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Research Article

A Correlational Study Between Preoperative Clinico- Radiological Findings On HRCT Temporal Bone And Intraoperative Surgical Findings In Patients With Chronic Suppurative Otitis Media Of Squamosal Type With Complications

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ABSTRACT

Background: Chronic otitis media (COM) resulting in hearing loss remains a major health concern. High-resolution computed tomography (HRCT), a variation of standard computed tomography (CT), utilizes different algorithms to provide outstanding resolution of spatial densities. Together coronal and axial CT scans has dramatically improved temporal bone imagery. The major pathologic symptom is the development of "cholesteatoma" and the inflammatory granulation tissue that induces bone degradation. Cholesteatoma is a sac of keratinized desquamated epithelium in the middle ear cleft, resting on a fibrous tissue layer called the matrix. The constant desquamation of the keratinized epithelium causes accumulation of epithelial debris in the middle ear cavity which becomes secondarily infected. **Material and methods:** This study was Cross sectional observational study conducted in HBT Medical College and R N Cooper municipal Hospital, vile parle (w) Mumbai over a period of one year from May 2019 to April 2020 on population of 50 patients in the age group between 20 to 70 years suffering from chronic suppurative otitis media of squamosal type with complications. **Results:** Based on distribution of patients with respect to age in years, most cases were found under age group 21-30 years i.e., 21 (42%) followed by 31-40 years i.e., 12 (24%) and on the basis of gender, most cases were males i.e., 33 (66%) respectively. Clinical features of selected patients were studied and found that most common were otorrhea i.e., 50 (100%) and hearing loss i.e., 45 (90%) and least common were giddiness, facial palsy and post-aural discharge i.e., 03 (06%), 04 (08%) and 04 (08%) respectively. On examination under microscopy, most common finding was Attic Cholesteatoma i.e., 12 (24%) followed by Attic Cholesteatoma with granulation i.e., 11 (22%) respectively and in audiometry findings most common was severe CHL i.e., 16 (32%) followed by moderate CHL i.e., 12 (24%) respectively. Based on intracranial complications, most common were meningitis i.e., 10 (20%) followed by temporal abscess i.e., 07(14%) and similarly for extracranial complications, most common was mastoid abscess i.e., 11 (22%) followed by post aural fistula i.e., 05 (10%) respectively. **Conclusion:** HRCT scan of Temporal bone is a highly sensitive and specific diagnostic modality to evaluate the hidden structures of middle ear and mastoid, and to precisely localize the pathological processes. Radiological limitations of HRCT Temporal bone can be decreased by studying radiological views in more than one projection, by bilateral comparison between diseased side and normal side & by familiarizing with normal radiographic variations.

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INTRODUCTION

Till the advent of modern antibiotics, otitis media was most frequently followed by poor outcome, illustrated primarily by a quote from Hippocrates: "Acute ear pain with prolonged high fever is to be feared because there is danger that the man may become delirious and die[1]."

After analysing the various population-based research conducted over the past few decades, communities with the largest prevalence include Inuits of Arctic, Greenland, Canada and Alaska (7% to 46%), and Native Americans (4% to 8%), led by South Pacific (4% to 6%) and African (2% to 6%). A smaller prevalence (1 to 2 percent) is seen in the Asian and Middle Eastern nations. Among developed nations, including the United States, the United Kingdom, Sweden, Denmark, and Israel, the lowest incidence rates exist[2]. Chronic otitis media (COM) resulting in hearing loss remains a major health concern. Short- and long-term otitis media consequences can be severe, but may be deemed preventable if early detection and appropriate care and early surgical intervention to reduce the disease are needed[3].

High-resolution computed tomography (HRCT), a variation of standard computed tomography (CT), utilizes different algorithms to provide outstanding resolution of spatial densities. Together coronal and axial CT scans has dramatically improved temporal bone imagery. HRCT reliably represents the borders between the outer, middle and inner ear cavities, thereby specifically localizing the disease and thus greatly defining the thin border between the temporal bone and the intracranial pocket with exact descriptions of primary temporal bone disease intracranial distribution[2]. Contrast media help to assess the vascularity and contrast enhancing characteristics particularly in temporal bone soft tissue lesions, which provide clues to histopathology[4]. Persistent suppurative otitis media (CSOM) is a chronic inflammatory mechanism causing permanent physiological modifications in the middle ear cleft. It is of two forms the form tubotympanic and atticoantral[5]. Tubotympanic form (safe form) is a type of healthy CSOM limited only to the cleft of the middle ear. Though atticoantral illness includes the attic, the antrum and the tympanum that follows a significant feature of this variety is that it is a bone eroding condition, so it reveals the underlying frameworks with subsequent problems and is thus considered a hazardous or unhealthy variety of chronic suppurative otitis media. The major pathologic symptom is the development of "cholesteatoma" and the inflammatory granulation tissue that induces bone degradation[5]. Cholesteatoma is a sac of keratinized desquamated epithelium in the middle ear cleft, resting on a fibrous tissue layer called the matrix. The constant desquamation of the keratinized epithelium causes accumulation of epithelial debris in the middle ear cavity which becomes secondarily infected[5].

This study compares the preoperative temporal bone HRCT findings with intraoperative findings in patients with chronic suppurative otitis media of squamosal type with complications.

Aim and objectives: To correlate clinico-radiological (HRCT Temporal bone) findings with intraoperative findings in patients with chronic suppurative otitis media of squamosal type with complications, to interpret HRCT Temporal bone and to know site, severity, extent of disease in patients with chronic suppurative otitis media of squamosal type with complications and to know the radiological limitations and pitfalls by correlating with intraoperative findings in patients with chronic suppurative otitis media of squamosal type with complications.

Material and methods: This study was Cross sectional observational study, approved by Ethical Committee and Scientific Committee HBT medical college and RNCH conducted in HBT Medical College and R N Cooper municipal Hospital, vile parle (w) Mumbai over a period of one year from May 2019 to April 2020 on population of 50 patients in the age group between 20 to 70 years suffering from chronic suppurative otitis media of squamosal

type with complications coming to HBTMC and RNCH.

Patient data collection and evaluation-

- Data was collected from all patients, irrespective of their background /socio economic status. The patients were evaluated and followed up according to protocol.
- All patients with chronic suppurative otitis media of squamosal type with complications were studied with respect to radiological and intraoperative findings.

A Performa was predesigned to gather the minimum but essential information. Keeping in mind the limitations of resources the Performa was made simple and brief.

Baseline data was recorded at the first visit which include age, sex, presenting complains like ear pain, ear discharge, hearing loss, fever, tinnitus, giddiness, nasal symptoms, Rinne's test and weber's test, HRCT scan temporal bone findings, surgeries like mastoidectomy, meatoplasty etc.

- Preoperative CT scan done in patients where it is indicated, and those patients were selected in the study. The diseased side was compared with the contralateral normal temporal bone.
- The CT scan model for this study was Philips,128 slice with 1 mm cuts ...the gantry tilt was given as negative 9° to canthomeatal line, this avoids irradiation of lens of eye ball and perpendicular to above plane coronal sections were taken. The images were seen in sharp algorithm.
- The CT study of the temporal bones should include at least two projections.
    1) Horizontal or Axial Projection Coronal
    2) Coronal or Frontal Projection
    3) Sagittal or Lateral Projection
    4) 20-Degree Coronal Oblique Projection

All CT scans were reported by single radiologist and a thorough review of the findings allowed demonstration of the anatomy and physiology and formulation of the surgical plan.

Surgical procedure

All the patients went through ear surgery and all the findings seen intra-operatively were noted. Both the radiological and surgical findings were tabulated and correlated with each other. All patients undergone canal wall down tynpano-mastiodectomy with wide chonchomeatoplasty under general anaesthesia. All surgeries were performed under direct supervision of one consultant and operative findings were recorded on standard proforma including:

1. Presence of soft tissue mass and extension of disease
2. Erosion of tegmen or sinus plate
3. Erosion of facial canal
4. Dehiscence of lateral semicircular canal
5. Status of ossicles

INCLUSION CRITERIA: All patients either male or female in age group 20 to 70 years suffering from chronic suppurative otitis media of squamosal type with complications in whom HRCT scan has been done were included in the study.

EXCLUSION CRITERIA:

Patients with

- Chronic suppurative otitis media of safe type
- Suspicion of ear pathology to be malignant.
- Congenital ear disease
- Previously operated ear cases

Data entry and analysis

Data entry will be done with Statistical Package for Social Sciences (SPSS IBM) version 27.0 and data entry checks will be done at regular intervals to ensure valid entries. Analysis of data will be done with SPSS IBM version 27.0. Both univariate and bivariate analysis will be done. Proportions will be calculated for qualitative variables and mean with standard deviation will be done for quantitative variables. Required tests of significance such as chi square tests and independent t tests will be applied. Significance of p value is taken as $p< 0.05$.

Results: A cross sectional observational study conducted in HBT Medical College and R N Cooper municipal Hospital, vile parle (w) Mumbai, on population comprised of 50 patients in the age group between 20 to 70 years suffering from chronic suppurative otitis media of squamosal type with complications during one year from May 2019 to April 2020.

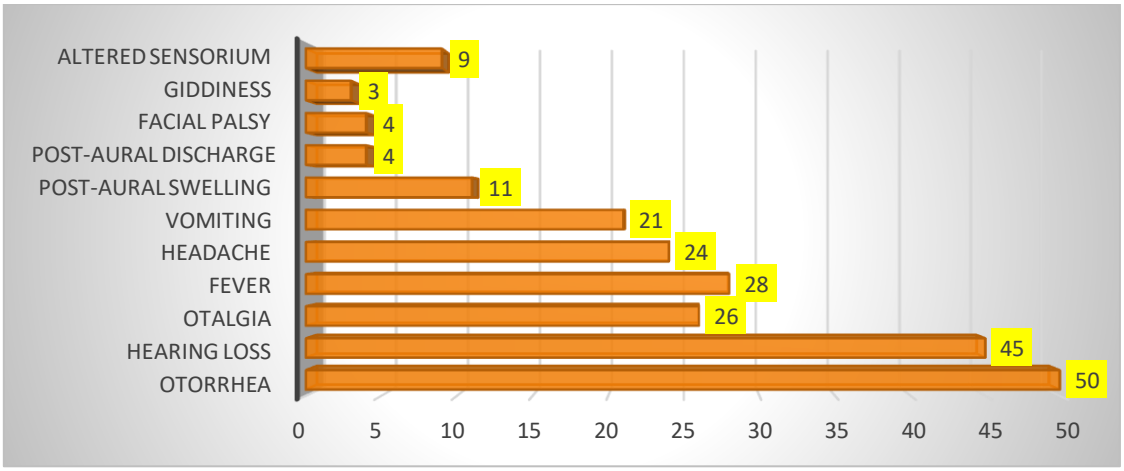
Table 1: Age distribution in selected patients of chronic suppurative Otis media of squamosal type with complications

Age in years	Number of patients	Percentage
21-30	21	42%
31-40	12	24%
41-50	09	18%
51-60	06	12%
61-70	02	04%
Total	50	100%

Table 2: Gender distribution in selected patients of chronic suppurative Otis media of squamosal type with complications

Gender	Number of patients	Percentage
Male	33	66%
Female	17	34%
Total	50	100%

Figure 1: Clinical features in selected patients of chronic suppurative Otis media of squamosal type with complications



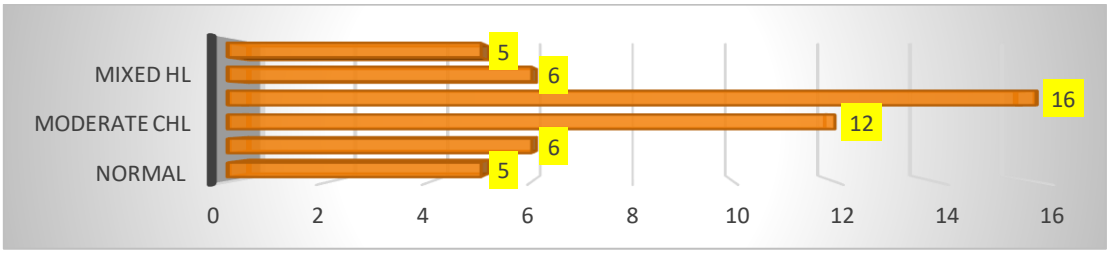
Based on distribution of patients with respect to age in years (Table 1), most cases were found under age group 21-30 years i.e., 21 (42%) followed by 31-40 years i.e., 12 (24%) and on the basis of gender, most cases were males i.e., 33 (66%) respectively (Table 2). Clinical features of selected patients were studied and found that most common were otorrhea i.e., 50 (100%) and hearing loss i.e., 45 (90%) and least common were giddiness, facial palsy and post-aural discharge i.e., 03 (06%), 04 (08%) and 04 (08%) respectively (Figure 1).

Table 4: Ear microscopy in selected patients of chronic suppurative Otis media of squamosal type with complications

EUM	Number of patients	Percentage
Attic Cholesteatoma	12	24%
Attic Cholesteatoma with granulation	11	22%
PSRP with flakes	09	18%
PSRP with granulation	06	12%
Combined Attic + PSRP	08	16%
Marginal perforation with epithelial ingrowing with granulation	03	06%
PSRP with polyp	01	02%

PSRP: Posterosuperior retraction pocket, EUM: Examination under microscopy

Figure 2: Audiometry findings in selected patients of chronic suppurative Otis media of squamosal type with complications



CHL: Conductive hearing loss, SNHL: Sensineaural hearing loss, HL: Hearing loss

Figure 3: Intracranial Complications in selected patients of chronic suppurative Otis media of squamosal type with complications

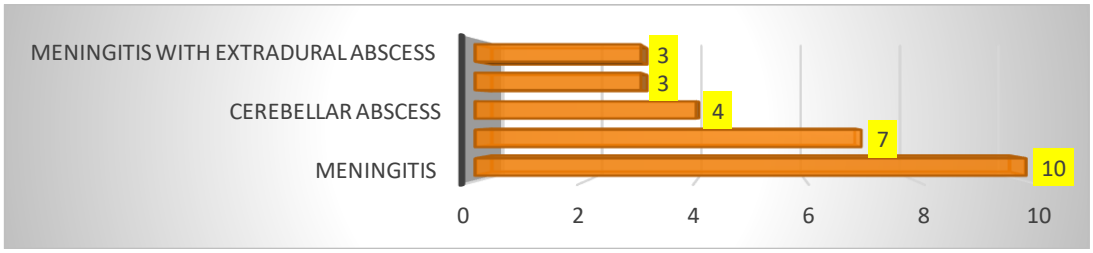
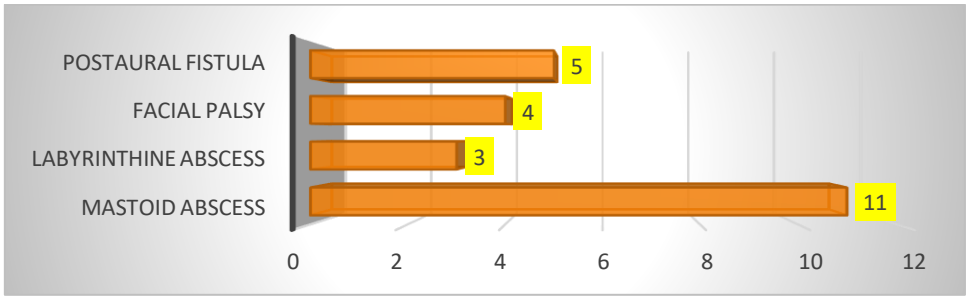


Figure 4: Extracranial Complications in selected patients of chronic suppurative Otis media of squamosal type with complications



On examination under microscopy, most common finding was Attic Cholesteatoma i.e., 12 (24%) followed by Attic Cholesteatoma with granulation i.e., 11 (22%) respectively (Table 4) and in audiometry findings most common was severe CHL i.e., 16 (32%)

followed by moderate CHL i.e., 12 (24%) respectively (Figure 2). Based on intracranial complications, most common were meningitis i.e., 10 (20%) followed by temporal abscess i.e., 07(14%) (Figure 3) and similarly for extracranial complications, most common was mastoid abscess i.e., 11 (22%) followed by post aural fistula i.e., 05 (10%) respectively (Figure 5).

Table 5: Correlation between CT and surgical findings

Findings	CT+	Surgery+	CT+ S- (False positive)	CT- S+ (False negative)
Middle ear and mastoid mass	50	50	00	00
Tegmen plate erosion	15	17	00	02
Sinus plate erosion	09	08	01	00
Semi-circular canal fistula	10	08	02	00
Facial canal erosion	11	13	02	05

CT: Computerised tomography, S: Surgery, +: Present, -: Absent

X stands for CT+ and Y stands for Surgery+

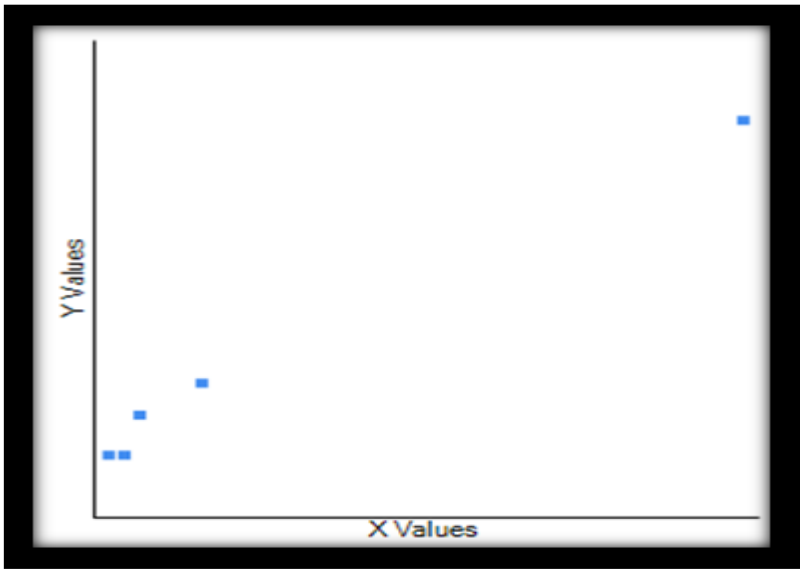
X Values: $\Sigma = 95$ Mean = 19 $\Sigma (X - Mx)^2 = SSx = 1222$

Y Values: $\Sigma = 96$ Mean = 19.2 $\Sigma (Y - My)^2 = SSy = 1242.8$,

X and Y Combined N = 5 $\Sigma (X - Mx) (Y - My) = 1226$

R Calculation $r = \Sigma ((X - My) (Y - Mx)) / \sqrt{((SSx)(SSy))}$

$r = 1226 / \sqrt{((1222) (1242.8))} = 0.9948$



Meta Numerics (cross-check), r (Pearson Coefficient) = 0.9948, this is a strong positive correlation, The chi –square statistic is 2.2602, The p-value is 0.688015. The result is not significant. Middle ear & mastoid mass: Sensitivity of the test for the detection of Middle ear & mastoid mass in this study found to be 100%.

Statistic	Value	95% CI
Sensitivity	100.00%	92.89% to 100.00%

Tegmen plate erosion: Sensitivity of the test for the detection of tegmen erosion in this study found to be 88.24%, positive predictive value 80.93% and specificity as 100%.

Statistic	Value	95% CI
Sensitivity	88.24%	63.56% to 98.54%
Specificity	100%	92.89% to 100.00%
Positive predictive value	80.93%	-

Sinus plate erosion: Sinus plate erosion is visualized as posterior limit of mastoid cavity in axial CT scan. The sensitivity of test is 100% and specificity was 96 % & the positive predictive value was 80%.

Statistic	Value	95% CI
Sensitivity	100.00%	63.06% to 100.00%
Specificity	96.00%	56.73% to 97.50%
Positive likelihood ratio	1.00	1.00 to 1.00
Positive predictive value	80.00%	-

Semicircular canal fistula: The sensitivity for detection of lateral semicircular canal fistula was 100%, with specificity being 93%. The positive predictive value is 64% and negative predictive value is 100%.

Statistic	Value	95% CI
Sensitivity	100.00%	63.06% to 100.00%
Specificity	93.00%	59.09% to 84.19%
Positive likelihood ratio	1.00	1.00 to 1.00
Positive predictive value	64.00%	-
Negative predictive value	100%	-

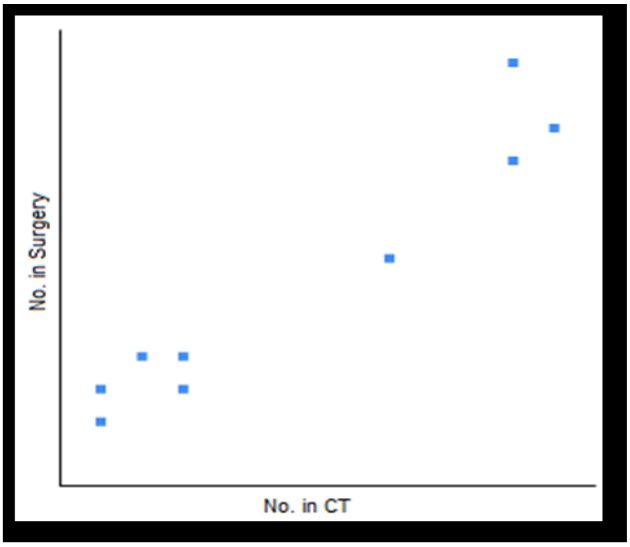
Facial canal erosion: The sensitivity of this test for the detection of facial nerve canal erosion was 68.75% while the specificity is 93.21%. The positive predictive value for the test is 74.00% with the negative predictive value being 87.35%.

Statistic	Value	95% CI
Sensitivity	68.75%	41.34% to 88.98%
Specificity	93.21%	59.09% to 84.19%
Positive likelihood ratio	1.00	1.00 to 1.00
Positive predictive value	74.00%	-
Negative predictive value	87.35%	-

Table 6: Incidence of complications of CSOM & its correlation between HRCT temporal bone and intraoperative findings

Complications	No. in CT	%	No. in Sx	%
Meningitis	11	22%	10	20%
Temporal abscess	08	16%	07	14%
Cerebellar abscess	03	06%	04	08%
Sinus thrombosis with perisinus abscess	01	02%	02	04%
Meningitis with extradural abscess	03	06%	03	06%
Mastoid abscess	12	24%	11	22%
Labyrinthine fistula	01	02%	03	06%
Facial canal erosion	11	22%	13	26%
Postaural fistula	02	04%	04	08%

X stands for No. in CT and Y stands for No. in surgery
X Values: Σ = 52 Mean = 5.778 Σ $(X - Mx)^2$ = SSx = 173.556
Y Values Σ = 57 Mean = 6.333 Σ $(Y - My)^2$ = SSy = 132
X and Y Combined N = 9 Σ (X - Mx) (Y - My) = 145.667
R Calculation: r = Σ ((X - My) (Y - Mx)) / √ ((SSx) (SSy))
Meta Numerics (cross-check): r (Pearson Coefficient) = 0.9624
This is a strong positive correlation



The chi-square statistic is 2.1439, The p-value is 0.709313 The result is not significant

OSSICULAR STATUS: The head of malleus and incus were consistently visualized in axial and coronal scans. The stapes was not consistently seen on CT. Malleus was seen on CT in 45 patients and was correlated during surgery in all patients. Malleus was found to be necrosed in 14 cases. Incus was visualized on CT in 35 patients and was correlated surgically in all patients. Out of 50 patients which necrosis of incus was found in 29 patients. Stapes on CT scan found in 17 patients. During surgery Stapes was found intact in 30 cases. Suprastructure was found to be necrosed in 20 cases.

Table 7: ossicular status correlation between HRCT Temporal and intraoperative findings

Ossicular status	CT+	SX+	Necrosis	Sensitivity	Specificity	PPV	NPV
Malleus	45	45	14	100%	100%	89.24%	78.36%
Incus	35	35	29	100%	100%	96.35%	75.39%
Stapes	17	30	20	56.67%	65.32%	74.98%	69.12%
p-value	The chi-square statistic is 11.8533. The p-value is .018476. The result is significant at p < .05.						

DISCUSSION:

A cross sectional observational study conducted in HBT Medical College and R N Cooper municipal Hospital, vile parle (w) Mumbai, on population comprised of 50 patients in the age group between 20 to 70 years suffering from of chronic suppurative Otis media of squamosal type with complications during one year from May 2019 to April 2020. In our study of 50 patients, 33 were males and 17 were females. Male: female ratio is 1.9:1. All studies conducted have male predominance. Exact etiology is not known. According to study conducted by Yadav and Bhatia[6] are more common in males (3.1:1).

In our study we found that 66% of all patients are in first 4 decade. According to study conducted by Yadav and Bhatia[6] complication are most common in first 3 decades of life with peak incidence in second decade. Also, Boruah DK et al[7] found 86.7% patients were in first four decades. These findings were also similar to those found by Grewal, Hathiram et al[8].

In our study, all patients have long standing history of ear discharge, mostly scanty, foul smelling purulent and blood stained, followed by decreased hearing as second most common complaint. Otalgia, fever, headache, vomiting, post aural swelling, discharge, giddiness, facial asymmetry is also associated in decreasing order. Similar to our study Bradely P J et al[9] reported discharging ear with headache as commonest presentation of complicated unsafe CSOM. Boruah DK et al[7] also found ear discharge was most common clinical symptom (93.30%). Similarly, Vallabhaneni R et al[10] found Otorrhoea (100%) is the most common symptom.

In our study it was found that, out of 50 patients, majority of patients (46%) had Attic pathology followed by PSRP (30%). Out of 30 patients, granulations were present in 40% patients. Similar to our study Vallabhaneni R et al[10] found Cholesteatomas were observed in 26 cases of which 9 cases were in attic, 6 cases were Attico-antral, 4 cases were in Mesotympanum, and 7 cases were holotympanic. Prakash MD et al[11] showed on otoscopic examination, 43.3% cases had cholesteatoma, 33.3% cases had retraction pocket with granulations, 6.6% had marginal perforation and 16.6% presented with ear polyps. On microscopic examination, cholesteatoma was found in 100% patients with retraction pocket with granulations, marginal perforation and ear polyps.

In our study of 50 patients, majority of the patients have intracranial complications (54%) followed by extracranial complications (46%). Out of intracranial complications, meningitis was most common complication followed by temporal lobe abscess. Out of extracranial complications, mastoid abscess was most common extracranial complication.

According to Osma U et al[12] study, intracranial complications are more common than extracranial complications. Meningitis was the most common intracranial complication while mastoid abscess extracranial complication. In contrast to our study Vallabhaneni R et al[10] showed wide spectrum of complications of CSOM out of which mastoiditis and mastoid abscess (20%) was the most common complication followed by Sinus plate erosion (12%), Erosion mastoid Cortex (8%), Intracranial complications like abscess, dural sinus thrombosis (6%), Facial canal Dehiscence (4%), Tegmen tympani Erosion (2%), Cochlea erosion (2%), Tegmen mastoideum Erosion (2%), Lateral semicircular canal erosion (2%). According to Maharaj TJ et al[13], intracranial complications were more common than extracranial complications. Brain abscess was the most common intracranial complication while mastoid abscess was extracranial complication. According to Maharaj TJ[13] study, multiple intracranial complications may be present in same patient.

In our study soft tissue mass was seen in all 50 cases in the variable extent with or without bone erosion on CT scan and surgically correlated in all 50 patients. In study conducted by Berry et al[14] found 100% correlation between soft tissue mass in mastoid and middle ear on CT and surgery. NWC Chee et al[15] also found that in 36 patients of cholesteatoma CT scans showed non-dependent soft tissue in 30 patients and bone erosion in 34 patients. Thus, CT scan is important for preoperative diagnosis and to know the extent of the disease in middle ear and mastoid.

Mafee et al[16] stated that hallmark of cholesteatoma on CT scans are soft tissue mass in attic and antrum along with smooth bony scalloping of the mastoid erosion of lateral attic wall and erosion of ossicles. They also suggested that accurate delineation of pathology as well as the demonstration of anatomical abnormalities is possible by CT scanning. Johnson DW et al[17] found that presence of a well-defined edge to the mass was a sure indication of cholesteatoma. O'Reilly et al[18] found that out of 29 patients who had soft tissue mass in the mastoid and middle ear cavity, 23 patients had cholesteatoma. Swartz et al[19] found that acquired cholesteatoma were of homogenous density on CT and congenital cholesteatoma of heterogenous density.

Jackler et al[20] found erosion of tegmen in 4 patients on surgery, which were associated with signs of bone destruction on CT but in additional 8 patients tegmen erosions could not be correlated surgically (false positive). Mafee et al[16] missed 3 out of 6 cases but had no false positives while O'Reilly et al[18] detected 5 out

of 11 cases but had 6 false positives. Berry et al[14] in their study correctly correlated erosion of tegmen in 66.66 % patients. Park KH et al[21], found predictive value of test for tegmen erosion as 90.2%. Vallabhaneni R et al[10] showed HRCT findings of temporal bone in chronic suppurative otitis media found sinus plate erosion in 6 cases and Tegmen erosion in 1 case.

In our study out of 50 patients 10 showed erosion of lateral canal in more than 2 or 3 cuts of CT scan. But it was correlated during surgery only in 08 patients. Jackler et al[20] found lateral canal fistula in 8 pts on CT of which 4 showed fistula, on surgery. They high incidence of false positive was caused by sole reliance on coronal scans. Mafee et al[16] found fistula in 4 pts which were diagnosed accurately on CT. O'Reily et al[18] detected 6 out of 8 lateral canal fistula and had false positive rate of 3.5%, false positive rate was in our study is 6 %. They found that axial scans were more satisfactory because they depicted the canal entirely and where less likely to produce false positive but useful could also be gain from coronal scans so both scans should be done.

Swartz et al[19], advised caution in making the diagnosis of lateral canal fistula as more anterior coronal sections may wrongly suggest the presence of fistula. On coronal scans lateral canal often appears dehiscent on medial wall of the antrum due to volume averaging of the thin wall. The presence of soft tissue density mass may give erroneous impression of lateral semicircular canal fistula. For accurate information on the status of lateral semicircular canal fistula, axial scans should be taken preferably tilted 300 to orbito meatal line. Boruah DK et al[7] showed HRCT findings, erosion of lateral semi-circular canal (80%).

In our study Out of total 50 patients, facial nerve appeared to be dehiscent on CT scan in 11 patients and intact in 39 patients. Out of the 11 patients, 2 didn't correlate surgically. During surgery facial canal erosion was found in 13 patients of whom 2 didn't show any erosion on CT. Kee Hyun Park et al[21] found correlation in case of horizontal facial nerve canal erosion in 80.4% of patients. Mafee et al[16] found correlation in 85% of cases (41 out of 48 cases) the rest with intact facial nerve canal radiologically showed erosion during surgery. Jackler et al[20] advised that the best technology to detect erosion of bony canal is to view with multiple section slices. For this reason, coronal scan is preferred for horizontal portion while axial scan is preferred for vertical portion. Prakash MD et al[11] showed Facial canal dehiscence in 4 patients on HRCT but surgically it was found in 5 patients.

The head of malleus and incus were consistently visualized in axial and coronal scans. The stapes was not consistently seen on CT. Malleus was seen on CT in 45 patients and was correlated during surgery in all patients. Malleus was found to be necrosed in 14 cases. Incus was visualized on CT in 35 patients and was correlated surgically in all patients. Out of 50 patients, necrosis of incus was found in 29 patients. Stapes on CT scan found in 17 patients. During surgery Stapes was found intact in 30 cases. Suprastructure of stapes was found to be necrosed in 20 cases. Banerjee et al[22] in their study found that ossicular erosion or preservation was correctly predicted on HRCT in 32 out of 39 patients. Jackler et al[20] found 100% (3out of 3) correlation in predicting complete destruction of ossicular chain. Kee Hyun park et al[21] also found significant correlation of ossicular chain erosion on HRCT, for malleus ,42 out of 43, for incus 47 out of 47 and for stapes 34 out of 35 patients.

CONCLUSION:

This study was conducted from May 2019 to April 2020. We have analysed HRCT Scan of temporal bone of included cases systematically and studied correlation between the radiological observations &surgical findings. We concluded that HRCT scan of Temporal bone is a highly sensitive and specific diagnostic modality to evaluate the hidden structures of middle ear and mastoid, and to precisely localize the pathological processes. The Correlation between HRCT scan of Temporal bone and surgical findings with respect to Middle ear and mastoid mass, Tegmen plate erosion, Sinus plate erosion, Lateral semicircular canal fistula, Facial canal erosion are strongly positive in our study. However, it is statistically insignificant (p-value 0.688). The Correlation between HRCT scan of Temporal bone and surgical findings with respect to status of ossicular chain is statistically significant (p-value 0.018).

Radiological limitations of HRCT Temporal bone can be decreased by studying radiological views in more than one projection, by bilateral comparison between diseased side and normal

side & by familiarizing with normal radiographic variations.

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