

Study of Audiological Improvement In Patients Undergoing Cortical Mastoidectomy

Dr.R.V.Kumar¹, Prof.Dr.A.R.Ali Sulthan², Dr.M.Sivakumar³, Dr.K.Vineetha⁴

¹Assistant Professor, Department Of ENT, Coimbatore Medical College, India

²Professor, Department Of ENT, Coimbatore Medical College, India

³Assistant Professor, Department Of ENT, Coimbatore Medical College, India

⁴Junior Resident, Department Of ENT, Coimbatore Medical College, India

Abstract

1.1 Objective: Comparative analysis of hearing preoperatively and postoperatively in patients undergoing cortical mastoidectomy with tympanoplasty.

1.2 Materials And Methods: 25 patients aged 15-50 years with chronic otitis media with conductive hearing loss who undergoes elective cortical mastoidectomy and tympanoplasty

1.3 Results: Audiological improvement of around 10-25dB is seen in the study group. The site and size of perforation determines the audiological improvement.

Keywords: Tympanoplasty, chronic otitis media, pure tone audiometry

I. Introduction

Chronic suppurative otitis media (CSOM) is a chronic inflammation of the middle ear and mastoid cavity. Clinical features are recurrent otorrhoea through a tympanic perforation, with conductive hearing loss of varying severity. Patients with CSOM that is unresponsive to topical and/or systemic medical therapy with appropriate aural toilet and control of granulation tissue require surgery. Tympanoplasty is performed to eradicate disease from the middle ear and to reconstruct the hearing mechanism, with or without grafting of the tympanic membrane. Cortical mastoidectomy is also known as the Schwartz operation. It consists of the removal of the outer wall of the mastoid cortex and the exteriorization of all the mastoid air cells. This may be performed immediately in coalescent mastoiditis, in which case a drain may be left postoperatively. This retrospective study is focused on assessing the outcome of surgery in terms of improvement in hearing postoperatively. Preoperative audiological reports of patients in this study group are collected and they were subjected to otoendoscopic examination and pure tone audiometry 3 months postoperatively. The success rate is assessed by the standard parameters like improvement in air bone gap.

Materials And Method

Source Of Data

25 patients aged 15-50 years with chronic otitis media with conductive hearing loss who undergoes elective cortical mastoidectomy and tympanoplasty in Coimbatore medical College and Government hospital will be included in the study, after obtaining the ethical committee clearance

Study period:

January 2016 – January 2017

Study design:

Retrospective study.

Study subjects:

Patients

- 15-50 years
- chronic otitis media safe type
- patients with intact ossicular chain

Sample Size : 25 patients

Inclusion Criteria

Patients of age 15-50 yrs with chronic otitis media without ossicular erosion undergoing cortical mastoidectomy with tympanoplasty surgery at Government Medical College Hospital, Coimbatore

Exclusion Criteria

- 1. Pregnant and lactating woman
- 2. Children <15 years
- 3. Only hearing ear
- 4. Sensory neural hearing loss
- Middle ear malignancies, otitis externa

Defining Criteria

Chronic inflammation of middle ear cleft including mucosa, tympanic membrane and ossicles characterized by persistent or intermittent ear discharge through tympanic membrane perforation. Ossicular erosion involves erosion of middle ear ossicles resulting in ossicular discontinuity.

II. Methodology

The study will be undertaken on patients who undergo cortical mastoidectomy with tympanoplasty at Coimbatore medical college hospital during the study period of one and half year (January 2016 to January 2017). A total of 25 patients who undergo cortical mastoidectomy with tympanoplasty surgery at Coimbatore medical college hospital will be studied. The study is proposed to be conducted after obtaining informed signed consent from the guardians of the patients. The duration of the study is one year from January 2016 to January 2017. The principal investigator, after obtaining informed signed consent from the patient or parents/guardians of the patients to participate in the study. Hearing is assessed using Pure Tone Audiometry before surgery. The procedures were performed by the same surgeon. Cortical Mastoidectomy and tympanic membrane perforation closure performed in usual manner intra operatively and post operatively uneventful. Pure tone audiometry done for each and every patient 3 months postop. Air bone gap evaluated. Among 25 patients 7 were having large central perforation and 18 central perforation. Patients with small cp found to have hearing improvement of about 10-15dB and about 20-25 dB hearing improvement in those having large and subtotal perforation

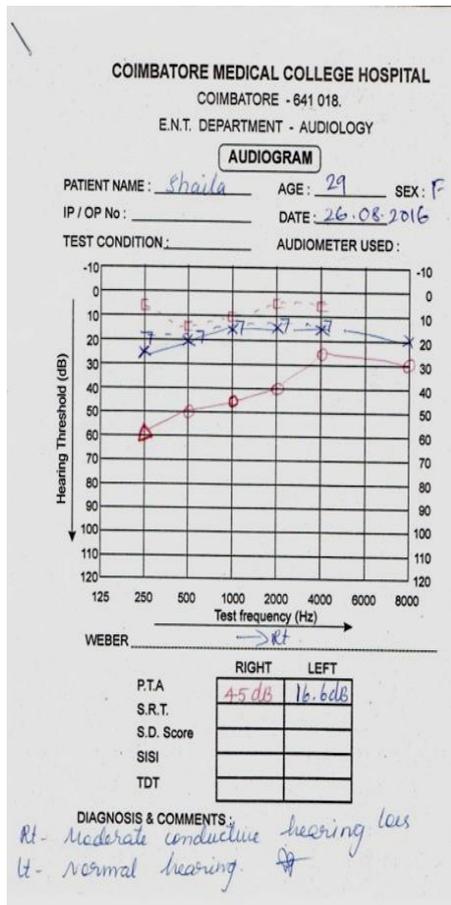


Fig.1 preop Audiogram

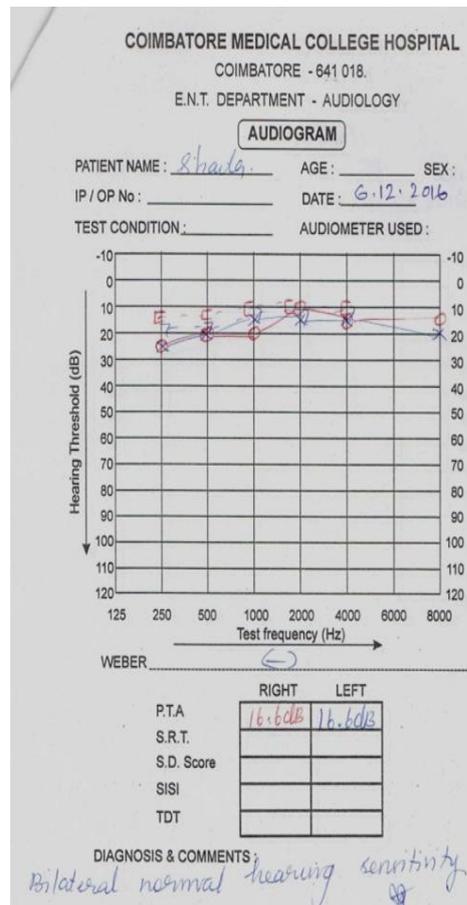


Fig.2 post op Audiogram

(note improvement in pure tone average postoperatively)

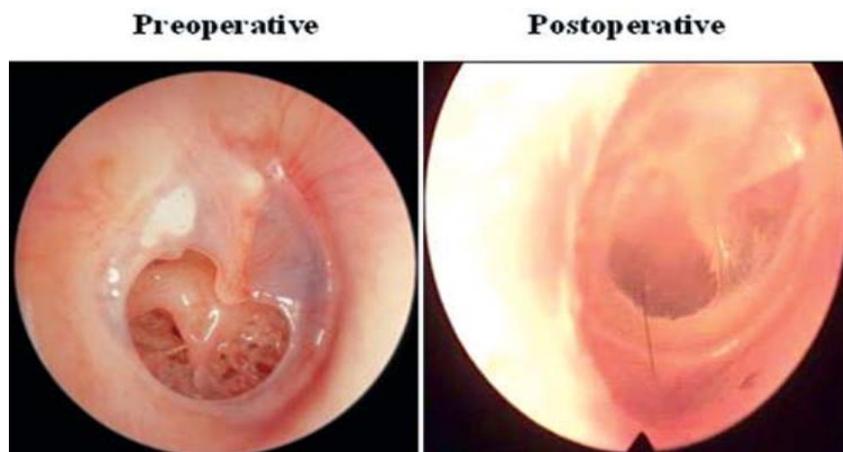


Fig.3- pre & post op TM images

III. Discussion

Patients with CSOM that is unresponsive to topical and/or systemic medical therapy with appropriate aural toilet and control of granulation tissue require surgery. Tympanoplasty is performed to eradicate disease from the middle ear and to reconstruct the hearing mechanism, with or without grafting of the tympanic membrane. The 5 different types of tympanoplasties have been defined. These are primarily of historical interest. The following definitions describing the 5 types of tympanoplasties are used for middle ear surgery and mastoid surgery:

- Type 1 is simple closure of the tympanic membrane perforation without reconstructing the ossicular chain
- Type 2 is any kind of ossicular reconstruction involving the malleus, the incus, or both; the stapes head is intact
- Type 3 involves putting the tympanic membrane graft over the head of the stapes
- Type 4 occurs when the stapes head is absent but the footplate is present; the stapes footplate is exteriorized to the mastoid cavity, and the graft is placed over the rest of the middle ear cavity, including the round window; hence, the phase difference is maintained.
- Type 5 is also called the fenestration operation; it involves making a fenestra in the lateral semicircular canal and then putting a graft over it; this is not often performed today

Cortical mastoidectomy is also known as the Schwartze operation. It consists of the removal of the outer wall of the mastoid cortex and the exteriorization of all the mastoid air cells. This may be performed immediately in coalescent mastoiditis, in which case a drain may be left postoperatively

1] Canal wall-up mastoidectomy refers to the removal of mastoid air cells while retaining the posterior canal wall. Using this approach with a facial recess (drilling the bone of the posterior mesotympanum or facial recess between the incus, the chorda tympani nerve, and the facial nerve), the middle ear structures can be accessed for careful dissection of the cholesteatoma. This approach leaves the normal ear canal anatomy intact, thereby preventing the potential problems seen with a mastoid cavity. This is also the common approach for cochlear implantation.

2] Modified radical mastoidectomy differs from radical mastoidectomy in that the ossicles and the tympanic membrane remnants are preserved for possible hearing reconstruction at a later stage. Radical mastoidectomy involves eradication of all disease from the middle ear and the mastoid and exteriorization of these structures into a single cavity. It also includes removing the entire tympanic membrane and the ossicles (except the stapes footplate) and closing the eustachian tube opening. Currently, this procedure is performed only in very unusual situations.

IV. Conclusion

Tympanoplasty is a good procedure for eradication of disease and regaining the hearing. Site of perforation and size of perforation determines the degree of hearing loss. Patients with large central and subtotal perforation had more hearing loss and had a good improvement in hearing post operatively (around 20-25dB)

	Name	Age/Sex	Central Perforation	Pre Operative	Post Operative
1	Suguna	45/F	Small	36.6db	28.3db
2	Prakash	27/M	Large	38.5db	18.3db
3	Shaila	29/F	Large	45db	16.6db
4	Samseena	20/F	Small	31.6db	21.6db
5	John Michael	45/M	Subtotal	41.6db	18.3db
6	Savithri	22/F	Small	30.3db	20db
7	Chandru	15/M	Large	31.6db	38.3db
8	Devaraj	47/M	Small	33.3db	23.3db
9	Kasiammal	36/F	Subtotal	46.6db	25db
10	Remya	47/F	Small	36.6db	31.6db
11	Saroja	50/F	Small	33.3db	22.5db
12	Akshaya	16/F	Small	28db	18.3db
13	Mariyammal	30/F	Small	28.3db	19db
14	Nisha	28/F	Large	38.3db	24db
15	Kuruvammal	41/F	Small	29.6db	18.3db
16	Tamilselvi	20/F	Small	27db	18db
17	Poovarasam	18/M	Small	32.3db	21db
18	Veerabadran	29/M	Large	41db	20db
19	Antony	27/M	Small	27db	16db
20	Seethalakshmi	35/F	Small	29db	19.6db
22	Lakshmi	45/F	Small	33.6db	21db
23	Divya	25/F	Small	35db	21.3db
24	Vivek	30/M	Small	27db	16db
25	Ramasamy	50/M	Small	36db	22.5db

List of patients selected for study