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Original Research Article

A COMPARATIVE ANALYSIS OF ENDOSCOPIC AND MICROSCOPIC MYRINGOPLASTY

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ABSTRACT

Background: Chronic otitis media is a persistent inflammation of the middle ear mucosa, typically caused by resistant infections. If left untreated, COM can lead to complications and exacerbate hearing loss. Endoscopic tympanoplasty is a relatively newer procedure that has been gaining popularity in recent years. Our study mainly aim at comparing rigid endoscopes in myringoplasty and myringoplasty done by post aural approach using microscope. **Materials and Methods:** A total of fourty cases were selected who was diagnosed with chronic otitis media, 20 underwent endoscopic myringoplasty and 20 underwent microscopic myringoplasty. All patients were followed up till 1 year post surgery. **Result:** The graft acceptance rates for endoscopic and microscopic techniques were 90% and 80% respectively. The gender and pre and post operative air bone gap of both groups were similar. **Conclusion:** The microscopic approach and endoscopy have similar functional success rates in myringoplasty. The endoscopic technique may become more widespread in the future due to its numerous benefits.

INTRODUCTION

Chronic otitis media is a persistent inflammation of the middle ear mucosa, typically caused by resistant infections. If left untreated, COM can lead to complications and exacerbate hearing loss.[1] Endoscopic tympanoplasty is a relatively newer procedure that has been gaining popularity in recent years.[2]

Myringoplasty is one of the commonest operations performed on middle ear.Our aim was to compare the results of endoscopic myringoplasty with conventional myringoplasty by post aural route using microscope. A total of 40 patients having COM were randomly divided into two groups ,20 each. Although the surgical treatment of ear disorders was transformed by the microscope, its fundamental optical characteristics have not changed in the past 30 years.[3]

Mer and colleagues introduced the middle ear endoscopy in 1967.Despite being mostly utilized for sinonasal surgeries, endoscopes are also utilized for ear, laryngeal and skull base surgeries.[4,5] Endoscopes have lot many advantages over microscope, like easy transportation. There are very few comparative research between the microscopic and endoscopic procedures.[3]

Our study mainly aim at comparing rigid endoscopes in myringoplasty and myringoplasty done by post aural approach using microscope.

MATERIALS AND METHODS

The study was carried out at the department of otolaryngology HIMS, Varanasi from feb 2023 to dec 2024. Written informed consent was taken from all the patients included in our study. A total of 40 patients were selected. A total of 40 patients were randomly divided into two groups. All patients were given a serial number on basis of first come first serve.Every patients received a serial number,with even numbers for microscopic procedures and odd numbers for endoscopic procedures. The pre and post operative audiograms and post operative graft uptake was compared. The patients were kept in follow up for 1 year.

Inclusion Criteria

1. COM - Tubotymanic type
2. Dry ear for atleast 3 weeks
3. Conductive Hearing Loss less than 40 dB.

Exclusion Criteria

1. Patients with active ear discharge
2. Patients with sensory neural hearing loss
3. Patients with ossicular chain abnormalities
4. Patients who underwent previous ear surgeries.

Surgical Procedure: All these patients underwent surgery under local anaesthesia. The external auditory canal is anaesthetised with 2% lignocaine with 1 in 200,000 adrenaline injection.Tragal cartilage along with perichondrium is harvested under local anaesthesia, and allowed to dry. In

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endoscopic tympanoplasty 0 degree, 4 mm rigid endoscope was used for the surgery. After local infiltration butterfly shaped cartilage from tragus was harvested along with perichondrium, using sharp and blunt dissection.Sized to the dimensions of the tympanic membrane defect,at the upper portion of the cartilage graft a wedge is removed to accommodate the handle of the malleus.Graft is placed properlyand canal is packed with gelfoam.

A total of 40 patients were taken in study

Group 1: Patients underwent Endoscopic Myringoplasty(n=20)

Group 2: Patient underwent Microscopic Myringoplasty (n=20)

Statistical Analysis: The study used both descriptive and statistical analysis.Results for continuous data were displayed as Mean +SD,whereas results for categorical measurements were displayed as numbers. Statistical analysis was performed using Microsoft Excel and SPSS version 20.

RESULTS

Out of 40 subjects 20 underwent endoscopic myringoplasty (Group 1), rest of the subject underwent conventional myringoplasty using microscope(n=20).

Table 1: Age Distribution

Age in years	Group 1	Group 2	Total
21-30	6(30%)	8(40%)	14(35%)
31-40	6(30%)	4(20%)	10(25%)
41-50	5(25%)	4(20%)	9(22.5%)
>50	3(15%)	4(20%)	7(17.5%)
Total	20(100%)	20(100%)	40(100%)

Mean+_SD of Group 1: 38+_10.2 yrs, Mean+-SD of Group 2: 37+_11.2 yrs

The mean age in group 1 was 38 and group 2 was 37. There was no significant difference in the age distribution of subjects in two groups (p=0.76).

Table 2: Gender Distribution

Gender	Group 1	Group 2	Total
Male	15(75%)	11(55%)	26(65%)
Female	5(25%)	9(40%)	14(35%)
Total	20(100%)	20(100%)	40(100%)

There is no significant variation in male to female ratio between both groups (15:2 versus11:9), p=0.18, which is not statistically significant.

Table 3: Preoperative Air Bone Gap

Pre operative audiometry (decibel)	Group 1	Group 2	Total
25-30	14(70%)	12(60%)	26(65%)
31-35	6(30%)	8(40%)	14(35%)
Total	20(100%)	20(100%)	40(100%)

Mean+_SD of Group 1: 29.15+_2.52dB, Mean+_ SD of Group 2: 29.7+_2.69dB

The median hearing loss in group 1 and group 2 were29.15(SD=2.52) and 29.7(SD= 2.69), and there was no significant difference between the groups (p=0.51)

Table 4: Post operative air- bone gap

Post op audiometry at 48 weeks(dB)	Group 1	Group 2	Total
10-14	5(25%)	6(30%)	11(27.5%)
15-19	11(55%)	2(10%)	13(32.5%)
20-25	4(20%)	12(60%)	16(40%)
Total	20(100%)	20(100%)	40(100%)

Mean +_SD OF Group 1 :16.85+_3.50dB, group 2-18.80+_4.74dB, in post operative period mean improvement of hearing loss gain was16.85 dB, and in group 2 post op hearing loss gain was 18.8dBb, comparatively the hearing gain was slightly better in endoscopic myringoplasty than microscopic myringoplasty.

Table 5: Graft uptake after surgery

Graft uptake	Group1	Group2	Total
Intact	18(90%)	16(80%)	34(85%)
Perforation	2(10%)	4(20%)	6(15%)
Total	20(100%)	20(100%)	40(100%)

The overall graft uptake was 90% in endoscopic myringoplasty and 80 % in conventional microscopic myringoplasty, after 24 weeks post operatively.

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DISCUSSION

In our study we discovered that the graft acceptance rates for endoscopic and microscopic techniques were 90% and 80% respectively. The gender and pre and post operative air bone gap of both groups were similar. Majority of patients were between the age group 18-40 yrs, which is similar to previous studies (Harugop et al).[3] Both groups were comparable in terms of gender. In our study male to female ratio is 1.36.1, which is comparable to the previous studies like Caye Thomas et al (2007).[6]

Hopkins invented rigid endoscopes by utilizing rod shaped lenses in the relay system.[8,9] Endoscopic myringoplasty offers advantages like

1. Helps to visualize the tympanic membrane without changing position of patient's head and microscope.
2. Provides sharp magnification with high resolution
3. Duration of surgery less

Regarding pre operative air bone gap, it was 29.15+_2.52dB in group 1 and 29.7+_2.69dB, there was no significant difference between the groups. In both groups there was a improvement in hearing gain, 16.85dB(Mean) gain in group 1 and 18.80dbBgain group 2.There are significant differences between two groups in the extent of improvement in A-B gap, which is consistent with the existing literature.[5,7]

Most of the patients had healthy graft uptake after 6 months,90% success rate in graft uptake in patient who underwent endoscopic myringoplasty and 80 % graft uptake in patients who underwent conventional microscopic myringoplasty. Lade et al found graft uptake in 83% of cases in both groups.[7] According to a study by Harugopet al., the success rate for endoscopic and traditional myringoplasty at six months was 86% and82%, respectively.[3]EI Guindy (1993) found graft uptake of 91.7% in endoscopic group.[8]In endoscope- assisted ear surgery,Tarabichi(1999) discovered a 94% graft absorption rate. When there is a narrow external auditory canal, the otoendoscopic methods vision is quite helpful.

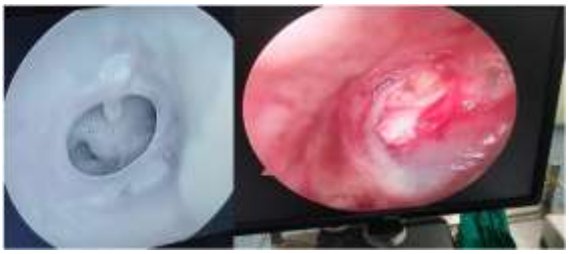

Figure 1(a): showing dry central perforation, 1(b) showing intraop picture with cartilage insitu

Figure 2: (a) showing harvestment of tragal cartilage2(b) showing butterfly shaped tragal cartilage

Figure 3: showing tragal cartilage with perichondrium

The conventionally employed microscopic approach has drawbacks like scarring and a lengthy operating period.The endoscopic approach is becoming more popular due to its less scarring and suitability for narrow ear canals.Because of its operational advantages and similar success rate, this study suggests that endoscopic technique is functionally equivalent to microscopic technique, supporting its broader use in otologic surgeons.

CONCLUSION

According to this study, the microscopic approach and endoscopy have similar functional success rates in myringoplasty. The endoscopic technique may become more widespread in the future due to its numerous benefits.

Forty samples were used in this investigation; twenty had endoscopic myringoplasty and twenty underwent traditional microscopic myringoplasty. In our investigation, the endoscopic group's graft uptake was 90%, while the standard microscopic method's was 80%. The endoscope's drawbacks, such as loss of depth perception and one-handed technique, are easily addressed with experience.

In our study the graft uptake was 90% in endoscopic group and 80% in conventional microscopic method. Loss of depth perception and one-handed technique are the limitations of the endoscope that can be easily overcome with practice.

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