RESEARCH ARTICLE

TYMPANOSCLEROSIS CAUSING BLOCKAGE OF MIDDLE EAR CLEFT

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ABSTRACT
Background: Middle ear cleft space starts from Eustachian tube, and includes middle ear, aditus & mastoid antrum. It develops from 1st visceral pouch. Blockage of middle ear cleft, particularly the aditus can result from a number of reasons. Tympanosclerosis creates obstruction in aeration of middle ear and mastoid antrum.
Aims & Objective: To study effect of tympanosclerosis on blockage of middle ear cleft.
Material and Methods: A retrospective study of all cases of cortical mastoidectomy surgeries done in a Tertiary care centre in Western U.P. was carried out. Relevant clinical data and histopathology reports were obtained from hospital records and the data was analysed. A total of 20 cases of cortical mastoidectomy were included in the study.
Results: A total of 20 cases were included in the study, in the age group of 16 to 58 years. Tympanosclerosis was seen in 13 cases. In tympanosclerosis positive group, the mean age was 25-32years. The aditus was not patent in 10(50%) of patients in this group.
Conclusion: Tympanosclerosis is a non-specific result of chronic inflammatory process and causes an increased risk for blockage of aditus through plaque formation. Clearance of these plaques and cortical mastoidectomy prevents recurrences.
Key-Words: Tympanosclerosis, Mastoidectomy; Blockage; Middle Ear Cleft

Introduction

Middle ear dysfunction like Eustachian obstruction is caused in tympanic membrane perforation and poor aeration due to diseased middle ear cleft and negative pressure in tympanum. Diseased middle ear mucosa shows pathological changes like hyaline degeneration and calcium deposition in tympanic membrane.[1-3] Cortical mastoidectomy followed by graft application gives a good result after a preoperative evaluation under CT/MRI. However, factors like age, sex, size of perforation, duration of dry perforation and other degenerative changes in tympanic membrane contribute considerably to a failed tympanic membrane reconstruction.[2] In chronic otitis media, tympanoplasty is the treatment of choice. Many specialists believe that addition of mastoidectomy greatly improves the operative success rate, while a lack of aerating mastoidectomy contributes to the failure of graft. Mastoidectomy also acts as a buffer to pressure changes in the middle ear.[3-6]

Materials and Methods

Present study was done at a tertiary care centre in western Uttar Pradesh.

Unit of Study: All patients who had undergone tympanoplasty procedure with cortical mastoidectomy surgery, were included in the study.

Type of Study: This retrospective study includes all patients who underwent tympanoplasty with cortical mastoidectomy surgery. Follow-up cases were excluded from the study. Data was obtained from hospital records regarding presence or absence of a patent mastoid antrum, the state of middle ear mucosa, whether it was healthy or unhealthy and histopathology reports regarding evaluation of pathology of tympanic sclerosis, along with other clinical details.

Study Period: 2 years (January 2010 – December 2011)

Sample Size: Total no. of cases were 20.

Study Schedule: An elaborate schedule was prepared before undertaking the study. In this retrospective study, data was recorded from the patients' files. A prior consent was taken from Institution's Ethical Committee (IEC).

Data Analysis: The information collected from the patients' records were correlated with previous studies done in the similar field and results were compared & correlated.

Results

In our present study, a total of 20 cases underwent tympanoplasty with cortical mastoidectomy, of which 12 of the patients were females (60%), giving the female to male ratio to be (F:M) 1.5:1. The age of the patients' ranged from

16 to 58 years (Table 1). Tympanosclerosis was seen in 13 (65%) out of 20 cases. In this tympanosclerosis positive group, the mean age was 25-32 years. The duration of the disease on both positive and negative groups was similar ranging between 1 – 13 years (table 2). All patients had undergone cortical mastoidectomy surgeries, with tympanoplasty. The patency of the aditus was evident by free flow of irrigated saline between the middle ear and antrum. In the study, aditus was not patent in 8 (40%) cases while it was seen to be patent in 12 (6%) (Table 3).

Table 4 shows a significant relation between tympanosclerosis and patency of aditus. In majority of the cases where blockage of aditus was found, presence of tympanosclerotic plaques were also seen in the aditus area which was confirmed by histopathological examination. The status of the middle ear mucosa was evaluated at the time of surgery. Out of all patients, 11 had unhealthy mucosa and 9 had healthy mucosa. Of these, aditus was patent in 4 (36.36%) and 6 (66.67%) respectively of healthy and unhealthy middle ear mucosa groups respectively. Aditus was not patent in 7 (63.63%) and 3 (33.33%) of unhealthy and healthy middle mucosa groups respectively. The data shows that the status of the mucosa did not carry any significance with respect to patency of aditus.

Table-1: Gender Distribution

Gender	No.	%
Males	8	40
Females	12	60
Total	20	100

Table-2: Distribution of Tympanosclerosis

Tympanosclerosis	No.	%
Present	13	65
Absent	7	35
Total	20	100

Table-3: Clinical Presentations

Presence of disease	No.	%
Right ear	5	25
Left ear	7	35
Both sides	8	40

Table-4: Status of Aditus regarding Tympanosclerosis

Tympanosclerosis	Aditus not patent	Aditus patent
Present	10	3
Absent	2	5

Discussion

The term 'tympanosclerosis' is used for a chronic non-specific inflammatory lesion in the middle ear. When the inflammation involves only the tympanic membrane, it is known as myringosclerosis[3], which is recognised as the first stage of the disease process. Tympanosclerosis is characterised by hyaline deposits in the membrane, the cavity and/or the mastoid. Histopathological examination of these lesions shows, pauci-cellular dense fibrous and collagenous connective tissue, along with hyaline degeneration.[3,4] Cortical mastoidectomy in management of chronic otitis media prior to graft application has been shown to be associated with higher success rates. However, some authors still prefer to add cortical mastoidectomy only in cases with congested, polypoidal or discharging ear.[4]

The female to male ratio (1.5:1) in our study, was in accordance with that observed in a study by Manjunath MK et al[3], who gave a ratio of 1.8:1 in his study. Tympanosclerosis was seen in 65% of cases included in the study, which was higher than seen in other studies3,4,5 which could be because the study group included only patients' who underwent tympanoplasty. When data regarding patent aditus with presence of tympanosclerosis, was correlated with different studies, most studies found significant association between the two like our study.[3,5,6]

Conclusion

Tympanoplasty has been the mainstay of treatment in chronic otitis media. Addition of cortical mastoidectomy has been preferred by many authors for better graft acceptance. Tympanosclerosis is seen in majority of the cases. A good number patients having blockage of middle ear, show presence of tympanosclerosis. Mastoid air cell system acts as a buffer to equalize middle ear pressure changes. Re-establishing the patency of this system helps in reducing the failure rates in tympanoplasty.

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