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Complications of chronic suppurative otitis media and their management: five year study at tertiary care centre

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ABSTRACT

Background: Chronic suppurative otitis media is a disease that can end up in complications when treatment is delayed. The present prospective study was conducted at our tertiary care hospital and teaching centre to evaluate the incidence of complications of CSOM and their management.
Methods: We analysed the clinical and intra operative findings, type of medical and surgical management and recovery of the patient.
Results: Total 20 cases of CSOM with complications were reviewed in study period of 5 years. Of these 20 cases, 14 cases had extracranial (EC) while 6 cases had intracranial (IC) complications. The encountered IC complications were brain abscess ie temporal lobe abscess, pyogenic meningitis, lateral sinus thrombophlebitis and extradural abscess. Among the EC complications, mastoid abscess, Bezolds abscess, zygomatic abscess and labyrinthitis were encountered. The IC complications presented with fever, headache, and signs of meningeal irritation. *Pseudomonas aeruginosa*, *Proteus*, *Staphylococcus epidermidis* and *E. coli* were the common organisms isolated. Both groups of patients had cholesteatoma and middle ear granulations. Surgery was the main modality of treatment with zero mortality rate. We reviewed the clinical presentation and management in both groups.
Conclusions: CSOM complications, inspite of their reduced incidence still pose a great challenge in developing countries. When the disease presents late, it lead to difficulty in management and consequently higher mortality. Our study emphasizes the importance of early diagnosis and prompt management.

Keywords: Chronic suppurative otitis media, Extracranial complications, Intracranial complications, Mastoid abscess, Labyrinthitis, Pyogenic meningitis, Lateral sinus thrombophlebitis

INTRODUCTION

Chronic suppurative otitis media is a disease associated with complications if not managed in time. Due to ignorance, poor literacy and late presentation the management becomes challenging and difficult. Inspite of the advent of higher antibiotics, chronic otitis media poses a threat to ENT surgeons because of the varied intra cranial and extra cranial complications that can be encountered. These complications are caused by progressive erosion of the bone thus increasing the risk of damage to exposed labyrinth, the dura and facial nerve. Prior to antibiotic era, intracranial (IC) complications occurred in 2.3–4% cases. With the advent of newer antibiotics and newer surgical techniques, the complication have been greatly reduced from 2.3-4% to 0.15–0.04%.[1] Likewise a decline in mortality has been seen from 25 to 8%.

Though there is an overall decline in the rate of complications of otitis media, life threatening complications are still seen to exist. The reasons behind

this may be, the changing virulence and susceptibility of bacteria, the state of individual patient and late presentation.[1] The aim of our study is to determine the prevalence of overall complications of Chronic suppurative otitis media (CSOM), warning signs and symptoms, the etiological agent and results of management. The objectives of our study are to determine the different types of complications affecting our patient population, study the efficacy of CT scan and culture and sensitivity tests and outcome of different management protocols.

METHODS

Over a study period of 5 years, overall 6595 patients with chronic suppurative otitis media were managed in the Department of ENT and Head Neck Surgery, D Y Patil Medical College Hospital and Research Centre, Kolhapur, Maharashtra. The study includes 20 cases of CSOM with complications. These patients were reviewed with regards to history, clinical findings investigations, audiology, radiological studies as well as ear swab culture and sensitivity tests. In our patients the complications of CSOM were classified into two major categories; extracranial (EC) and intracranial (IC) complications. The extracranial group includes subperiosteal abscess, Bezolds abscess, zygomatic abscess, labyrinthitis, and mastoiditis. Whereas the IC group included temporal lobe abscess, pyogenic meningitis, lateral sinus thrombosis, perisinus abscess and extradural abscess.

RESULTS

Prevalence

The prevalence of the EC group was 0.09% and for the IC group was 0.04%. The male to female ratio was found to be 2:1. The otitis media with complications usually occurred between the ages of 8–55 years. The youngest patient was 8 years old whereas the oldest one was of 55 years of age. The majority of patients were in the age group of 35–55 years (Table 1).

Table 1: Age wise distribution.

Age group (in years)	No. of cases
5-15	5
16-25	7
26-35	5
36-45	2
46-55	1

Occupation

The patients included students, farmers, labourers and housewives. All patients were of low socioeconomic status and presented with a long standing history of ear discharge. Most of our patients with intra cranial complication were staying in remote rural places where access to medical facility and expertise were far from reach.

Type of complications

Total 20 cases of CSOM were identified with complications, out of which 14 patients had EC while 06 patients had IC complications. The common complication in EC group was subperiosteal abscess -10, followed by Bezolds abscess-1, zygomatic abscess-1 and labyrinthitis-2. The complications encountered in EC group were temporal lobe abscess-1, pyogenic meningitis-2, lateral sinus thrombophlebitis-2 and extradural abscess-1 (Table 2).

Table 2: Types of complications.

Complication	No. of cases	Type of complication	No. of cases
Extracranial	14	Subperiosteal abscess	10
		Labyrinthitis	02
		Bezolds abscess	01
		Zygomatic abscess	01
Intracranial	06	Pyogenic meningitis	02
		Lateral sinus thrombophlebitis	02
		Temporal lobe abscess	01
		Extradural abscess	01

Clinical signs and symptoms

Out of 20 cases, the duration of otorrhoea was 5 years in 40% of cases and 5–10 years in 60% of cases. Hearing loss assessment showed a conductive hearing loss in 16 cases, sensorineural hearing loss in 2 cases while mixed type hearing loss in 2 cases. Common clinical signs and symptoms in both the groups are as stated in Table 3.

Table 3: Common clinical signs and symptoms.

S. no.	Signs and symptoms	IC group no. of cases	EC group no. of cases
1.	Fever	6	12
2.	Headache	6	11
3.	Meningeal signs	3	0
4.	Altered sensorium	5	0
5.	Otalgia	6	14
6.	Nausea/ vomiting	5	2
7.	Localising signs	6	14
8.	Post aural swelling	5	12
9.	Papilloedema	5	0
10.	Vertigo	4	2
11.	Nystagmus	4	2
12.	Facial nerve palsy	0	0

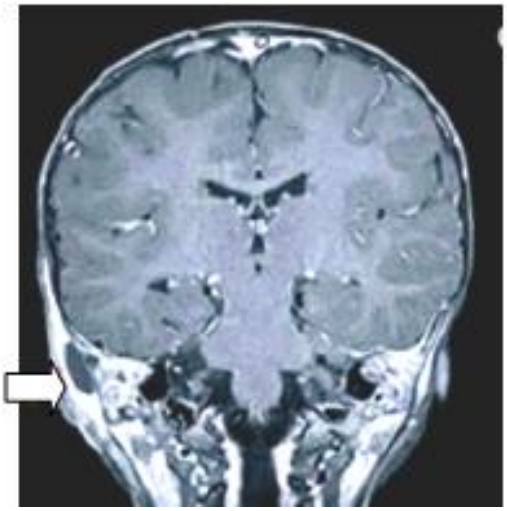

Figure 1: Coronal contrast enhanced T1 W image demonstrates a sub periosteal abscess.

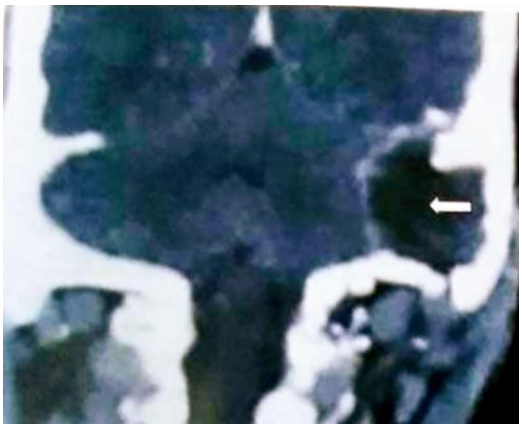

Figure 2: Coronal CT with contrast demonstrating mastoiditis with abscess collection in right sternocleidomastoid (Bezolds abscess).

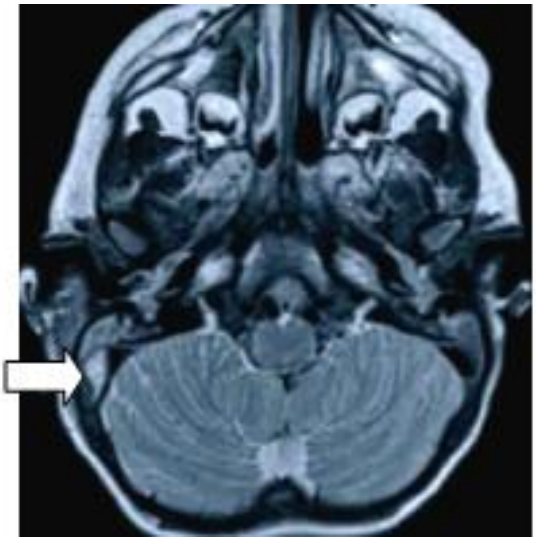

Figure 3: Axial T2 W image demonstrating a perisinus abscess.

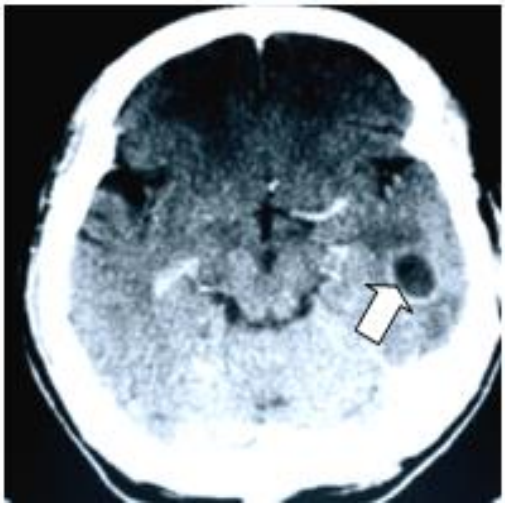

Figure 4: CT with contrast showing ring enhancing lesion indicating left temporal lobe abscess.

Radiological assessment included X-ray mastoid Schuller's view showed sclerosis in 15 cases and cloudy mastoid in 3 cases whereas CT scan head and temporal bone was done in 5 cases of which 1 case showed extradural collection while another case revealed temporal collection 2 others showed peri sinus collection (Figure 1-4).

Bacterial organisms

Of 6 cases in IC group, 2 cases were sterile on culture because patients already received IV antibiotics while rest four patients showed growth of *Proteus mirabilis*. In the EC group seven cases showed *Staphalococcus aureus* growth, three showed *Pseudomonas*, 2 showed *E. coli* while two cases were sterile (Table 4).

Table 4: Bacterial organisms isolated on culture.

Intra cranial group		Extra cranial group	
Organism isolated	**No. of cases**	**Organism isolated**	**No. of cases**
Proteus Mirabilis	4	*Staph aureus*	7
		Pseudomonas	3
Sterile	2	*E. coli*	2
		Sterile	2

Treatment

We treated our patients with multiple high dose parenteral antibiotics such as Inj Cefuroxime (100–150 mg/kg/day, 8 hourly), aminoglycosides like Inj Amikacin (7.5 mg/kg/day, 12 hourly) and Inj. Metronidazole (500 mg/100 ml, 8 hourly/day) or Tinidazole (2 mg/1 ml-400 ml) infusion before surgery. The other antibiotics used were inj. Amoxycillin clavulanic acid/Ceftriaxone/ Pepracillin Tazobactum depending on culture and sensitivity. The most common complication in EC group was subperiosteal abscess followed by Bezolds and

zygomatic abscess. Incision and drainage of post aural abscess was followed by canal wall down mastoid surgery. The 2nd EC complication encountered was labyrinthitis. These two patients required IV multiple dose antibiotics, labyrinthine sedatives, absolute bed rest with canal wall down mastoidectomy with complete removal of the disease and repair of fistula. In 4 of the cases, horizontal segment of facial nerve was exposed by the disease but luckily none of these patients in our study presented with facial palsy (Figure 5).

Figure 5: Clinical photograph showing postaural fistula with neck swelling in a case of Bezolds abscess.

Treatment in IC group included multiple high dose parenteral antibiotics, IC drainage and canal wall down mastoidectomy. The IV antibiotic therapy was initially given for 48–72 hours before draining the abscess. The ear surgery i.e. canal wall down mastoidectomy was performed 7 days later. Meningitis is the second most common complication in our study. Lumbar puncture was done to confirm the diagnosis and 72 hours later with intravenous antibiotic cover the patients were subjected to mastoidectomy. In patients with perisinus abscess and possible lateral sinus thrombosis, aspiration through sinus wall was done and sinus packed tightly with gauze before the wall was incised. In all cases with IC complication, patients were treated with canal wall down mastoidectomy because most of these patients had extensive cholesteatoma and were from remote rural places. We feared poor follow up in them (Table 5) (Figure 6).

Figure 6: Intra operative photograph showing dehiscent facial nerve with erosion of sinus plate and mastoid tip.

Table 5: Treatment protocol followed in our study.

Type of complication	Name of the complication	Medical management in all cases	Surgical management Canal wall down (CWD) Incision and drainage(Iand D)
Extracranial	Subperiosteal abscess	IV antibiotics	I and D followed by CWD mastoidectomy
	Labyrinthitis		Repair of labyrinthine fistula and CWD mastoidectomy.
	Bezolds abscess		I and D followed by CWD mastoidectomy
	Zygomatic abscess		I and D followed by CWD mastoidectomy.
Intracranial	Pyogenic meningitis		CWD mastoidectomy
	Lateral sinus thrombophlebitis/ perisinus abscess		Sinus exploration with CWD mastoidectomy.
	Temporal lobe abscess		Craniotomy for abscess drainage followed by CWD mastoidectomy.
	Extradural abscess		CWD mastoidectomy.

Result of treatment

For IC as well as EC group no mortality was seen in our series. One of the case who developed perichondritis following meatoplasty, settled after adequate management. One patient had CSF leak, which was repaired intra operatively. One of the female patient diagnosed of labyrinthitis developed Grade II facial

paresis on postoperative day 7 which completely recovered by 3 weeks with medical management.

DISCUSSION

In total, the prevalence of CSOM with complication in our series was 0.13%. The extracranial complications accounted to 0.09% and intracranial accounted to 0.04%. Many studies have shown a decline in prevalence of these complications which could be explained due to factors like increase in number of ENT surgeons, improvement in standard of living and quality of life of the people.[2] In our study, the common age group affected was between 15 to 35 years as compared to age group of 10–20 years seen in other reports.[2] Males had high preponderance compared to females.[3,4] The reason for this may be related to ignorance of long standing offensive ear discharge.[3] The development of subperiosteal abscess reduces the pressure of pus within the middle ear cleft thus reducing the chances of infection spreading intracranially. Consequently we found younger patients frequently developing mastoid abscess and post aural fistula than IC complication. This may be explained because of shallow mastoid antrum in younger patients. Pyogenic meningitis is the most common IC complication.[5,6] CT scan is necessary to rule out any IC complication. Lateral sinus thrombosis in our study showed zero mortality which may be because of early arrival of the patients and adequate intravenous/ oral antibiotics received.[3,6-8] We did not administer thrombolytics to our patients because of risk of dislodgement of infected thrombus. Brain abscess is the most common IC complication that can be caused by extensive cholesteatoma. Temporal lobe abscess is most commonly found IC abscess. Prompt management with the support of a neurosurgeon gave a good result with zero mortality.[3,6,9] Every patient who presents with headache, fever and neck stiffness must undergo necessary investigations followed by prompt early management. *Proteus mirabilis*, *Pseudomonas aerugenosa*, *Staphylo-coccus* and *E. coli* were the most common organisms isolated in our patients and were comparable with other studies.[9-11] Appropriate parenteral antibiotics with IV fluids 48hrs before surgical intervention play a role to control the infection and improve the general condition of the patient. Antibiotics were administered as per culture sensitivity report and the expert opinion of our physicians. We did canal wall down mastoidectomy for all our cases because of extensive cholesteatoma since our patients were from remote interior places which would make their follow up difficult. Craniotomy for intra cranial abscess drainage should be done first and aural surgery should be scheduled at the earliest safe time during recovery which is usually several days to weeks.[11] In our study, canal wall down mastoidectomy was done as an interval procedure, 48–72 hours after medical treatment in life threatening complications and 7–10 days after medical treatment in non life threatening complications so as to avoid risk of anaesthesia. We preferred to expose lateral sinus plate in anticipation of an infected thrombus in it. The same was true in study by Sharma et al.[12] The mortality in our study is zero as compared to other studies.[2-4,6]

To conclude, otogenic complications of CSOM can still occur in spite of modern antibiotics though the incidence has reduced. The decrease in mortality is due to modern antibiotic therapy, early diagnosis based on clinical features, CT scan and culture sensitivity and early intervention as and when required.

It is hoped that this study might create awareness among the budding ENT surgeons so as to result in early diagnosis, followed by prompt and efficient management thus reducing the mortality rate of CSOM with complication.

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REFERENCES

1. Sharma N, Jaiswal AA, Garg A. Complications of Chronic Suppurative Otitis Media and their Management: A single Instituition 12 Years Experience. Indian J Otolaryngol Head Neck Surg. 2015;67(4):353-60.
2. Kangsanarak J, Fooanant S, Ruckphaopunt K, Navacharoen N, Teotrakul S. Extracranial and intracranial complications of suppurative otitis media; report of 102 cases. J Laryngol Otol. 1993;107(11):999–1004.
3. Dubey SP, Larawin V, Molumi CP. Complications of chronic suppurative otitis media and their management. Laryngoscope. 2007;117(2):264–7.
4. Singh B, Maharaj TJ. Radical mastoidectomy: Its place in otitic intracranial complications. J Laryngol Otol. 1993;107(12):1113–8.
5. Osma U, Cureoglu S, Hosoglu S. The complications of chronic otitis media: report of 93 cases. J Laryngol Otol. 2000;114(02):97–100.
6. Samuel J, Fernandes CM, Steinberg JL. Intracranial otogenic complications: a persisting problem. Laryngoscope. 1986;96(3):272–8.
7. Syms MJ, Tsai PD, Holtel MR. Management of lateral sinus thrombosis. Laryngoscope. 1999;109(10):1616–20.
8. Kutluhan A, Kiris¸ M, Yurttas¸ V, Kirog˘lu AF, Unal O. When can lateral sinus thrombosis be

treated conservatively? J Otolaryngol. 2004;33(2):107–10.
9. Kangsanarak J, Navacharoen N, Fooanant S, Ruckphaopunt K. Intracranial complications of suppurative otitis media: 13 years' experience. Am J Otol. 1995;16(1):104–9.
10. Mathews TJ, Oliver SP. Bacteriology of mastoiditis, 5 year experience. J Laryngol Otol. 1988;102:397–8.
11. Myers EN, Ballantine HT. The management of otogenic brain abscess. Laryngoscope. 1965;75:273–88.

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