Section: ENT

Original Research Article

A STUDY OF CORRELATION BETWEEN CHOLESTEATOMA AND MASTOID PNEUMATIZATION IN TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Chronic otitis Media is a long-standing infection of a part or whole of the middle ear cleft characterised by intermittent or continuous discharge through a persistent tympanic membrane perforation. Its incidence is higher in developing countries with low socioeconomic status, and poor health and nutrition facilities. The mastoid air cells are an integral part of the middle ear cleft has to role to play in the middle ear inflammatory diseases. Temporal bone pneumatisation plays an important role in the aetiology, behaviour, course, and outcome of COM. **Objective:** To asses the relation between occurence of cholesteatoma and mastoid pneumatisation in cases of chronic otitis media.

Materials and Methods: This is a retrospective analytical study based on hosptial medical records of subjects presented with chronic otitis media and cholesteatoma. Data of history, clinical examination, investigations, radiological data like HRCT temporal bones obtained and analysed for comparision.

Results: This shows that the combined cholesteatoma involving both pars flaccida and parstensa is the most commonly observed finding in this study followed by pars flaccidaand pars tensa alone respectively. Erosion of scutum is the most commonly observed finding followed by blunting of scutum. The study population have sclerotic mastoids (83.33%) followed by diploic (13.34%) and (3.33%) have completely pneumatized mastoid air cells.

Conclusion: Apart from age at presentation, gender, laterality, first symptom at presentation, and type and location of cholesteatoma, in the remaining variables, there is no statistical significance.

Keywords: Cholesteatoma, Mastoid Pneumatization.

INTRODUCTION

Cholesteatoma is a mass formed by keratinizing squamous epithelium in the middle ear and/or mastoid, subepithelial connective tissue and by the progressive accumulation of keratin debris with/without surrounding inflammatory reaction. Temporal bone pneumatisation plays an important role in the aetiology, behaviour, course, and outcome of COM. Of the parts of the temporal bone mastoid antrum, petrous pyramid, squamous, and tympanic portion the pneumatisation of mastoid cells begins at 33rd week and continues up to 8 to 9 yrs. The mastoid air cell system has been recognized as an important contributor to the pathophysiology of middle ear inflammatory diseases.

Aim

To study the relation between cholesteatoma and mastoid pneumatization

Objectives

1. To asses the pneumatisation pattern in mastoid bone in cases of cholesteatoma
2. To analyse the pneumatisation of opposite ears in cases of unilateral disease.
3. To determine the association of retraction and mastoid pneumatisation

MATERIALS AND METHODS

A 4 months retrospective analytical study was performed based on the data obtained from hospital medical records of subjects presented to ENT department, Government ENT hospital between January 2025 and April 2025 diagnosed with Chronic otitis media with cholesteatoma. This study is conducted on a sample size of 100.

Inclusion Criteria

1. Subjects with Chronic otitis mediawith Cholesteatoma presented to ENT department.
2. Subjects aged between 7 to 80 years of either sex
3. Subjects prove otherwise healthy following clinical examination

Exclusion Criteria

1. Subjects with mucosal Chronic otits media.
2. Subjects with specific otitis media (tuberculosis, syphilis).
3. Subjects who are not willing to provide informed consent.

Data was collected from the medical records systems from the department of ENT and analysed.

Collection of data by examining patient admission data, treatment forms, and clinical progress entries with postoperative follow up for 2 months

Data was collected regarding the clinical presentation and otoscopic findings, hearing assessment from Tuning fork tests, Audiometry and radiological assessment with x-ray both mastoids schullers view and HRCT temporal bones.

Data were extracted from files using pre-structured data extraction sheet for standardisation to avoid errors in data extraction

All the data will e entered into an Excel spreadsheet and analysis done using SPSS version 25.0.

Ethical considerations

All the participants in this study are Voluntarily involved. Obtaining consent for interview and examination. Obtaining consent for collection of samples. Maintenance of confidentially is taken care of. The doubts of patients will be answered to avoid any confusion. The academic purpose behind the study will be explained to the patient and then enrolled. The patient can withdraw from the study anytime during the process

No physical insult or inconvenience was caused to the patient.

RESULTS

Site of perforation in study population (N=100)

Perforation site	Number	Percentage
Attic	50	50%
Total	30	30%
Central	13	13%
Marginal	7	7%
Total	100	100%

The most common site for tympanic perforation in this study is attic perforation followed by total tympanic membrane perforation

Site of Cholesteatoma in middle ear (N=100)

Type of cholesteatoma	Number	Percentage
Pars tensa	10	10%
Pars flaccida	15	15%
Combined	75	75%
Total	100	100%

Combined cholesteatoma involving both pars flaccida and pars tensa is the most commonly observed finding in this study followed by pars flaccida and pars tensa respectively.

Pneumatization process of mastoid (N=100)

pneumatisation process of mastoid	Number	Percentage
Sclerotic	83	83%
Diploic	13	13%
Pneumatic	4	4%
Total	100	100%

83% (n=83) of the study population have sclerotic mastoids followed by 13% (n=13) of the study population have diploic mastoid air cells.

Pneumatization process of contralateral mastoid (N=100)

Pneumatisation of contralateral Mastoid	Number	Percentage
Sclerotic	20	20%
Diploic	10	10%

Pneumatic	70	70%
Total	100	100%

70% (n=70) of the study population have well-pneumatized contralateral mastoid air cells followed by 20% (n=20) of the study population have sclerotic mastoid air cells

Postero-superior retraction of pars tensa and pneumatization

posterior superior retraction of pars tensa and pneumatization	number	Percentage
Sclerotic	10	100%
Diploic	-	-
Pneumatic	-	-
Total	10	100%

10% (n=10) of the study population have a purely posterior superior retraction of pars tensa. Out of which 100% are with sclerotic mastoid air cells.

Retraction of pars flaccida and pneumatization :

retraction of pars flaccida and pneumatization	number	Percentage
Sclerotic	10	77%
Diploic	3	23%
Pneumatic	-	-
Total	13	100%

13 (n=13) of the study population have a retraction of pars flaccida. out of which 77% have sclerotic mastoid air cells and 23% have diploic mastoid air cells.

DISCUSSION

This study results show 83% (n=83) of the study population have sclerotic mastoids followed by 13% (n=13) of the study population with diploic mastoid air cells, 3% (n=3) have completely pneumatized mastoid air cells. p-value is > 0.05 which infers that there is no statistical significance This study shows that 70% (n=70) of the study population have well-pneumatized contralateral mastoid air cells followed by 20% (n=20) of the study population with sclerotic mastoid air cells. 10% (n=10) have diploic mastoid air cells. p-value is > 0.05 which infers that there is no statistical significance.

This study shows that 10% (n=3) of the study population have a purely posterior superior retraction of pars tensa. Out of which, 100% are with sclerotic mastoid air cells.

This study shows that 13% (n=13) of the study population have a retraction of pars flaccida. out of which 77% have sclerotic mastoid air cells and 23% have diploic mastoid air cells. p-value is > 0.05 which infers that there is no statistical significance.

CONCLUSION

This study, shows that the attic is the most common site for tympanic membrane perforation. Most commonly we found combined pars tensa and pars flaccida cholesteatoma in the atticoantral region. Erosion of scutum is the most commonly eroded part in the middle ear bony wall. Mild hearing loss, sclerotic ipsilateral mastoids and pneumatic contralateral mastoids are the most commonly observed. The contralateral ear is diseased in 20% of the study sample. Apart from age at presentation, gender, laterality, first symptom at presentation, and type and location of cholesteatoma, in the remaining variables, there is no statistical significance.

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