

ONLAY VS. INLAY MYRINGOPLASTY WITH TRAGAL PERICHONDRIUM- A HOSPITAL-BASED RETROSPECTIVE STUDY

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ABSTRACT

BACKGROUND

Myringoplasty is the surgical repair of tympanic membrane. Most commonly used techniques are onlay and inlay. Common graft materials include temporalis fascia and tragal perichondrium.

MATERIALS AND METHODS

In this present retrospective study involving 60 patients with 30 each in onlay and inlay group who underwent myringoplasty by transmeatal approach using tragal perichondrial graft.

RESULTS

We found success rate of 90% in onlay and 93.3% in inlay method, difference of which was not statistically significant. Degree of hearing improvement was 15.95 dB for onlay group and 16.48 in inlay group and the difference was again not significant.

CONCLUSION

The only advantage of onlay procedure was consumption of little less amount of time. Apart from that, we concluded that none of these methods are superior to other.

KEYWORDS

Myringoplasty, Inlay, Onlay, Tragal Perichondrium, CSOM.

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BACKGROUND

Myringoplasty is a surgical procedure of repairing perforated Tympanic Membrane (TM). This can either be an isolated procedure or a part of other ear surgeries. It was introduced by Berthold, which was later modified and improved by Wullstein, Zollner and Heerman.^{1,2,3,4} Myringoplasty is classified in different ways, which are either modifications of Wullstein's classification or classified according to the size and site of the perforation.

The most common aetiology of TM perforation is Chronic Suppurative Otitis Media (CSOM), which is still an important public health hazard in developing country like India. There are other causes like trauma where it heals mostly on its own.

Myringoplasty is generally done under Local Anaesthesia (LA) though in children General Anaesthesia (GA) may be required. It can either be transmeatal end or

postaural approach. Common graft material used is temporalis fascia or tragal perichondrium, both autologous materials. There are different techniques, but onlay (over lay) and inlay (under lay) are the most common types. In the former, the graft is placed lateral to remnant of TM and it is medial in case of the later.⁵ Prerequisite of myringoplasty are preferably a dry ear with tubotympanic type of CSOM with no foci of infection, good Eustachian tube function and intact neural pathway.

This procedure not only helps in middle ear sealing, but also contributes in restoration of hearing if other components are functional.

AIMS AND OBJECTIVES

This study was aimed at comparing onlay and inlay techniques of myringoplasty in terms of graft uptake and degree of hearing improvement.

MATERIALS AND METHODS

This is a retrospective hospital-based study done at the Department of ENT at Agartala Government Medical College, Agartala, India, analysing cases of myringoplasties during 2012-13. Patients aged above 15 years of both sexes were included who had dry Central Perforation (CP) with no other sinonasal disease at the time of operation and underwent myringoplasty by transmeatal approach using tragal perichondrial graft and operated by the team

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of authors. Patients below 15 years of age were excluded as this study was done in patients who underwent surgery under LA, which is not suitable for younger children. Patients having active ear discharge, any sinonasal disease, associated sensory neural hearing loss, other comorbidities like uncontrolled diabetes, hypertension, heart disease, renal pathology or positive for viral serology for HIV, Hepatitis B or C were also excluded. Matching for age and sex were done to avoid bias.

A total number of 60 patients fulfilling the inclusion criteria were included in the present study, out of which 30 each underwent myringoplasty by onlay and inlay technique. Routine blood investigations including bleeding time and clotting time, blood sugar estimation, renal function tests, viral serology for HIV, Hepatitis B and C, Chest x-ray, ECG were done preoperatively. X-ray nose and paranasal sinuses were done to rule out any sinonasal pathology.

Pure Tone Audiometry (PTA) was done prior to surgery to assess hearing status. Eustachian tube patency was checked by clinical methods for the same.

Patients were followed up for 6 months. The data of graft uptake and degree of hearing improvement by PTA were documented at 3 and 6 month intervals.

STATISTICAL ANALYSIS

Comparison of success rate of graft uptake and the level of significance of difference was calculated by chi-square test. Difference in the degree of hearing improvement was calculated by Mann-Whitney U test to compare the mean of two groups and the level of significance of the difference.

RESULTS

Total numbers of cases were 60 in which 30 each underwent myringoplasty by onlay and inlay method. In the onlay group, 16 (53.33%) were males and 14 (46.66%) were females with 22 (73.33%) in the age group of 15 to 45 years and 08 (26.60%) were >45 years old.

Whereas, the inlay group had 15 (50%) males and females each with 20 (66.66%) in the age group of 15 to 45 years and 10 (33.33%) were >45 years old. In the onlay group, 08 (26.60%) had an air-bone (A-B) gap between 11-20 dB, 14 (46.60%) had 21-30 dB and 08 (26.60%) had 31-40 dB in preoperative PTA with the minimum A-B gap being 16 dB and the maximum was 40 dB with an average of 24.34 dB for this group. Whereas in the inlay group, the same was 11 (36.67%), 09 (30%) and 10 (33.33%) respectively with minimum being 18 dB and maximum 38 dB with an average of 22.88 dB.

In the postoperative follow up period, 2 patients from each group had a pinhole perforation in early postoperative period, which was chemically cauterised with Trichloro Acetic Acid (TCA) and had an intact TM at 3 and 6 month's follow up. There was re-perforation in 2 (6.67%) patient in the inlay group and 3 (10%) in the onlay group at 3 and 6 month followup. Thus, the success rate of onlay was 90% with 27 out of 30 graft uptake. Same for the inlay group was 93.30% with 28 successful uptakes. Chi-square test was applied to analyse the level of significance of the difference and we arrived at a p value >0.05 showing no statistically significant difference between these two groups.

During postoperative hearing assessment by PTA at 3 and 6 months in the onlay group mean A-B gap of 0-10 dB was present in 16 (53.33%) patients, 11 (36.67%) had 11-20 dB and 3 (10%) who had re-perforation had 11-30 dB A-B gap with mean of 15.95 dB.

In the inlay group, the same were 14 (46.67%), 14 (46.67%), 2 (6.67%) respectively with mean of 16.48 dB. To test the level of significance of the difference, Mann-Whitney U test was applied and p value obtained was >0.05 showing no statistically significant difference between these two groups.

Technique	Total	Success	Failure	Mean Hearing Improvement
Onlay	30	27 (90%)	3 (10%)	15.95
Inlay	30	28 (93.30%)	2 (6.67%)	16.48
Overall	60	55 (91.67%)	5 (8.33%)	16.21
p-value		>0.05	>0.05	>0.05

DISCUSSION

Success rate in the present study was 90% for onlay and 93.30% for inlay group with an overall rate of 91.67%, which is similar to the finding of Sengupta A et al where it was 92.50% with no significant difference between the two groups.⁶ Brown had found 74% success rate in onlay and 100% in the inlay technique, which is not consistent with our study.⁷ The result of Sergi B et al are of the opinion that inlay technique is better with statistical significance in terms of both graft uptake and hearing improvement.⁸

Thus, most of the studies like SathiRaju V et al, Chanvimalueng W, Ozgursoy are in agreement with our findings with varied success rate, but without any statistical significance.^{9,10}

A good success rate in our study may be attributed to the fact that it was all operated and followed up by the same surgical team of the authors and careful case selection.

Degree of hearing improvement in our study was 15.95 dB for onlay and 16.48 dB for inlay group with no statistically significant difference. This is less than what Javid et al observed at 21 dB, but in agreement with our study in having slight better result for inlay group.¹¹ Similar was the observation of Habibur Rehman et al, but they concluded the inlay method to be superior with statistical significance.¹² Another study by SathiRaju V et al found this to be 9.9 for onlay and 9.45 for inlay group, which is on a little lower side than our observation as well as it is better

for onlay group in their study with no statistical significance.¹³ Singh et al concluded that success rate was similar in both methods with 93.30%, which is similar to our study, but hearing gain better for inlay technique.¹⁴

CONCLUSION

Myringoplasty is a very common procedure for treatment of TM perforation. Most commonly used techniques are onlay and inlay method, which stood the test of time. Our study concludes that both these methods are equally good in expert hands. The only advantage maybe little lesser time consumed in the onlay method.

This study maybe compared by using temporalis fascia graft in future.

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