e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(5); 1920-1922

Original Research Article

Comparative Study on Pre- and Post-Operative Hearing Outcome Following Tympanoplasty

Mona Sarawgi[1], Amit Kumar[2], Manoj Kumar[3], Rizwan Ahmad[4], Md. Ozair[5]

[1]Ex. Senior Resident, Department of ENT, DMCH, Laheriasarai, Darbhanga
[2]Senior Resident, Department of ENT, DMCH, Laheriasarai, Darbhanga
[3]Assistant Professor, Department of ENT, DMCH, Laheriasarai, Darbhanga
[4]Associate Professor, Department of ENT, DMCH, Laheriasarai, Darbhanga
[5]Assistant Professor & Head, Department of ENT, DMCH, Laheriasarai, Darbhanga

Received: 25-03-2024 / Revised: 23-04-2024 / Accepted: 16-05-2024
Corresponding Author: Dr. Amit Kumar
Conflict of interest: Nil

Abstract:

Background and Objectives: Tympanoplasty is a commonly performed surgical procedure to close perforations of the tympanic membrane in chronic otitis media. It is performed to eradicate disease from the middle ear cleft and to reconstruct the hearing mechanism with or without tympanic membrane grafting. The aim of this study is to evaluate hearing outcome in the pre- and post-operative after tympanoplasty

Materials and Methods: The present observations study was conducted on 30 randomly selected patients visited the department of ENT, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga. Thirty cases of diagnosed chronic otitis media, aged above 18 years, with a demonstrable conductive deafness not more than 40 dB was included in the study.

Results: The mean age of the patients is 32.16 ± 3.61 years. Female outnumbered male counterpart. Commonest presentingcomplaints was Otorrhoea (93.3%) followed by Hearing loss (86.7%), Vertigo (53.3%) and Tinnitus is found in (40.0%) of patients. The mean pre- and post-operative outcomes in terms Pure tone ($p<0.05$), Air-bone gap ($p<0.05$) and Hearing gain ($p<0.05$).

Conclusions: The present study concluded that Tympanoplasty is a beneficial procedure for hearing improvement and the eradication of the disease.

Keywords: Otorrhoea, Tympanoplasty, Hearing Loss, vertigo.

Introduction

Chronic otitis media is a widespread disease of developing countries such as India, especially in rural areas, and the prevalence ranges from 2% to 15%.[1] Tympanoplasty is a commonly performed surgical procedure to close perforations of the tympanic membrane in chronic otitis media. It is performed to eradicate disease from the middle ear cleft and to reconstruct the hearing mechanism with or without tympanic membrane grafting [2] Since the fundamental principles of Tympanoplasty were introduced by Wullstein and Zollner, surgery of the ear has been directed toward the restoration of function as well as providing a stabilized trouble-free ear [2] Zollner and Wullstein provided a classification of Tympanoplasty that focused on the type of ossicular chain reconstruction (OCR) needed. The five types of Tympanoplasty they described refer to the most lateral intact structure on which the conductive mechanism will be constructed.

Type I: indicates all three ossicles to be present and mobile.

Type II: grafts the tympanic membrane to an intact incus and stapes.

Type III: exists when an intact mobile stapes superstructureis present and the tympanic membrane or graft remains directly on the stapes superstructure.

Type IV: describes an absent or eroded superstructure withthe graft or tympanic membrane overlying a mobile stapes footplate.

Type V: refers to a fenestration created in the horizontal semicircular canal. In the present prospective comparative study, we analyzedthe pre and post surgery hearing benefit to the patient.

We hope the results will enable both patients and surgeons to understand the hearing benefit.

Materials and Methods

The present observations study was conducted on 30 randomly selected patients visited the department of ENT, at Darbhanga Medical College and Hospital,

Laheriasarai, Darbhanga Bihar. Study duration is Two years.

Inclusion Criteria

1. Patients above 18 years of age of either sex
2. Patients diagnosed with chronic otitis media
3. Those who give informed consent Exclusion Criteria

Exclusion Criteria

- Patients who are unfit for surgery
- Patients who have not signed the informed consent

The study protocol was reviewed by the Ethical Committeeof the Hospital and granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained.

Sample Selection

The sample size was calculated using a prior type of power analysis by G* Power Software Version 3.0.1.0 (Franz Faul, Universitat Kiel, Germany). The minimum sample size was calculated, following these input conditions: power of 0.80 and $P \leq 0.05$ and sample size arrived were 24 participants. Final sample achieved was 30.

Methodology

After taking detailed history and recording demographic data and thorough clinical examination was carried outfollowed by routine blood investigations, X-ray mastoid, otomicroscopy, and pure tone audiometry. Most of thepatients were operated under local anesthesia. Patientswere operated under local anesthesia. Postauricular approach was used for tympanoplasty.

Follow-up

All the patients are followed after surgery as usual on the 7th and 14th days. But the audiogram was done on 3 and 6months to assess the outcome. We used the criteria recommended by the Japan Clinical Otology Committee for calculation of the hearing improvement (Tai, 1998).[3]

- Using the proportion of patients with a postoperativehearing within 40 dB as the first criterion
- Using hearing gain exceeding 15 dB as the secondcriterion
- Using postoperative air-bone gap within 20 dB as thirdcriterion

Statistical Analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 20 (IBMSPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. The variables were assessed for normality using the Kolmogorov Smirnov test. Descriptive statistics included computation of percentages, means and standard deviations. Level of significance was set at $p \leq 0.05$.

Results

Table 1: Demographic profile of the study population

Age (years)	32.16±3.61
Gender (M/F)	14 (46.7%) /16 (53.3%)

Table 2: Distribution of presenting symptoms

Symptoms	N (%)
Otorrhoea	28 (93.3%)
Hearing Loss	26 (86.7%)
Vertigo	16 (53.3%)
Tinnitus	12 (40.0%)

Table 3: Comparison of pre and post operative outcome

Operative	Pure tone	Air-bone gap	Hearing gain
Preoperative	40.32	26.24	8.69
Post operative	31.41	16.33	6.52
p-value	0.022 (Sig.)	0.001 (Sig.)	0.041 (Sig.)

Test applied: Paired t-test

Discussion

In the present study, a total of 30 cases, aged above 18 years, with a demonstrable conductive deafness not more than 40 dB and consented to participate in the study procedure underwent tympanoplasty. The patients were followed for a period of 6 months to analyze audiometric outcome and hearing gains. The mean age of the patients is 32.16 ± 3.61 years. Female outnumbered male counterpart.

This was found in agreement with previous studies documented in the literature.[4,5] In the present study the commonest presenting complaints was Otorrhoea (93.3%) follwed by Hearing loss (86.7%), Vertigo (53.3%) and Tinnitus is found in (40.0%) of

patients. Similarly Shetty S. (2012) found commonest presenting complaints are ear discharge and hearing loss seen in all the (100%) patients. Tinnitus is found in 15%, pain in the ear in 33.3% and vertigo in 11.3% of patients.[6] The mean pre- and post-operative outcomes in terms Pure tone ($p<0.05$), Airbone gap ($p<0.05$) and Hearing gain ($p<0.05$) were found comparable with the results of the studies conducted by Yadav et al.[7] and Haruqop et al.8Many studies on Tympanoplasty have found place in the literature with varying success rates.[9-11]

Conclusion

The present study concluded that Tympanoplasty is a beneficial procedure for hearing improvement and the eradication of the disease. But, it is difficult to compare theresults of the present study with other studies because of different age groups and sub groups, the definition of success; as many studies did not look at hearing outcome, the technique used and the experience level of the surgeon.

References

1. World Health Organization. Child and Adolescent Health and Development. Prevention of Blindness and Deafness [PressRelease]. Geneva, Switzerland: World Health Organization; 2004.
2. Sismanis A. Tympanoplasty: Tympanic Membrane Repair. GlasscockShambaugh Surgery of the Ear. 6th ed. China: PMPH-USA; 2010. p. 465-85.
3. Bhat KV, Naseeruddin K, Nagalotimath US, Kumar PR, Hegde JS. Cortical mastoidectomy in quiescent, tubotympanic, chronic otitis media: Is it routinely necessary? J Laryngol Otol 2009; 123:383-90.
4. Aich ML, Alam ABMK, Talukder DC, Harun AA, Abdullah M. Outcome of myringoplasty. Bangladesh J Otorhinolaryngol 2009; 15:40-4.
5. Shaikh AA, Farrukh MS, Mutiullah S, Rafi T, Onali MA. Audiological results of Type I Tympanoplasty by underly technique with temporalis fascia graft. Pak J Otolaryngol 2009; 25:30-1.
6. Shetty S. Pre-Operative and Post-Operative Assessment of Hearing following Tympanoplasty Indian J Otolaryngol Head Neck Surg. 2012; 64(4):377-81.
7. Yadav SP, Aggarwal N, Julaha M, Goel A. Endoscope-assisted myringoplasty. Singapore Med J 2009; 50:510-2.
8. Haruqop A, Mudhol R, Godhi RA. A comparative study of endoscope assisted myringoplasty and microscope assisted myringoplasty. Indian J Otolaryngol Head Neck Surg 2008; 60:298-302.
9. Fukucbi I, Cerbiari DP, Garcia E, Rezende CEB, Rapoport PB. Tympanoplasty: surgical results and a comparison of the factors that may interfere in their success. Braz J Otorhinolaryngol. 2006;72(2):267-72.
10. Yuen AP, Ho WK, Hui Y, Wei WI, Au DK (2000) Correlation of pure tone audiogram results and hearing benefit of tympanoplasty for chronic suppurative otitis media. Ann Otol Rhinol Laryngol 109(4):381-84.
    Roy Chaudhuri BK. Three flap tympanoplasty-a simple and sure success technique. Indian J Otol HNS.2004; 56(3):195–200.