



Status of Contralateral Ear in Patients with Unilateral Chronic Otitis Media

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Abstract This study was conducted to evaluate the existence of otoscopic abnormality, hearing status and radiological changes in contralateral ear of patients with chronic otitis media. 300 patients having unilateral Chronic Otitis Media attending OPD in the Department of Otorhinolaryngology, Institute of Medical Sciences, Banaras Hindu University, Varanasi during the period of March 2019 to March 2020 were selected. Otoscopy, Pure Tone Audiometry and Bilateral X-ray mastoids (lateral oblique view) and/or HRCT Temporal bone were done. Contralateral ear was affected in more than 30% cases. Out of 188 patients having Mucosal COM, 58 cases (30.9%) had abnormal TM. Out of 112 patients having Squamosal COM, 48 cases (42.9%) had abnormal CLE. Out of 300 cases, 231 (77.0%) of them had normal hearing in contralateral ear. It was followed by 65 cases (21.6%) with conductive hearing loss. Mixed hearing loss and SNHL were seen in 2 patients each. In contralateral ear of Mucosal COM, pneumatic pattern of pneumatization was seen in 69.1% followed by Diploic pattern (30.9%). In squamosal COM, X-ray mastoid showed pneumatic pattern (64.3%) followed by Diploic pattern (33.9%) in the contralateral ear. Sclerotic pattern was seen in only 1.8% of cases in contralateral ear. Chronic otitis media as a disease is not limited to one ear. The precise and critical evaluation of both ears does not play a role in prognostic evaluation of the patient only, but it can also serve as a guide for early detection of probable evolution of the disease process in a

patient in contralateral ear with unilateral chronic otitis media.

Keywords Unilateral COM · Chronic otitis media · Contralateral ear · Abnormal tympanic membrane · Diploic pattern · Sclerotic pattern

Introduction

Chronic Otitis Media (COM) implies a permanent abnormality of Pars tensa or Pars flaccida, most likely as a result of earlier Acute Otitis Media (AOM), negative middle ear pressure or Otitis Media with Effusion [1]. WHO estimated that 65–330 million people are worldwide affected by COM, of whom 50% suffer from hearing impairment and approximately 28,000 death per annum are attributable to the complications of Otitis Media [2]. Contralateral ear in this study is defined as the asymptomatic ear in the setting of unilateral chronic otitis media. Unilateral chronic otitis media in true sense is a rare event as evident from previous studies, chronic otitis media frequently involves both ears as many factors implicated in the pathogenesis of the disease affect a common drainage area i.e., nasopharynx. Evaluation of contralateral ear will throw a torch on the status of the asymptomatic ear which may show variable degree of drift from normalcy, indicator of an ongoing process leading to frank disease.

The aim of this study was clinical, audiological and radiological assessment of contralateral ear with both mucosal and squamosal type of chronic otitis media.

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Materials and Methods

Ethical clearance was obtained from institutional ethical committee. 300 patients having unilateral Chronic Otitis Media attending OPD in a tertiary care centre during the period of March 2019–March 2020 were selected using random number table.

Patients having history of long-standing ear discharge associated with tympanic membrane perforation or retraction were selected after having informed consent. The patients belonging to age groups more than 10 years, irrespective of sex and of various socioeconomic status were included in the study. The Patients with perforation in both ears, congenital ear malformation in either ear previous history of surgery or grommet insertion in contralateral ear, or trauma to either ear were excluded from the study. Detailed history was taken followed by clinical examination, Otoendoscopy and Otomicroscopy and Pure Tone Audiometry were done. Bilateral X-ray mastoids (lateral oblique view) was done. HRCT Temporal bone was considered where relevant. Presence or absence of perforation in tympanic membrane, cholesteatoma, tympanosclerosis/thin TM and retraction and its grading if present were recorded. Retraction in pars tensa was classified according to Sadé and Berco [3] and that of pars flaccida according to Tos et al. [4] Imaging examinations, X-Ray mastoid (Schuller's view) was done to have an idea of mastoid pneumatization and certain anatomical structures. HRCT temporal bone was obtained wherever required. All the subjects with unilateral COM were divided into two groups i.e., either mucosal type or squamous type. CLE was evaluated as normal or abnormal. CLE is again classified according to their otoscopic findings. That may be normal, fluid in the middle ear, tympanosclerosis, retraction of pars tensa and pars flaccida, granulation, atelectasis and healed thin membrane [5]. Pure tone audiometry was done to assess the type and degree of hearing loss; and was graded as per WHO classification. Data were compiled, stored and analysed using SPSS statistical software.

Result

Total 300 patients were included in the study, out of which 188 patients had Mucosal COM and 112 patients had Squamous COM (Fig. 1), 40.0% were males and 60.0% were females.

Out of 188 patients having Mucosal COM, 58 cases (30.9%) had abnormal TM (Fig. 2) whereas TM was normal in 130 cases in CLE. Single abnormality of TM included thin TM (19 cases), TSP (14 cases) and retraction

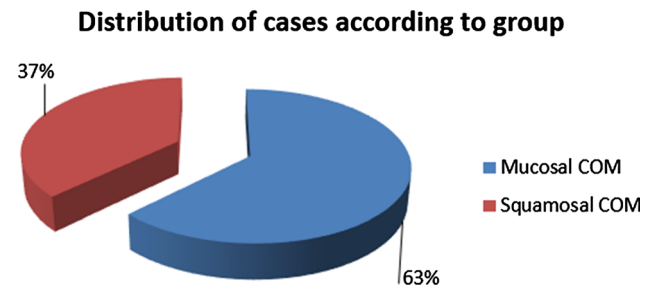


Fig. 1 Type of COM

pockets (8 cases). 17 cases had two abnormalities consisting of 12 cases with TSP and thin TM, rest 5 cases had TSP in addition to retraction pockets. Out of 13 cases of Mucosal COM having retraction pocket in contralateral ear, grade 2 retraction pockets were seen in 7 patients whereas 4 patients had grade 1 retraction pocket. Two patients had grade 3 retraction pockets.

Out of 112 patients having Squamous COM, 48 cases (42.9%) had abnormal CLE (Fig. 3). Single abnormality of TM included TSP (14 cases), thin TM (10 cases) and retraction pockets (12 cases). 12 cases had two abnormalities consisting of 6 cases with TSP and thin TM, rest 6 cases had TSP in addition to retraction pockets.

Out of 18 cases of Squamous COM having retraction pocket in contralateral ear, 11 of them had grade 3 retraction pocket, 4 cases had grade 2 retraction pockets whereas rest 3 had grade 4 retraction pockets.

Out of 300 cases, 231 (77.0%) of them had normal hearing in contralateral ear. It was followed by 65 cases (21.6%) with conductive hearing loss. Mixed hearing loss and SNHL were seen in 2 patients each.

In patients with Mucosal COM, 34 patients had mild conductive hearing loss whereas moderate and profound conductive hearing loss were seen in 2 and 1 patients respectively in contralateral ear. Mixed hearing loss and SNHL of moderate degree were seen in 1 patient each in contralateral ear (Fig. 4).

In patients with Squamous COM, 28 patients had mild conductive hearing loss whereas moderate conductive hearing loss was seen in 1 patient in contralateral ear. Only one patient had SNHL in contralateral ear of moderate degree (Fig. 5).

In contralateral ear of Mucosal COM, pneumatic pattern of pneumatization was seen in 69.1% followed by Diploic pattern (30.9%).

In squamous COM, X-ray mastoid showed pneumatic pattern (64.3%) followed by Diploic pattern (33.9%) in the contralateral ear. Sclerotic pattern was seen in only 1.8% of cases in contralateral ear (Fig. 6).

Fig. 2 Otosopic findings in CLE with Mucosal COM

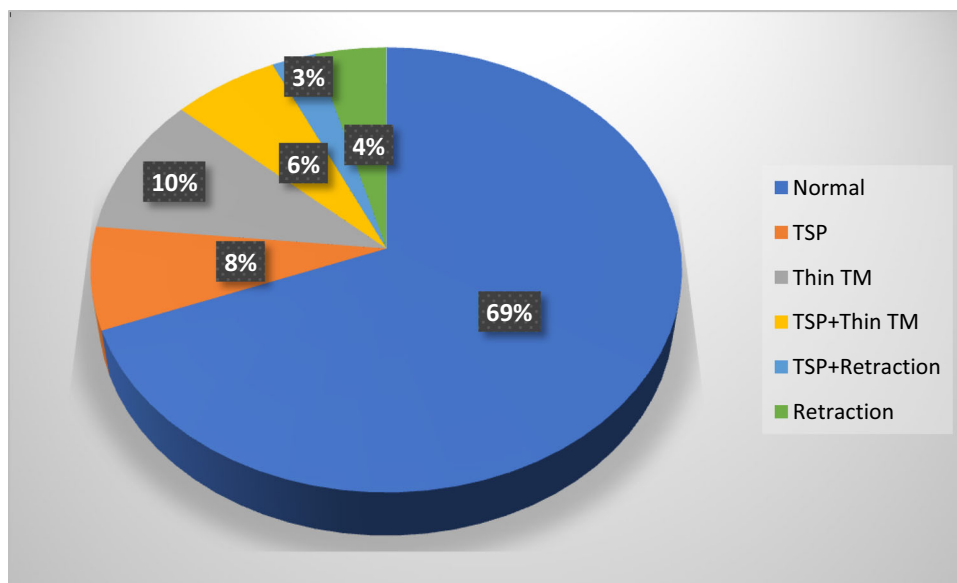
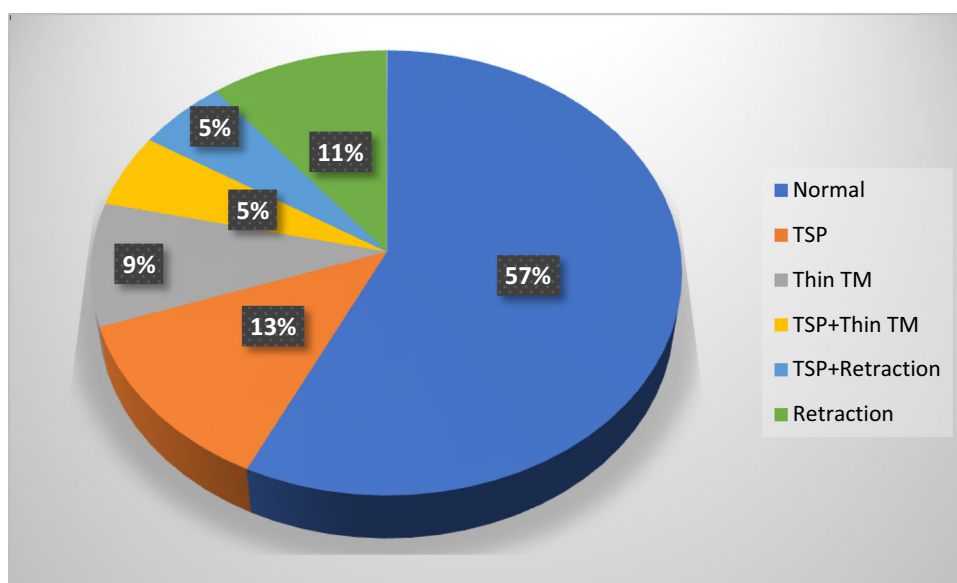


Fig. 3 Otoscopic findings in CLE with Squamosal COM



Discussion

The findings from our study emphasizes the fact that contralateral ear although asymptomatic, is not always normal.

Nigam et al. [5] observed that CSOM was more prevalent among the age group of 20–30 years (41.6%) followed by 12–20 years (27%). In our study, maximum number of patients were from the age group 21–30 years (40.3%) and 11–20 years (28.3%). The range of age distribution was 13–56 years and mean age was 28.02 years. This is in line with the earlier study by Nigam et al. [5].

Out of 188 patients having Mucosal COM, 30.9% had abnormal TM whereas out of 112 patients having

Squamosal COM, 48 cases 42.9% had abnormal CLE. Abnormality in CLE was reported to range from 20.1–87.69% [6–15] in the literature which was more prevalent in patients with squamosal COM [6, 7, 9, 14].

As in earlier studies, our study also reflects that contralateral ear is not always normal. Patients with TM perforation in bilateral ears were not included in our study so abnormalities in CLE are less common as compared to most of the previous literature available. TSP was the most common abnormality detected in CLE in patients with unilateral Mucosal COM whereas retraction pocket was the most common abnormality detected in CLE in patients with unilateral Squamosal COM.

Fig. 4 Hearing status in CLE with Mucosal COM

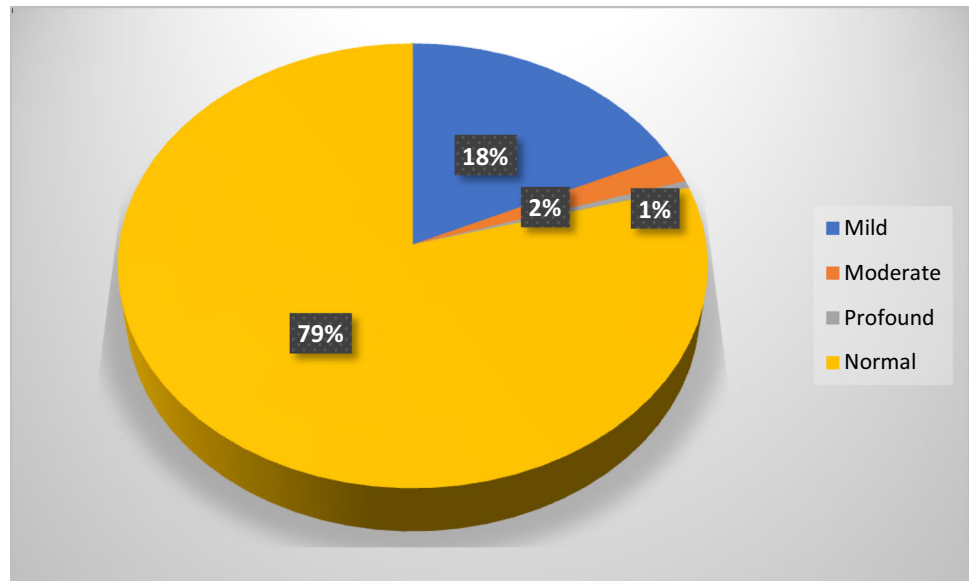
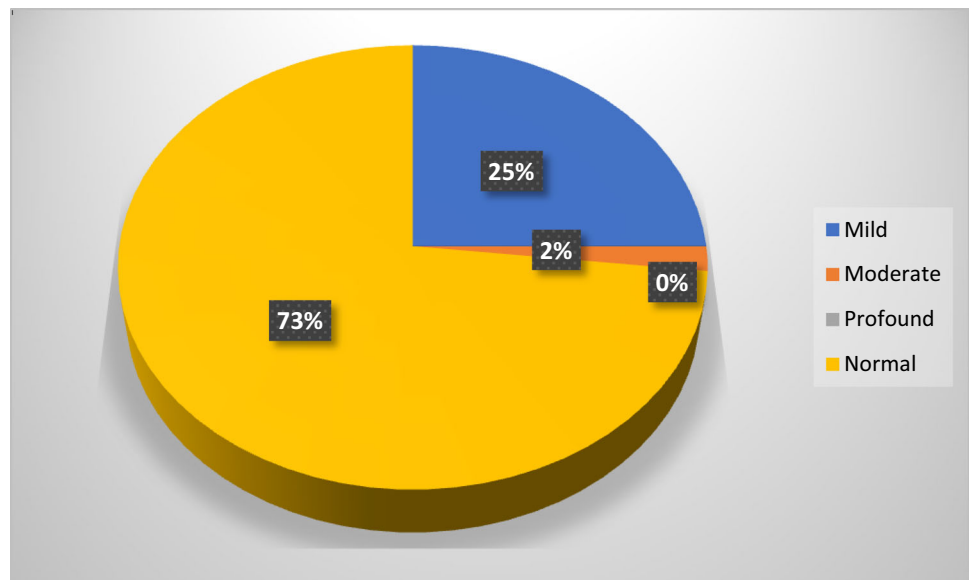


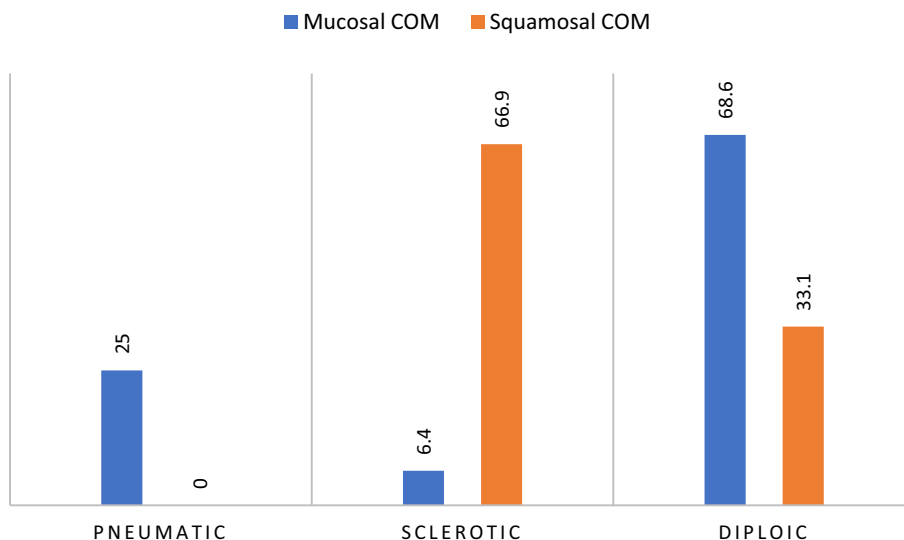
Fig. 5 Hearing status in CLE with Squamosal COM



Out of 13 cases of Mucosal COM having retraction pocket in contralateral ear, grade 2 retraction pockets were seen in 7 patients (53.8%) whereas 4 patients (30.8%) had grade 1 retraction pocket. Two patients had grade 3 retraction pockets. Sady Selaimen da Costa et al. [6] found in the NCCOM group mild retractions in 17.9% of the CLE, moderate retractions in 8.6%, and severe retractions in 3.6%. Jambunathan et al. [14] stated that the most common pathology in otoscopy was grade 2 retraction of tympanic membrane which was present in 43.20% patients among which the affected ear had mucosal type COM. There is less prevalence of grade 2 retractions in pars tensa of CLE in this study as compared to our study.

Out of 18 cases of Squamosal COM having retraction pocket in contralateral ear, 11 of them (61.1%) had grade 3 retraction pocket, 4 cases (22.2%) had grade 2 retraction pockets whereas rest 3 had grade 4 retraction pockets. Sady Selaimen da Costa et al. [6] observed that in the CCOM group, those with cholesteatoma in the most affected ear displayed severe retractions in 24.7% of the CLE, mild retractions in 14.1%, and moderate retractions in 11.2%. Jambunathan et al. [14] stated that the most common pathology in otoscopy was grade 2 retraction of tympanic membrane in squamosal COM followed by grade 3 retraction. There is less prevalence of grade 3 retractions in pars flaccida of CLE in this study as compared to our study.

Fig. 6 Mastoid cellularity percentage in CLE



Out of 300 cases, 231 (77.0%) of them had normal hearing in contralateral ear. It was followed by 65 cases (21.6%) with conductive hearing loss. Mixed hearing loss and SNHL were seen in 2 patients each.

In patients with Mucosal COM, 34 patients had mild conductive hearing loss whereas moderate and profound conductive hearing loss were seen in 2 and 1 patients respectively in contralateral ear. Mixed hearing loss and SNHL of moderate degree were seen in 1 patient each in contralateral ear.

In patients with Squamosal COM, 28 patients had mild conductive hearing loss whereas moderate conductive hearing loss was seen in 1 patient in contralateral ear. Only one patient had SNHL in contralateral ear of moderate degree.

Hearing loss in CLE ranged between 30 and 67.6% in various work done previously [9, 10, 13–15] When present, Squamosal cases had a slight increased incidence of hearing impairment [15].

In contralateral ear of Mucosal COM, pneumatic pattern of pneumatisation was seen in 69.1% followed by diploic pattern (30.9%).

In squamosal COM, X-Ray mastoids showed pneumatic pattern (64.3%) followed by diploic pattern (33.9%) in the contralateral ear. Sclerotic pattern was seen in only 1.8% of cases in contralateral ear. Reduced cellularity has been well observed in the ears affected with COM both in diseased as well as contralateral ears [8, 9, 11, 12, 14, 15].

Conclusions

In our study we found that contralateral ear was affected in more than 30% cases. The result of this study and previous studies shows that chronic otitis media as a disease is not

limited to one ear. The precise and critical evaluation of both ears does not play a role in prognostic evaluation of the patient only, but it can also serve as a guide for early detection of probable evolution of the disease process in CLE in a patient with unilateral chronic otitis media. Patient with chronic otitis media in one ear are very likely to present with the onset of disease in another ear sooner or later. The importance of evaluation of contralateral ear helps in better understanding of the pathogenesis of chronic otitis media, treatment and counselling of the patient. Thus not only ear having complaint, but also CLE must be worked up of the patient.

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