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Intracranial Complications of Chronic Otitis Media at Mohammad Hoesin Hospital Palembang

Abla Ghanie

Department of Otorhinolaryngology-Head and Neck Surgery, Universitas Sriwijaya, Mohammad Hoesin Hospital, Palembang, South Sumatera, Indonesia

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ABSTRACT

Chronic Otitis Media (COM) is an inflammation in all or part of middle ear mucosa characterized by tymphanic membrane perforation, mucopurulent secretions, and persists at least 8 weeks. Chronic Otitis Media (COM) may cause intracranial complications. Baig et al in 2011 reported 4 out of 160 COM were found with intracranial complication. Intracranial complications are associated with high rates of serious morbidity and mortality. Therefore comprehensive management is necessary. Objective: To find out the incidence of COM with intracranial complication at Dr. Mohammad Hoesin Hospital. Case: From 1312 COM Cases, 116 were found with cholesteatoma. Eleven cases of COM with cholesteatoma were found with intracranial complications. We reported intracranial complication such as cerebral abscess, meningitis, and hidrocephalus. Management: Seven of cerebral abscess were identified, whereas 3 cases were treated with mastoidektomy CWD and burr hole, 2 cases were undergone mastoidektomy CWD without any neurosurgery intervention, and 2 others were managed with conservative medication treatment and neurosurgery intervention with craniotomy and burr hole, patients died before the mastoidectomy was done. All cases of meningitis (2 cases) were treated with mastoidectomy CWD. And 2 hidrocephalus cases were treated with mastoidektomy CWD and VP shunt. Prompt diagnosis and comprehensive therapy are critical to minimizing the morbidity and mortality of COM with intracranial complication.

Keywords: COM, Cholesteatoma, Intracranial Complication

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Corresponding author: Abla Ghanie
e-mail✉ abla_ghanie_irwan@yahoo.com
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INTRODUCTION

Chronic Otitis Media (COM) is an inflammation in all or part of middle ear mucosa characterized by tymphanic membrane perforation, mucopurulent secretions, and persists at least 8 weeks. There are two types of chronic otitis media, the first is benign type (tubotimpanal), which is a mucosal inflammatory process only and usually does not affect bone, rarely cause complications, and there is no cholesteatoma. Both types of atikoantral are characterized by marginal perforation or attic, can affect bone with kolesteatoma. Chronic otitis media with persistent cholesteatoma can lead to intracranial and intratemporal complications, frequently fatal outcome and associated with high rates of serious morbidity and mortality. The most common intracranial complications are cerebral abscess, meningitis and hydrocephalus ottic [1, 2, 6].

The burden of COM varies. Global prevalence rates estimates a range between 1% and 46%; it has been estimated that 65–330 million individuals have discharging ears, 60% of whom suffer from significant hearing impairment. According to the World Health Organization (WHO), Western Pacific countries have the highest prevalence (2.5% to 43%), followed by South East Asia (0.9% to 7.8%), Africa (0.4% to 4.2%), South and Central America (3%), the Eastern Mediterranean (1.4%), and finally Europe (average prevalence of 0.4%). The incidence of chronic otitis media with the highest intracranial complications is found in

developing countries. WHO explained the percentage, the prevalence of chronic otitis media with intracranial complications in various countries namely, Thailand 0.9% -4.7%, India 7.8% and Indonesia as much as 3.9%. Males are reported more often than women. In Mohammad Hoesin Hospital (RSMH) Palembang reported 1312 cases of COM found 116 cases with cholesteatoma, and 11 cases of intracranial complications. A total of 7 cases of cerebral abscess, 2 cases of meningitis, and 2 cases of hydrocephalus [1, 3].

The diagnosis of cholesteatoma with intracranial complications can be established by history, physical examination and imaging. Anamneses obtained are otorrhae and foul-smelling for 2 months. The most common intracranial complications clinical symptoms are headache, fever, nausea, vomiting, sometimes accompanied by neurological deficit and even decreased untill loss of consciousness. Physical examination of otoscopy are found perforation of tympanic membrane (TM) especially attic, with mucopurulent secret and foul-smelling. Temporal bone CT imaging is very useful and will likely demonstrate the pathology and site of lesion. MR imaging is helpful if lesions other than cholesteatoma are considered. Management of chronic otitis media with intracranial complications should be treated with conservative therapy. When complications have resulted from COM and mastoiditis, initial antibiotic therapy should involve broad-spectrum antibiotics effective against anaerobic and aerobic organisms. In all of these cases, some form of mastoidectomy is required. When surgery is necessary for intracranial complications, the neurosurgeon conventionally operates first, and temporal bone management is considered separately. A mastoidectomy may be performed at the same sitting, if the patient's condition permits. The aim of this case report is to find out the incidence of COM with intracranial complication at Dr. Mohammad Hoesin Hospital [1, 4].

CASE REPORT

From 1312 COM Cases, 116 were found with cholesteatoma. Eleven cases of COM with cholesteatoma were found with intracranial complications. We reported intracranial complication such as cerebral abscess, cerebral, meningitis, and hidrocephalus. Among the selected 11 patients, 7 were male (63,6%) and 4 were female (36.3%). In a series of 11 intracranial complications of COM, 45,4% were present in patients younger than 20 years of age. Baseline characteristics are shown in the table. Participants complained about otorrhea, headache, loss of consciousness, fever, otalgia, seizure, stiff neck, nausea or vomiting. Based on these clinical symptoms, all of the participants complained otorrhae (100%). While 9 participants (81,8%) had headache, only a few participants complained of nausea or vomiting (18,1%).

Seven of cerebral abscess were identified, whereas 3 cases were treated with canal wall down (CWD) mastoidectomy and brain abscess drainage (burr hole), 2 cases COM with cerebral abscess < 2 cm were undergone CWD mastoidectomy without any neurosurgery intervention that we can see in table 1. There were 2 others COM with cerebral abscess complication were managed with conservative medication treatment and neurosurgery intervention with craniotomy and burr hole, patients died before the mastoidectomy was done (table 2).

All cases of meningitis (patient number 8 and 9) were treated with CWD mastoidectomy. And 2 hidrocephalus cases (patient number 10 and 11) were treated with CWD mastoidectomy and VP shunt that we can see in table 3.

DISCUSSION

Chronic otitis media (COM) is a middle ear infection lasting more than 2 months accompanied by otorrhae. COM with cholesteatoma can cause intratemporal and intracranial complications. Low socioeconomic status and overcrowding confer either greater risk of or diminished resistance to infection, with an associated higher incidence of an extended course and complications. Associations with inadequate health education and limited access to medical care likely contribute to the heightened risk of complication. For this reason, most of the current reports of otogenic brain abscesses come from underdeveloped countries, including Indonesia. The cases of COM in Palembang, especially in Dr. Mohammad Hosein Hospital reported 1312 cases, found 116 cases COM with cholesteatoma and 11 cases with intracranial complications include cerebral abscess, meningitis, and hydrocephalus [1, 4].

Table 1: Cholesteatoma patients with cereberal abscess complication. Clinical presentation, Audiogram, Imaging, Procedures, Intraoperative Findings

	Patient no				
	1	**2**	**3**	**4**	**5**
Age, yrs	41	29	21	13	40
Gender	Male	Male	Male	Male	Male
History of Otorrhae	± 10 yrs	> 10 yrs	± 10 yrs	± 10 yrs	± 5 yrs
symptoms	Headache, unconsciousness, vomiting	Headache	Headache, Otalgia	Seizures, unconsciousness,	Headache, Otalgia
Otoscopy findings	Left ear : mucopurullent secretion (+), granulation tissue (+), attic perforation, cholesteatoma (+)	Right ear : total perforation of tympanic membrane (TM)	Right ear : mucopurullent secretion (+), granulation tissue (+)	Left Ear : total perforation of TM, mucopurullent secretion (+)	Right Ear : sub total perforation of TM, granulation tissue (+)
Audiogram	Conductive hearing loss (CHL) : Right Ear 37,5 dB Left Ear 37,5 dB	Right Ear : sensorineural hearing loss (SNHL) >90dB Left Ear : Mixed hearing loss (MHL) 56,25dB	Right Ear : SNHL (68,75 dB) Left Ear : Normal Hearing (21,25 dB)	Right Ear : CHL (33,75 dB) Left Ear : SNHL (>90 dB)	Right Ear : SNHL (73,75 dB) Left Ear : CHL (37,5 dB)
Ro Mastoid	Cholesteatoma (+)	Cholesteatoma (+)`	Chronic mastoiditis dextra, Cholesteatoma (+)	Chronic mastoiditis sinistra, Cholesteatoma (+)	Cholesteatoma (+)
Brain CT, Abscess location	Cereberal abscess	Cereberal abscess, Temporal lobe	Cereberal abscess	Cereberal abscess < 2cm, Parietal lobe	Cereberal abscess < 2cm
Microbiology (Ear)	Proteus mirabilis	Streptokokus pyogenes	Pseudomonas aeruginosa	Pseudomonas aeruginosa	Pseudomonas aeruginosa
Surgery procedures	• Neurosurgery : craniotomy, Brain abscess (BA) drainage • ORLHN: Radical mastoidectomy	BA drainage and CWD mastoidectomy	BA drainage and CWD mastoidectomy	CWD mastoidectomy	CWD mastoidectomy
Intraoperative Findings	Defect of tegmen tympani and antri	Defect of tegmen tympani and antri	Defect of tegmen tympani and antri	Defect of mastoid antrum	Defect of tegmen tympani and antri

Table 2: Cholesteatoma patients with cereberal abscess complication who had died before the mastoidectomy was done. Clinical presentation, Audiogram, Imaging, Procedures

	Patient No.	
	6	**7**
Age, yrs	19	45
Gender	Male	Male
History of Otorrhae	± 12 yrs	> 10 yrs
symptoms	Headache, seizure, loss of consciousness	Headache, seizure, loss of consciousness
Otoscopy findings	Right ear : Granulation tissue (+)	Left Ear : total perforation of TM, mucopurullent secretion (+)
Audiogram	Right ear : SNHL (87,5 dB) Left ear : CHL (40 dB)	Right ear : CHL (40 dB) Left ear : SNHL (87,5 dB)
Ro Mastoid	Cholesteatoma (+)	Chronic mastoiditis bilateral, Cholesteatoma (+)
Brain CT, Abscess location	Cereberal abscess	Cereberal abscess, Temporal lobe
Microbiology (Ear)	Proteus mirabilis	Pseudomonas aureginosa
Surgery procedures	Neurosurgery : craniotomy	Neurosurgery : craniotomy

Table 3: Cholesteatoma patients with meningitis and hidrocephalus complication. Clinical presentation, Audiogram, Imaging, Procedures, Intraoperative Findings

	Patient No.			
	8	**9**	**10**	**11**
Age, yrs	14	11	22	10
Gender	Female	Male	Female	Female
History of Otorrhae	4 yrs	4 yrs	5 yrs	> 5 yrs
symptoms	Seizure, loss of consciousness, stiff neck	Headache, loss of consciousness, stiff neck, vomiting	Headache, stiff neck, otalgia	Headache
Otoscopy findings	Right ear : sagging antero-postero-inferior	Total perforation of TM, granulation tissue (+)	Right ear : sub total perforation of TM Left ear: granulation tissue (+), mucoid secret (+)	Right Ear : total perforation of TM, cholesteatoma (+), granulation tissue (+)
Audiogram	Right ear : SNHL (>90 dB) Left ear: Normal hearing (20 dB)	Both : SNHL (>90dB)	Right ear : MHL (72,5 dB) Left ear : SNHL (> 90 dB)	Right ear : CHL (56,25 dB) Left ear : CHL (50dB)
Ro Mastoid	Cholesteatoma (-)	Cholesteatoma (+)	Bilateral chronic mastoiditis, Cholesteatoma (+)	Cholesteatoma (+)
Brain CT,	Cerebral abscess (-)	Cerebral abscess (-)	Hidrocephalus (+)	Hidrocephalus (+)
Microbiology (Ear)	Staphylococcus epidermidis	Pseudomonas aeruginosa	Pseudomonas aeruginosa	Pseudomonas aeruginosa
Surgery procedures	Radical mastoidectomy	CWD mastoidectomy	Neurosurgery : VP Shunt • ORLHN : radical mastoidectomy	• Neurosurgery : VP Shunt ORLHN : CWD mastoidectomy
Intraoperative findings	Defect of tegmen tympani and antri	Defect of mastoid antrum	Defect of tegmen tympani and antri	Defect of mastoid Antrum

Among the selected 11 patients, 7 were male (63,6%) and 4 were female (36.3%). penido et al reported from 1816 COM patients, 52% were female and the mean age was 31 years. Mustafa *et al*., reported that the incidence of COM in Kosovo from 91 patients, found 55 male patients and 36 patients were women. Predisposing factors that may affect chronic otitis media include upper respiratory tract infection, poor hygiene and weak socioeconomics. dr. jose acuin explains there are several predisposing factors for the occurrence of chronic suppurative media ottis, among others, upper respiratory tract infections [2, 3, 10].

The cases of com found in Mohammad Hoesin hospital have symptoms such as ottorhae, foul-smelling, hearing loss, headache and even decreased untill loss of consciousness. Otorrhae symptoms found in some of the above cases commonly more than 1 year, accompanied by increasingly severe headache, conductive hearing loss is most commonly found in this case. Ahmed *et al.,* in the study reported, chronic otitis media symptoms obtained 100% otore, 100% hearing loss, headache and otalgia 48.7%, 48.7% fever, nausea vomiting 19.5%. Shemsedin *et al* in 2013 in Kosovo explained that in chronic otitis media, 50% of conductive hearing loss occurred [5, 7].

Eleven cases of com with cholesteatoma were found with intracranial complications. We reported intracranial complication such as cerebral abscess, meningitis, and hidrocephalus. Management of com with intracranial complications was performed at the same time with neurosurgery if the patient's condition permits (1 patient). The other case, the management were done separately. Neurosurgeon did the operation first, and then temporal bone management (mastoidectomy) were done. in the cases of cereberal abscess were smaller than 2 cm were treated conservative therapy and performed mastoidectomy. In the cases of hydrocephalus were performed vp shunt first and then mastoidectomy. Intracranial complications of meningitis were managed conservative and followed by mastoidectomy procedure to remove the source of infection. Penindo *et* al., reported intracranial complications in omk, 46% cerebral abscess, 37% meningitis, 9% lateral sinus thrombosis, 4% subdural empyema, 2% epidural empyema. when complications have resulted from COM and mastoiditis, initial antibiotic therapy

should involve broad-spectrum antibiotics effective against anaerobic and aerobic organisms. in all of these cases, some form of mastoidectomy is required. When surgery is necessary for intracranial complications, the neurosurgeon conventionally operates first, and temporal bone management is considered separately. A mastoidectomy may be performed at the same sitting, if the patient's condition permits. The aim of this case report is to find out the incidence of com with intracranial complication at Mohammad Hoesin hospital [2, 4, 12, 15].

Sampath in 2013, explained that com with cerebral abscesses patients caused by an extension of the source of infection from middle ear infections that spread by hematogen or on the parenkim cerebri directly. In most instances, except for brain abscess and subdural empyema, the com and its complications are treated entirely through the mastoid. when intracranial and otologic surgical procedures are necessary, the surgeons must plan the order of procedures, preparation, draping, and incisions to limit the duration of the anesthesia and optimize surgery. A mastoidectomy under these circumstances is hampered by inflammation, and landmarks can be obscured. when no cholesteatoma is associated with the mastoiditis, the external auditory canal wall can be left intact unless visibility is inadequate. an open-cavity, canal-wall-down procedure is preferred in the presence of cholesteatoma. Currently preoperative antibiotic therapy is a recommended therapy for cerebral abscess, reported giving omoxicillin clavulanat have effectiveness against bacteria 79,4%, ciprofloksasin 95%, amoxicillin 76,9% [4, 11, 13, 14].

CONCLUSION

At Mohammad Hoesin Hospital Palembang, there were 11 cases of chronic otitis media (COM) with intracranial complication and 9 of them were operated through mastoidectomy procedure. Without a high suspicion, early evidence of an impending complication will be missed. Early symptoms and signs of complication are otorrhea, otalgia, fever, headache, loss of consciousness, stiff neck, nausea or vomiting. A high level of clinical awareness is important for early diagnosis and it is the responsibility of otorhinolaryngologists and primary care physicians. Thus, we should encourage primary care physicians to refer patients with COM who have had the signs and symptoms of intracranial complication immediately. Prompt diagnosis and comprehensive therapy are critical to minimizing the morbidity and mortality of COM with intracranial complication.

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