Original article

# Success Rate of Simple Underlay Myringoplasty in Smaller Perforation of Tympanic Membrane

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**Abstract**

**Introduction:** The objective of the study was to compare the success rate of Simple Underlay Myringoplasty (SUM) in smaller perforation of tympanic membrane (TM) with that of Conventional Underlay Myringoplasty.

**Methods:** It was a prospective, longitudinal study on 46 patients of more than 15 years of age with Chronic Otitis Media Mucosal type with the small and medium sized perforations. The patients with average hearing loss more than 30 dB were excluded from the study. The patients were randomized into two groups: group A – who underwent SUM (26 patients) and group B – who underwent Conventional Myringoplasty (20 patients). The patients were followed up on 6th, 8th and 10th post operative week for the assessment of the status of the graft. The status was described as; intact TM, graft with residual pin point perforation and total rejection of the graft with remaining perforation.

**Results:** There was no statistical difference in graft status between SUM and Conventional Myringoplasty in all the three post operative follow up (p value = 0.121, 0.279 and 1.0 in 6th, 8th and 10th week of follow up respectively).

**Conclusion:** Simple Underlay Myringoplasty has comparable success rate (88.46%, 23/26) as Conventional Underlay Myringoplasty (90.0%, 18/20).

**Key words:** Chronic Otitis Media mucosal type, Underlay Myringoplasty, Tympanic Membrane.

## Introduction

Simple Underlay Myringoplasty (SUM) is a simple and minimally invasive procedure for a closure of the perforated Tympanic Membrane (TM) without elevating the tympanomeatal flap. "SUM" was introduced by Yuasa[1] in 1989. Sakagami et al[2] has also described the same, where they used fibrin glue for graft adhesion. Conventional Underlay Myringoplasty is the most widely used technique in which tympanomeatal flap is elevated. There is greater risk of damaging structures like chorda tympani and annulus and also has risk of sensorineural hearing loss. Therefore, it has been argued that conventional underlay myringoplasty with greater risks are better avoided in small size perforations.

The size of the perforation of pars tensa can be classified according to the classification given by Singh et al as; small: <25%; medium: 25-50% and large: >50% of surface area of tympanic membrane.[3] The aim of the study was to compare the success rate of SUM in smaller perforation (small and medium size) of tympanic membrane with that of Conventional Myringoplasty.

## Methods

It is a prospective, longitudinal study done on patients with Mucosal type of Chronic Otitis Media (COM) having small and medium size perforation. Patients of all gender aged

more than 15 years with average hearing loss of maximum 30 dB were included. The patients were divided into two groups randomly: one who underwent SUM (group A) and another who underwent Conventional Underlay Myringoplasty (group B). The surgeries were performed by the author in various mobile ear surgical camps conducted by IMPACT Nepal in different areas of Nepal and in Institute of Medicine, TU Teaching Hospital from 2009 to 2012.

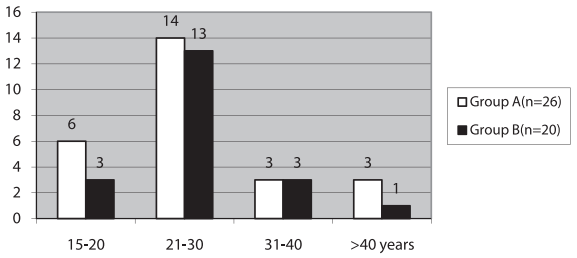
All the Myringoplasties were performed under local anaesthesia using 2 % Xylocaine with 1:200,000 Adrenalines which was injected in four quadrants of external auditory canal and supra-auricular area just above the superior attachment of pinna. Temporalis fascia graft was harvested from supra-auricular area which was of small size for group A and larger for group B. The graft was dried and shaped to final size.

All the cases were performed via permeatal approach. The margin of the perforation was freshened and the undersurface of the remnant tympanic membrane near the margin was denuded in both the groups. The middle ear space was filled with Gelatin sponge (Gel Foam) through the perforation in group A followed by placement of graft. The graft was tucked in all around the margin in such a way that it was in contact with the perforation margin. However, in group B, a standard tympanomeatal flap was elevated. The middle ear was filled with dry Gelatin sponge (Gel Foam) and graft was tucked under the handle of malleus and remnant of tympanic membrane. Standard tympanomeatal flap was repositioned covering the part of the graft over the posterior bony canal wall. The wet gelatin sponges were placed over the graft and remnant of Tympanic Membrane and the external auditory canal was packed with Bismuth Iodoform Paraffin Paste (BIPP) impregnated ribbon gauze in both groups.

Oral antibiotic and analgesics were prescribed. BIPP pack was removed on 6th post operative day. Topical antibiotic and steroid ear drops were prescribed for 10 days after pack removal. The patients were followed up on 6th, 8th and 10th post operative week to assess the status of graft. Graft status is described in three categories: Intact TM, residual pin point perforation and total rejection of the graft with remaining perforation.

## Results

Fifty two patients (30 in group A and 22 in group B) were enrolled in the study. Six patients (4 in group A and 2 in group B) were lost to follow up and therefore excluded. Total forty six patients (26 in group A and 20 in group B) were analysed. The age and gender distribution are shown in figure 1 and 2.



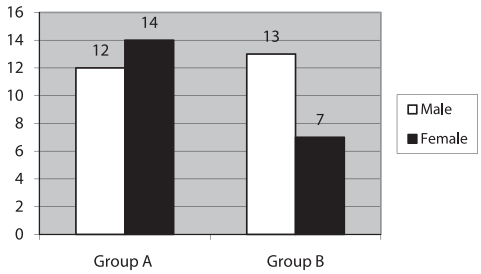




**Figure 1: Age Distribution,**

**Figure 2: Gender Distribution**

**Post operative graft status**

In SUM group (group A), TM was intact in 21, 20 and 23 patients in 6th, 8th and 10th post operative week respectively. Out of four patients who had pinpoint perforation on 6th week, two got recovered and categorized into intact TM on 8th and 10th post operative week. Similarly, 3 patients with intact graft on 6th post-operative week were found to have pin point perforation on 8th post-operative week, but these got healed by 10th week follow up. On 10th post operative week, only 2 patients were found to have pin point perforation. (Table1)

In Conventional Underlay Myringoplasty (group B), all 20 patients had intact graft on 6th week of follow up. But two patients subsequently had infection resulting in pin point perforation in one patient and total rejection of the graft in one patients on 10th week follow up. (Table 2).

There was no statistical difference in graft status between SUM and conventional myringoplasty in all the three post operative follow up (p value = 0.121, 0.279 and 1.0 in 6th, 8th and 10th week follow up respectively). (Table 3, 4 & 5).

**Table 1. Graft Status in Group A**

| Graft status | 6th week | 8th week | 10th week |
|---|---|---|---|
| Intact TM | 21 | 20 | 23 |
| Pin point perforation | 4 | 5 | 2 |
| Total rejection | 1 | 1 | 1 |

**Table 2. Graft status in Group B**

| Graft status | 6th week | 8th week | 10th week |
|---|---|---|---|
| Intact TM | 20 | 19 | 18 |
| Pin point perforation | 0 | 1 | 1 |
| Total rejection | 0 | 0 | 1 |

**Table 3. Comparison of graft status between two groups on 6th week**

| Group | Intact TM | Pin point perforation | Total rejection |
|---|---|---|---|
| Group A (n=26) | 21(80.76%) | 4 (15.38%) | 1 (3.85%) |
| Group B (n=20) | 20 (100%) | 0 | 0 |

**p= 0.121**

**Table 4. Comparison of graft status between two groups on 8th week**

| Group | Intact TM | Pin point perforation | Total rejection |
|---|---|---|---|
| Group A (n=26) | 20 (76.92%) | 5 (19.23%) | 1(3.85%) |
| Group B (n=20) | 19 (95.0%) | 1(5.0%) | 0 |

**p= 0.279**

**Table 5. Comparison of graft status between two groups on 10th week**

| Group | Intact TM | Pin point perforation | Total rejection |
|---|---|---|---|
| Group A (n=26) | 23(88.46%) | 2 (7.69%) | 1 (3.85%) |
| Group B (n=20) | 18(90.0%) | 1(5.0%) | 1(5.0%) |

**p= 1.0**

## Discussion

All the patients were above 15 years of age as children below 15 years were difficult to operate under local anesthesia in camp basis. The mean age in group A is 27.11 years and in group B is 27.7 years. The age distribution in two groups was homogenous. Most of patients are in between 21 to 30 years as in other studies.[4,5] Male and female ratio is 1.19:1 suggesting no gender preponderance of the disease.

In the study, size of the perforation was categorized according to Singh et al[3] as small: <25%; medium: 25-50% and large: >50% of surface area of tympanic perforation. The perforations smaller than 50% of the surface area were enrolled in the study. In smaller perforation, the chance of graft displacement after SUM is very less in comparison to the large perforation. In larger perforation tympanomeatal flap helps to stabilize the graft. Therefore only the TM with smaller perforations were selected. None of the patients in the study had anterior marginal perforation. As ossicular status cannot be assessed in SUM, the patients having less than 30dB hearing level only were included.

In this study the graft status was assessed in 6th, 8th, and 10th post operative week. By 6th week, gel foam placed lateral to the graft in EAC is expected to have dissolved completely along with the vascularization of the graft.[1] On assessing the status of the graft in SUM group on 10th week, 88.46% were intact, 7.69% had pin point perforation and 3.85% had total rejection. The results are almost similar to conventional group which are 90.0%, 5.0% and 5.0% respectively. The difference is statistically not significant with p value of 1.0. This result is similar to that of Alzoubi et a[l6] in which the graft uptake rate was 84.65% in SUM group and 94.45% in conventional group. Singh et al3 in 2006 had 84% of success rate in small and medium size perforation. Similarly, Sakagami et a[l2] had success rate of 77.7 percent of closure of perforation of tympanic membrane by SUM after initial attempt (304/391). Out of 87 unsuccessful cases 70 patients had successful re-closure so that the overall success rate became 95.7 per cent (374/391).

Out of 7 (4 in 6th and 3 in 8th week) patients who had pin point perforation in 6th and/or 8th follow up week recovered in 10th week of follow up. Two patients in group A and one in group B still had pin point perforation at 10th week of follow up which might get healed on further evaluation. Therefore, the long term study would better evaluate the efficacy of SUM. The sample size in this study is also low. Although the prevalence of mucosal type of COM in our country is 7.2%7, the prevalence of small and medium sized perforation is unknown as no such study is done till date.

## Conclusion

Simple Underlay Myringoplasty is a simple and minimally invasive procedure. It has comparable success rate (88.46%, 23/26) to that of Conventional Underlay Myringoplasty (90.0%, 18/20) with no statistically significance difference (p value=1.0).

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