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Clinical Features And Complications Among Cholesteatoma Cases: A Prospective Observational Study

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Abstract

Background: *Cholesteatoma is a complex and potentially serious ear condition characterized by the abnormal growth of the squamous epithelium in the middle ear or mastoid process. It is a cyst-like accumulation that contains skin cells as well as connective tissue. Cholesteatoma is a three-dimensional epidermoid structure that exhibits independent growth, replacing middle ear mucosa, resorbing and replacing underlying bone. Although it is not a neoplastic lesion, it can be potentially dangerous to the patient.*

Aim of the study: *This study aimed to assess the clinical features and complications among cholesteatoma cases.*

Methods: *This prospective observational study was conducted in the Department of Otolaryngology and Head-Neck Surgery, Combined Military Hospital (CMH), Dhaka, Bangladesh from July 2008 to Dec 2009. In total 50 cholesteatoma patients were enrolled in this study as the study subjects. A simple random sampling technique was used in sample selection. All data were collected by personal interview and clinical examination in a pre-designed data sheet and were analyzed and disseminated by using the MS Office program.*

Results: *Among the total participants, 70% were male whereas the rest 30% were female. So, the male-female ratio of the participants was 2.3:1. The mean ±SD age of the respondents was 17 ±8.79. The most common symptom was otorrhoea (100%), followed by hearing impairment (80%), otalgia (16%) and postauricular painful swelling (12%). We observed that, in all the patients (100%) discharge was present and in 30% cases granulation was found. The extracranial complication was found in 26% and intracranial complication was found in 12% of cases. By CT scan, abscess (temporal lobe and extradural) was found in 10% of the patients. The majority of patients (74.47%) had moderate conductive deafness (74.47%) followed by mild (19.15%) and mixed deafness (6.38%).*

Conclusion: *Younger male people are mainly prone to cholesteatoma. Otorrhoea and hearing impairment are the most common symptom of this disease. Deafness may be another name for cholesteatoma. Discharge and granulation of the external auditory canals are very common conditions of such patients. The discharge is usually thick purulent foul smelling, scanty and occasionally blood-stained. Early diagnosis as well as prompt treatment is very necessary here.*

Keywords: *Clinical features, Presentations, Complications Cholesteatoma, Ear, Hearing loss*

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I. INTRODUCTION

Cholesteatoma presents with a range of clinical manifestations that reflect its potential to affect various structures within the ear. The clinical presentation of cholesteatoma includes symptoms such as hearing loss, otorrhea, aural fullness, pain, and vertigo. Hearing loss is a common initial complaint, often attributed to ossicular erosion and accumulation of keratin debris within the middle ear [1]. Patients frequently report a sensation of aural fullness due to the presence of the sac-like growth, causing pressure changes within the ear [2]. Pain may also accompany cholesteatoma, particularly when there is a concurrent infection or inflammation [3]. Vertigo and imbalance can occur, stemming from the involvement of the balance system within the ear [4]. The etiology of cholesteatoma involves congenital and acquired factors. Acquired cholesteatomas frequently arise from chronic otitis media and eustachian tube dysfunction, while congenital cholesteatomas originate from embryonic epithelial remnants [5]. The condition can lead to severe complications, such as facial nerve paralysis due to erosion of the facial canal [6], intracranial infections like meningitis and brain abscess through temporal

bone breaches [7], and imbalance resulting from inner ear damage [4]. The prevalence of cholesteatoma varies among populations, with an incidence of approximately 9.2 to 27.5 cases per 100,000 individuals per year in Western countries [8]. It primarily affects individuals in their second and third decades of life, although it can occur at any age [9]. While both acquired and congenital factors contribute to cholesteatoma formation, acquired cholesteatomas often result from chronic middle ear infections and eustachian tube dysfunction, whereas congenital cholesteatomas arise from embryonic epithelial remnants [10]. Complications associated with cholesteatoma are numerous and can lead to severe outcomes. Facial nerve paralysis can result from the erosion of the facial nerve canal [7]. Additionally, the cholesteatoma can breach the temporal bone, leading to intracranial infections such as meningitis and brain abscesses [4]. Imbalance and vertigo may occur due to damage to the inner ear structures. The objective of this current study was to assess the clinical features and complications among cholesteatoma cases.

II. METHODOLOGY

This was a prospective observational study and was conducted in the Department of Otolaryngology and Head-Neck Surgery, Combined Military Hospital (CMH), Dhaka, Bangladesh from July 2008 to Dec 2009. In total 50 cholesteatoma patients were enrolled in this study as the study subjects. In sample selection, a simple random sampling technique was used. The study was approved by the ethical committee of the mentioned hospital. Properly written consent was taken from all the participants before data collection. The whole intervention was conducted following the principles of human research specified in the Helsinki Declaration [11] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [12]. As per the inclusion criteria of this study, patients with chronic active squamous otitis media were included. On the other hand, according to the exclusion criteria of this study, patients with mucosal otitis media, cases with CSOM with scanty foul-smelling discharge or attic perforation were excluded. All the demographic and clinical information of the participants was recorded. All data were collected by personal interview and clinical examination in a pre-designed data sheet and were analyzed and disseminated by using the MS Office program.

III. RESULT

In this study, among the total participants, 70% were male whereas the rest 30% were female. So, the male-female ratio of the participants was 2.3:1. The mean ±SD age of the respondents was 17 ±8.79 years and the highest number of respondents were from the 11-20 years age group who contributed 54%. In this study, almost all of the patients presented with more than one symptom. The commonest symptoms among those were otorrhoea (In 100%), followed by hearing impairment (In 80%), otalgia (In 16%), postauricular painful swelling (In 12%) and postauricular discharging sinus (In 10%). In some cases, tinnitus (2%) and imbalance were observed. In analyzing the condition of the external auditory canals of the participants we observed that in all the patients (100%) discharge was present and in 30% of cases granulation was found. In the total of 50 ears, a malodourous smell was present, in 40 ears, the amount was scanty and in 40 ears, pearly color was observed which was noticeable. In analyzing the complications among our participants, we observed that postauricular abscess and postauricular sinus were present in 12% and 10% cases respectively which were noticeable. Besides, facial palsy (n=2), extradural abscess (n=1), lateral sinus thrombophlebitis (n=1), meningitis (n=3) and temporal lobe abscess (n=1) were found in some cases. Through a CT scan of the ear, circumscribed cavity with ossicular erosion was found in 18 cases and by a CT scan of the brain, a space-occupying lesion was found in 2 cases. According to the audio logical findings, a maximum of our patients had moderate conductive type of deafness (74.47%) followed by mild conductive deafness (19.15%) and a few with mixed deafness (6.38%).

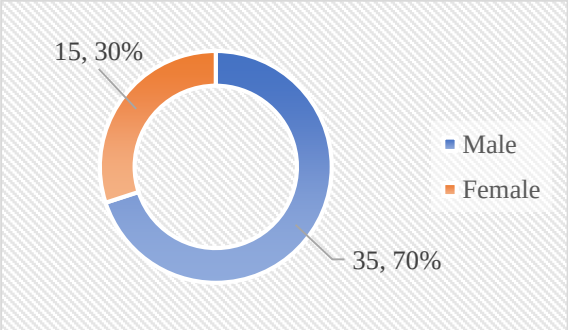

Figure 1: Distribution of participants as per gender (N=50)

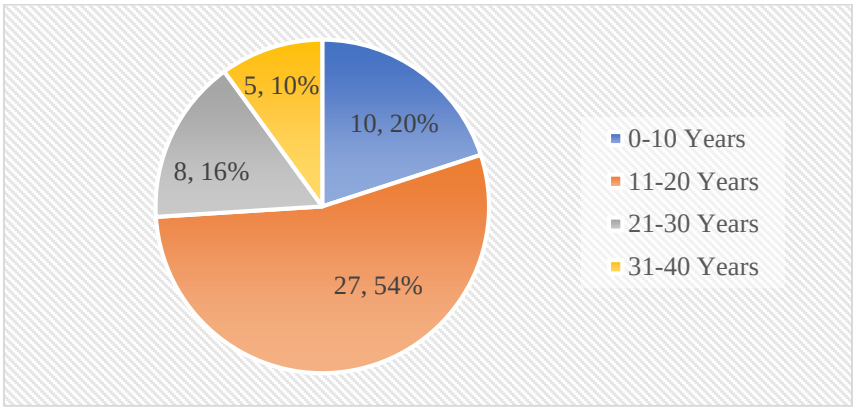

Figure 2: Distribution of participants as per age (N=50)

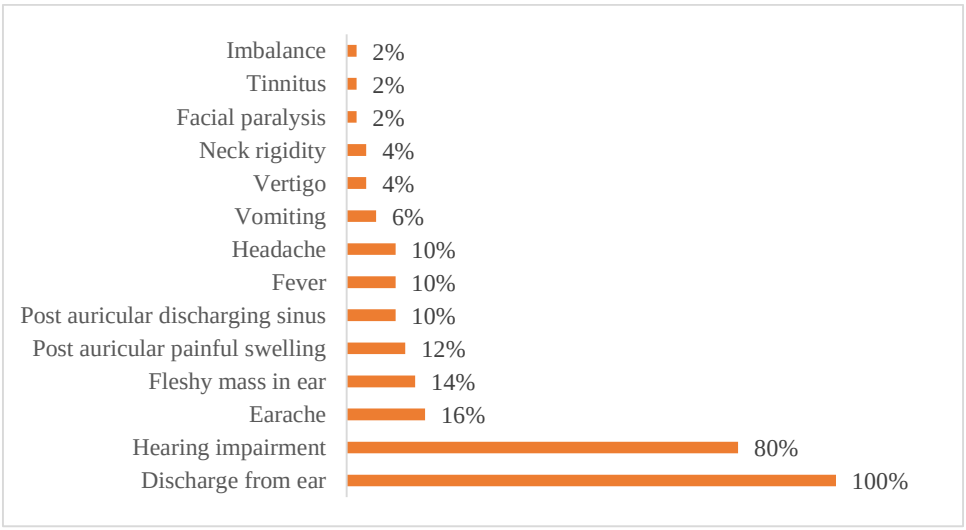

Figure 3: Distribution of patients as per clinical presentation (N=50)

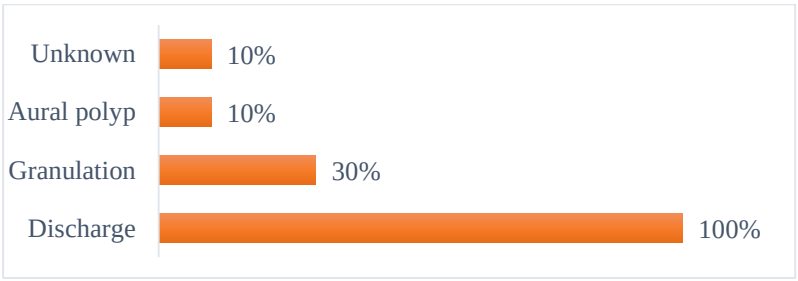

Figure 4: Distribution of patients by the condition of the external auditory canal (n=50)

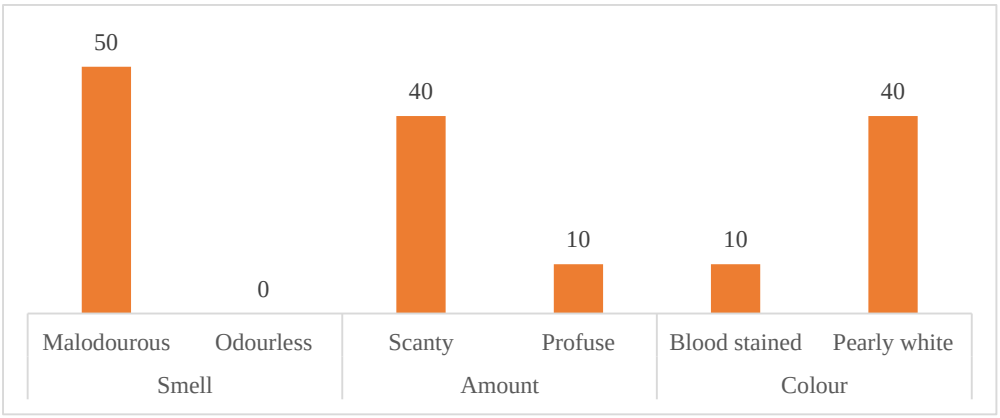

Figure 5: Distribution of patients by character of discharge (n=50 ears)

Table 1: Distribution of patients by the site of perforation and retraction pocket in the attic region of the tympanic membrane (N=50)

Characteristics	n	%
Marginal	23	46%
Attic	26	52%
Retraction pocket	1	2%

Table 2: Distribution of patients as per complications (N=50)

Complications	n	%
Postauricular abscess	6	12%
Postauricular Sinus	5	10%
Facial palsy	2	4%
Extradural abscess	1	2%
Lateral sinus thrombophlebitis	1	2%
Meningitis	3	6%
Temporal lobe abscess	1	2%

Table 3: Distribution of patients by findings of CT scan of temporal bone and brain (n=20)

Findings	n
CT scan of the ear: Circumscribed cavity with ossicular erosion	18
CT scan of brain: Space occupying lesion	2

Table 4: Audiological findings of the patient (n=47 ears)

Findings		n	%
Stage	Range		
Mild deafness	26-40 dB	9	19%
Moderate deafness	41-60 dB	35	74%
Severe deafness	61-90 dB	3	6%

IV. DISCUSSION

This study aimed to assess the clinical features and complications among cholesteatoma cases. In this study, the highest number of participants belonged to the age group of 11-20 years who contributed 44%. The youngest participant in this study was 6 years old and the eldest was 40 years old. A Study conducted by Shenoi PM and Cody TR et al. reported that the youngest patient was 04 years old and the eldest was 55 years old [13]. All of our respondents were with multiple symptoms of otorrhoea (100%) which was the commonest symptom, followed by hearing impairment in 80%, otalgia in 16%, fleshy mass in 14% in the external auditory meatus, postauricular discharging sinus in 10%. Among the total study subjects, 26% were with extracranial complications whereas 12% were with intracranial complications. Kangsanarak J et al. [14] reported that most of the cases (89%) were with ear discharge and 7% were with intracranial complications which were not similar to this study. In analyzing the condition of the external auditory canals of the participants we observed that in all the patients (100%) discharge was present and in 30% of cases granulation was found. In the total of 50 ears, a malodourous smell was present, in 40 ears, the amount was scanty and in 40 ears, pearly color was observed which was noticeable. Ludman H et al. [15] found reported that foul-smelling ear discharge was in 98% and granulation tissue in 10% of the cases. In this current study, about the condition of the eardrum, the most common findings were perforation of the eardrum (49 ears) either in the posterosuperior marginal (46%) or in the attic (52%). Roland PS et al. [16] reported attic perforation in 60% of the cases and marginal perforation in 40% of the cases which was similar to this study. In our study only 12% of cases presented with intracranial complications, 3 with meningitis, 1 with extradural abscess, 1 with lateral sinus thrombophlebitis and 1 with temporal lobe abscess. Almost one-fourth of our participants were with extracranial complications; 06 with postauricular abscess, 05 with post-aural discharging sinus and 02 with facial nerve palsy. Kemppainen HO et al [17] reported that 25% of the cases were with extracranial complications; most of them were with postauricular abscess and discharging sinus which was similar to the findings of this study but inconsistent with some other studies [18,19] In our study, through CT-scan of the ear, circumscribed cavity with ossicular erosion was found in 18 cases and by CT scan of the brain, the space-occupying lesion was found in 2 cases. According to the audio logical findings, a maximum of our patients had moderate conductive type of deafness (74.47%) followed

by mild conductive deafness (19.15%) and a few with mixed deafness (6.38%). All the findings of this current study may be helpful in further similar studies.

Limitation of the study:

This was a single-centered study with small-sized samples. Moreover, the study was conducted over a very short period. So, the findings of this study may not reflect the exact scenario of the whole country.

V. CONCLUSION & RECOMMENDATION

As per the findings of this current study, we can conclude that younger male people are mainly prone to cholesteatoma. Deafness may be another name for cholesteatoma which is very frequent among cholesteatoma patients. Otorrhoea and hearing impairment are the most common symptom of this disease; discharge and granulation of the external auditory canals are very common conditions in such patients. The discharge is usually thick purulent foul smelling, scanty and occasionally blood-stained. In children, grave intracranial complications developed because of illiteracy, lack of awareness, poverty and lack of medical facilities mostly in rural areas. Early diagnosis and prompt treatment are a must for such patients. For getting more specific results, we would like to recommend conducting similar studies in several places with larger-sized samples.

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Conflict of interest: None declared.

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