



ORIGINAL RESEARCH PAPER

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A COMPARATIVE STUDY OF USE OF TEMPORALIS FASCIA GRAFT VS TRAGAL PERICHONDRIMUM GRAFT IN TYMPANOPLASTY

KEY WORDS: Temporalis fascia graft, Tragal perichondrium graft.

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ABSTRACT

Tympanoplasty is the most effective method for control of the disease and hearing improvement. Both temporalis fascia and tragal perichondrium are excellent graft materials. Graft uptake rate is good for both with slightly better take rates for temporalis fascia, than tragal perichondrium. 40 tympanoplasties were performed. Age ranged from 15-45 years with mean age of patients 29.12 years. 18 (45%) patients were males and 22 (55%) were females with male to female ratio 1:1.22. Majority of the patients preoperatively showed mild to moderate hearing loss. 47.5% patients showed up to 20 db air bone gap range, 52.5% patients showed 21-40db air-bone gap and none of the patients showed above 40db. Surgeries were performed by post-aural approach. In all surgeries grafts were placed as underlay technique. 20(50%) patients were operated using temporalis fascia and 20(50%) patients using tragal perichondrium. Graft take rate was overall 77.5%. All the patients selected for tympanoplasty had dry ear for atleast 6weeks which might explain good graft take rate of 77.5%. Graft uptake rate was 80% with temporalis fascia and 75% with tragal perichondrium. In postoperative hearing analysis, 80% patients showed air-bone gap up to 20db. Uptake rate of graft was not influenced by the size/site of perforation.

Introduction

Hearing is a sense that enables man to establish contact with his fellows via speech to experience life more fully. The otologist in the past had not much to offer to hearing handicapped people with chronic middle ear disease. In recent times with the advent of the antibiotic era, the operating microscope and modern anaesthetic techniques, magnified operating field, have radically altered the outlook.

Taking the above mentioned facts in consideration, this study was taken up to compare the results of the two connective tissue graft materials, viz temporalis fascia and the tragal perichondrium. The study includes the advantages and disadvantages of these graft materials vis-à-vis to each other.

Aims and Objectives

To do comparative study of underlay tympanoplasty with temporalis fascia and tragal perichondrium.

We undertook this study to know the outcome of the surgery in respect with :

1. Complication.
2. Graft uptake .
3. Hearing improvement .

Materials and Methods

Present study is a prospective trial which was carried out from January 2012 to August 2013 on the patients attending the ENT Outpatient Department of our institution M.G.M medical college and hospital Kamothe, Navi Mumbai where tympanoplasty is performed using temporalis fascia in 20 patients and tragal perichondrium in 20 patients in the age group of 15-45 years (males and females both)

The overall 40 cases are primary procedures.

Patients with the complaint of discharging ear and decreased hearing were screened. Patients, in whom tubotympanic type of chronic suppurative Otitis Media was found, were taken for this prospective study with randomization. Each patient was subjected to a detail examination of nose, paranasal sinuses and throat to rule out any focus of infection, which could influence the result of tympanoplasty. Patients were subjected to tympanoplasty with temporalis fascia while the remaining underwent with tragal perichondrium.

Inclusion criteria were unilateral CSOM ,nonhealed traumatic perforation, patients of either sex in the age group between 15 – 45 years. Patients excluded in the study were those with unsafe CSOM, safe CSOM with sensorineural hearing loss, patients < 15years > 45years, wet ears, ASOM cases, congenital hearing disorder, previous history of ear surgery.

Post operative at 3 months of follow up, patients subjective hearing was enquired and recorded .

Post operative pure tone audiometry and ear microscopy was done in every case at the end of three months to record the hearing and graft uptake respectively.

Observations and Results

TABLE-1: Age distribution

Age in years	No of Patients	Percentage
< 20	06	15%
21 – 30	16	40%
31- 40	08	20%
>40	10	25%
Total	40	100%

Maximum number of patients belonged between the age group of 21-40 years.

TABLE-2: Sex distribution

Sex	No of Patients	Percentage
Male	18	45%
Female	22	55%
Total	40	100%

There were 18(45)% males and 22(55%) females. The male to female ratio is 1:1.22.

TABLE-3: Preoperative hearing levels

Preoperative Air- Bone Gap	No. of Patients			Percentage
	Temporalis Fascia	Tragal Perichondrium	Total	
<20	10	09	19	47.5%
21-40	10	11	21	52.5%
> 40	0	0	0	0%

Majority of the patients showed mild to moderate hearing loss.47.5% of them had air-bone gap up to 20 db.52.5% of them had air-bone gap 21-40 db.None of them had air-bone gap above 40 db.

TABLE-4: Postoperative hearing levels

Postoperative Air- Bone Gap	No. of Patients			Percentage
	Temporalis Fascia	Tragal Perichondrium	Total	
<20	16	15	31	77.5%
21-40	4	5	9	22.5%
>40	0	0	0	0%

In the postoperative hearing analysis,77.5% of the patients showed air- bone gap upto 20db.22.5% of the patients showed air- bone gap in the range of 21-40db.80% of the patients operated with temporalis fascia showed air bone gap upto 20db.75% of the patients operated with tragal perichondrium showed air-bone gap upto 20db.

TABLE 5: Post operative hearing improvement level

Mean change in hearing levels in dB	No of patients			Percentage
	Temporalis fascia	Tragal perichondrium	Total	
No change or worsen	4	5	9	22.5%
1-15	16	15	31	77.5%
16-30	4	5	9	22.5%
>30	0	0	0	0%

Hearing at 3 months showed , 31 out of 40 patients improvement in hearing (77.5%). Out of these, 16 out of 20 patients were operated using temporalis fascia showed improvement in hearing i.e. (80%) and 15 out of 20 patients were operated using tragal perichondrium showed improvement in hearing i.e. (75%).There is not much statistical significant difference in hearing improvement, using temporalis fascia or perichondrium for tympanoplasty.

TABLE 6:Mean hearing level in tympanoplasty using fascia and perichondrium

Type of graft	Mean levels of hearing		
	Preoperative hearing levels	Post operative hearing levels	Post operative change in hearing
Temporalis fascia	399/20 = 19.99	209/20 = 10.45	190/20 = 09.5
Tragal perichondrium	452/20 = 22.6	272/20 = 13.6	180/20 = 9
Total	851/40 = 21.27	481/40 = 12.02	370/40 = 9.25

Mean improvement in hearing temporalis fascia is 09.5 db.Mean improvement in hearing using tragal perichondrium is 09.0 db. P>0.05, we found that there was no statistically difference in mean improvement in hearing using either temporalis fascia or tragal perichondrium.

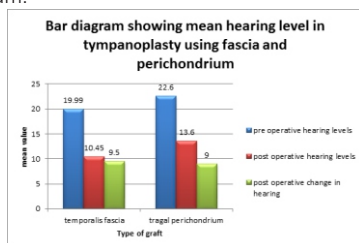


TABLE NO 7: Graft uptake rate

Type of graft	Graft uptake	Percentage
Temporalis fascia	16/20	80 %
Tragal perichondrium	15/20	75%
Overall	31/40	77.5 %

The above table indicates that 16 (80%) out of 20 ears operated using temporalis fascia graft healed completely at the end of 6months with well taken graft.15 (75%) out of 20 ears operated using tragal perichondrium were dry with graft in place at the end of 6 weeks. No statistical significant association was found in graft uptake with respect to type of graft (P>0.05).

Most revision patients were not included in the study as these patients were subjected to more extensive surgery including atticotomy and mastoidectomy to detect and treat hidden pathologies.Z=0.36, p>0.05.

Discussion

20 patients were subjected to tympanoplasty with temporalis fascia remaining 20 with tragal perichondrium. Follow up of postoperative cases was for 3months.

Age Distribution

The youngest patient in our study was 15 years old while the oldest patient was 45 years old. The mean age of the patients was 29.12 years. A study conducted by Jyoti Dhabolkar (2007)¹ corresponded with same age group.

Sex Distribution

Caye – Thomas et al (2007)²in their study found male to female ratio 1:1.36.

John Mathai(1999)³ in his study of 200 cases male to female ratio was 1:1.85.

In our study we had 28 female and 22 male, who underwent tympanoplasty with male to female ratio 1:1.22, which is similar to existing literature.

Graft Uptake Rate

The graft take rate after 3 months was 77.5%. Long term studies were not possible due patient’s noncompliance. Similar report was given by Palva T et al (1995)⁴ with graft take rate were 97%.

In our study, graft uptake rate for temporalis fascia was 80% as compared to tragal perichondrium was 75%. Graft take-rate was slightly better for temporalis fascia than for tragal perichondrium (not significant p>>0.005). Various studies showed the grafts uptake was in the ratio of 80 to 90%, for either temporalis fascia or tragal perichondrium.

These reports compare well with similar study conducted by Jyoti P Dabholkar (2007)¹ whose postoperative graft uptake rate with temporalis fascia was 84% and tragal perichondrium showed 80%.

Ahad SA (1986)⁵, reports 83.30% success with homologous temporalis fascia, Blanshard JD (1990)⁶, 78% take-rate with temporalis fascia in pediatric tympanoplasty. P.K. Parida S.K Nochikattil (2012)⁷ in their study found 80% uptake rate with temporalis fascia.

Hearing Result

77.5% of cases showed improvement in hearing, while 22.5% of them showed no improvement, at 3 month follow-up period. About 80% cases operated with temporalis fascia showed hearing improvement, while same percentage (75%) of cases who were operated using tragal perichondrium showed improvement in hearing (statistically not significant p>> 0.05).

Mean improvement in hearing using temporalis fascia was 09.50 db and that with tragal perichondrium it is 09.0db (statistically not significant p>>0.05). These results compare well with Strauss et al (1975) who found that improvement in air bone gap was 15 db. These result also compare well with Terry RM (1988)⁸, result with fat myringoplasty.

Jyoti P. Dabhalkar (2007)¹reported hearing result in total 50 patients, temporalis fascia group improved in76% while tragal

perichondrium group achieved 75% hearing gain.

Factors Affecting Graft Take-rate

Uptake rate was nearly similar for all the site and size of perforations, maximum for perforation in posterior quadrant of the drum, followed by perforation in anterior quadrant of the drum and also perforation in both the quadrants of the drum have healed well. Take-rate was not influenced by site and size of perforation.

Similar opinion is expressed by Blanshard JD (1990)⁶ who opines that age at operation, size of perforation and prior adenoidectomy had no significant influence on the success rate or audiological outcomes.

Factor such as duration of illness, age and sex of patients, did not significantly affect graft uptake rate in our study. Vartiainen E (1993)⁹ also states that the preoperative factor like dryness or discharging ear, site of perforation of technique (onlay/underlay) do not affect the take rate.

Conclusions

Tympanoplasty is the most effective method for control of the disease and hearing improvement. Both temporalis fascia and tragal perichondrium are excellent graft materials for closure of perforation of tympanic membrane and hearing improvement. Graft uptake rate is good for both with slightly better take rates for temporalis fascia, than tragal perichondrium. Hearing improvement does not depend on type of graft (No statistically significant difference – $p > 0.5$). In our study, uptake rate of graft was neither influenced by the site or size of the perforation. Improvement in hearing is not significantly influenced by duration of disease, age or sex of patients.

References

1. Jyoti P Dabholkar. Comparative study of underlay tympanoplasty with temporalis fascia and tragal perichondrium. *Ind. Otolaryngol Head Neck Surg.* 2007; 116-119.
2. Thomas CP, Nielsen RT, Tos M. Bilateral Myringoplasty in Chronic Otitis Media. *Laryngoscope* 2007 May; 117:903-6.
3. Mathai J. Myringoplasty with temporalis fascia: Analysis of 200 cases. *Indian Journal of Otology and Head and Neck Surgery* 1999 Apr; 51 (2):9-13.
4. Palva T, Ramsay H. Myringoplasty and tympanoplasty- results related to training and experience. *Clin Otolaryngology Allied Science.* 1995; 20: 329-335.
5. Ahad SA. Myringoplasty using homologous temporalis fascia. *Ind J Otol.* 1986; 33:28-29.
6. Blandshard JD. A long term view of myringoplasty in children. *J Laryngol. Otol.* 1990; 104(10): 758-762.
7. P.K. Parida, S.K. Nochikatil. A Comparative Study of Temporalis Fascia Graft and Vein Graft in Myringoplasty. *Ind. Otolaryngol Head Neck Surg.* 2011: 0543-4.
8. Terry RM. Fat graft myringoplasty: A prospective trial. *Clin Otolaryngol.* 1988; 13(3): 227-229.
9. Vartiainen E. Findings in revision myringoplasty. *Ear Nose and Throat J.* 1993; 72(3): 201-204.