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# Evaluation of "Pathologies of Temporal Bone" By High Resolution Computed Tomography

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**ABSTRACT**
The modification of computed tomography, HRCT (High resolution computed tomography) provide the detailed minute anatomical details of the complex temporal bone including the major blood vessels and nerves passing through it. The main purpose of our study is to study the pathologies in the temporal bone, anatomical variations, congenital anomalies and tumors.
**KEYWORDS:** HIGH RESOLUTION COMPUTED TOMOGRAPHY
TEMPORAL BONE

## I. INTRODUCTION AND BACKGROUND

- The temporal bone is a complex anatomic structure containing the organs of hearing and balance. Clinical examination of temporal bone pathologies alone is not sufficient, owing to prevalence, complications and recurrence of various lesions of the temporal bone, imaging plays a major role in the management and the treatment.[1]
- Many imaging modalities are available for the evaluation of temporal bone including plain radiographs, angiography, CSF analysis, air and non ionic contrast cisternography , CT, 3D CT and MRI. [2]
- CT and MRI have largely replaced the other modalities.

## II. AIMS AND OBJECTIVES:

- To study the extent of middle ear infections and their complications.
- To evaluate temporal bone neoplasms and stage them.
- To study the congenital anomalies of the ear according to compartment involvement.
- To assess the normal variation in the structure of temporal bone.

## III. MATERIALS AND METHODS:

- The source of data for the study is 30 patients.
- Duration of study: 12 months.
- Data Analysis: Prospective study.
- All patients referred to the department of Radio-Diagnosis with either suspected or diagnosed to have symptoms related to temporal bone disease are taken for the study.
- Patients are scanned in the axial and coronal planes.
- Scanning started from lower margin of external auditory meatus and extended upward to the arcuate eminence of the superior semicircular canal as seen on lateral topogram.
- Coronal images were obtained perpendicular to the axial plane from the cochlea to the posterior semicircular canal.
- In case of bilateral temporal bone pathologies, each side was taken as a separate case.
- HRCT images will be evaluated in detail and findings was tabulated in the proforma.
- Surgical findings were noted whenever patients are operated.
- Clinical correlation and follow up were done for rest of the cases.
- The final diagnosis after correlating clinical, imaging and surgical findings were taken as the gold standard.

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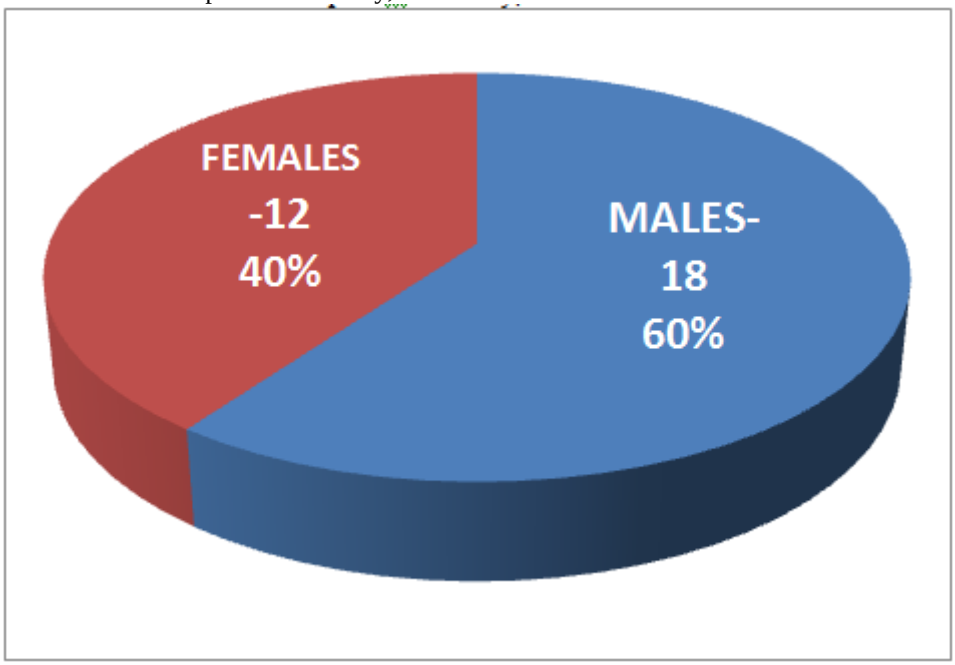
## IV. RESULTS:

Graph 1 In our study, 18 were males and 12 were females.




**Graph 2 In our study of 30 patients, Types of lesions are-Infections- 28 patients- 93.3%, Tumors - 2 patients- 6.8% patients.**

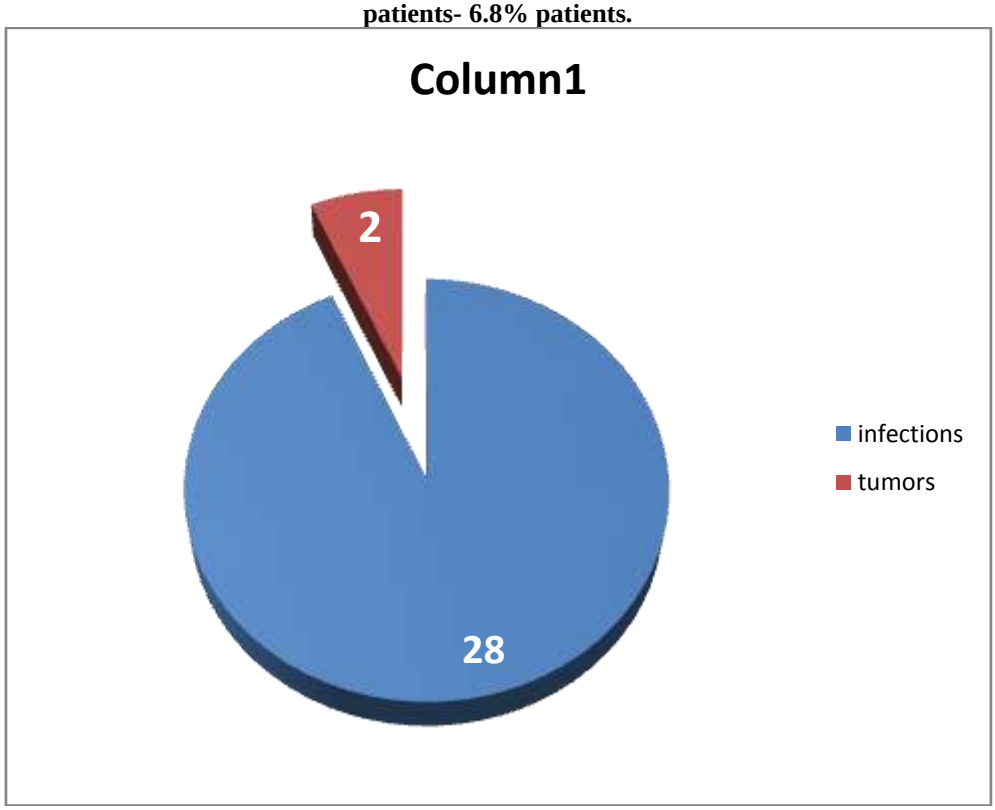


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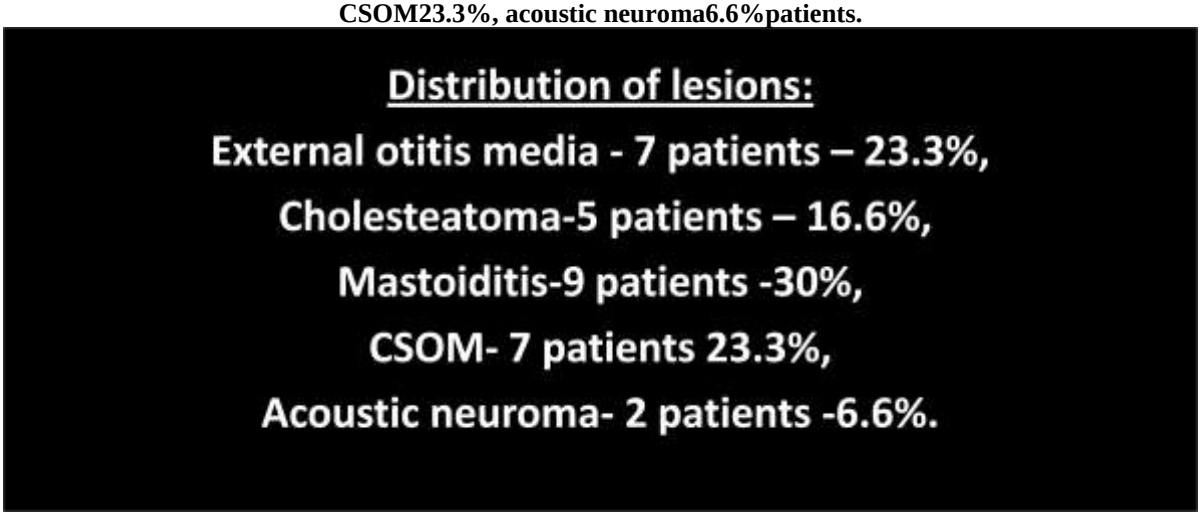
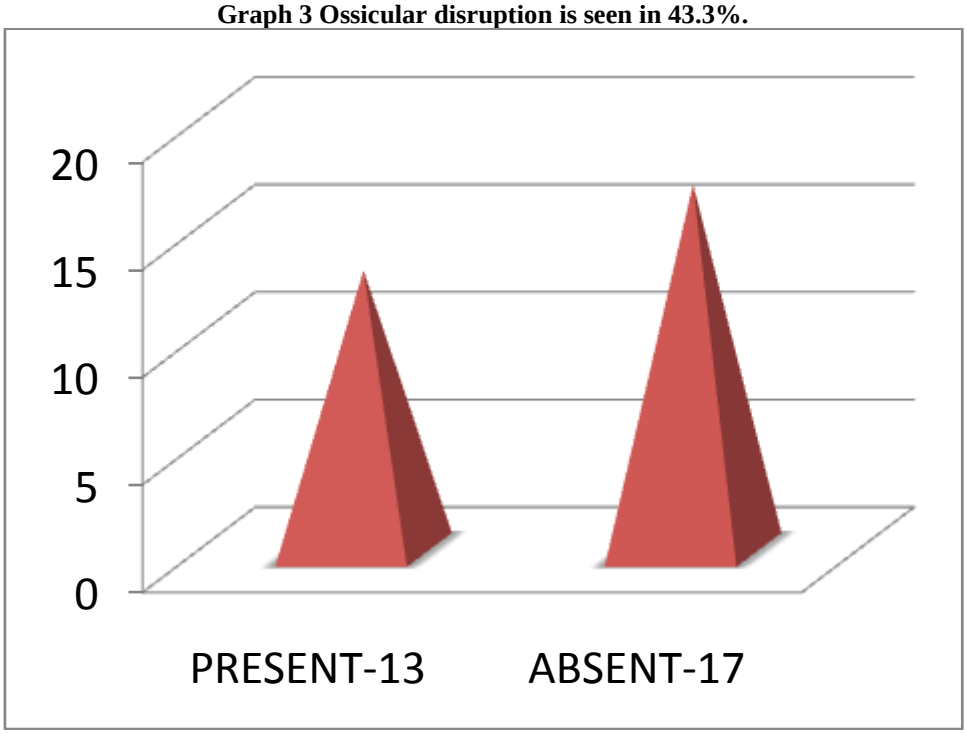
**Table 1 Distribution of lesions are- external otitis media23.3%, cholesteatoma-16.6%, mastoiditis-30%, CSOM23.3%, acoustic neuroma6.6%patients.**




**Graph 3 Ossicular disruption is seen in 43.3%.**




## V. DISCUSSION:

This study assesses the usefulness of a pre-operative high resolution CT scan in depicting the status of the external , middle & inner ear, mastoid penumatization and also anatomical variations.[3]

The present study was carried out with an aim to study any normal variation, congenital anomalies in the structure of temporal bone and to evaluate various infective pathologies of temporal bone and their complications with HRCT. In this prospective study carried out on 30 patients, majority of cases were males (60%).

Out of 30 cases, 28 cases were infectious with mastoiditis being the commonest followed by the chronic suppurative otitis media, cholesteatoma & external otitis media and rest 2 cases of acoustic neuroma.[4]

Thukral et al in 2015 in their study got 83.3% cases of cholesteatoma compared to our study where we got 16.6 % of cases.[1]

Among the 28 infectious cases, 18 cases were operated with 16 cases showing the correct imaging, surgical and pathological correlation.

Both the tumor cases were operated confirming the imaging findings.

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Out of the total 30 cases, middle ear ossicles disruption is seen in 17 cases and absent in 13 cases.[5]

Thukral et al in 2015 in their study got 66% cases with ossicular disruption which was close to our study with 56.6 % of cases with ossicular disruption.[1]

In our study there are no congenital anomalies seen.

Although sample size is the major drawback in our study, our study showed a good agreement between the imaging findings on HRCT with surgical and clinicopathological correlation with good sensitivity.

## VI. CONCLUSION:

Temporal bone anatomy is complex. High resolution Computed tomography of temporal bone is boon for accurate diagnosis of the pathologies and their complications. It also delineates the anatomical variations hence helps the surgical approach to be safe. The results of the present study showed good correlation between the clinical, imaging and surgical findings. Therefore we conclude HRCT is the best modality for diagnosis and management of temporal bone pathologies.

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**IMAGES:**

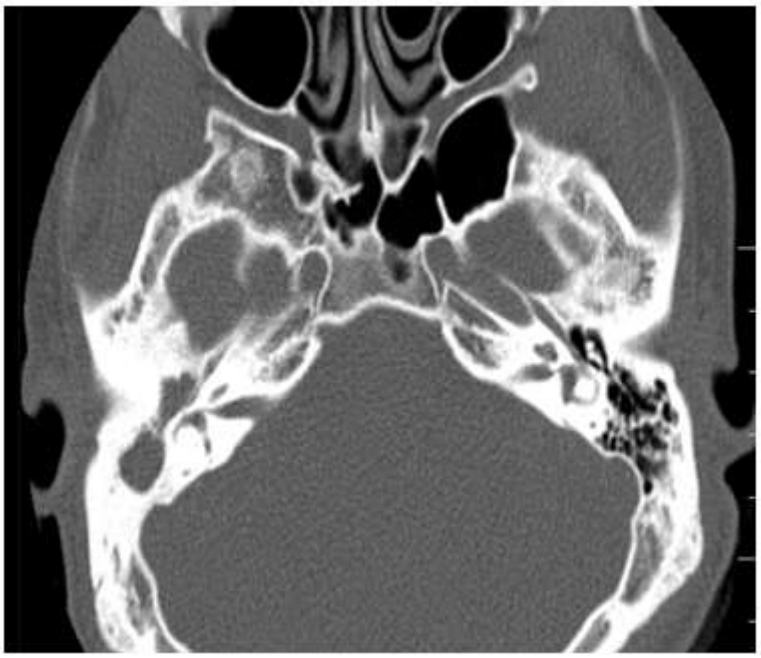

**Figure 1 Soft tissue density in right middle ear cavity with extension into mastoid cavity-Likely Otitis media with ossicular destruction.**

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**Figure 2 Soft tissue density area with air foci in right auditory canal- Cholesteatoma.**

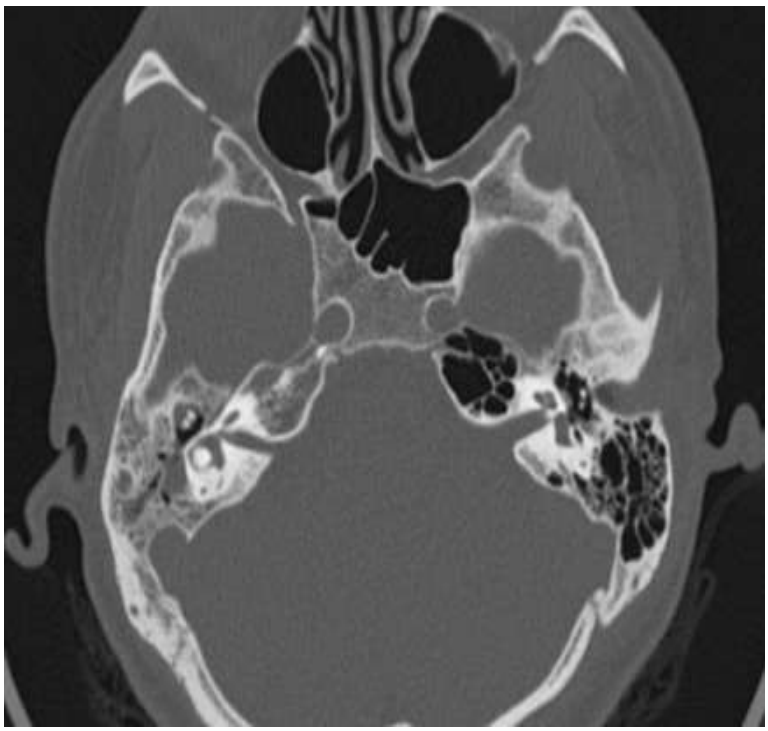

**Figure 3 Soft tissue density in right middle ear cavity with extension into mastoid cavity -Likely Chronic Otitis media.**

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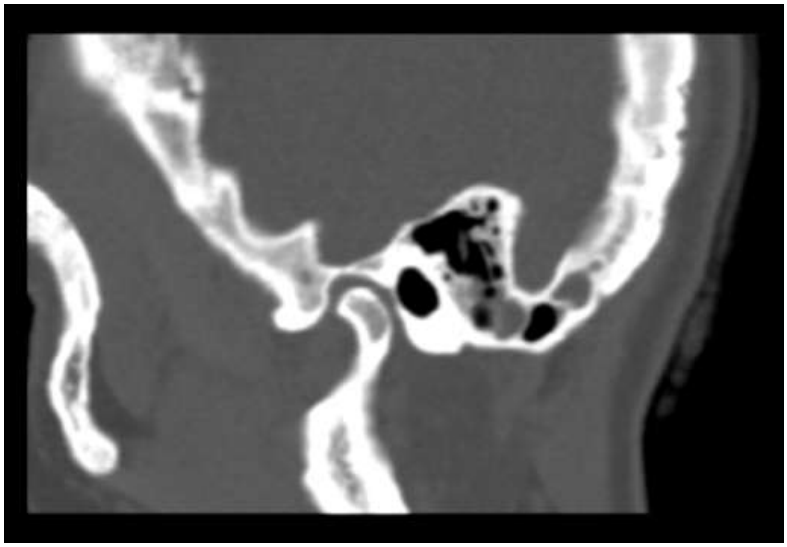

**Figure 4 Soft tissue density noted in right mastoid air cells – Mastoiditis.**

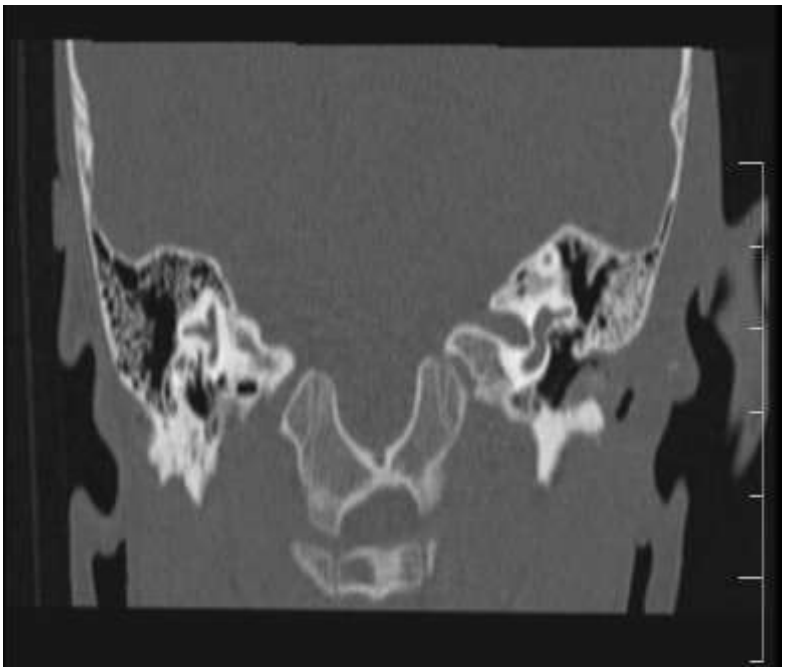

**Figure 5 Soft tissue density in left external auditory canal, auricular and mastoid regions -Abscess**