



ORIGINAL RESEARCH PAPER

Otolaryngology

A COMPARATIVE STUDY OF PREOPERATIVE HRCT TEMPORAL BONE AND INTRAOPERATIVE FINDING IN CSOM PATIENTS

KEY WORDS: HRCT Temporal Bone , Squamosal Chronic Otitis Media.

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ABSTRACT

Background: After the invention of CT by British engineer Godfrey Hounsfield in 1972, the view of surgical management has completely changed. HRCT temporal bone is considered to be the GOLD STANDARD in diagnosing the pathology and extent of CSOM patients.

Methods: A prospective study of 40 patients was done with suspected squamosal chronic otitis media was carried out in tertiary care hospital, Gwalior, India in a time period of 1 year from May 2018 to May 2019. Preoperative evaluation of disease is done by HRCT temporal bone followed by surgical intervention. Important findings in HRCT temporal bone and surgery were correlated for statistical significance.

Results: This study of 40 patients revealed 23(57.5%) male patients and 17 female patients (42.5%) with mean age of presentation is 24.24 years with 47.5 % patients presented with right ear pathology, 40 % with left ear pathology and 12.5 % with bilateral ear pathology. Mesotympanum was involved in 75% of patients followed by incus erosion (50%) in HRCT findings. A high sensitivity (100%) of HRCT is found in scutum erosion, facial canal dehiscence, malleus, incus and stapes erosion, sinus plate erosion, mastoid erosion. Low sensitivity is found in EAC involvement (66.6%). A high specificity of HRCT temporal bone is found in tegmen erosion (100%).

Conclusion: HRCT temporal bone provides an excellent tool to diagnose the ear pathology and helps in planning surgeries so as to reduce the mortality rate occurring due to inappropriate treatment of ear diseases.

INTRODUCTION :

Squamosal chronic otitis media can be inactive with retracted pars flaccida / tensa usually at posterosuperior quadrant with potential of becoming active with retained debris or active with cholesteatoma. Cholesteatoma is a misnomer. It is a non-cancerous skin growth consisting of keratinizing squamous epithelium that causes destruction of adjacent structures.^[1,2]

The incidence of cholesteatoma is 3 per 100,000 in children and 9.2 per 100,000 in adults with male to female ratio of 3:2.^[3] Cholesteatoma usually involves posterior attic, mesotympanum and anterior attic. It can be congenital or acquired with same features resembling morphologically.^[4] In congenital cholesteatoma there is white epidermal cysts medial to intact tympanic membrane with normal pars tensa and flaccida and there is no previous history of ear discharge, perforation or previous surgeries.^[5] Acquired cholesteatoma is formed either due to migration of squamous epithelium into middle ear through a perforated tympanic membrane or due to progressive retraction of tympanic membrane with atrophy of pars tensa or due to basal cell hyperplasia.^[6,7,8]

The diagnosis of cholesteatoma is made by otoscopic examination. Imaging such as HRCT temporal bone is required to know the extent of pathology, and status of adjacent structures so as to plan proper surgical intervention.

AIMS :

The present study was aimed to compare the HRCT findings with intraoperative findings in patients of chronic otitis media.

MATERIALS AND METHODS :

A prospective study of 40 patients was done with suspected squamosal chronic otitis media was carried out in tertiary care hospital, Gwalior, India in a time period of 1 year from May 2018 to May 2019. Patients underwent otoscopic examination. Suspected patients underwent HRCT temporal bone with thin 1mm contrast enhanced scans using high spatial frequency algorithm. All patients who were surgically fit underwent surgery. Intraoperative finding and HRCT findings were compared.

Inclusion criteria

All patients with cholesteatoma which is diagnosed clinically.

Exclusion criteria

1. Pregnancy
2. those who are not fit surgically
3. congenital ear deformities
4. already operated case

RESULTS :

In our study of 40 patients, mean age of presentation is 24.24 years.

57.5% were males and 42.5 % were females. 47.5 % patients have right ear pathology, 40% were having left side pathology while 12.5% were having bilateral ear pathology.

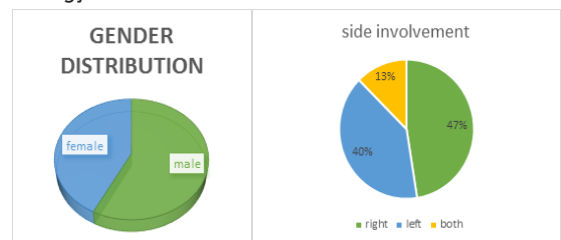


Figure 1 showing gender wise and side wise involvement of cases

In this study, in HRCT findings mesotympanum involvement is most common (75%). Among bony erosion incus erosion is most common (50%), followed by malleus erosion (37.5%) stapes erosion (12.5%). Scutum erosion is seen in 20% patients, tegmen erosion is found in 32.5% patients, facial canal dehiscence in 15% patients, erosion of sinus plate in 10% patients, mastoid erosion in 40% patents, EAC involvement in 25% patients.

In intraoperative finding most common is mesotympanum involvement (62.5%) followed by mastoid involvement 25%. Incus erosion is seen in 45% patients, malleus erosion in 25% patients, stapes erosion in 7.5% patients. Scutum erosion is seen in 15% patients, tegmen erosion is found in 37.5% patients, facial canal dehiscence in 5% patients, erosion of sinus plate in 10% patients, EAC involvement in 37.5% patients.

s.no	Finding	HRCT finding	Surgical finding	HRCT sensitivity	HRCT specificity	HRCT PPV	HRCT NPV	HRCT accuracy
01	scutum erosion	20	15	100	87.5	75	100	96
02	Tegmen erosion	32.5	37.5	86.6	100	100	92.5	95
03	Facial canal dehiscence	15	5	100	89.4	34	100	90
04	Lateral semi-circular canal dehiscence	5	0	-	-	-	-	-
05	Malleus erosion	37.5	25	100	83.3	66.6	100	87.5
06	Incus erosion	50	45	100	90.9	90	100	95
07	Stapes erosion	12.5	7.5	100	95.7	60	100	96
08	Mesotympanum involvement	75	75	100	100	100	100	100
09	Fistula formation	2.5	0	-	-	-	-	-
10.	Erosion of sinus plate	10	5	100	85.7	50	100	87.5
11.	Mastoid involvement	40	25	100	81.2	62.5	100	90
12	EAC involvement	25	37.5	66.6	100	100	83.3	87.5

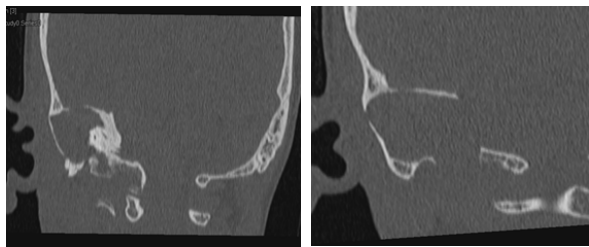


Figure 1 showing right side tegmen erosion Figure 2 showing right side sigmoid plate erosion

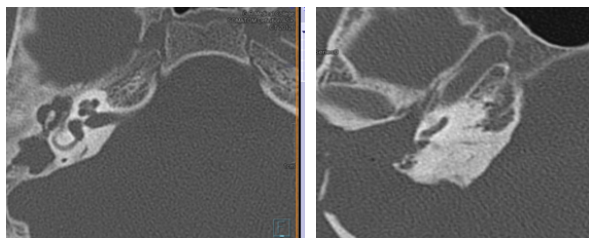


Figure 3 showing right side ossicles involvement Figure 4 showing R lateral semicircular canal fistula formation

DISCUSSION:

HRCT is a modality of choice in preoperative evaluation of extent of pathology and destruction of adjacent structures and helps in proper planning of surgery so as to reduce the morbidity rate.

In this study, in HRCT, mesotympanum was most commonly involved (75%) followed by mastoid involvement (40%) while incus is most common bone to be eroded (50%) followed by malleus erosion (37.5%). This in accordance with the study done by Dashottar et al where mesotympanum was involved in 96% cases followed by mastoid involvement(48%).^[9] Incus erosion was 70% and malleus erosion was 54%.

In study done by Shreedhar et al,^[10] attic involvement was most common (80%) followed by mastoid (76%), and mesotympanum (56%). Incus erosion is most common bony erosion (88%).

In this study, a high sensitivity (100%) of HRCT is found in scutum erosion, facial canal dehiscence, malleus, incus and stapes erosion, sinus plate erosion, mastoid erosion. Low sensitivity is found in EAC involvement (66.6%). A high specificity of HRCT temporal bone is found in tegmen erosion (100%).

In study done by Shreedhar et al,^[10] high sensitivity (100%) was found in scutum erosion, tegmen erosion, malleus erosion, mesotympanum involvement and mastoid involvement. Low sensitivity (83.3%) was found for stapes erosion.

In study done by Dashottar et al, high sensitivity (82-100%) was found in erosion of scutum, tegmen tympani and incus while specificity of malleus erosion is low.

This study showed 100 % accuracy in localising disease in mesotympanum.

Since in this study sample is not adequate, results of this study may not be accurate.

CONCLUSION:

HRCT is a modality of choice in preoperative evaluation of extent of pathology and destruction of adjacent structures and helps in proper planning of surgery so as to reduce the morbidity rate. This study showed 100 % accuracy in localising disease in mesotympanum.

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