

## MYRINGOPLASTY GRAFT UPTAKE: SHORT AND LONG TERM OUTCOME

Roshan Acharya,<sup>1</sup> Bishow Tulachan,<sup>1</sup> Anup Acharya

### ABSTRACT

### INTRODUCTION

Myringoplasty is surgical procedure to restore tympanic membrane perforation. The objective of the study is to compare overall success rate of myringoplasty after 6 weeks and 6 months postoperatively.

### MATERIAL AND METHODS

This is a retrospective, comparative study carried out in the Department of ENT (Ear, Nose and Throat) and Head and Neck Surgery (ENT-HNS), Universal College of Medical Sciences-Teaching Hospital (UCMS-TH), Bhairahawa, Rupandehi, Nepal. All the data was collected from the operative notes and operative record book of our hospital which were done from October 2018 to September 2020 over a period of 24 months by single surgeon. A total of 77 patients with age range of 12-70 years including all gender with chronic otitis media (COM) mucosal type, inactive who underwent myringoplasty were studied. Graft uptake results were assessed after 6 weeks and 6 months following surgery.

### RESULTS

The age of the patients ranged from 12-70 years. The mean  $\pm$  standard deviation (S.D) of age was  $27.84 \pm 13.16$  years. There were 47 (61%) female patients and 30 (39%) male patients involved in the study. Graft uptake success rates were 84.4% (65) and 83.1% (64) after 6 weeks and 6 months respectively.

### CONCLUSION

No statistical significance was noted in graft success and failure rates between 6 weeks and 6 months ( $p=0.320$ ).

### KEY WORDS

Chronic otitis media, Graft uptake, Myringoplasty, Tympanic Membrane.

1. Department of ENT-Head and Neck Surgery, Universal College of Medical Sciences, Bhairahawa, Nepal

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### For Correspondence

Dr. Roshan Acharya,  
Department of ENT-Head and Neck Surgery  
Universal College of Medical Sciences, Bhairahawa, Nepal  
Email: [iroshanacharya@gmail.com](mailto:iroshanacharya@gmail.com)

## INTRODUCTION

Chronic otitis media (COM) is defined as a longstanding inflammatory condition of the middle ear and mastoid associated with or without a perforation of the tympanic membrane (TM).<sup>1</sup> COM is a common condition affecting 0.5-30% of any community. Therefore, a conservative estimate of the number of people in the world suffering from COM is over 20 million. COM is a common public health problem worldwide and a major cause of hearing impairment among children in developing countries. Poverty, overcrowding, inadequate housing, and poor hygiene are known to contribute to high rates of COM. The four factors found to have the strongest association with COM were a history of ear discharge in the last 12 months, swimming in local pools, recurrent respiratory tract infection of more than three times per year, and overcrowding of more than three families per house.<sup>2</sup>

Treating COM with surgical therapy through myringoplasty is one of the common procedures in ENT-HNS. Myringoplasty is defined as "an operation in which reconstructive procedure is limited to repair of tympanic membrane perforation. It can be part of major reconstruction of middle ear and ear canal, or part of a tympanoplasty with ossicular reconstruction or only a repair of a perforation, without any work in tympanic cavity. The benefits of successful myringoplasty include prevention of middle ear infections and ear discharge, improvement in hearing, ease of hearing aid usage and elimination of the need to take water precautions when showering, washing hair or swimming. In addition to above, it has been suggested to protect against long-term middle ear damage by preventing the progression of ossicular pathology and preventing the migration of squamous epithelium around the margins of the perforation with possible consequent cholesteatoma formation."<sup>3</sup>

Several factors may affect the outcome of myringoplasty such as the site and size of the perforation, technique (underlay versus overlay), experience of the surgeon, condition of the other ear, type of graft used, age of the patient and condition of the operated ear (dry versus wet).<sup>4</sup> Failure for graft uptake after a long period have been considered due to initial failure to heal, reperforation, or formation of a non-cleaning atelectatic pocket.<sup>5</sup>

Most of the time, we are centered on result over short duration and overlook or ignore the long-term outcome following myringoplasty. The objective of the current study is to compare overall success rate of myringoplasty after 6 weeks and 6 months following surgery.

## MATERIAL AND METHODS

The current study was a hospital based retrospective and comparative study conducted at UCMS, Bhairahawa, Nepal that was approved by Institutional Review Committee with registration number UCMS/IRC/085/21 prior to the study. Both verbal and written consents were taken from the participants. All the data was collected from the operative

notes and operative record book of our hospital which were done in between October 2018 to September 2020 over a period of 24 months by a single surgeon. All the patient of age 12-70 years who underwent myringoplasty with temporalis fascia as graft were included in study. Patients with complications of chronic otitis media, revision myringoplasty and had application of graft other than temporalis fascia were excluded.

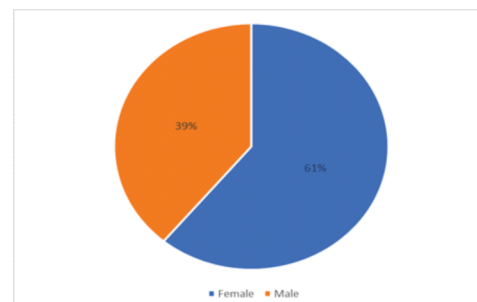
The graft uptake rate was 95 percent in study done by J. Westerberg et al over a 10- year period from 1994 to 2004.<sup>6</sup> So, taking 95 percent as estimated proportion and estimated error at 0.05, minimum sample size required was 73. Total sample size of the current study was 77.

Patient's post-op record and post-surgery OPD card record was evaluated in the out-patient's department and ward. The patients were evaluated on the basis of otoscopic examination (perforation/retraction pocket/cholesteatoma/granulation tissue) and the symptoms (ear discharge/otalgia/slowly progressive deafness). Follow up record in OPD book was collected from 6th week and 6-month visits. Graft uptake status was assessed after 6 weeks and 6 months postoperatively. Data collection regarding age, sex, cause was compiled in a systematic way in preformed Proforma. All the data from cases were entered in Microsoft (MS) Excel office and then analyzed by Statistical Package for Social Service (SPSS). P value <0.05 was considered to be statistically significant.

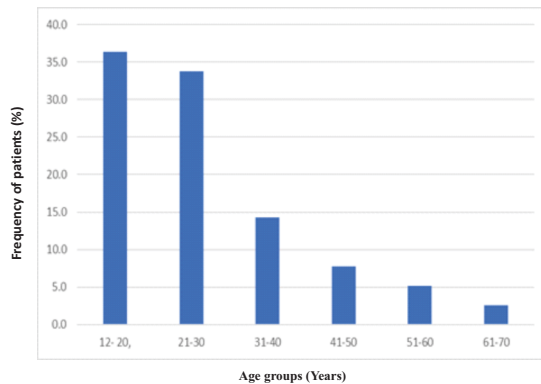
## RESULTS

Seventy-seven patients were enrolled in the study which included 47 (61%) female and 30 (39%) male patients (Figure I) with mean age of the study population being  $27.84 \pm 13.16$  years. Maximum number of cases belonged to the age group 12-20 years with frequency of 28 (36.4%) followed by 26 (33.8%) cases in age groups 21-30 years. Age groups 61-70 years showed least number of cases 2 (2.6%) (Figure II). Out of the 77 cases, 43 (55.8%) had right ear myringoplasty whereas 34 (44.2%) had left ear myringoplasty.

Graft uptake success rates was 65 (84.4%) in 6 weeks and 64 (83.1%) in 6 months (table 1) and failure rates in 6 weeks and 6 months were 12 (15.6%) and 13 (16.9%) respectively. There was no statistical significance noted in graft success and failure rates after 6 weeks and 6 months post operative follow up of the patients ( $p=0.320$ ).



**Figure 1. Gender wise distribution of patient**



**Figure II.** Age wise distribution of patients

**Table 1.** Distribution of patients based on graft success and failure rates between 6 weeks and 6 months

Graft uptake	6 weeks	6 months	p-value
Success	65 (84.4%)	64 (83.1%)	0.32
Failure	12 (15.6%)	13 (16.9%)	

## DISCUSSION

Myringoplasty is the surgical technique to repair the tympanic membrane perforation. It is one of the most common surgical procedure carried out in otorhinolaryngology practice. Most of the ENT surgeon assess graft uptake in 6 weeks following myringoplasty. We aimed to assess graft uptake in both 6 weeks and 6 months following surgical treatment and see the differences in graft uptake rate.

Early adulthood (twenties) is the common age group who undergo myringoplasty procedure as described by some studies.<sup>7,8</sup> Maximum number of cases in the current study belonged to the age group of 12-20 years. Mean age group in present study was 27.07 years.

Temporalis fascia and perichondrium are the most widely used materials as graft in myringoplasty and the successful closure can be achieved in 80% to 90% of patients who undergo myringoplasty using the above material.<sup>9</sup> All the studied cases had temporalis fascia as graft material in our study.

Myringoplasty using underlay technique employing temporalis fascia graft is a top-notch surgical procedure to close tympanic membrane perforation with high success rates. Though the ability of surgeon is important aspect for the success of the operation, there are other elements which can influence the surgical outcome. Among these are measurement of the perforation, surgical techniques, graft material, eustachian tube function, previous myringoplasty and risk factor like smoking. Besides, respiratory infection and graft contamination can also limit success rate.<sup>10</sup>

Most of the time surgical outcome is focussed on shorter time period and surgeons tend to overlook or ignore the long-term

outcome following myringoplasty. Hence, this retrospective study was conducted to assess graft uptake after 6 months and compare it with graft uptake in 6 weeks' time. In our study 65 patients out of 77 studied cases (84.4%) had successful graft uptake rates in 6 weeks and 64 out of 76 (83.1%) had successful graft uptake rates in 6 months. Our result was in concordance with the result of Acharya K. et al who had studied 978 patients during the period of 26 months and the overall graft uptake rate was 82 % by the end of 6 weeks which further decreased to 78% by the end of 4 months.<sup>11</sup> In a study conducted by Nardone M et al, the graft uptake was 85% one year after the operation, 81% after 2 years, 80% after 4 years, and 78% after 10 years.<sup>12</sup> Shrestha BL et al in their study had demonstrated no difference in graft uptake rate between short term and long term with both being at 95.2%.<sup>13</sup>

Failure after a long period have been considered due to initial failure to heal, reperforation, or formation of a non-cleaning atelectatic pocket. In a study done by Jurovitzki IA, et al 7.6% of the eardrum's deterioration occurred over the years, to a degree that turned an initial successful outcome of the operation into a failure.<sup>14</sup> One case of residual ear perforation was recorded after 6 months follow up in the current study. Of the various factors that characterized and accompanied the initial perforation before the operation, or the various operative technical aspects, none was found to influence the late outcome of myringoplasty.

In contrast to our result, Knutsson J et al had showed three TMs with a residual perforation at the six-week follow-up were healed at the one-year follow-up. Animal studies of the spontaneous healing process of TM perforations showed that the healing process continues for longer than six weeks.<sup>15</sup> Whether this is also true for myringoplasties in man is not known.

There are chances of healing of residual perforation past six weeks and probabilities of failure after a long period due to preliminary failure to heal, reperforation, or formation of a non-cleaning atelectatic pocket. So, long term follow up would be better.

## CONCLUSION

The graft uptake rate was (65/77) 84.4% in six weeks and (64/77) 83.1% 6 months. There was no statistically significance noted in graft success and failure rates between six weeks and six months ( $p = 0.320$ ). Although, the graft uptake rate in our study was comparable to other studies, more long-term postoperative follow-up for graft uptake would have been better.

## CONFLICT OF INTEREST

None

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