

# A study of hearing improvement after myringoplasty in chronic suppurative otitis media patients in a tertiary care hospital

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## Abstract

**Background:** Myringoplasty is a routine surgical procedure done in medical college hospitals. In this study we evaluate the hearing improvement in patients who had undergone Myringoplasty in a period of one year. **Methods:** In this prospective study 50 patients who were diagnosed as Chronic Suppurative Otitis Media (CSOM) with central perforation underwent Myringoplasty. Myringoplasty was performed using underlay technique by transcanal approach with an endoscope. Temporalis fascia graft was used for all patients. The data of all patients regarding pre operative perforation size, pure tone audiogram results, post operative graft uptake and post operative pure tone audiogram results were analysed. **Results:** Out of 50 patients, 42 (84%) had successful graft uptake. These 42 patients were subjected to pure tone audiometry post operatively. The results of pure tone audiometry in these 42 patients were analysed pre operatively and post operatively. Out of these 42 patients, 11 (26.19%) patients had 0-25dB Air Bone Gap (A-B Gap), 18 (42, 85%) had 26-40 dB Air Bone Gap and 13 (30.95%) had 40-50 dB Air Bone Gap preoperatively. Post operatively out of these 42 patients, 27 (64.28%) patients had 0-25dB Air Bone Gap (A-B Gap), 13 (30.95%) had 26-40 dB Air Bone Gap and 2 (4.76%) had 40-50 dB Air Bone Gap. **Conclusion:** Myringoplasty is an effective surgery to improve the hearing in CSOM with tubotympanic disease. The hearing improved significantly after surgery in these patients.

**Key Words:** Myringoplasty, temporalis fascia, pure tone audiogram.

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## INTRODUCTION

Myringoplasty is a surgical procedure which is performed to reconstruct the tympanic membrane with a suitable graft material. It does not include removal of middle ear disease or reconstruction of ossicular chain<sup>1</sup>. The main objectives of Myringoplasty are to make the ear dry and to improve the hearing<sup>2</sup>. Grafts used in Myringoplasty are

Temporalis Fascia, Tragal pericondrium, Conchal pericondrium, Fascia lata and Venous graft. Fatty tissues from ear lobule, Dura, Periostium are also used as graft materials in Myringoplasty<sup>3</sup>. Temporalis Fascia is most common graft material used in Myringoplasty. The advantages of Temporalis Fascia graft are location of site, easy to harvest, thickness similar to ear drum and low basal metabolic rate<sup>4</sup>. Pure tone Audiogram is a basic audiological evaluation done in patients having hard of hearing. In CSOM patients with tubotympanic disease the commonest type of hearing loss is conductive hearing loss<sup>5</sup>. In these patients pure tone audiogram is done to evaluate type of hearing loss, quantity and quality of hearing loss. Pure tone Audiogram determines the relationship between air conduction and bone conduction thresholds<sup>6</sup>. When air conduction thresholds are elevated relative to normal bone conduction thresholds, a phenomenon referred to as an air bone gap is seen in conductive hearing loss<sup>7</sup>. In normal persons the air bone

gap remain is between 0 to 10 decibels. Air bone gap of more than 15dB indicates conductive hearing loss. When air conduction and bone conduction thresholds indicate the same amount of hearing loss, then the hearing loss is classified as sensorineural hearing loss<sup>8</sup>. This study aims to evaluate the improvement of hearing in CSOM with tubotympanic disease after Myringoplasty.

## MATERIALS AND METHODS

This prospective study was carried out in the Department of ENT and Head and Neck Surgery of Karpaga Vinayaga Institute of Medical Sciences, Madhuranthagam, Tamil Nadu from May 2016 to April 2017. In this prospective study, we have chosen 50 patients seen in our ENT outpatient department who have been diagnosed as CSOM with tubotympanic disease. These 50 patients underwent Myringoplasty as underlay technique. Myringoplasty was done by transcanal approach using endoscope. Temporalis fascia was used as graft. Preoperatively these patients were subjected to pure tone audiometry. These patients were followed for a period of 3 months after surgery. After 3 months patients were analysed for graft uptake and hearing improvement by using otoscopy and pure tone audiometry respectively.

### Inclusion Criteria

1. Patients diagnosed as CSOM with tubotympanic disease
2. Patients age between 20 to 50 years
3. Patients having dry perforation
4. Patients having inactive disease for more than 6 weeks

### Exculsion Criteria

1. Patients having sensorineural hearing loss and mixed hearing loss
2. Patients having more than 50 db air bone gap in audiogram
3. Patients having active ear discharge
4. Patients having co morbid conditions like diabetes and hypertension
5. Previous ear surgery

## RESULTS

**Table 1:** Sex distribution

Male	Female	Total
18(36%)	32(64%)	50(100%)

**Table 2:** Age distribution

Age Group	No of Patients
21-30	19(38%)
31-40	25(50%)
41-50	6(12%)

**Table 3:**

Size of Perforation	Number of Patients
Small	12(24%)
Large	29(58%)
<b>Subtotal</b>	<b>9(18%)</b>

**Table 4:** Preoperative pure tone audiogram results

Air Bone Gap	Number of Patients
0-25dB	11(26.19%)
26-40dB	18(42.85%)
40-50dB	13(30.95%)
<b>Total</b>	<b>42(100%)</b>

**Table 5:** Post operative pure tone audiogram results

Air Bone Gap	Number Of Patients
0-25dB	27(64.28%)
26-40dB	13(30.95%)
40-50dB	2(4.76%)
<b>Total</b>	<b>42(100%)</b>

In this study, out of 50 patients 32 (64%) were females and 18 (36%) were males (Table: 1). The age distribution in this study is as follows age group 21-30years is 19(38%), 31-40 years 25(50%), 41-50 years 6(12%) (Table: 2). According to the size of perforation patients were classified in to three groups as small, large, subtotal perforation (Table : 3). Perforation involving single quadrant was taken as small perforation, perforation involving two or more quadrants was taken as large perforation, perforation involving all four quadrant except tympanic annulus was taken as subtotal perforation. Out of 50 patients, 12 (24%) had small perforation, 29(58%) had large perforation, 9 (18%) had subtotal perforation. All these 50 patients underwent Myringoplasty by underlay technique. These patients were subjected to pure tone audiometry before surgery. These patients were followed for a period of 3 months. Out of 50 patients, 42 (84%) had successful graft uptake. These 42 patients were subjected to pure tone audiometry post operatively. The results of pure tone audiometry in these 42 patients were analysed pre operatively and post operatively. Out of these 42 patients, 11 (26.19%) patients had 0-25dB Air Bone Gap (A-B Gap), 18 (42, 85%) had 26-40 dB Air Bone Gap and 13 (30.95%) had 40-50 dB Air Bone Gap preoperatively (Table: 4). Post operatively out of these 42 patients, 27 (64.28%) patients had 0-25dB Air Bone Gap (A-B Gap), 13 (30.95%) had 26-40 dB Air Bone Gap and 2 (4.76%) had 40-50 dB Air Bone Gap (Table: 5).

## DISCUSSION

In our study we have operated 50 patients between the age group of 20-50 years. In our study we utilized underlay technique using Temporalis fascia. Out of 50 patients, 42 (84%) of the patients had successful graft uptake. These 42 patients had significant hearing

improvement as analysed in the result. Post operatively, 27 (64.28%) patients had 0-25dB Air Bone Gap (A-B Gap), 13 (30.95%) had 26-40 dB Air Bone Gap and 2 (4.76%) had 40-50 dB Air Bone Gap. This shows Myringoplasty will give a significant improvement in the hearing of the CSOM patients. BJ Bennett in reviewing the post operative hearing of his 85 Myringoplasties reports that 72 cases (84.3%) achieved adequate hearing<sup>9</sup>. Packer, M Solar in their study showed closure of air bone gap was better in patients who had under gone Myringoplasty by underlay technique<sup>10</sup>. In our study also, there was a significant improvement in hearing in terms of closure of air bone gap using same underlay technique of Myringoplasty.

### CONCLUSION

Myringoplasty is an easier surgery to perform and gives better results. The hearing results are good and complications are minimal. The overall study showed, using the underlay technique with temporalis fascia gives a high success rate in terms of closure of perforation. The analysis of this study showed there is a marked improvement in hearing after Myringoplasty. Therefore, Myringoplasty is a safe and effective technique to improve the quality of life of patients with CSOM –tubo tympanic disease.

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