

Chemical Cauterization Of Tympanic Membrane Perforations Using Trichloroacetic Acid (TCA) – A Case Series

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Abstract:

Background: In countries like India, where medical facility is not available to all people, treatment should be cost effective procedures like Chemical Cauterization in the treatment of tympanic membrane perforation. Aim of present study was to study of use of chemical cauterization using trichloroacetic acid in chronic small dry central perforation of Tympanic Membrane.

Materials and Methods: Total 50 patients with dry tympanic membrane perforations were included in the study. After thorough ENT examination, 30% TCA was used to cauterize the margins of the perforation for all patients. Total 50 patients, 25 Male and 25 Female were treated. Successful closure of the central perforation was noted in average 4 applications. A maximum of six applications were done before healing was noticed in two patients. Out of 50 perforations, 45 healed, 5 did not heal and underwent myringoplasty later. This clinical study of application of trichloroacetic acid for treatment of small sized central perforation of tympanic membrane (3 mm) proves to have a beneficial effect in healing in selected patients. An overall success rate of 90% was achieved in this study.

Result: Total 50 patients, 25 Male and 25 Female were treated. Successful closure of the central perforation was noted in average 4 applications. A maximum of six applications were done before healing was noticed in two patients. Out of 50 perforations, 45 healed, 5 did not heal and underwent myringoplasty later. This clinical study of application of trichloroacetic acid for treatment of small sized central perforation of tympanic membrane (3 mm) proves to have a beneficial effect in healing in selected patients. An overall success rate of 90% was achieved in this study.

Conclusion: It is a promising office-based technique for closure of chronic small dry tympanic membrane perforations. It is a easy, simple, safe and economical procedure. Surgical procedure can be avoided by this technique. It can be safely tried in those with systemic medical conditions and in whom surgical intervention is contraindicated.

KeyWord: TCA (Trichloroacetic acid), CSOM (Chronic suppurative otitis media)

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I. Introduction

Major ENT problem faced in India are discharging ear and deafness. The commonest disease seen in ENT clinics is probably mucosal CSOM. Chronic otitis media was found to be a major cause of conductive hearing loss. It is one of the commonest cause for hearing loss that mainly result due to tympanic membrane perforations. (1) It is important for early diagnosis of chronic otitis media in order to prevent hearing loss. A history of previous ear discharge with cold, sore throat, cough, or some other symptom of upper respiratory infection, should raise the suspicion of CSOM. (2) Without any interventions, almost 80% of tympanic membrane perforations of any size heal, the rest become chronic and require surgery. (3) Medical costs associated with tympanoplasty have recently compelled investigators to search for less expensive, simple non-surgical methods. (4)

Without closure of perforation, there may occur deterioration of hearing. (5) The purpose of closing chronic dry perforations of the tympanic membrane is to improve hearing and prevent middle ear infections. (6). (7) Etiologically, tympanic membrane perforations are either due to inflammation or trauma. (1)

(8) Traumatic perforations usually heal spontaneously, and it is preferable to wait for at least 3 weeks prior to any intervention. (6) A perforated tympanic membrane results in loss of hearing due to decreased drum area and liability to recurrent infection of the middle ear mucosa. (9). (10).

II. Materials and Methods

This is a prospective study performed in the Department of ENT at a tertiary care hospital for the period of 8 Months from May 22 to Dec 22. , total 50 patients of age 21-40 years were included , out of which 30 patients are male and 20 patients are female.

All 50 patients are having central perforation in which 50% of patients having antero-superior quadrant central perforation and 50% having antero-inferior quadrant central perforation.

Inclusive Criteria

1. Chronic Non-Discharging Ears.
2. Dry Small Central Perforation for Minimum 6 Weeks.
3. Involving anterior half of Tympanic Membrane.

Exclusion Criteria

1. Small Perforation with Discharge.
2. Large Central Perforation.
3. Atticoantral type of CSOM.
4. Perforations of posterior half of Tympanic Membrane.

Hearing was assessed by tuning fork tests and pure tone audiometry. The technique was carried out as an OPD procedure. For the initial application, 4% Xylocaine was used to anaesthetize the tympanic membrane placing it into the external canal wall over the surface of the tympanic membrane for about 10 min. Under the microscope, the rim of the perforation was cauterized using a cotton tipped applicator dipped in 30% trichloroacetic acid until a white cauterized margin 0.5 mm in width is created. Care was taken not to damage the adjacent structures.

Once the blanching of the rim was completed, a sterile abgel which was moistened with antibiotic drop was placed over the perforation. Repetition of the cautery at weekly intervals is done, many of them requiring more than one application and the technique was repeated for a maximum of six times. After the first application, an antibiotic was given for 1 week.

During follow up, an otoscopic examination and an otoendoscopy will be performed to assess perforation size.

III. Result

Total 50 patients were treated. Successful closure of the central perforation was noted in average 4 applications. A maximum of six applications were done before healing was noticed in two patients. Out of 50 perforations, 45 healed, 5 did not heal and underwent myringoplasty later. This clinical study of application of trichloroacetic acid for treatment of small sized central perforation of tympanic membrane (3 mm) proves to have a beneficial effect in healing in selected patients. An overall success rate of 90% was achieved in this study.

IV. Discussion

The Tympanic Membrane (TM) plays a significant role in the physiology of hearing. The tympanic membrane perforations impair the quality of life in patients.(1) A small perforation of the tympanic membrane with no additional lesion of the middle ear transformer mechanism has two different effects on the hearing.

First, there is the decreased surface area of tympanic membrane on which sound pressure is exerted, resulting in dampened ossicular chain excursion. For a small (1 mm) perforation, Békésy found that the effect on ossicular motion is confined to sounds below 400 Hz and is 12 dB at 100 Hz, 29 dB at 50 Hz and 48 dB at 10 Hz.(5) A tympanic membrane perforation causes conductive hearing loss due to loss of ossicular coupling, which is again due to loss of sound pressure difference across the tympanic membrane, which provides the primary drive to the motion of the drum and ossicles.

Perforation induced losses are greatest at lowest frequencies. The volume of middle ear space also affects hearing. Smaller volume results in larger air-bone gap. Different patching materials have also been used. Wright (1956) used cotton patch with neomycin ear drops, while Mitchell (1958) used sterispon gelatin sponge soaked in patient's own blood. Juers reported an 88% success with an average of 3.7 applications. He had further everted the margins of the perforation under the operating microscope, whereas Derlacki who reported 75% success in office treatment at biweekly intervals had used cautery alone. Dunlop had a 100% success with 3-33 treatment at biweekly intervals.(11).(12) Present study gave an overall success rate of 90%, which is comparable with the previous studies documented in the literature.

AGE GROUP	NUMBER OF PATIENTS
21-25	15
26-35	20
36-40	15

Table I: Age Group

SEX	NUMBER OF PATIENTS
MALE	30
FEMALE	20

Table II: Sex

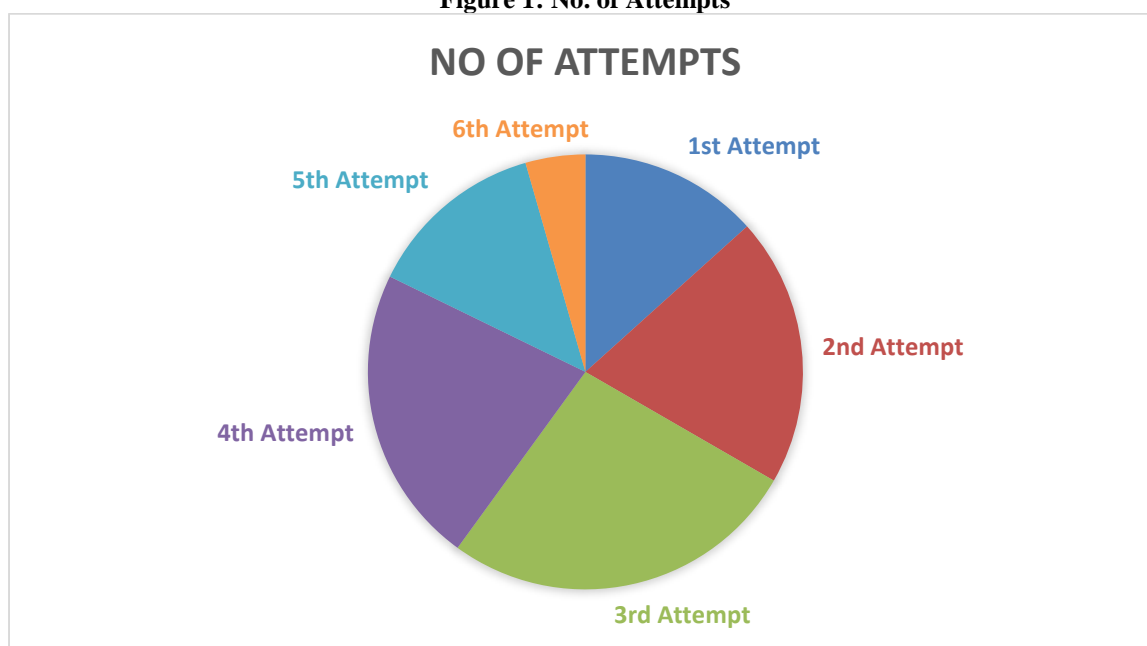
PERFORATION SITE	NUMBER OF PATIENTS
ANTERO-SUPERIOR	25
ANTERO-INFERIOR	25

Table III : Site of Perforation

NO OF ATTEMPTS	NUMBER OF PATIENTS
1	6
2	9
3	12
4	10
5	6
6	2

Table IV :No. of Attempts

Figure 1: No. of Attempts



V. Conclusion

It is a promising office-based technique for closure of chronic small dry tympanic membrane perforations. It is a easy, simple, safe and economical procedure. Surgical procedure can be avoided by this technique. It can be safely tried in those with systemic medical conditions and in whom surgical intervention is contraindicated.

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