

## Otogenic Intracranial Complications - A Case Series

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### ABSTRACT

**Background:** Intracranial complications of otogenic origin is now a rarity. Advent of antibiotics are both blessings if used intelligently and curse if used indiscriminately especially by quacks. Antibiotic resistance and cross resistance have given adverse results. **Methods:** A total of twenty cases were studied in the Department of ENT at Jawaharlal Nehru Medical College, AMU, Aligarh, Uttar Pradesh **Results:** Maximum number of cases belonged to 10 to 20 years age group, i.e eight cases (40%) followed by six cases (30%) in the age group greater than 30 years, four cases (20%) in 20 to 30 years age group, and 2 cases (10%) below 10 years. Males were affected more than females in the ratio of 4:1. The commonest presenting symptom was otorrhea, headache, fever and hearing loss. About half of the patients had vomiting, some had vertigo, otalgia and one patient had facial weakness. **Conclusions:** Almost all the intracranial complications encountered were intensively and meticulously treated by medical and surgical exercise which gave excellent results with collective team approach.

**Key words:** CSOM, meningitis, abscess, antibiotics.

### INTRODUCTION

Chronic suppurative otitis media (CSOM) is a common public health problem in India. Though there is decline in the incidence of complications but they are still frequent due to poor socio-economic conditions, lack of awareness about healthcare and non-availability of trained specialist in rural settings. Otogenic intracranial complications although rare are not uncommon. Preantibiotic era had more cases of central nervous system involvement compared to present time. Patients with chronic otitis media with complications usually present late due to ignorance, treatment by quacks and lack of primary healthcare. Therefore, it presents a challenge for early recognition, adequate treatment and satisfactory results.

Although, it lies in the domain of Otorhinolaryngologist, teamwork is required for the best outcome. Serious life threatening events ensue if headache, vomiting, fever, drowsiness and visual field defects are noted as reported by V.B. Modak et al,<sup>[1]</sup> In spite of significant decrease after antibiotic advent, intracranial complications of chronic otitis media still represent a challenging situation owing to its high mortality rate of 36%. Muira M S et al in their study found most common presentations as meningitis, cerebral abscess, extradural abscess and lateral sinus thrombophlebitis.<sup>[2]</sup>

### AIM OF THE STUDY

Aim of study was to evaluate the incidence, etiopathogenesis, clinical features, diagnosis, relevant investigations, treatment and prognosis of all patients with otogenic intracranial complications in our setup by combined efforts of Department of E.N.T and neurosurgery at Jawaharlal Nehru Medical College, AMU, Aligarh.

### METHODS

This was a retrospective study conducted jointly by Department of ENT and neurosurgery at Jawaharlal Nehru Medical College from Jan 2010 to Jan 2015. Majority of the patients presented with complications in emergency and only a few presented in routine outpatient department (OPD). Twenty patients exclusively with intracranial

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complications secondary to CSOM were admitted in ENT/neurosurgery ward from Jan 2010 to Jan 2015. All the patients with extra cranial complications were discarded from the study. Two patients with meningitis and concomitant brain abscess were also excluded from the study. After complete general, systemic and local examination, relevant routine and specific investigations like pus culture and sensitivity, lumbar puncture, X-rays, CECT, MRI etc were done and treatment planned accordingly. Medical and surgical therapies were instituted as per requirement of the circumstances. Medical therapy was given in all cases even if the patient had to undergo surgery. The therapy comprised of TRIPLE REGIMEN comprising of Ceftriaxone with sulbactam/tazobactam, Metronidazole infusion and gentamycin / amikacin / tobramycin. Some patients even received higher antibiotics like Piperacillin. Steroids and mannitol were given when raised intracranial tension was detected. All those cases which required neurosurgical intervention were dealt by neurosurgeons and later the unsafe ear was treated by ENT surgeons. Five cases were operated in one sitting by both the surgeons.

## RESULTS

We included twenty cases of CSOM with intracranial complications in our study. Age ranged from 4 to 45 years. Maximum number of cases belonged to 10 to 20 years age group, i.e eight cases (40%) followed by six cases (30%) in the age group greater than 30 years, four cases (20%) in 20 to 30 years age group, and 2 cases (10%) below 10 years. Males were affected more than females in the ratio of 4:1. The commonest presenting symptom was otorrhea, headache, fever and hearing loss. About half of the patients had vomiting, some had vertigo, otalgia and one patient had facial weakness (Table no 1).

A thorough general examination was carried out especially for orientation, intelligence, anemia, speech and vitals. Pattern of fever, pulse, blood pressure and respiratory rate were regularly charted. Systemic examination was also done with emphasis on central nervous system with special stress on pattern of fever, neck rigidity, Kernigs sign, Babinski's sign, fundus examination and eye movements. These signs helped us to assess the intracranial complications clinically. All the twenty patients underwent relevant routine and specific investigations which included blood culture, pus culture & sensitivity, CSF examination, CECT of brain and temporal bone and lastly MRI if required. Provisional diagnosis was confirmed after investigation (Table 2) and definitive treatment protocol was instituted. Patients having meningitis were treated medically and surgery was done in other cases were medicine failed.

## DISCUSSION

Although intracranial complications owing to CSOM have been drastically reduced, still they do occur. Complications can be classified as extracranial or intracranial. Intracranial includes extradural abscess, brain abscess, subdural

abscess, sigmoid sinus thrombophlebitis, otic hydrocephalus, and meningitis. Since the introduction of antibiotics, intra cranial complications owing to CSOM are less common; however, the occurrence should not be underestimated due to their associated morbidity and mortality. We encountered twenty [20] cases of intracranial complications due to CSOM (unsafe type) over period of five years. It is less than 1% of all ear cases examined at our center.

**Table 1: Clinical features of patients**

S.No.	Clinical features	
1	Otorrhoea	90%
2	Headache	85%
3	Hearing Loss	75%
4	Fever	75%
5	Vomiting	50%
6	Vertigo	40%
7	Unconsciousness	35%
8	Otalgia	25%
9	Neurological symptoms	20%
10	Post auricular Sinus	15%
11	Decreased vision	10%
12	Facial weakness	5%
13	Diplopia	None
14	Retro orbital pain	None

**Table 2: Types of Intracranial Complications**

Types of complications	No of cases
Meningitis	6
Brain abscess:	
Cerebellar	2
Temporal	3
Extradural abscess	5
Subdural abscess	3
Lateral sinus thrombophlebitis	1
Otitic hydrocephalus	0



**Fig.1 Patient with Post auricular Sinus**



Fig. 2 Patient with Post auricular Discharging Sinus



Fig. 6 CECT showing Temporal Lobe Abscess



Fig. 3 Clinical photograph Rt ear disease

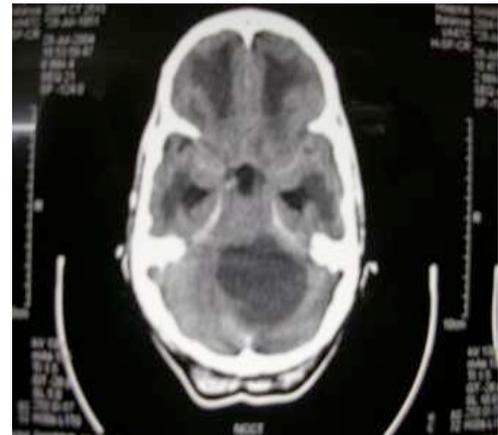


Fig. 7 CECT showing Lt Cerebellar Abscess



Fig. 4 CECT showing evolving abscess



Fig. 8 CECT showing evolving Cerebellar Abscess



Fig. 5 NCCT showing Cholesteatoma



Fig. 9 CECT showing Lt Temporal Lobe Abscess

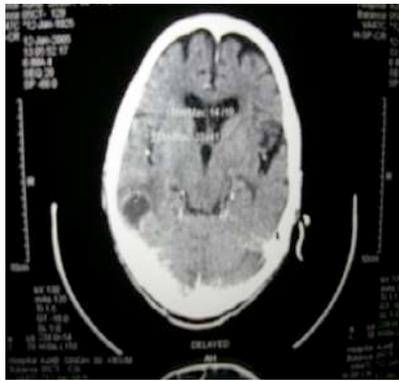


Fig 10. CECT showing Rt Temporal Lobe Abscess



Fig. 14 Patient with postauricular sinus (Unsafe ear)



Fig. 11 Postoperated Patient with Postauricular sinus

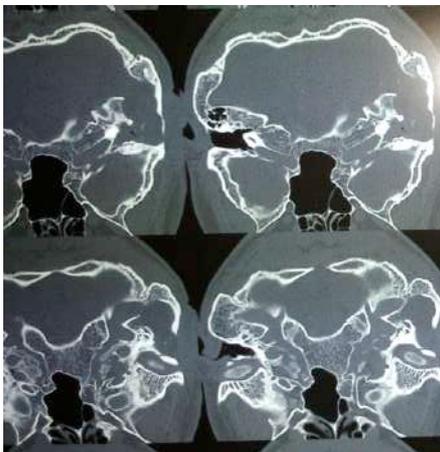


Fig. 12 NCCT of Temporal bone showing Sinus plate defect



Fig. 13 Patient with postauricular sinus

The patients we examined were mostly from lower socio economic group. Rural population was more frequently afflicted. The reasons were lower awareness level and probably low immunity because of low nutritious diet. Nestic V et al<sup>[3]</sup> detected in his study that people with no basic or elementary education were afflicted more than highly educated. Majority of the patients were less than 30 years (70%) with male predilection of 4:1 consistent with the studies of Scnnaroglu L. et al<sup>[4]</sup> & Yen P.T. et al.<sup>[5]</sup> Majid,Khan et al<sup>[6]</sup> too in their study found majority of the patients presented in the second and third decade of life. Most of the patients (59.1%) were of lower socioeconomic status consistent with our study. Majority of the patients had presented with otorrhoea (90%), headache (85%), fever (75%) & vomiting (50%) as seen in the study of Timothy T K et al<sup>[7]</sup> Treatment protocol at our centre is to start with triple regimen of ceftriaxone with or without sulbactam/tazobactam, metronidazole infusion & amikacin. Depending upon fundus examination and consciousness, steroid, mannitol and phenytoin was added, as was followed by V. B. Modak et al.<sup>[1]</sup> Relevant investigations were carried out like pus culture and sensitivity, blood culture, CSF examination, CECT of temporal bone and brain. MRI was done as and when required. Saez- Llorens X<sup>[8]</sup> highlighted in their study that CECT & MRI are essential diagnostic tools that enable the physician to make an accurate diagnosis of intracranial purulent collections. Pus culture exhibited gram negative organisms predominantly. Isolated bacteria included Proteus, Pseudomonas, Klebsiella, Citrobacter, Enterococci, Streptococcus and Staphylococcus aureus. Similar pathogens were detected in chronic suppurative otitis media study causing intracranial complications by Perrido Nde O.et al<sup>[9]</sup> Of all causes of brain abscess, otogenic etiology constitutes 40%-80% (Jovanovic M B et al).<sup>[10]</sup> Temporal lobe abscess is more frequent than cerebellar abscess and has better prognosis. Younger age group was more affected than older patients as regards for brain abscess. Similar observations were made by Voronkin V.F. et al<sup>[11]</sup> in his study.

The most common intracranial complication was lateral sinus thrombophlebitis (19.5%), followed by perisigmoid sinus abscess (13.5%), meningitis (9%), brain abscess

(6.5%), and extradural abscess (4.5%), (Yorgancilar E et al),<sup>[12]</sup> In the study conducted by Swapnil Pawar and Yogesh Shulka.<sup>[13]</sup> at Jabalpur Madhya Pradesh in India they detected that intratemporal complications was seen in 46 (88.46%) of the patients while only 6 (11.53%) had intracranial complications. Meningitis was treated conservatively with good results. Most of the procedures were staged except for five in which we operated together with neurosurgeons. Burr hole and craniotomy was the procedure carried out by the neurosurgeons while modified radical mastoidectomies (MRM) with slight variation as per requirement of the case was carried out by Otorhinolaryngologist.

Most of the cases had cholesteatoma, granulation with ostietis. Cholesteatoma was the preoperative finding in almost all the cases similar to the observations made by Jovanovic M B et al<sup>[10]</sup> in his study when he detected 50-80% cases associated with cholesteatoma. In almost all cases, there was direct extension of the disease process after bony erosion (Nesic V et al),<sup>[3]</sup> except for few, in which probably thrombophlebitis and preformed pathways were the culprit like in meningitis ( Lela Migirov et al),<sup>[14]</sup> Most frequent intraoperative finding of complicated CSOM patients was cholesteatoma, with the exception of patients with facial nerve paralysis. The additional morbidities were recorded in 25 patients (20.6%), (Yorgancilar E et al),<sup>[12]</sup> Otoneurological procedure was carried out in twelve patients and modified radical mastoidectomies in all the patients except one. Hearing mechanism reconstruction was done after the disease had healed. One patient with cerebellar abscess expired while one had permanent facial palsy (no improvement after surgery). None expect one had neurological deficit and the recovery was uneventful. In this study, we emphasize the importance of an accurate and early diagnosis, followed by adequate surgical therapy and a multidisciplinary approach.

## CONCLUSION

For early management, it is necessary to have a high index of suspicion. It is important to identify non-typical cases because they might be masqueraded by antibiotic use. Patients with intracranial complications should be meticulously examined for neurological signs and symptoms. Thorough workup in collaboration with neurosurgical team with prompt institution of medical and surgical therapy could minimize the morbidity and mortality associated with this life-threatening condition. In India, rural population needs more awareness and specialized healthcare services to mitigate the menace of the complication of various disease processes especially for

otological diseases as they require good trained doctors and sophisticated instruments and infrastructure.

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