiology was identify during the period of this 2 years study (Table 3).

Firstly, CWD was performed on 26 patients (63.41%). Secondly, CWU was performed together with tympanoplasty on 7 patients (17.07%). Thirdly, CWU was performed on 5 patients (12.2%), and finally CWD was performed together with tympanoplasty on 3 patients (7.32%). Based on the data, tympanoplasty was not performed on any patient so far in the past two years. Mostly, CWD were performed on the patients (Table 4).

Moreover, abnormalities were discovered in the middle ear structures, such as in mastoid antrum in 34 patients (82.97%), tegmen tympani in 2 patients (4.88%), sigmoid sinus in 9 patients (21.95%), semicircular canal in 5 patients (12.2%), facial canal in 6 patients (14.63%), aditus ad antrum in 32 patients (78.05%), auditory ossicles in 29 patients (70.73%), tympanic cavity in 28 patients

(68.29%) and CAE in 30 patients (73.71%) (Table 5).

Discussion

Based on sex, the frequency of male patients was higher compared to female patients. Based on another study conducted by Mustafa et al.¹¹ in Kosovo, 91 patients are discovered with CSOM, and males patients are higher 55 (60.4%) than female patients 36 (39.6%). Another study conducted in Saudi Arabia⁵ shows that males are highly prominent than females due to the childhood infections caused by major differences based on anatomic, behavioral and socioeconomic factors.

Data analysis showed highest in patients who underwent mastoidectomy was those aged between 15–64 years (83.37%) or also known as the productive age. A study carried out in Palembang² from 2008 till 2010, states that among 84 patients who have mastoidectomy, mostly are aged between 16–30 years (48.8%), and the youngest is 6 years old while the oldest is 59 years old. Otitis media (OM) are discovered in children

Table 5 Abnormalities Findings in the Middle Ear Structure during Surgery

Abnormalities in	Frequency	Percentage (%)
Mastoid antrum	34	82.97
Tegmen tympani	2	4.88
Sigmoid Sinus	9	21.95
Semicircular canal	5	12.2
Facial canal	6	14.63
Aditus ad antrum	32	78.05
Auditory ossicles	29	70.73
Tympani cavity	28	68.29
Canalis Acusticus Externus (CAE)	30	73.17

and developed as age increases, due to many risk factors such as artificial feeding, low socioeconomic, exposure to smoking, allergic rhinitis, adenoid hypertrophy, chronic tonsillitis, upper respiratory tract infection (URTI) and lower respiratory tract infection (LRTI).⁵

The most common cause of the CSOM is infection.⁵ A study conducted by Ghonaim⁵ in Saudi Arabia proves that bacterium are the major cause of OM. Out of 110 patients who are taken for bacterial cultures, 68 CSOM patients have positive results. *S.pneumoniae*, *Staph. Aureus*, *proteus* and *P. aeruginosa* are the most common causative agents of Acute Suppurative Otitis Media (ASOM) and CSOM.⁵ In addition, there were also other chief complaints, such as trauma and tumor. Trauma normally occurs due to the high pressure which can feel inside of the flight while flying over.⁶ This situation often results in perforation of tympanic membrane. Tumor such as cholesteatoma is mostly associated with COM. It usually damages bony parts of temporal bone.⁷ The study in Palembang² states that out of 84 patients with CSOM, 62 (73.8%) patients are with cholesteatoma and 22 (25.2%) patients without cholesteatoma. This clearly shows CSOM is mostly associated with cholesteatoma.

Based on the above results, CSOM patients often complained about having effusion in the middle ear or in other words otorrhea. Besides, patients also came up with many chief complaints, such as otalgia, hearing loss, retroauricular abscess, headache, facial nerve palsy and vertigo. While, otalgia, hearing loss and retroauricular abscess were the second highest chief complaints of patients. Vertigo and headache were the least complaints of patients. All these chief complaints indicated the acute otitis media (AOM) had become more severe and needed immediate treatment to prevent further complications such as total hearing loss. Based on an article in Orissa Journal of Otolaryngology, ear discharge is the main chief complaint, followed by hearing loss, headache, facial palsy, otalgia, and vertigo.⁸

Mastoidectomy is a surgical procedure which is classified into CWU and CWD. Both the CWD and CWU can also be performed together with tympanoplasty if necessary. CWD is now conducted worldwide. CWD has become the major type surgery because it is more effective, easy to be done in shorter duration and prevent recurrence and residual rate in those patients with cholesteatoma.¹² Additionally, Cholesteatoma is the major cause

of hearing loss. Based on a clinical study and management of cavity problems encountered in CWD mastoidectomy in 2009, it state that a retrospective study of 101 patients who have undergone CWD, the anatomic and function of the ears regains to normal.⁴ A research in Palembang² shows that out of a total of 84 patients with CSOM, the majority of 61 patients (72.6%) have undergone CWD, 13 patients (15.5%) have undergone CWU and 10 patients (11.9%) have undergone Tympanoplasty. Another study in India⁹ shows 600 patients have undergone canal wall down tympanomastoidectomy and 546 patients shows dry and healed cavity with best curative and functional results. In addition, another journal has stated that canal wall down tympanomastoid is performed to those CSOM patients to eliminate cholesteatoma with extradural granulation.¹⁰

Intraoperative findings are abnormalities discovered in the anatomic parts of the ear during surgery. Based on the data analysis, the most common abnormalities discovered were in antrum mastoid, tegmen tympani, sigmoid sinus, semicircular canal, facial canal, aditus ad antrum, auditory ossicle, tympanic cavity and CAE. Most commonly, the abnormalities that could be discovered were cholesteatoma, granulation tissue, secretion and many more.

The study was conducted using secondary data which were medical records of patients who underwent mastoidectomy at Hasan Sadikin Hospital Bandung from 1st January 2012 until 31st December 2013, and the data obtained were 55 samples. Out of the 55 samples, only 41 samples could be used as study-subject, whereas the remaining 14 samples were not used as subject because of incomplete information.

It can be concluded that the highest frequency is age of 15–64, male, while, otorrhea is the chief complaint of the patients and infection is the main cause. The majority of patients have undergone CWD, and abnormalities are discovered in the middle ear structure during the surgery, such as in mastoid antrum, tegmen tympani, sigmoid sinus, semicircular canal, facial canal, auditory ad antrum, tympanic cavity and CAE.

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