

# A clinical study on 50 cases of myringoplasty using tragal cartilage with/without perichondrium as a graft material

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## Abstract

**Background:** Cartilage was first used in middle ear surgery for ossicular chain reconstruction in 1958 by Jansen. In 1963, Salen and Jansen first reported the use of cartilage composite grafts for tympanic membrane reconstruction. Myringoplasty and tympanoplasty are descriptive terms defining surgical procedures that address pathology of the tympanic membrane <sup>TM</sup> and middle ear. Myringoplasty is an operative procedure used in the reconstruction of perforation of the tympanic membrane. **Material and Methods:** The present study was done on patients who visited the out patient department of Otorhinolaryngology Government Medical College and AG Hospitals, Kota. The study was carried out of 50 patients of different age (12-48 years) and sex group. **Conclusion and Results:** The main point of interest are summarised as follow:- 1- That most of the cases were young adults between 21-30 years of age. The male to female ratio being about 1:1.5 most of which were middle class house wives. 2- The chief complaints found in all the cases were diminished hearing perforation and the ears were dry for over a period of 1 to 3 months. 3- On radiological examination 40% of the cases had cellular mastoid, 56% had hypocellular mastoid and 4% sclerosed. All the cases had normal patent E. tube. 4- All cases inlay graft technique (100%) was used. 5- We found that the successful results i.e. taking up of the graft and good hearing achieved in cellular mastoid were 100% while in hypocellular the results achieved were 98%. 6- Out of 50 cases in which myringoplasty was performed (94%) healed completely while in (6%) there was graft failure. When compared with graft material used the success rate was (100%) with tragal cartilage alone and 90% with cartilage with perichondrium. (composite graft) which was used in large or sub total perforation.

**Key Word:** myringoplasty.

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## INTRODUCTION

Myringoplasty and tympanoplasty are descriptive terms defining surgical procedures that address pathology of the tympanic membrane <sup>TM</sup> and middle ear. Myringoplasty is an operative procedure used in the reconstruction of

perforation of the tympanic membrane. This assumes that the middle ear space, its mucosa, and the ossicular chain are free of active infection. There is no direct inspection of the middle ear during the procedure implying that the TM is not elevated from its sulcus. Tympanoplasty implies reconstruction of the tympanic membrane but also deals with pathology within the middle ear cleft, such as chronic infection, cholesteatoma, or an ossicular chain problem. To distinguish these two terms further, Rizer (1997) defines tympanoplasty to include all procedures in which “the drum is lifted from its position in the ear canal.” Subsequent additional procedures such as grafting the tympanic membrane, alone, or in combination with ossiculoplasty (tympanoplasty with ossicular chain reconstruction), comprise the varying subtypes of tympanoplasty. Cartilage was first used in middle ear surgery for ossicular chain reconstruction in 1958 by

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Jansen. In 1963, Salen and Jansen first reported the use of cartilage composite grafts for tympanic membrane reconstruction<sup>27</sup>. Over the past twenty recurrence retraction pockets and cholesteatomas in patients with Eustachian tube dysfunction. Cartilage is also thought to reduce the rate of extrusion of their prostheses used for ossicular chain reconstruction. Vrabec (2002) showed that patients and recommends cartilage tympanoplasty to prevent this. Cartilage grafts are usually used in combination with temporalis fascia grafts and are most successful when placed posterosuperiorly and in the area of the posterior pars flaccid (Poe and Gadre, 1993). Cartilage has also been used to graft the entire TM (Dornhoffer, 1997). Hearing results after cartilage tympanoplasty have been shown to be comparable to temporalis fascia and perichondrium (Gerber *et al.*, 2000 and Dornhoffer, 1997 respectively<sup>26</sup>).

## OBSERVATIONS

## AIMS AND OBJECTIVES

1. Closure of tympanic membrane to prevent recurrence infection and cochlear loss.
2. To improve the hearing status.
3. Fitness for various services like military, telephone deptt. Etc.
4. In Cases of S.N. hearing loss closure of tympanic membrane is helpful for wearing hearing aids.

## MATERIAL AND METHODS

The present study was done on patients who visited the out patient department of Otorhinolaryngology of MBS Hospital, Kota The study was carried out of 50 patients of different age (12-48 years) and sex group. The cases examination under microscope. The criteria for selection of these patients included dry ear for a period of 01 month. Intact and functioning ossicular chain, tested by paper patch test patent E. tube and absence of any other pathology like cholesteotoma and granulations. Patients were operated upon to improve hearing and prevent recurrent infection.

**Table 1:** Age wise distribution of Patients

Age in years	No of Patients	Percentage of Patients
0-10	0	0
11-20	11	22
21-30	19	38
31-40	14	28
41-50	6	12

**Table 2:** Sex wise distribution of Patients

Sex	No of Patients	Percentage of Patients
Male	20	40
Female	30	60

**Table 3:** Distribution of Patients according to involvement of Ear

Nature of work	No of Patient	Percentage of Patients
Student	5	10
House Wife	21	42
Business Man	8	16
Service Man	12	24
Labour	4	8

**Table 5:** Distribution of Patients according to duration of complaints

Complaints	3-6 Months		7-12 Months		1-2 years		3-5 years	
	No	Percentage	No	Percentage	No	Percentage	No	Percentage
Discharge	18	36	24	48	6	12	2	4
Hearing Loss	16	32	22	44	8	16	4	8
Otalgia	4	8	2	4	0	0	0	0
Rec.URI	4	8	2	4	0	0	0	0

**Table 6:** Distribution of Patients according to the area of T.M

Nature of Work	No of Patients	Percentage of Patients
Antero-Inferior	3	6
Postero- inferior	7	14
Sub-Total	12	24
Centrally Situated	28	56

**Table 7:** Distribution of Patients according to the size of perforation

Nature of Work	No of Patients	Percentage of Patients
One Quadrant	11	22
Two Quadrant	13	26
Three Quadrant	14	28
Sub-Total	12	24

**Table 8:** No of Patients with healed perforation at 1 year follow up

Duration	No of Patients	Percentage of Patients
At 03 Months	50	100
At 06 Months	48	96
At 1 year	47	94

**Table 9:** Distribution of Patients according to pre operative A-B Gap

Degree of Hearing Loss	pre operative A-B Gap	No of Patients	Percentage of Patients
At 03 Months	20-30 dB	18	36
At 06 Months	30-40 dB	27	54
At 1 year	Above 40 dB	5	10

**Table 10:** Surgical Technique Used

Surgical Technique	No of Patients	Percentage of Patients
Inlay	50	100
Onlay	0	0
Interlay	0	0

**Table 11:** Distribution of Patients according to mastoid cellularity (Study of X-ray Mastoid)

Type of Skiagram	Number of Patients	Percentage of Patients	Acceptency of Graft			
			Healed	%	Rejected	%
Cellular	50	40	20	100	Nil	
Hypo Cellular	28	56	27	98	1	
Sclerosed	2	4	Nil	0	2	

**Table 12:** Graft Material Used

Graft Material	Number of Patients	Percentage of Patients
Tragal Cartilage alone	17	34
Cartilage with perichondrium (Composite Graft)	17	34

**Table 13:** Graft Material Used and their result at 1 Year

Graft Material	No. of Patients	%	Acceptance	%	Rejected	%
Tragal Cartilage	17	34	17	100	0	0
Cartilage with perichondrium ( Composite Graft)	33	66	50	90.3	3	10

**Table 14:** Distribution of patients according to the closure of A-B gap at 1 month

Hearing gain in dB	No. of Patients	%
30 dB or above	9	18
21-30 dB	16	36
11-20 dB	19	38
1-10 dB	6	12
No gain	0	0

**Table 15:** Distribution of patients according to the closure of A-B gap at 3 month

Hearing gain in dB	No. of Patients	%
0-10 dB	6	12
10-20 dB	16	32
30-40 dB	28	56
No gain	0	0

**Table 16:** Hearing Improvement at 1 year

Hearing gain in dB	No. of Patients	%
No Gain	3	6
0-10 dB	3	6
10-20 dB	19	38
30-40 dB	25	50

## DISCUSSION

The Present study was conducted on 50 cases of CSOM with dry central perforation selected for myringoplasty in Department of E.N.T., M.B.S. Medical College, Kota. The 1st table shows that the maximum incidence in these cases were in the age group of 12-30 years (60%) followed by 31-40 years age group (28%). Minimum age in our study was 12 years and maximum was 50 years. We have not operated my case below 12 years of age. Since, it is the age of recurrent adenoiditis and upper respiratory tract infections, which can be a cause of failure in simple myringoplasties, this correspond to the studies done by Singh and Bhaskar (1972) and Gupta A.K. (1972). Where the maximum number of cases were also in the age group 25-35 years. The 2nd table shows the sex distribution of these cases in the present study with the male female ratio of 1:1.5 respectively. This explains that females were more worried about the hearing and recurrent discharge from ears. Because of Social stigma associated. Therefore they came forward for operative procedure and to improve hearing. The 3rd table shows that the left ear was predominantly involved in the present series i.e. 52% while right ear was involved only in 32% both ears were involved in 16% of cases. The 4th table shows that the maximum number of cases were house wives i.e. 42% followed by service class i.e. 24% labourer class (8%). This can be explained by the fact that ladies and educated members came forward for getting hearing improvement. Uneducated or labourer came only when there was severe hearing loss, thus we can say that education play a great role in seeking early advise regarding disease and treatment. This study is similar to Gupta J.P. (1978), in his study the maximum number of cases were house wives (36.3%) and students (23.4%) and minimum (13.3%) cases were in labour group. The table number 5th indicated the distribution of cases according to duration of complaint. In 48 cases (96%) the duration of discharge was more than one year and ranging up to 3-5 years. Similarly hearing loss was present in all these cases. The longer the duration more was the hearing loss. Hence, the

results were not as good as in the cases of shortly history. Four cases had also complaints of Otalgia that can be explained due to associated acute upper respiratory tract infection. The 6th table shows that involvement of the quadrant of tympanic membrane in perforation. Most cases (56%) were of central perforation only in 12 cases (24%) sub total perforation was present. For this study small central perforation cases were good and satisfactory results were obtained. Anteroinferiorly placed perforation (below the handle of malleus) were selected only for putting cartilage with perichondrium. Keeping in mind that this could not disturb the ossicular chain. Posteriorly placed perforation were not selected for putting the cartilage with perichondrium graft to avoid ossicular chain disruption. This study is similar to the Gupta J.P. (1978). In this study the large central perforation was (63.40%) and small central perforation in 36.6% cases. The 7th table shows that the distribution of patients according to the size of perforation is maximum in three quadrant (28%) of T.M. involved. Two quadrant of T.M. involved in (26%) cases and one quadrant of T.M. involved in (22%) . Sub total perforation occurs in (24%) cases. The 8th table shows that (100%) of cases at 3 month duration as completely healed (96%) of cases healed at 6 months duration. (94%) cases healed at 1 year duration. In 9th table shows that the maximum number of cases had hearing loss of 30-40 dB i.e. 27 cases(54%) followed by 20-30 dB hearing loss in (36%) cases, while more than 40 dB hearing loss was present only in five (5) cases. This hearing loss can be explained by the size of perforation patients with ossicular discontinuity were excluded from the study. The 10th table shows that inlay technique was used in all cases i.e. 100%. The result of inlay technique were excellent in the present series with only three failure, so we can that inlay technique stands superior to onlay and interlay techniques. The 11th table revealed the radiological features of middle ear cleft. In (40%) cases mastoids were cellular, (56%) mastoids were hypo cellular while only in (4%) cases had sclerosed mastoid.

This indicates that disease was limited only upto the middle ear not extending to antrum aditus and epitympanum. This study is similar to Gupta J.P. (1978). In his study (40%) mastoids were cellular while (60%) were hypo cellular. The 12th table shows that in most of the cases tragal cartilage with perichondrium (composite graft) was used as a graft material from the patients himself (66%), followed by cartilage alone i.e. (34%) cases. The 13th table shows that out of 17 cases done using tragal cartilage as a graft, in all 17 cases graft material remained healthy till complete healing. Out of 33 cases where cartilage with perichondrium was used ended with satisfactory graft take up and hearing, while in 3 cases the graft was not accepted due to infection. The 14th table shows the postoperative hearing gain in dB. The maximum hearing gain was 11-20 dB or above which was in 19 cases i.e. (36%) while 21-30 dB hearing gain was seen in 16 cases (32%) and 10 dB gain found in 6 cases i.e. (12%). No hearing improvement seen in 3 cases which included the failure cases. These findings are quite similar to those mentioned by Kacker *et al* (1974). Ghosh and Mehra (1975) and Kicker (1976) where good hearing was obtained in 71% cases and satisfactory in 17% cases with no improvement in 12% cases. Good hearing gain was observed in the cases where cartilage was taken as a graft material while satisfactory hearing gain was observed in the cases where cartilage with perichondrium were used as a graft material. We can explain the less hearing gain with cartilage with perichondrium, graft as compared to cartilage which restricts the mobility of tympanic membrane. The 15th table shows that 28 cases shows closure of A-B gap of 30-40 dB. At 3 months duration. 16 cases closure of A-B gap, 10-20 dB. 06 cases shows closure of A-B gap of 10 dB. The 16th table shows that 25 cases shows hearing improvement at 1 year of 30-40 dB. 19 cases shows hearing improvement of 10-20 dB. 3 cases shows hearing gain of only 10 dB. While 3 cases no hearing improvement occurs at 1 year duration.

### SUMMARY AND CONCLUSION

50 cases of dry central perforation in which myringoplasty was performed using tragal cartilage alone or tragal cartilage with perichondrium were studied. The main point of interest are summarised as follow :-

- 1- That most of the cases were young adults between 21-30 years of age. The male to female ratio being about 1:1.5 most of which were middle class house wives.
- 2- The chief complaints found in all the cases were diminished hearing perforation and the ears were dry for over a period of 1 to 3 months.

3- On radiological examination 40% of the cases had cellular mastoid, 56% had hypocellular mastoid and 4% sclerosed. All the cases had normal patent E. tube.

4- All cases inlay graft technique (100%) was used.

5- We found that the successful results i.e. taking up of the graft and good hearing achieved in cellular mastoid were 100% while in hypocellular the results achieved were 98%.

6- Out of 50 cases in which myringoplasty was performed (94%) healed completely while in (6%) there was graft failure. When compared with graft material used the success rate was (100%) with tragal cartilage alone and 90% with cartilage with perichondrium. (composite graft) which was used in large or sub total perforation. In none of the cases we came across any perichondritis therefore we conclude from our study that tubal function and cellularity of mastoid play a vital role in achieving good results in myringoplasty. Tragal cartilage nad cartilage with perichondrium ( composite graft) used as graft material gave good results in the present series.

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