



CLINICO-AUDIOLOGICAL PROFILE OF OSSICULAR STATUS IN CHRONIC SUPPURATIVE OTITIS MEDIA PATIENTS IN A TERTIARY CARE CENTER OF NORTHERN INDIA

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ABSTRACT

Introduction: CSOM, A Common Condition In Otorhinolaryngology, Is Characterized By Chronic, Intermittent or Persistent Discharge Through A Perforated Tympanic Membrane. Both Types Of CSOM, Tubotympanic Which Is Considered Safe, As Well As Attico-Antral Which Is Considered Unsafe, May Lead To Erosion Of The Ossicular Chain. This Propensity For Ossicular Destruction Is Much Greater In Cases Of Unsafe CSOM, Due To The Presence Of Cholesteatoma and/or Granulations. **Methodology:** This study was conducted at a tertiary care hospital of Himachal Pradesh from June 2018 to May 2019 on all patients presenting with CSOM to ENT OPD. All patients underwent a pre-operative pure tone audiometry to find out the hearing status. Intra-operative middle ear findings were noted. **Results:** A total of 53 patients were enrolled for the study. The age of the patients ranged between 12 – 63 years with mean age being 32.86 ± 12.8 years. females outnumbered males with a ratio of 1:1.4. profound hearing loss was observed in 2 patients and both had all three ossicles eroded while if only incus was eroded than no hearing loss was observed. **Conclusion:** Complete ossicular erosion leads to profound hearing loss. Incus is most susceptible for erosion followed by malleus.

KEYWORDS

Introduction:

Chronic suppurative otitis media is a common condition in otorhinolaryngology characterized by chronic intermittent or persistent discharge[1]. Prevalence of CSOM in developing countries represents a wide range of 0.4% to 33.3%. In India, the prevalence rate of CSOM is 7.8% according to surveys conducted by the World Health Organisation.[2] The WHO has classified India as country with highest prevalence requiring urgent attention to deal with a massive public health problem[3].

CSOM is defined as a persistent discharge from the middle ear through a tympanic membrane perforation for more than 12 weeks[4]. CSOM has been classified into Tubo-Tympanic and Attico-Antral disease. Tubo-Tympanic Type of CSOM is characterized by a perforation of pars tensa, while Marginal & Attic perforations are pathognomonic of Attico-Antral variety. The latter category is usually associated with the presence of cholesteatoma[5,6].

Erosion of the bone is an established pathological characteristic of cholesteatoma.

The proposed mechanism for erosion is chronic middle ear inflammation as a result of overproduction of cytokines- TNF alpha, interleukin-2, fibroblast growth factor and platelet derived growth factor, which promote hyper vascularisation, osteoclast activation and bone resorption causing ossicular damage. CSOM is thus an inflammatory process with a defective wound healing mechanism [7].

Basically there are four major ossicular defect, the most common is the involvement of long process of incus with intact malleus and stapes. The second most common defect is erosion of stapes supra structure as well as loss of incus. Third, the cholesteatoma growing into the middle ear involving the malleus handle and stapes remain intact. Finally there may be loss of all ossicles except the stapedial foot plate. The reason of the erosion of long process of incus by cholesteatoma, being most frequently encountered defect of ossicular chain is due to its delicate structure rather than its tenuous blood supply[7,8,9]. Complete disruption of the ossicular chain can result in a 60 dB hearing loss [7].

Since hearing loss is a common complication of CSOM, we designed this study to evaluate preoperative pure tone audiometry findings in patients with CSOM and its relation with intra operative findings.

Material and Methods:

This prospective observational study was conducted in the department of ENT, Dr. Rajendra Prasad Government Medical College Kangra at Tanda w.e.f 01st June 2018 to 31st May 2019 after obtaining ethical approval from institutional ethical committee. This study included all the patients of CSOM of all age groups coming to ENT OPD and gave informed consent.

The diagnosis of CSOM was suspected in patients with history of ear discharge more than 6 weeks.

Inclusion criteria:

1. Patients of any age group of both sexes having safe or unsafe type of CSOM.
2. Patients willing for reconstructive surgery offered to him/her.
3. Patients willing to come for regular follow up and obey the medical advice.
4. Patients willing to give consent.

Exclusion criteria:

1. Patients refusing to participate in the study.
2. Patients not willing for surgery or unfit for surgery or anaesthesia.
3. Patients who are revision case of tympanoplasty and mastoidectomy surgery.
4. Patients with extra and intra cranial complications of CSOM.
5. Patients with traumatic perforation of tympanic membrane.

Methodology:

The selected patients were subjected to detailed history and clinical examination. The ears were examined by otoscopy initially and later subjected to microscopy to establish a pre-operative diagnosis of safe or unsafe disease. All patients underwent a pre-operative pure tone audiometry to find out the hearing status. X- ray mastoid (bilateral Schuller's view) was done to assess the pathology and the surgical anatomy of mastoid air cell system. Intra-operative middle ear findings including ossicular chain status, erosion of ossicles and continuity of incudo-malleal and incudo-stapedial joint was noted.

Results:

A total of 53 patients with CSOM were studied. The age of the patients ranged between 12 – 63 years, the majority belonging to 26-40 years (37.7%) with mean age being 32.86 ± 12.8 years. There were 22 (41.5%) males and 31 (58.5%) females in the study. The primary complaints of the patients were ear discharge and hearing loss seen in 100% of the cases. Hearing loss was conductive in 40 and mixed in 13

patients.

Table 1: Intra-operative ossicular status and degree of hearing loss

Ossicle Eroded	Hearing Loss						
	Normal	Mild	Moderate	Moderately Severe	Severe	Profound	Total
Normal	0	6	1	2	2	0	11
Malleus	0	0	0	1	0	0	1
Incus	2	7	2	4	0	0	15
Stapes	0	2	0	0	0	0	2
Malleus + Incus	0	0	4	5	0	0	9
Malleus + Stapes	0	0	0	1	0	0	1
Incus + Stapes	0	1	2	0	0	0	3
Malleus+Incus+Stapes	0	0	2	7	0	2	11
Total	2	16	11	20	2	2	53

There were 11 patients with normal ossicles and out of them 6 had mild hearing loss followed by 1 patient with moderate hearing loss and 2 patients each with moderately severe and severe hearing loss. Malleus was eroded in only 1 patient who had moderately severe hearing loss. Incus was eroded in 2 patients with normal and moderate hearing loss followed by 4 patients of moderately severe hearing loss. 7 patients with eroded incus had mild degree of hearing loss. 2 patients with mild hearing loss had stapes eroded. Malleus & incus and malleus & stapes was eroded in 9 and 1 patients respectively and out of 5 and 1 had moderately severe hearing loss respectively. All the three ossicles were eroded in 11 patients, of which 2 had moderate, 7 had moderately severe and 2 had profound hearing loss (Table 1).

Discussion

In this study we studied a total of 53 patients of CSOM to assess the intra-operative ossicular status. The most commonly affected age group was between 26 to 40 years. The early presentation may be due to increased awareness to health issues and difficulty in hearing affecting the work efficiency, leading patients and parents to seek early medical intervention.

We observed that there were 31 females and 22 males with male to female ratio of 1:1.4. The reason for higher number of females may be that in hilly areas females do most of the outdoor work and hence are more prone to atmospheric and climate changes.

In our study there were 11 patients with normal ossicles and out of them 6 had mild hearing loss followed by 1 patient with moderate hearing loss and 2 patients each with moderately severe and severe hearing loss. Malleus was eroded in only 1 patient who had moderately severe hearing loss. Incus was eroded in 2 patients with normal and moderate hearing loss followed by 4 patients of moderately severe hearing loss. 7 patients with eroded incus had mild degree of hearing loss. 2 patients with mild hearing loss had stapes eroded. Malleus & incus and malleus & stapes was eroded in 9 and 1 patients respectively and out of 5 and 1 had moderately severe hearing loss respectively. All the three ossicles were eroded in 11 patients, of which 2 had moderate, 7 had moderately severe and 2 had profound hearing loss.

In a study by Dudda R et al [10] malleus was eroded in 21 patients and incus was eroded in 34 patients who had on an average moderate hearing loss. Stapes was eroded in 12 patients, malleus & incus in 14 patients, incus & stapes in 11 patients and all the three ossicles were eroded in 7 patients and all had moderately severe degree of hearing loss on an average.

In another study by Kumar BYP [11], when both malleus & stapes were normal they observed hearing loss of moderate degree. With malleus or stapes eroded, again moderate degree of hearing loss was observed. When both the ossicles, malleus and stapes, were eroded moderately severe degree of hearing loss was observed.

Conclusion:

To conclude, our study demonstrates that stapes followed by malleus is the most resistant ossicle to erosion in chronic suppurative otitis media whereas incus is the most susceptible one. Early detection of disease with minimal ossicular damage is best for good ossiculoplasty procedure and thereby utmost hearing outcome with disease control.

Pre-operative knowledge of the status of the ossicular chain would allow the surgeon to be ready for proper ossicular chain reconstruction and to better advise the patient on the degree of hearing attainable after surgery

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