

## Original Research Article

# A comparative study of hearing outcomes in myringostapediopexy and myringoplatinopexy in our experience

K. Santhanakrishnan, G. Gandhi\*, K. Pradheep

Department of ENT, Sri ManakulaVinyagar Medical College and Hospital, Pondicherry, Tamil Nadu, India

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### \*Correspondence:

Dr. G. Gandhi,

E-mail: [santhanakrishnan2709@gmail.com](mailto:santhanakrishnan2709@gmail.com)

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## ABSTRACT

**Background:** COM causes considerable morbidity with ear discharge, conductive hearing loss and complications. Myringostapediopexy and myringoplatinopexy is a surgical procedure which intends improve the hearing and quality of the life.

**Methods:** The study was conducted in the department of ENT, SMVMCH, Puducherry from April 2017 to April 2018. A detailed history taking thorough clinical examination done for these patients. PTA was done before the procedure, post operatively at 3<sup>rd</sup> month. Hearing improvement analysed using different parameters like type of graft used, hearing gain and graft uptake. The data collected was tabulated and subjected to statistical analysis.

**Results:** Myringostapediopexy better hearing gain than myringoplatinopexy. Myringostapediopexy mean hearing gain 19.53 dB, myringoplatinopexy 12.59 dB.

**Conclusions:** This study compared the hearing outcomes of Myringostapediopexy and myringoplatinopexy with respect to hearing gain. Myringostapediopexy better hearing gain than myringoplatinopexy due to presence of stapes supra-structure.

**Keywords:** Chronic suppurative otitis media, Autologous ossicles, Temporalis fascia, Myringostapediopexy, Myringoplatinopexy

## INTRODUCTION

Chronic suppurative otitis media (CSOM) is a common cause of hearing impairment and disability, leading to fatal intracranial and extracranial infections.

Chronic suppurative otitis media (CSOM) prevalence varies in different parts of the world. It varies from one percent in some parts of the world to more than forty percent in other parts of the world.<sup>1</sup>

Many factors have been outlined as risk factors for "chronic suppurative otitis media". These include younger age, people living in overcrowded dwellings,

lack of proper housing conditions, lack of proper hygiene, malnutrition, exposure to indoor or outdoor pollution, dysfunction of eustachian tube etc.<sup>2</sup>

Ossiculoplasty represents the reconstruction of the ossicular chain integrity in such a manner that it will transmit sound vibrations from the tympanic membrane to the oval window and to the inner ear. The aim of ossiculoplasty is to restore the ossicular chain as much as possible. In the last three decades, various ossiculoplasty methods have evolved and good results were achieved. Nevertheless ossicula reconstruction continues to be a process in evolution.<sup>3</sup>

This study was done to compare the hearing outcomes in myringostapedioplasty (MSP) and myringoplasty (MPP) using autologous ossicles.

## METHODS

**Source of data:** Patient attending the department of ENT of Sri Manakula Vinayagar Medical College and Hospital from April 2017 to April 2018.

**Material used:** Autologous temporalis fascia, Autologous ossicles.

All the patients presenting with chronic otitis media with tympanic membrane were selected for the study.

### Inclusion criteria:

- Hearing loss >40 db
- Ossicular discontinuity in head injury
- Ossicular destruction due to cholesteatoma

Patients with sensorineural hearing loss, recurrent cases and malignancy are excluded from this study.

A written informed consent was taken from all patients included in the study. A detailed history taking, thorough clinical examination was done. Patient underwent routine blood investigations. In all patients X ray mastoid Schuller's view was taken. Pure tone audiometry was done once before the surgery, then post operatively at 3<sup>rd</sup> month.

**Sample size:** 50 patients presenting with CSOM.

**Sampling method:** Simple random sampling.

**Operative procedure:** General anaesthesia along with local infiltration of 2% lignocaine with adrenaline used.

Local and general anaesthesia can be used for middle ear surgery. Local anaesthesia is achieved by the subcutaneous injection of 1% or 2% local anaesthetic with 1:100,000 adrenaline using a 2 ml syringe. The needle is then advanced further under permanent application of local anaesthetic towards the posterior canal skin, then pulled back and advanced superiorly and inferiorly to the prior injection site. Subsequently the ear canal is opened with a nasal speculum, allowing subperiosteal injection at the 3, 6, 9 and 12<sup>o</sup> clock positions. In some cases the local anaesthesia is insufficient for the promontorial region innervated by the tympanic nerve. This can be overcome by the topical application of 4% xylocaine. Local anaesthesia infiltrated endaurally and postaurally like explained before. Koerner's flap elevated. The meatal skin is incised from 12 to 6 o'clock 4-5 mm medial from the fibrous annulus and two vertical incisions at 12 and 6<sup>o</sup> clock position respectively. Koerner flap elevated till bony cartilaginous junction. The temporalis fascia harvested using a post auricular

incision. The skin incision is done approximately 1 cm post-auricularly behind the posterior auricular sulcus by pulling the auricle anteriorly. Incision extends from superior attachment of auricle to inferior attachment. Temporalis fascia is harvested and mastoid exposed and cortical mastoidectomy carried out. After tympanomeatal flap was elevated ossicular chain was assessed for continuity. Depend on the erosion, myringostapedioplasty or myringoplasty carried out using autologous ossicles. Aural pack was placed, which was removed after 3 weeks.

Regular follow up was done every week for first 3 weeks, later at 6<sup>th</sup> week, 3<sup>rd</sup> month and 6<sup>th</sup> month. Patients were assessed for hearing improvement using PTA and for graft uptake using otoscopy.

## RESULTS

Among 50 cases included in this study, 20 patients were male and 30 patients were female. Age of the patient varied from 13 years to 66 years, majority of the patients belonging to the age group of 15-25 years.

Group 1 (myringostapedioplasty) included 26 patients in whom autologous ossicle (malleus or incus) and temporalis fascia over the ossicle was used as graft material. Group 2 myringoplasty included 24 patients in whom autologous ossicle (malleus or incus) and temporalis fascia over the ossicle was used as graft material.

According to our study myringostapedioplasty has better hearing outcomes when compared to myringoplasty. MSP hearing gain mean 19.53 db and MPP was 12.59 db.

**Table 1: Sex distribution in our study.**

Sex distribution	male	female
<b>Number</b>	20	30

**Table 2: Comparison of myringostapedioplasty and myringoplasty.**

Group	No. of patients	Mean post op AB gap (3 months)
<b>1-myringostapedioplasty</b>	26	19.53 db
<b>2- myringoplasty</b>	24	12.59 db

Independent 't' test t-value -4.1, p value -0.001 (significant).

**Table 3: Comparison between autologous ossicle.**

	Number	Mean
<b>Autologous incus</b>	28	23.83 db
<b>Autologous malleus</b>	22	14.33 db

## DISCUSSION

Tympanoplasty was classified by Wullstein and Zollner.<sup>4,5</sup> Auto-ossicular residue reposition is a better choice for ossicular chain reconstruction.<sup>6</sup> A total number of 50 cases were studied in the study. Types of tympanoplasty and materials used in these cases were analysed from the view point of hearing Improvement. The cases selected have tympanic membrane perforation and both active and inactive middle ear disease and pre-operative hearing loss >40 db. The operation performed was mastoidectomy with tympanoplasty. The graft used was temporalis fascia.

This study is discussed under the following headings:

- Age and sex incidence
- Ossicle involvement
- Hearing gain and its management

Cheang et al concluded that when surgically feasible, the technique of myringoplastinopexy is a useful method of preserving serviceable hearing in single-stage mastoid cavity surgery.<sup>7</sup>

Chin-Lung Kuo et al stated that stapes destruction is an independent negative prognostic determinant of achieving hearing success.<sup>8</sup>

### *Age and sex incidence*

In this study series females are commonly affected (30 patients). 20 patients are males. Most commonly affected age group 15-25 years. In these age group males are commonly affected 55%, females 53.3%. 16% of patient fall in less than 15 years of age group. 15- 25 years group consists of 54% of patient. 26-35 years group consists of 16%. More than 35 years consists of 14% of patient. Gulathi study series 76% were between 15-25 years age group.

### *Ossicle involvement*

In our study incus was commonly affected 94%, stapes 30%, malleus 26%. In part of ossicle involvement long and lenticular process were 48% (common), complete incus erosion 46%, head of stapes 26%, malleus 16%, malleus handle 8%, anterior crus of stapes 4%, malleus head 2%. Mohammadi et al study shows total (55.4%) or partial (30.7%) erosion of the incus was the most common pathology. The long process (25.9%) and the body of incus (4.8%) were also involved. Erosion of the stapes superstructure occurred more commonly than a total loss of the bone (40.9% vs. 25.9%). Erosion of the malleus was least common in their study.<sup>9</sup>

In our Myringostapediopey better hearing gain than myringoplastinopexy. Myringostapediopey mean hearing gain 19.53 db, myringoplastinopexy 12.59 db.

## CONCLUSION

Myringostapediopey hearing gain better than myringoplastinopexy using autologous ossicles.

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