

Clinical Spectrum of Intracranial Complication in Children with Chronic Otitis Media Review of 11 Cases

Masyita Gaffar^{1,2,3*}, Sri Wartati¹, Abdul Kadir¹, Hardianti Agri¹, Andhika Y Putra¹, Ardian P Saputra¹

¹Departement of Otorhinolaryngology Head and Neck Surgery, Makassar Indonesia

²Hospital of Wahidin Sudirohusodo, Makassar, Indonesia

³Jaury Yusuf Akademis Hospital, Makassar

Citation: Masyita Gaffar, Sri Wartati, Abdul Kadir, Hardianti Agri, Andhika Y Putra, Ardian P Saputra. Clinical Spectrum of Intracranial Complication in Children with Chronic Otitis Media Review of 11 Cases. *Annal of Otol Head and Neck Surg.* 2026;5(4):1-6.

Received Date: 05 June, 2026; **Accepted Date:** 10 June, 2026; **Published Date:** 12 June, 2026

***Corresponding author:** Masyita Gaffar, Department of Otorhinolaryngology - Head and Neck Surgery Hasanuddin University, Makassar, South Sulawesi, Indonesia

Copyright: © Masyita Gaffar, Open Access 2026. This article, published in *Annal of Otol Head and Neck Surg (AOHNS)* (Attribution 4.0 International), as described by <http://creativecommons.org/licenses/by/4.0/>.

ABSTRACT

Background: Otitis media is one of the most common childhood infections, with chronic suppurative otitis media (CSOM) and cholesteatoma posing risks for severe intracranial complications. Although rare, these complications can be life-threatening and require urgent multidisciplinary management.

Methods: We retrospectively reviewed 11 pediatric patients treated for intracranial complications of CSOM between March 2021 and March 2024 at three tertiary teaching hospitals affiliated with Hasanuddin University, Makassar, Indonesia. Clinical features, imaging findings, microbiology, surgical interventions, and outcomes were analyzed.

Results: Of the 11 patients (10 boys, 1 girl; mean age 11 years), all had CSOM with cholesteatoma. The most common symptoms were fetid otorrhea (100%) and severe cephalgia (90.9%). Intracranial complications included brain abscesses (72.7%), sigmoid sinus thrombosis (18%), hydrocephalus (18%), extradural abscess (9%), and subdural empyema (9%). All patients underwent canal wall down mastoidectomy; eight required simultaneous craniotomy. Positive cultures were obtained in four cases, identifying *Staphylococcus haemolyticus*, *Staphylococcus* spp., *Streptococcus constellatus*, and *Pseudomonas aeruginosa*. At six months, 72.7% achieved a dry ear. Neurological recovery was partial: hemiparesis improved in most cases, while aphasia persisted in two patients. No mortality was recorded.

Conclusion: Intracranial complications of CSOM in children, though uncommon, remain clinically significant and potentially devastating. Brain abscess is the most frequent complication, often presenting with severe neurological deficits. Early recognition, aggressive surgical management, and prolonged antibiotic therapy are essential for favorable outcomes.

Keywords: Intracranial complication; CSOM; Children

INTRODUCTION

Otitis media is among the most common childhood infections; by the age of three, more than 80% of children will have experienced at least one episode [1]. Chronic otitis media (COM) can result in both extracranial and intracranial complications. Intracranial (IC) complications, particularly those associated with cholesteatoma in pediatric patients, are often severe, potentially life-threatening, and demand prompt, aggressive intervention. Although infrequent, intracranial complications occur in 0.3% of cases in developed countries and up to 3% in developing regions [2,3].

Objective: This study aimed to describe the clinical features, management strategies, and outcomes of children presenting with intracranial complications of chronic suppurative otitis media (CSOM).

METHODS

Eleven pediatric patients treated for intracranial complications of CSOM between March 2021 and March 2024 were included. All were managed at three tertiary teaching hospitals affiliated with Hasanuddin University, Makassar, Indonesia.

Imaging: CT scans of the temporal bone and brain with contrast, or MRI, were performed for all patients.

Audiometry: Pure Tone Audiometry was feasible in five patients; others were uncooperative due to decreased consciousness.

Data collected: Age, sex, clinical presentation, management, and outcomes.

RESULTS

A total of 11 children (10 boys, 1 girl; mean age 11 years, range 4-17) were identified. Seven were diagnosed in the Department of Otorhinolaryngology, two referred from Neurosurgery, and two from Pediatrics.

Laterality: Left ear involvement in 5 patients (45.5%), right ear in 3 (27.2%), and bilateral disease in 3 (Table 1).

Pathology: All cases involved CSOM with cholesteatoma (100%).

Symptoms

Of the 11 patients, the most commonly symptoms were fetid otorrhea (100%), severe cephalgia (90.9%), fever (45.4%), lethargy (36.3%), hemiparesis (36.3%), vomiting (27.2%), picket fence fever (18%), seizures (18%), and aphasia (18%) (Table 2). Four patients were found to have extracranial complication namely subperiosteal abscess with/without fistula in eight patients (72.7%).

Complications: Brain abscess was most frequent (72.7%), followed by sigmoid sinus thrombosis (18%), hydrocephalus (18%), extradural abscess (9%), and subdural empyema (9%).

The complications found can be single or multiple in one patient, and this seems to affects the severity of the symptoms (Table 3).

Tympanic membrane perforation mostly observed in pars tensa 63, 6% (7), while attic perforation in 4 patients.

Table 1: Patient Characteristics and Findings.

No	Sex	Age	Ear Disease & IC Complication	Signs & Symptoms	Ear Surgery	Outcome
1	Boy	8	Left CSOM cholesteatoma, subperiosteal abscess, temporoparietal abscess	GCS 12, lethargy, hemiparesis, severe cephalgia, fever, profuse otorrhea	Mastoidectomy + craniotomy	3 years FU: tympanic membrane perforation, mobility recovery
2	Boy	8	Right CSOM cholesteatoma, sigmoid sinus thrombosis	Picket fence fever >10 days, cephalgia, fetid otorrhea	Mastoidectomy	16 months FU: revision mastoidectomy, recurrent cholesteatoma; 2 yr FU: dry ear
3	Boy	12	Right CSOM cholesteatoma, sigmoid sinus thrombosis	Picket fence fever 3 weeks, severe cephalgia, retroauricular abscess, lethargy	Mastoidectomy	23 months FU: dry ear
4	Girl	7	Left CSOM cholesteatoma, subdural abscess	Fetid otorrhea, severe cephalgia, hemiparesis	Mastoidectomy + craniotomy	3 years FU: dry ear Mobility recovery
5	Boy	17	Congenital petrous bone cholesteatoma, temporal/cerebellar abscess, hydrocephalus	Cephalgia, otalgia, focal neurologic signs, poor wound healing	Mastoidectomy, abscess drainage, VP shunt	3 years FU: dry ear, severe hearing loss
6	Boy	11	Bilateral CSOM, abscess/fistula retroauricular, left cerebri, subdural abscess, empyema	Severe cephalgia, otalgia Fever, fetid otorrhea, aphasia, right hemiparesis	Mastoidectomy, craniectomy	4 years FU, aphasia, well mastoid epithelialization, tympanic membrane perforation, mobility recovery
7	Boy	13	Bilateral CSOM, right cholesteatoma , cerebellar abscess, hydrocephalus	Lethargy , Otorrhea 5 years, severe cephalgia, vomiting, aphasia hemiparesis	Mastoidectomy, PV shunt, craniotomy	3 years FU Dry ear, aphasia, mobility mild improvement
8	Boy	15	Left CSOM, stenosis of EAC, temporal lobe abscess	Cephalgia, fetid otorrhea	Left mastoidectomy, craniotomy	18 months FU: dry mastoid cavity
9	Boy	4	Right CSOM cholesteatoma , extradural abscess	Cephalgia, otalgia, Fetid otorrhea,	Right mastoidectomy, abscess drainage	1 year FU, dry ear
10	Boy	17	Left CSOM, temporal lobe abscess	Severe Cephalgia, otalgia	Left mastoidectomy, craniotomy	19 months FU, dry ear
11	Boy	10	Bilateral CSOM, left cholesteatoma , temporal lobe abscess	Lethargi , cephalgia, fever	Left mastoidectomy, craniotomy	2 years FU dry ear

Key: CSOM=chronic suppurative otitis media; GCS= Glasgow coma scale; EAC=external auditory canal; PV=ventriculoperitoneal, FU: follow up

Table 2: Symptoms and Signs

Symptom/Sign	n	%
Fetid otorrhea	11	100
Severe cephalgia	10	91
Fever	5	45
Lethargy	4	36
Hemiparesis	3	27
Vomiting	3	27
Picket fence fever	2	18
Seizures	2	18
Aphasia	2	18

Table 3: Intracranial Complications

Complication	n
Temporal lobe abscess	6
Cerebellar abscess	1
Sigmoid sinus thrombosis	2
Hydrocephalus	2
Subdural abscess/empyema	1
Extradural abscess	1

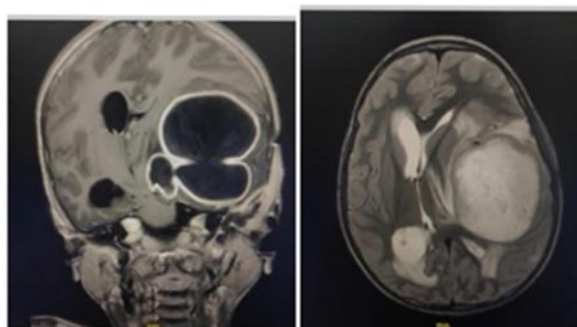


Figure 1: MRI contrast show a huge temporal lobe abscess with perifocal edema +/- 5, 95x3, 07x3, 28 cm at left temporoparietal lobe, narrowing left lateral ventricle push the midline to the contralateral +/- 0, 95 cm.

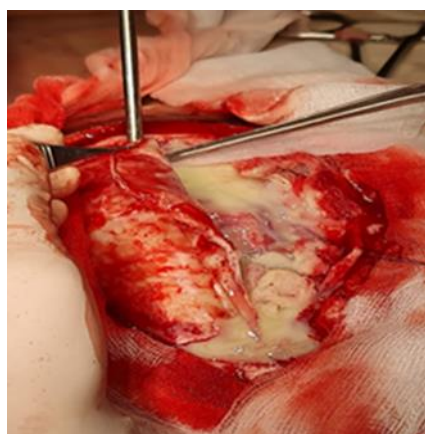


Figure 2: Purulent collection in the subdural space

Treatment: All patients underwent canal wall down mastoidectomy. Eight required simultaneous craniotomy; three underwent mastoidectomy alone. Antibiotics were administered for 6–8 weeks.

Microbiology: Positive cultures in 4 patients (Staphylococcus haemolyticus, Staphylococcus spp., Streptococcus constellatus, Pseudomonas aeruginosa).

Outcomes: At six months, 72.7% achieved a dry ear. Persistent otorrhea occurred in three patients (from middle ear). Two patients with aphasia showed no improvement, while three of four with hemiparesis recovered. No mortality was recorded.

One patient experienced a recurrent intracranial abscess, necessitating a second neurosurgical intervention two weeks after the initial craniotomy. Additionally, cholesteatoma recurred in one patient 18 months following the previous surgery, who successfully underwent a revision mastoidectomy.

DISCUSSION

Otitis media, particularly when complicated by cholesteatoma, poses a significant risk for severe intracranial complications. In children, cholesteatoma tends to be more aggressive and recurrent compared to adults [4].

In this series, males predominated (90.9%), consistent with prior reports, though the reason remains unclear [5]. Brain abscess was the most common intracranial complication (72.7%), typically located in the temporal lobe or cerebellum due to contiguous spread [5,6]. Clinical manifestations included lethargy, hemiparesis, and aphasia.

Sigmoid sinus thrombosis occurred in 18% of cases, reflecting its known association with chronic mastoiditis. Despite declining incidence, diagnosis requires high clinical suspicion due to variable presentation [7,8].

Headache was the most consistent symptom, aligning with previous studies, while “picket fence fever” was observed in two cases of sinus thrombosis. Rare complications such as subdural empyema were also encountered, presenting with severe neurological deficits such as hemiparesis and aphasia [9,10].

Given the severity of disease, canal wall down mastoidectomy was performed universally to minimize recurrence and facilitate postoperative care. Outcomes were favorable, with no mortality, though persistent deficits such as aphasia highlight the potential for long-term morbidity.

REFERENCES

1. Kliegman RM, Behrman RE, Jenson HB, Stanton BM. Nelson textbook of pediatrics. 20th ed. Elsevier; 2016.
2. Sharma N, Jaiswal AA, Banerjee PK, Garg AK. Complications of chronic suppurative otitis media and their management: a single institution 12 years’ experience. Indian J Otolaryngol Head Neck Surg. 2015;67(4):353-60.
3. O’Connor TE, Perry CF, Lannigan FJ. Complications of otitis media in Indigenous and non-Indigenous children. Med J Aust. 2009;191(S9):S60-4.
4. Alqudehy ZA, Al-Abdulqader A, Alsyayikh H. Pediatric cholesteatoma aggressiveness; a comparative study of predictive factors and recurrence rate. Otolaryngol Open Access J. 2016;1(2): 25-32.
5. Ankur Gupta, Anthony Thai, MD, and Peter Luke Santa. Epidemiology of Chronic Suppurative Otitis Media in the United States. Ann Otol Rhinol Laryngol. 2024;133(8):741-749.

6. Ryan JT, Pena M, Zalzal GH, Preciado DA. Otogenic lateral sinus thrombosis in children: a review of 7 cases. Ear Nose Throat J. 2016;95(3):108-12.
7. Garcia RD, Baker AS, Cunningham MJ, Weber AL. Lateral sinus thrombosis associated with otitis media and mastoiditis in children. Pediatr Infect Dis J. 1995;14(07):617-623.
8. Smith JA, Danner CJ. Complications of chronic otitis media and cholesteatoma. Otolaryngol Clin North Am. 2006;39(06):1237-1255.
9. Ghosh PS, Ghosh D, Goldfarb J, Sabella C. Lateral sinus thrombosis associated with mastoiditis and otitis media in children: a retrospective chart review and review of the literature. J Child Neurol. 2011;26(08):1000-1004.
10. de Oliveira Penido N, Testa JR, Inoue DP, Cruz OL. Presentation, treatment, and clinical course of otogenic lateral sinus thrombosis. Acta Otolaryngol. 2009;129(07):729-734.