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Study Of Outcome Of Chemical Cauterisation Of Cases Of Small Central Perforation Of Tympanic Membrane In A Tertiary Care Hospital In North East India.

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***Abstract**: Central perforation of tympanic membrane of fifty patients were cauterized with 30 percent trichloroacetic acid having around 1-6mm size of perforation.Most of the cases that were undertaken were post traumatic and inflammatory in nature.The site of the perforations were mostly the anterioinferior and posterioinferior quadrants.Almost all the traumatic perforations were irregular in shape.The range of hearing loss was 15-40dB.TCA cauterization was undertaken after a discharge free period of atleast 3 weeks and in cases of traumatic perforations it was undertaken after 4 weeks for wait of spontaneous closure. In 4 cases we had to go for 4 attempts, in 2 cases for 6 attempts and the rest healed within 1-3 attempts of cauterization. In three cases there was no improvement in hearing ,and in 9 cases a mild gain in hearing.In this study,76% success rate has been achieved.*

***Keywords**: Trauma,Tympanic membrane perforation, Trichloroacetic acid, Hearing assessment*

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I. Introduction

Tympanic Membrane Perforations are one of the most common presentations in an otolaryngologists clinic. Tympanic Membrane Perforation is usually a source of recurrent infection, discharge, and reduction in hearing in the patient.

Closure of the perforation had been initially tried with a prosthesis-ivory tube(Banzer 1640),rubber disc(toynbee1853),paper disc(Blake 1887) and with various other materials.[1]

Tympanic membrane perforations result mostly due to inflammation or trauma. Traumatic perforations usually heal spontaneously, but, it is apt to wait for atleast 3 weeks prior to any intervention. The Eustachian tube dysfunction is the main cause of permanent perforation and hence in these cases cauterization cannot be undertaken.[2]

Though surgical closure of the tympanic membrane stands out to be the treatment of choice ,but effective closure of tympanic membrane, can be achieved by chemical cauterization, with a gain of around 25db of hearing.

II. Materials And Methods

This is a Prospective study undertaken in the Department of ENT,Tripura Medical College,Tripura, within the Study period October 2017-march 2018,the sample size has been calculated to 50 by the following formula:

$n=4pq/l^2$where n=sample size
p=proportion of success rate of healing of tympanic membrane=70%
q=100-p=30%
l=absolute precision=10%
Sampling procedure-convenience

Inclusion criteria-

1.Dry,central perforation for atleast 6 weeks
2.Mild conductive loss(<40db)
3.Normal Eustachian tube

Exclusion criteria
1.Small perforation with discharge
2.Moderate hearing loss(>40db)
3.Atticoantral type of chronic otitis media

Data collection tool-
Microscope
Trichloroacetic Acid(30%)
Cottoinoids
4%Xylocaine
Antibiotic Drops And Ointment
Applicator
Ethical clearance has been obtained.
Informed,written consent was taken before the procedure.

Hearing was assessed by Tuning Fork tests and Pure Tone Audiometry(PTA) The technique was undertaken as an OPD procedure.

For patients with bilateral perforation,one ear was treated first, followed by 6 weeks later , of the other ear.

Cottonoid dipped in 4% xylocaine was placed in external auditory canal for about 10minutes.The rim of the perforation was cauterized using a cotton dipped applicator in trichloroacetic acid,under microscopic guidance.Once the blanching of the rim is completed,an antibiotic smeared aural pack is placed over it. Repitition of the procedure was required in few cases,at weekly intervals ,for a maximum of six weeks. The collected data was entered in SPSS Software version 15. Results are expressed in frequency and percentage.

Figures And Tables

1.Pure Tone Audiometry Findings

SL NO	DAY1	AFTER 7 DAYS	AFTER 1 MONTH	AFTER 3 MONTHS	AFTER 6 MONTHS
1	33.3dB	30dB	30dB	26.6dB	26.6dB
2	25dB	20dB	20dB	18.3dB	16.6db
3	28.3dB	25dB	21.6dB	20dB	20dB
4	30dB	28dB	25	23.3	23.3
5	30dB	23.3 db	23.3	23.3	23.3
6	38dB	33.33 db	33.3	30	30
7	26.6dB	20 db	20	18.3	18.3
8	35db	31.6 db	31	31	31
9	28.3db	25 db	23.3	21.6	21.6
10	25db	21.6 db	21.6	20	20
11	35db	33.3 db	28.3	25	23.3
12	31.6 db	20 db	20	18.3	16.6
13	40 db	33 . 3db	30	30	30
14	23.3 db	20 db	18.3	18.3	16.6
15	21.6 db	16.6 db	16.6	16.3	16.6
16	25 db	23.3 db	20	20	20
17	26.6 db	25 db	23.3	20	20
18	31.6 db	26.6 db	30	31.6	33.3
19	30 db	28.3 db	26.6	25	25
20	23.3 db	20 db	20	20	20
21	28.3 db	25 db	23.3	21.6	21.6
22	30 db	28.3 db	25	25	25
23	40 db	38.3 db	35	33.3	30
24	23.3 db	20 db	18.3	18.3	20
25	25 db	23.3 db	20	16.6	16.6
26	26.6 db	20 db	20	25	25
27	23.3 db	20 db	18.3	18	18.3
28	20 db	18.3 db	16.6	16.6	15
29	20 db	16.6 db	15	15	15
30	18.3 db	16.6 db	18.3	18.3	18.3
31	23.3 db	20 db	20	20	20
32	21.6 db	16.6 db	20	21.6	21.6
33	30 db	25 db	23.3	23.3	20
34	33.3 db	30 db	30	28.3	25
35	30 db	26.6 db	26.6	25	23.3
36	28.3 db	23.3 db	20	18.3	18.3

37	35db	33.3 db	30	28.3	26.6
38	40 db	35 db	35	33.3	33.3
39	35 db	33.3 db	30	30	30
40	33.3 db	30 db	28.3	25	25
41	26.6 db	25 db	25	23.3	23.3
42	30 db	28.3 db	26.6	25	25
43	26.6 db	23.3 db	20	18.3	16.6
44	20 db	16.6 db	16.6	16.6	16.6
45	18.3 db	15 db	15	15	15
46	40 db	35 db	33.3	30	30
47	40 db	38.3 db	40	40	40
48	35 db	30 db	28.3	26.6	26.6
49	40 db	38.3 db	35	33.3	33.3
50	25db	25db	23.3	23.3	20

2.Otoendoscopic Findings

SL NO.	DAY1	AFTER 7 DAYS	AFTER 1 MONTH	AFTER 3 MONTHS	AFTER 6 MONTHS
1	Tp	Moderate	Small	Small	Healed
2	Tp	Irregular small	irregular	Irregular	Healed
3	Cp	moderate	small	Small	Small
4	Cp	Small cp	Small cp	Small cp	Small cp
5	Cp	Small cp	Small cp	Small cp	Small cp
6	Tp	Irregular perforation	irregular	Irregular	Irregular
8	Tp	irregular	irregular	Irregular	Irregular
9	Tp	irregular	irregular	Irregular	Small
10	Tp irregular moderate	Irregular small healingl	healing	Healing	Healed
11	Cp	moderate	small	Small	Small
12	Tp	Moderate irregular	irregular	Irregular	Irregular
13	Cp	Cp	small	Small	Small
14	Tp	Irregular small	irregular	Irregular	Healed
15	Tp	moderate	moderate	Small	Healed
16	Tp	Irregular small	healing	Healing	Healed
17	Tp	irregular	irregular	Irregular	Irregular
18	Cp	Cp(same)	Cp	Cp	Cp(same)
19	cp	irregular	irregular	Small	Small
20	Tp	Irregular small	healing	Healing	Healed
21	Cp	Cp	Cp	Cp	Cp
22	Cp	Cp	Cp	Cp	Small
23	Tp	irregular	irregular	Irregular	Irregular
24	Tp	Irregular small	healing	Healing	Healed
25	Tp	Tp	Tp	Tp	Healed
26	Tp	irregular	irregular	Irregular	Irregular
27	Tp	healing	healed	Healed	Healed
28	Tp	irregular	healing	Healing	Healed
29	Tp moderate	Small healing	healing	Healing	Healed
30	cp	Cp(same)	Cp(same)	Cp(same)	Cp(same)
31	Tp	irregular	irregular	Irregular	Healed
32	cp	Cp(same)	Cp (same)	Cp(same)	Cp(same)
33	Tp	irregular	small	Small	Small
34	cp	Cp	Cp	Cp	Cp
35	cp	Cp	Cp	Cp	Cp
36	cp	Cp	Cp	Cp	Cp
37	cp	Cp	Cp	Cp	Cp
38	Tp	irregular	irregular	Small	Small
39	cp	Cp	Cp	Cp	Cp
40	cp	Cp	Cp	Cp	Cp
41	Tp	irregular	irregular	Irregular	Irregular
42	cp	Cp	Cp	Cp	Cp
43	cp	Cp	Cp	Cp	Cp
44	Tp	healed	healed	Healed	Healed
45	Tp irregular	healing	healing	Healing	Healed
46	cp	Cp	Cp	Cp	Cp
47	Cp moderate	Cp(same)	Cp(same)	Cp(same)	Cp(same)
48	cp	Small cp	Cp	Cp	Cp
49	cp	Moderate cp	Cp	Cp	Cp
50	Cp moderate	Moderate cp	Moderate cp	Healed	Healed

3.Frequency
-Traumatic perforations(TP)- 26 ; Central perforations(CP)- 24

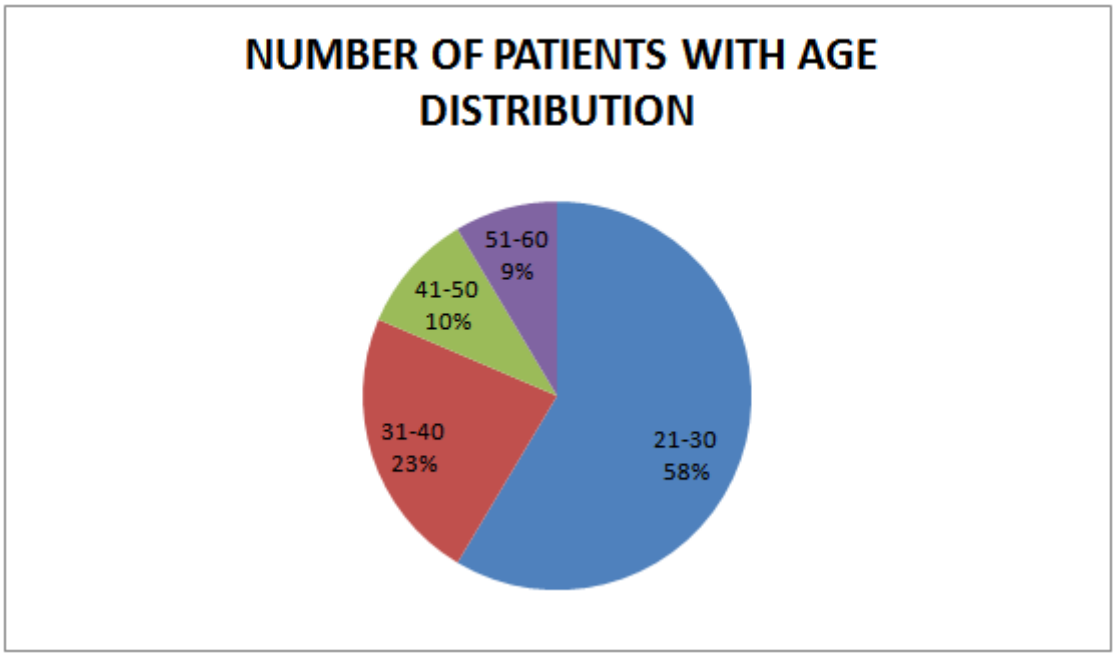

FIG:Showing number of patients with age distribution.

III. Conclusion

1.The smaller the perforation, better is the healing and thus the results.
2.Traumatic perforations heal faster.
3.Small central perforations can be tried with TCA Cauterisation prior to Myringoplasty, or in patients who do not consent for Myringoplasty.
4.Atleast 6 attempts to be undertaken before considering the procedure a failure.

IV. Discussion

Tympanic membrane perforation is a frequent manifestation of ear injury.The common causes include compressional injury due to change in air pressure,blast injury,slap injury.We had studied 50 patients.Tuning Fork tests, Pure Tone Audiometry, were done to assess audiological function.Otoendoscopy was done in all cases.In cases of traumatic perforation,we waited for a month for spontaneous closure.In rest of the cases after a 3 week period of dry ear,we went for cauterization.Two cases required six attempts of cauterization,4 cases required 4 attempts.Most of the cases were seen in the age group of 21-30 years . In a study age of the patients varied from 8 to 56 year.[3] In the present series age range was from 21-60 years. The sex incidence in the present study showd a male predominance perhaps because of their more exposed way of life.The site of perforation was mostly in anterioinferior and posterioinferior quadrants.The perforation was limited to mostly one quadrant only.The site of perforation was mostly in the anterioinferior quadrant [7.] ,whereas in another study it was found to be in the posterioinferior quadrant mostly [10] . Another study had the quickest closure occurring in two treatments.[4]After healing of the perforation,hearing returned to near normal in all cases,with no AB Gap. No patient presented with ossicular disruption or inner ear injury in our study.we noted a 76% sucess rate, whereas in another study 75% [8] and 78%[5] and 92%[9] success rate were noticed.

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