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Original Article

Cortical Mastoidectomies in Mucosal COM (Chronic Otitis Media) and Its Outcomes –A Study on 50 Cases

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ABSTRACT

Introduction: COM is an inflammation of middle ear cleft, of mucosal and squamosal types, WHO definition is 2 weeks otorrhea, for ENT surgeon it is >3 months, HRCT temporal bones is useful in evaluation along with audiological evaluation to plan the treatment.
AIM: To determine the outcomes of cortical mastoidectomies in mucosal COM cases.
Background: First mastoid surgery in 1776, suat keskin at al-surgical findings are highly compatable with CT findings, 1921 first use of microscope in ear surgery.
Materials and methods: Cross sectional observational study, study population is patients attending to ENT OPD in tertiary centre, sample size 50, patients with dry ear were selected and of safe type investigated and planned for cortical mastoidectomy surgery outcomes are studied in the form of sequential correlation with clinical, audiological, radiological, intraoperative findings.
Inclusion and exclusion criteria
Patients with safe COM were selected, patients below the age of 15, unsafe types excluded. Sample size 50, cross sectional observational study.
Results and conclusion: Patients attending to ENT OPD were screened for safe COM and admitted sent for HRCT, PTA, done with EUM, blood parameters are taken for cortical mastoidectomy surgery and out comes were studied. Major age group is between 15-30, females were little more effected, BPL is of major concern, ear discharge and hard of hearing are major complaints, unilateral perforations are more, mild to moderate CHL is common, unilateral sclerosed mastoids in X-RAY are common, soft tissue density in mastoid cavity, haziness is of <25 %, decided surgery for >90% of cases is CM with Tplasty, intraoperatively CP in pars tensa in >95% cases, OC erosion is less common, FN is intact in 100% cases.
Discussion: This study was conducted in tertiary centre patients with ear discharge, HOH as major complaints on examination TM perforation, after audiological and radiological evaluation ,<75% with CHL ,of mild to moderate type,<50% with positive HRCT findings which are correlates with intra op findings >95%, so outcomes with cortical mastoidectomy along with HRCT temporal bone as preop investigation of choice will give >70% better results along with lesser the chance of graft rejection and incomplete disease clearance when compare to tympanoplasty surgery.

Keywords: *COM,CM, OC,FN, WHO, ENT OPD,TM,HRCT,HOH.*

INTRODUCTION

CSOM is an inflammation of middle ear cleft for long duration -2 types mucosal and squamosal COM. Symptoms are chronic ear discharge, hard of hearing, earache, blocking in ears etc. CT scan of temporal bones –is must for knowing anatomical variations and destructions/erosions hence to avoid any complications during surgery, in generally TM

perforations with mucoid/mucopurulent discharges for a period >3 months are considered as COM cases. WHO definition –requires only 2weeks of otorrhea, ENT surgeons tend to adopt a longer duration >3 months active discharge prior to go for any treatment /systemic therapy. Culture should be obtained for sensitivity, HRCT useful to know complications, ability of CT scan to depict the status of structure of temporal bone, than plain CT represents a major advance in delivering pathology before surgical exploration of ears cases.

AIMS AND OBJECTIVES

1. To determine the outcomes of cortical mastoidectomies in mucosal COM cases
2. To study the findings of HRCT temporal bones and intraoperative findings of patients of COM to study the outcomes from CM surgeries
3. To observe the intra operative sides of involvement of TM, middle ear, mastoid air cell system in these patients.
4. To find the difference between radiological and intra operative findings in mucosal type of COM cases

LITARATURE REVIEW

2000 years ago Hippocrates compared the PM to spiders web, ear suppuration observation in 460 BC, first mastoid operation in 1776, by Jeen Pefit of paris, german physiologist Johannes Mueller at al coined the term cholestaeatoma, Suat Keskin at al –surgical findings are highly compatabteble with CT findings Berger, a dannish port physician in 1833 suffered from tinnitus Hermann Schwartz and Adlof Eyusell in 1873 –surgical discrpsion of mastroidectomy. Nylen in 1921 – 1st use of micro scope in ear surgery. Curiesh Mishra at al (FEB 2021) HRTC is reliable pre operative multisuergion in case of CSOM. Ashraf Mahmond Khaled at al (june 2022) - HPET is highly reliable – mastoid findings.

BRIEF ANATOMY

Middle ear cleft – 6 walls, spaces, mucosalfolds, prussack space is important, atic, aditus, antrum, fossa incudis, facial recess, sinus tympany, mastoid auntrum, TYPES – well pneumatised, sclerotic. Temproral bones have 4 parts – squamous, zygomatic, tympanic, styloid process, petromastoid parts

CSOM 2 types.

1. Mucosal type, 2. squamosal type
   Facial nerve – important in attic disease
   Reading of tempered bone – in HRCT

MATERIALS AND METHODS

This study is carried out in tertiary care centre in dept. of ENT

1. Study period – 6 months
2. Study design – cross sectional observatory study
3. Study population – patients attending to ENT OPD in tertiary care centre
4. Sample size – 50

INCLUSION CRITERIA

1. Patients above the age of 15 years were included.
2. Patients with safe type of COM were taken

EXCLUSION CRITERIA

1. Patients below the age of 15 yrs were excluded.
2. Patients with chronic medical history like CAD, CVA were excluded
3. Patients with squamosal COM were excluded.

This study is a cross sectional observational study of HRCT temporal bone and intra operative findings of CSOM in mucosal type of CSOM. Done in dept of ENT at tertiary care centre for a period of 6 months, over 50 patients, patients with dry ear were selected, examined clinically admitted, sent for HRCT, preoperative PTA was done, most of the patients were selected for cortical mastoidectomy and T plasty for minimal disease in middle ear along with perforation which is presented in TM Pars tensa at the time of surgery intraoperative findings were recorded and outcomes were studied.

HRCT was performed on siemens SOMATOPOM DR2 whole body scanner contigious (0, 30) and coronal section(70) were taken slice thickness 2mm parameter of evaluation was detected are 1. Extent of pneumatisation 2. Soft tissue extentsion 3. Bone erosion of any rare in safe type 4. Ossicles 5. Facial canal Surgery done, Procedure adapted was cortical mastoidectomy and T plasty if necessary on table extension as done as MRM and also tympanoplasty.

OBSERVATION AND RESULTS

During the period of July 2023 to December 2023 patients who are attending to ENT OPD were selected and with COM symptoms was admitted and sent for necessary investigations and done cortical mastoidectomy surgery and outcomes were studied

TABLES AND CHARTS

AGE DISTRIBUTION

AGE IN YEARS	15 -30	30 - 45	45 – 60	60
NO.OF PATIENTS	23	14	10	3
PERCENTAGE	46%	28%	20%	6%

SEX DISTRIBUTION

SEX	MALE	FEMALE
NO.OF PATIENTS	23	27
PERCENTAGE	46%	54%

SOCIO ECONOMIC STATUS

S.E STATUS	B.P.L	A.P.L
NO.OF PATIENTS	47	3
PERCENTAGE	94%	6%

FAMILY HISTORY

	FAMILY HISTORY +VE	FAMILY HISTORY –VE
NO. OF CASES	2	48
PERCENTAGE	4%	96%

ADDICTIONS

TYPE OF ADDICTION	+VE HISTORY	PERCENTAGE
TADDY DRINKING	4	8%
SMOKING	0	0%
PAN/GUTKA CHEWING	0	0%
-VE ADDICTIONS	46	92%

CHIEF COMPLAINTS

COMPLAINT TYPE	NO. OF PATIENTS	% PERCENTAGE
EAR DISCHARGE	42	84%
HARD OF HEARING	32	64%
EAR PAIN	14	28%
OTHER (dizziness , giddiness, vertigo, itching)	8	16%
Assosiated complaints like (fever, headache)	Nil	0%

PAST HISTORY TABLE

TYPE OF HISTORY	HTN	PM	Others CAP , CVD, etc	SIMILAR COMPLAINTS
NO. OF PATIENTS	3	1	Nil	5
PERCENTAGE	6%	2%	0%	10%

EAR MAJOR HISTORY & EXAMINATIONS FINDINGS

-	NO. OF PATIENTS	PERCENTAGE
EXTERNAL AUDITORY CANAL	-	-
CLEAR	40	80%
DISCHARGE /OTHERS	6	12%
FUNGAL SPORES / conjetion , granulations discomated apeterial debris	4	8%

TYMPANIC MEMBRANE FINDINGS

FINDINGS	NO. OF PATIENTS	PERCENTAGE

PASS TENSA PERCORATION	48	96%
PASS FLACCIDA PERFORATION	2	2%

TABLE OF CLINICAL FINDINGS IN EFFECTED EAR OF MIDDLE EAR OSSICULAR CHAIN

FINDINGS	NO. OF PATIENTS		PERCENTAGE
MIDDLE EAR MUCOSA	NORMAL	34	68%
	COGESTED/PALE	5	10%
OSSICULAR CHAIN	ERODED HOM	7	14%
	EROSION OF INCUS	3	6%
	HYPOPLASTIC STAPES	1	2%

FINDINGS OF FACIAL NERVE

FINDING	NORMAL FACIAL NERVE	FN PALSY
NO. OF PATIENTS	50	NIL
PERCENTAGE	100%	0%

CLINICAL HEARING TESTS FINDINGS BONE CONDUCTION AND AIR CONDUCTION

TYPE OF TESTS	NO. OF PATIENTS	PERCENTAGE
RINNE –VE	34	68%
RINNE +VE	16	32%
WEBERS TEST Lateralization to poor ear	48	96%

Pure tone Audiometry findings

Hearing loss	No of patients	Percentage
Normal hearing	6	12%
Mild HL(20-40dB)	30	60%
MODERATE(40-55dB)	10	20%
MODERATLY SEVERE(55-65)	3	6%
SEVERE65-80)	1	2%
PROFOUND(>80)	-	-

OCCULISION OF EAC - 30 – 40 DBHL
TM PERFORMATION - 10 – 40 DBHL
OSSICULAR CHAIN DISORDERS FIXING WITHOUT PERFORATION - 54 DBHL
OSSICULAR CHAIN DISORDERS & FIXITY OF TM - 38 DBHL
MALLEUS FIXATION - 10 – 25 DBHL
CLOSURE OF OVAL WINDOW - 60 DBHL

X – RAY MASTOIDS FINDINGS TABLE

X – RAY MASTOIDS TYPE OF INVESTEGATION	PNEWMATISED		SCLEROSED	
	B/L	U/L	B/L	U/L
NO. OF PATIENTS	9	23	13	28
PERCENTAGE	18%	46%	26%	56%

HRTC TEMPORAL BONE FINDINGS

FINDINGS	RT	PERCENTAGE	LT	PERCENTAGE
	12	24%	8	16%
MIDDLE EAR MASTOID CAVITY	7	14%	6	12%
OSSICLE	6	12%	5	10%
SOFT TISSUE DENSITY	13	26%	7	14%
FACIAL NERVE STATUS	-	0%	0	0%

IMPEDENCE AUDIOMETRY DONE TO 3 PATIENTS SHOWED B TYPE OF GRAPH

SURGERY DONE TABLE

TYPE OF SURGERY	NO. OF PATIENTS	PERCENTAGE
CORTICAL MASTOIDATOMY WITH TYMPANOPLASY	44%	88%
T. PLASTY , (ENDOSCOPIC /CONVENTIONAL)	6%	12%

TABLE OF INTRAOPERATIVE FINDINGS

FINDING	EAC DISCHARGE	TYMPANIC MEMBRANE PERFORATION	GRANULATIONS /HYPERTROPHY OF MIDDLE EAR MASTOID CAVITY	OSSICLES EROSION	SOFT TISSUE DENSITY	FALOPIAN CANAL ABNORMAL	RARE FINDINGS LIKE HIGH JB, KORNERS SEPTUM,FORWARD SIGMOID SINUS, MEATOPLASTY DONE ETC
NO OF PATIENTS	8	48	11	6	5	-	3
PERCENTAGE	16%	96%	22%	12%	10%	-	6%

TABLE OF COMPLICATIONS

COMPLICATIONS	NO OF PATIENTS	PERCENTAGE
PRESENT	2	4%
ABSENT	48	96%

PNEUMATIZATION OF MASTOID

TYPE	WELL PNEUMATIZED IN CT SCAN	WELL PNEUMATIZED IN SURGERY	SCLEROTIC IN CT SCAN	SCLEROTIC IN SURGERY
NO OF PATIENTS	32	32	21	10
PERCENTAGE	64%	64%	42%	20%

OSSICULAR CHAIN INTEGRITY(AUSTINS CLASIFICATION)

OSSICULAR EROSION	IN CT	IN SURGERY
NO OF CASES	11	13
PERCENTAGE	22%	26%

DISCUSSION

This study conducted in dept of ENT, in tertiary centre for 6 months followed the below said criteria and outcomes were studied. Examination reveals CSOM of safe type (or) unsafe type however radiology is necessary to access the pathology in ear, mastoid, also useful in same middle ear conditions, mastoids, who do not co- operate for examination and also for children.

- At the same time audiological evaluation is also useful to perform / to decided the type of surgery to perform anatomy to the status of hearing loss which is mandatory of conductive type and acquired, when you perform a surgery there is achance to stop the hearing loss at that level by doing repair of the tympanic membrane and by visualizing the middle ear ,mastoid antrum,ossicular chain ,intraoperatively and radiologically we can avoid 1.future complications,2.residual disease for repair,3.nessesity of the follow up.

- In the present study all the 50 cases who are with central perforations on examination ,hard of hearing,ear discharge as complaints,were sent for audiological and radiological examination in the form of PTA and HRCT temporal bones we assessed the hearing loss type,extent and nature of disease by abnormal soft tissue opacification, ossicular chain erosion,the purpose of ct scan is to know the extent of lesion and its spread to surrounding vital structures,routine scan is helpful in anatomy of middle ear,and mastoid, congenital choleseatoma,single functioning ear etc.

- Pneumatization of mastoid-commonly occur in CSOM, it is almost correlating with surgical findings.
- Pramod v at al,19 cases had mastoiditis
- Sasnita et al,had good sensitivity in the detection of automastoidectomy.
- Ossicular destruction –erosion of long process of incus &HOM and head in malleus in CT

- Ranjith parupalli-OC erosion in 90% cases
- Thomson at al-long process of incus erosion in CM
- Varshney et al -found malleus is resistant

Importance of audiological evaluation in CSOM:
For diagnosis and cause of hearing loss, extent of hearing loss, speech understanding ,to guide treatment descision, including surgical evaluation, moniter the effectiveness and treatment, any change in hearing status.

CONCLUSION

Patients attending to ENT OPD were screened for safe COM with complaints of ear discharge, HOH, and admitted sent for HRCT, PTA,done with EUM, blood parameters taken, patients who need surgical treatment were admitted and planned for cortical mastoidectomy surgery and out comes were studied. Major age group is between 15-30, females are more effected>50%, BPL is of major concern>90%, ear discharge and hard of hearing are major complaints upto 50%,unilateral perforations are more >40%,mild to moderate CHL is common upto 50%,unilateral sclerosed mastoids in X-RAY are common>40%,soft tissue density with mastoid cavity hazyness is of <25 %,decided and done surgery for >90% of cases is CM with T.plasty, intraoperatively CP in pars tensa in >95%cases,OC erosion is less common<20%,FN is intact in 100% cases. so outcomes with cortical mastoidectomy along with HRCT temporal bone as preop investigation of choice will give >70% better results along with lesser the chance of graft rejection and complete disease clearance when compare to tympanoplasty surgery.

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