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Role Of Ct Scan In Unsafe Chronic Otitis Media Cases Of Jammu

Aditiya Saraf[1], Padam Singh[2], Raies Ahmad[3], Parmod Kalsotra[4]
[1,2,3,4]*Department of ENT and Head and Neck Surgery, SMGS Hospital, Government Medical College Jammu, Jammu and Kashmir, India.*

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ABSTRACT
Aims and Objectives: To evaluate the role of HRCT (High Resolution Computed Tomography) in unsafe chronic otitis media cases of Jammu province and correlating it with intra-operative findings.
Material and methods: This prospective study was conducted in Department of ENT, GMC Jammu on 158 patients from March 2019 to November 2019 after approval by Institutional Ethics Committee . Patients with chronic otitis media squamosal type were included in our study. All of the 158 patients underwent mastoidectomy and final pre-operative HRCT diagnosis was then correlated with intra-operative status.
Results: The main diagnosis on HRCT was cholesteatoma in all 158 patients (100%), with additional information like ossicular erosion in 115 patients (73.3%), lateral semicircular canal fistula in 10 patients (6.3%), extradural abscess in 7 patients (4.4%) and facial nerve dehiscence in 10 patients (6.3%).Intraoperatively, cholesteatoma was present in all 158 cases (100%), ossicular erosion in 158 patients (100%), facial nerve dehiscence in 31 cases (20%), extradural abscess in 7 patients (4.4%) and lateral semicircular canal fistula in 10 patients (6.3%). The correlation coefficient showed positive relationship.
Conclusion: HRCT temporal bone is a reliable modality to diagnose unsafe COM as there was good correlation between HRCT findings and intra-operative findings.
Keywords: HRCT, mastoidectomy, extradural, dehiscence

I. INTRODUCTION

The temporal bone is a complex anatomic structure containing the organs of hearing and balance. Diseases of temporal bone are very common, especially pathologies related to ear.[1]

Chronic otitis media is a long standing infection of the middle ear cleft characterised by persistent or recurrent aural discharge, deafness and perforation of tympanic membrane Chronic otitis media (COM) is usually classified into following types- Healed COM, Mucosal COM (safe) and Squamosal COM (unsafe).[2]

Owing to the associated recurrences and complications, patients with unsafe csom usually should not only undergo complete clinical examination and audiological tests but also, imaging studies, so as to get a reliable and accurate diagnosis.[3]

Many imaging modalities are available for assessment of temporal bone pathologies, namely- plain radiographs, computed tomography, magnetic resonance imaging, air & non ionic contrasts cisternography etc. However, CT scan and MRI are the most widely used modalities. [4]

High resolution CT scan is a modification of routine CT scan that produces images with higher contrast and better spatial resolution, being devoid of any artefacts. Also, hidden areas of middle ear such as facial recess and sinus tympani can be better studied with HRCT scan.[5]

HRCT scan enables an otologist to better understand the disease course with early detection of any complication, thus, reducing morbidity and mortality related to temporal bone pathologies.

The aim of our study was to evaluate the role of HRCT in unsafe chronic otitis media and correlating it with intra-operative findings.

II. MATERIAL AND METHODS

This prospective study was conducted in Department of ENT, GMC Jammu on 158 patients from March 2018 to April 2019 after approval by Institutional Ethics Committee..

Inclusion criteria: Patients with chronic otitis media- active squamosal type

Exclusion criteria: Chronic otitis media mucosal type, cases of ear/head trauma, temporal bone neoplasm, any previous ear surgery.

All patients meeting the inclusion criteria underwent clinical assessment including otoscopy, examination under microscope and pure tone audiometry. After routine blood investigations, HRCT scan was done at our institute. HRCT was done using thin section, high resolution and bone algorithm technique. Sections in both axial and coronal planes were obtained. Coronal planes were

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done by neck extension and prone position. Axial planes were done in supine and neutral position of neck.

HRCT was studied mainly for the following parameters:

- Site and Extent of lesion
- Status of ossicular chain
- Status of facial nerve
- Status of labyrinth
- Status of mastoid air cell system

All of the 158 patients underwent mastoidectomy and final HRCT diagnosis was then correlated with intra-operative status.

Statistical analysis of the data was carried out by using SPSS 17.0.

III. RESULTS

Out of 158 patients, there were 97 males (61.3%) and 61 females (38.6%). The age range of our study was from 8 years to 56 years, the majority of patients in age group of 21-30 years (mean= 27.53 ±3.23 years)

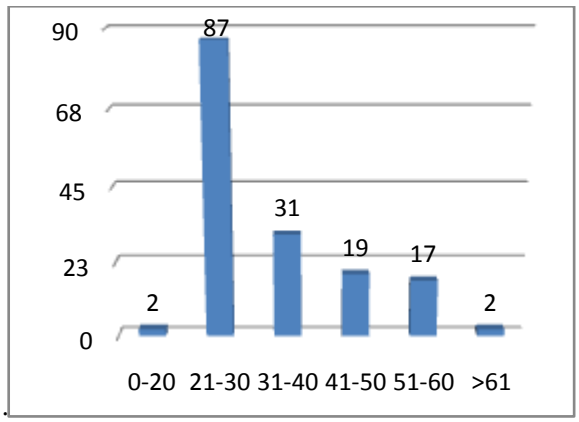

Fig 1: Age distribution

The most common presenting complaint was ear discharge (100%), followed by impaired hearing(80%), vertigo(6%), headache(6%) and facial palsy(6%).

COMPLAINT	PERCENTAGE OF CASES
Ear discharge	100
Impaired hearing	80
Vertigo	6
Headache	6
Facial palsy	6

Table 1: Symptom distribution

The main diagnosis on HRCT was cholesteatoma in all 158 patients (100%), with additional information like ossicular erosion in 115 patients (73.3%), lateral semicircular canal fistula in 10 patients (6.3%), extradural abscess in 7 patients (4.4%) and facial nerve dehiscence in 10 patient (6.3%).

Intraoperatively, cholesteatoma was present in all 158 cases (100%), ossicular erosion in 158 patients (100%), facial nerve dehiscence in 31 cases (20%), extradural abscess in 7 patients (4.4%) and lateral semicircular canal fistula in 10 patient (6.3%). The correlation coefficient showed positive relationship (Pearson correlation coefficient = 0.4).

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FINDING	HRCT (%)	INTRA-OPERATIVE (%)
Cholesteatoma	100	100
Ossicular erosion	73.3	100
Facial nerve dehiscence	6.3	20
Horizontal SCC fistula	6.3	6.3
Extradural abscess	4.4	4.4

Table 2: HRCT and Intraoperative finding percentages

IV. DISCUSSION

HRCT provides a direct visual window into the temporal bone, giving details regarding anatomy as well as pathology of middle ear, thus, forming a road map for the surgeon.[6]

Out of 158 patients, there were 97 males (61.3%) and 61 females (38.6%). This finding is consistent with study by Poursadegh M et al.[7] This could be due to reluctance of female population in India to visit health care center for medical advise. The age range of our study was from 8 years to 56 years, the majority of patients in age group of 21-30 years (mean age= 27.53 ±3.23 years) . Similar age group preponderance was reported by Thukral CL et al.[3] and Datta G et al.[8] Majority of studies related to temporal bone pathologies suggest it to be a disease of younger population.

The most common presenting complaint was ear discharge (100%), followed by impaired hearing (80%). This finding was comparable to studies by Gomaa MA et al.[9] However, Sharma R et al.[4] showed in their study that most common complaint was hearing loss. Though ours was a study with limited study population, still we had patients with some additional complaints like vertigo in 6% patients, which was later revealed to be due to labyrinthine fistula, headache in 6% patients which was due to extradural abscess in that patient , and facial palsy in 6 % patients, due to dehiscent bony facial canal. Hearing impairment was not present in all the patients possibly due to some of them being cholesteatoma hearers.

The main diagnosis on HRCT was cholesteatoma in all 158 patients, with additional informations like ossicular erosion in 115 patients, lateral semicircular canal fistula in 10 patients, extradural abscess in 7 patients and facial nerve dehiscence in 10 patients. Intraoperatively, cholesteatoma was present in all 158 cases, ossicular erosion in 158 patients, facial nerve dehiscence in 31 cases, extradural abscess in 7 patients and lateral semicircular canal fistula in 10 patients.

According to our study, HRCT temporal bone could detect cholesteatoma correctly in all of the 158 patients. This finding was comparable to study conducted by Thukral CL et al.[3] The hallmark of cholesteatoma on HRCT is a soft tissue mass in attic and mastoid antrum associated with smooth bony expansion, scalloping of mastoid and erosion of scutum.

HRCT temporal bone could correctly detect labyrinthine fistula and extra dural abscess. This finding was consistent with study by Prata AAS et al.[10]

HRCT temporal bone could not detect facial nerve dehiscence in 21 patients. This could be due to small size of facial nerve, its oblique orientation or presence of a developmental dehiscence, abutted by soft tissue mass. Our finding was consistent with study conducted by Garg P et al.[11]

HRCT could not detect ossicular erosion in 43 patients. This could be due to surrounding soft tissues. Our finding was consistent with Thukral CL et al.[3]

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Fig 1: Intraoperative picture showing Lateral SCC fistula

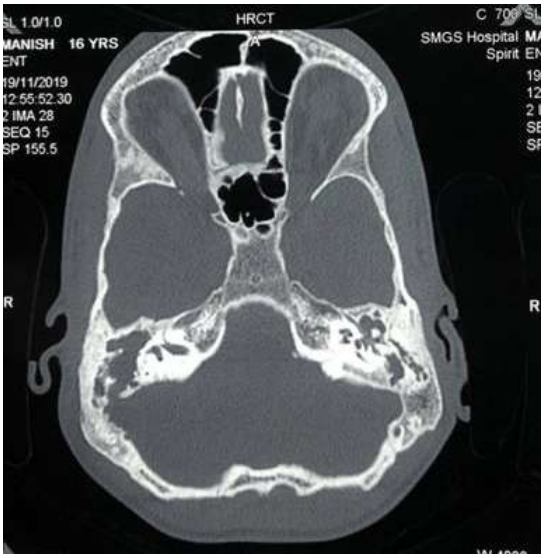

Fig 2: HRCT showing right sided Extra-dural abscess

Fig 3: Intraoperative picture showing Cholesteatoma

V. CONCLUSION

Due to limitations of clinical examination and conventional radiography to detect extent of disease, HRCT temporal is a valuable tool to detect various pathologies in unsafe chronic otitis media. Though our study had small sample size and small

study duration, still we can conclude that HRCT temporal bone is a reliable modality to diagnose unsafe COM as there was good correlation between HRCT findings and intra-operative findings.

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