

Compare the Outcomes of Underlay and Onlay Myringoplasty

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ABSTRACT

Objective: To determine the outcomes between underlay and onlay techniques underwent myringoplasty.

Study Design: Quasi-experimental study.

Place and Duration of Study: Department of ENT, Nowshera medical College/Qazi Hussain Ahmad Medical Complex, Nowshera from 1st July 2018 to 30th June 2020.

Methodology: One hundred patients with age ranges 12-55 years were enrolled. Patients details demographics age, sex and body mass index were recorded after taking informed written consent. Patients suffered with tympanic membrane perforation related to chronic otitis media and/or trauma were included. They were divided into two groups, I and II. Group I had 50 patients and received underlay myringoplasty and group II had 50 patients underwent for onlay myringoplasty. Outcomes among both groups were assessed in terms of graft success rate. Complete follow-up among both groups was taken in duration of 4 months.

Results: There were 35 (70%) males and 15 (30%) females in group I while in group II 30 (60%) males and 20 (40%) females. Mean age in group I was 24.15±8.41 years with mean BMI 25.17±6.53 kg/m² and in group II mean age was 25.15±8.41 years with mean BMI 25.21±6.14 kg/m². In group I graft success rate was 48 (96%) and in group II 45 (90%) graft success found. Medialization in group I was 2 (4%) and in group II was 4 (8%) and no any lateralization was found in both groups. Hearing was improved in group I, mean air bone gap closure was 9.8±6.45dB and in group II 11.8±4.54 dB.

Conclusion: The underlay technique for myringoplasty was more effective in terms of graft success and hearing improvement. Overall success rate among both groups was 93% among both groups.

Keywords: Underlay technique, Overlay technique, Myringoplasty

INTRODUCTION

Myringoplasty is the term used to repair and improve the hearing level of the perforated tympanic membrane.¹ Drilling of the tympanic membrane results mainly from infections or trauma of the middle ears. Spontaneous healing of up to 80% of the drillings.² Myringoplastics are normally performed for the remainder. The advantages of myringoplastic treatment include preventing ear infection; aural discharge; better auditory and long-term middle-ear protection through ossicular disease prevention; squamous epithelium migration on perforation margins.³

A variety of myringoplastic techniques have been described in the literature including: the underlay, overlay technique, the technique 'Gelfilm Sandwich,' 'Swinging Door' technique, 'C' technique, the double-swing technique, 'fascible stitching' technique, the anterior anchor technique, the 'spot welding' technique assisted by laser.⁴⁻⁹ The "underlay" and the "overlay" technique are two of the most frequent methods to position the graft relative to the remains of the tympanic membrane and the tympanic annulus.¹⁰

The former is widely used and can be done relatively easily since the graft is placed completely in the medium of the remaining drum (or annulus) and manubrium. This technique is ideal to repair small and easily visualized perforations, to avoid stunning and lateral grafting, to heal the drum at the correct level in comparison with the annulus and osselets, and to perform quickly and easily.¹¹

The disadvantages are, on the other hand, that the middle ear space is reduced by adherence to the tubes, that medialization or atelectatic adhesion is possible; that there is increased failure due to a limited bed size of the

graft, that supplies poor vascularity; that the exposure of the middle ear is relatively limited; The overlay technique is more difficult, instead, and is typically reserved for complete drilling, anterior drilling or failed underlay surgery.¹² When the squamous layer is removed carefully from the tympanic membrane residue and the ear channel, this graft technique lateral is placed on the ring and any remaining fibrous middle layer. The anterior metal recess that in case of anterior drilling reaching the anterior annulus, has excellent visualisation. Furthermore, the healing rate is high because the drum remains intact and there is no reduction in the middle ear space. The main disadvantages include the stumping and lateralizing of the graft of the anterior metal recess; furthermore, it is more laborious and has a long period of treatment.¹³ The objective of the study was to explore and appraise the advantages and disadvantages of the two myringoplastic procedures, the sublayer and the onlay.

MATERIALS AND METHODS

This experimental study was conducted at Department of ENT, Nowshera medical College/Qazi Hussain Ahmad Medical Complex, Nowshera from 1st July 2018 to 30th June 2020 and comprised of 100 patients with age range 12-55 years. Patients with wet tympanum, loss of cochlear and those did not give any written consent were excluded from this study. Patients details demographics age, sex and body mass index were recorded after taking informed written consent. Patients suffered tympanic membrane perforation related to chronic otitis media and/or trauma were included. Patients were divided into two groups, I and II. Group I had 50 patients and received underlay

myringoplasty and group II had 50 patients underwent for onlay myringoplasty. Outcomes among both groups were assessed in terms of graft success rate. Complete follow up among both groups was taken in duration of 4 months. Complete data was analyzed by SPSS-24.

RESULTS

There were 35 (70%) males and 15 (30%) females in group I while in group II 30 (60%) males and 20 (40%) females. Mean age in group I was 24.15±8.41 years with mean BMI 25.17±6.53 kg/m² and in group II mean age was 25.15±8.41 years with mean BMI was 25.21±6.14 kg/m² (Table 1).

In group I, graft success rate was 48 (96%) and in group II, 45 (90%) graft success found. Medialization in group I was 2 (4%) and in group II was 4 (8%) and no any lateralization was found in both groups (Table 2).

Hearing was improved in group I, mean air bone gap closure was 9.8±6.45 dB and in group II 11.8±4.54 dB. Statistically there was not significant (P>0.152) different between the groups (Table 3).

Table 1: Baseline details demographics of enrolled cases (n=100)

Variable	Group I	Group II
Age (years)	24.15±8.41	25.15±8.41
BMI (kg/m ²)	25.17±6.53	25.21±6.14
Gender		
Male	35 (70%)	30 (60%)
Female	15 (30%)	20 (40%)

Table 2: Comparison of outcomes among both groups (n=100)

Variable	Group I	Group II
Graft success		
Yes	48 (96%)	45 (90%)
No	2 (4%)	5 (10%)
Medialization	2 (4%)	4 (8%)
Lateralization	-	-

Table 3: Comparison of hearing improvement among both groups

Mean air bone gap closure (dB)	Group I	Group II
	9.8±6.45	11.8±4.54
P value	0.152	

DISCUSSION

Myringoplastic treatment has now become a well known and satisfying treatment frequently conducted by otologists worldwide. Quest continues by designing new techniques to improve myringoplastics results. The various myringoplastic procedures mentioned in the literature demonstrate this. The claims of better anatomical and functional results are offered for each technique.

In the present study, the mean age in group I was 24.15±8.41 years with mean BMI 25.17±6.53 kg/m² and in group II mean age was 25.15±8.41 years with mean BMI 25.21±6.14 kg/m². Our findings were comparable to the previous study.^{14,15} There were 35 (70%) males and 15 (30%) females in group I while in group II 30 (60%) males and 20 (40%) females in the current study. The two techniques of onlay and underlay are the most frequently accepted. The underlay technique was received in my study group while the onlay technique was received in group II. Underlay technology among otologic surgeons is much more popular because it is not only easy to do, but

also connected with positive results. There are several pros and cons to each strategy.

In our study graft success rate was 48 (96%) in group I and 45 (90%) in group II (onlay technique). Overall success rate among both groups was 93%. These results were comparable to the previous findings.¹⁵ Fernandes⁶ revealed that their success rate for grafting was 77.5% in 94 cases using the same underlay technique. In the previous literatures, the percentage of graft success of the underlay technique varies between 94 and 100 per cent.¹⁴⁻¹⁵ Other studies have documented the rate of graft success between 70 and 96 per cent.^{15,16} The graft success percentage reported by the Yigit et al¹⁶ in 58 patients was 94.9% using the over-underlay technique. In another investigation, the success of Kartush and others¹⁷ with the over underlay strategy was 100%. In the procedure for underlaying, graft is positioned between the remaining medial and tympanic membrane. The positioning of the graft medial in the tympanic membrane residue reduces the space in the middle ear and may lead to graft medialization and atelactasis. This sequelae not only compromises myringoplastic results in terms of reducing the hearing but also leads to retraction bags and the build-up of squamous debris that cause chlosteatoma. The medialization of graft can be prevented by the use of the underlaying technique by inserting the lateral (over) graft handle of the malleus and the medial (under) the tympanic membrane rests and the annulus. This does not only reduce middle ear space, but also offers an excellent medial support for the graft that prevents the medialization of the handle.¹⁷

Both myringoplastic procedures employed in our study were associated with improved hearing in all patients, however in underlaying technology more improvements were found, mean air bone gap closure was 9.8±6.45 dB and in group II 11.8±4.54 dB.¹⁶ The reports of 90% and 95% of post surgical hearing improvements in underlay and over lay r techniques respectively were in study of Panchal et al.¹⁸ Karela¹⁹ reported 211 patients with myringoplastic underlay surgery for any size and perforation site, with 91.5% success rate and average hearing function improvement in 91.5% of patients by 14.67 dB. These authors have indicated that myringoplastic treatment can improve the hearing regardless of the site and perforation size and can be utilized as an indication of myringoplastic.

A study by Lou²⁰ demonstrated that the graft success rate was 98.5% (66/67) in the group double layer tragal cartilage-perichondrium graft and 94.0% (63/67) in the group temporal muscle fascia graft at 6 months, the difference wasn't statistically significant (p = 0.362).

CONCLUSION

The underlay technique for myringoplasty was more effective in terms of graft success and hearing improvement. Overall success rate among both groups was 93% among both groups.

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