



Comparative Study of Tympanoplasty Done by Temporalis Fascia and Fascia Lata Graft

**Grishma Katara
M.B.B.S**

Department of E.N.T., Smt. N.H.L. Municipal Medical College and Smt. Shardaben General Hospital, Ahmedabad

Vatsal Patel M.S

Department of E.N.T., Smt. N.H.L. Municipal Medical College and Smt. Shardaben General Hospital, Ahmedabad

**Bhagirath Parmar
M.B.B.S**

Department of E.N.T., Smt. N.H.L. Municipal Medical College and Smt. Shardaben General Hospital, Ahmedabad

Alpesh Patel, M.S

Department of E.N.T., Smt. N.H.L. Municipal Medical College and Smt. Shardaben General Hospital, Ahmedabad

KEYWORDS :

INTRODUCTION

Chronic otitis media is the chronic inflammation of mucoperiosteal lining of the middle ear cleft characterized by ear discharge, a permanent perforation of the tympanic membrane and impairment in hearing. It is one of the most common ear diseases encountered in developing countries due to poor socio-economic standards, poor nutrition, lack of health education and unhygienic habits^{1,3}. It is a major cause for deafness in India⁴. Tympanoplasty is now an established surgery for tympanic membrane perforations being carried out routinely by otorhinolaryngologists.⁵

Autologous graft materials such as, temporalis fascia, perichondrium, cartilage, fat, and fascialata have stood the test of time in repairing tympanic membrane perforations. Such abundance of materials implies that there is no clear cut favourite and the choice of graft material depends on individual surgeon's preference^{6,7}.

Graft displacement, improper placement⁸, autolysis, infection, hemorrhage, Eustachian tube dysfunction are the known contributing factors for the failure of closure of perforation. Thus, consistent achievement of good hearing is still a challenge and one of the most difficult tasks of otology surgery.

A good graft material is the one which is locally available, is easily harvestable, is tough and is easy to be handled. Both temporalis fascia and fascialata graft satisfy all these criteria. So with this in mind this study is carried out to find out which amongst this a better graft material.

A set of 50 patients were taken and divided into 2 groups of 25 patients each. One group underwent type 1 Tympanoplasty using temporalis fascia graft while other underwent the same surgery using fascia lata graft. The patients were followed regularly and the intactness of the graft and hearing were assessed.

AIMS AND OBJECTIVES

The aims of the study:

1. To evaluate the efficacy of graft uptake following temporalis fascia and fascia lata graft in Type I Tympanoplasty.
2. To compare the post operative hearing level in both the grafts.
3. To compare the comfortness of patient and surgeon in both grafts.

MATERIALS AND METHODS

The present study was carried out in the ENT Department of Sharda-ben Hospital, Ahmedabad during the period of June 2012 to Novem-

ber 2014.

Patients presenting to the outpatient department and fulfilling the following criteria were included in the study.

Criteria for selection:

1. Patients between 15-65 years of age having chronic suppurative otitis media.
2. Tubotympanic type of the disease.
3. Patients having dry ear for at least 4 weeks.
4. Only the cases of perforation confined to pars tensa (unilateral or bilateral) were taken for study.

Exclusion criteria:

1. Patients not included in the above age group.
2. Patients with perforation in any ear with atticofacial disease.

Method:

- 50 patients were randomly selected fulfilling the above criteria.
- A proforma was prepared for all the cases, finding was noted and treatment and follow up was charted.
- After clinical examination was over, routine investigations for fitness of anaesthesia were carried out. All the patients underwent Pure Tone Audiometry (PTA) and X-ray mastoids.
- All patients given consent to take part in this study.
- Patients were admitted in the ward. Surgery was carried out under local anaesthesia with sedation or under general anaesthesia.
- In 25 patients temporalis fascia and in rest 25 patients fascia lata graft were use respectively.
- Postoperatively the patients were given antibiotics, anti-histaminics routinely for 21 days. Stitches from the postaural region and antero-lateral aspect of thigh were removed after 7th and 10th days respectively.
- On 30th day ear canal was cleaned of all dressing and debris.
- Clinical evaluation of subjective and objective hearing improvement following surgery with tuning fork tests with 512, 1024 and 2048 Hz. were done after 1 and 3 months.
- Audiological assessment was done after 3 months.
- The outcome was taken as:
 1. Success: If at the end of 3 months the graft was in situ and the effective hearing gain was of at least more than 10 dB and no ear discharge.
 2. Failure: If at the end of 3 months the graft was rejected and the effective hearing gain was less than 10 dB or having discharge in the ear.
- Hearing gain was calculated by pre-operative hearing in dB – post-operative hearing in dB.

Operative techniques:

Techniques of repair of perforation in tympanic membrane

1. Underlay technique (Inlay technique)
In this technique, graft is placed medial to the tympanic annulus.
2. Overlay technique (Onlay technique)
In this technique, graft is placed lateral to fibrous layer.

Surgical procedure of temporalis fascia / fascia lata graft in type 1 Tympano-plasty

1. The ear canal, auricle and surrounding skin were cleansed with povidine iodine scrub and spirit and were draped using sterile technique.
 2. Injection 2% xylocaine with 1:100,000 epinephrine infiltrated locally in the external auditory canal at the bony cartilaginous junction at 12,3,6, and 9 o'clock position and then region around the tragus and in the post aural region.
 3. Post aural wild's incision kept.
 4. Skin, subcutaneous tissues were cut. Blunt dissection was done in the upper part of the incision until temporalis fascia reached which was identified by its white glistening colour. Small amount of 2% xylocaine was injected to balloon the fascia away from the underlying muscle.
 5. a.) Fascia of adequate size (tempolaris fascia) was removed from incision site using scissors and the fascia was then pressed and spread out and dried to dehydrate it.
b.) Incision kept (for fascia lata graft) over upper 2/3rd and lower 1/3th anterolateral aspect of thigh. Skin and subcutaneous tissue was cut from upper 2/3th and lower 1/3th of antero-lateral aspect of thigh. Blunt dissection was done. Small amount of local injected to balloon the fascia lata graft from underlying muscle.
c.) Fascia lata graft of adequate size removed using scissors and the fascia was then pressed and spread out and dried to dehydrate it and wound closed by suture material.
 6. After harvesting the graft, an incision made along the linea temporalis. A T-shaped incision, bone deep was made from the mid-point of the linea temporalis to the mastoid tip.
 7. A Lampert's periosteal elevator was employed to mobilize the soft tissues from the mastoid process.
 8. Spine of Henle identified and then the skin of the external auditory canal is elevated from the bone.
 9. An incision made into the canal wall skin to expose the tympanic membrane.
 10. Posterior canal wall skin flap elevated down to the fibrous annulus. Posterior tympanomeatal flap is raised anteriorly from 11 o'clock position to 7 o'clock position.
 11. The margin of perforation was carefully trimmed using a sickle knife and grasped by a microcup forceps. Care was taken to remove any in growth of squamous epithelium. Tympanosclerotic patch if present was removed.
 12. Posterior canal widen 1/5 joint exposed. Mobility of the ossicles checked by gently moving the handle of the malleus with the curved peak.
 13. The temporalis fascia graft kept either Inlay or onlay method.
 14. The tympanomeatal flap was repositioned back. Antibiotic soaked gel foam kept in the canal and wick soaked with Neosporin cream was kept. And wound closed in layer by suture material.
 15. Betadine soaked cotton plug kept in the canal. Dressing done.
- Follow up**
16. Suture and wick removed on 7th day.
 17. Suture from antero-lateral aspect of thigh removed on 10th day. (for fascia lata graft)
 18. Abgel removed on 30th day.



Fascia lata graft harvesting site
Fascia lata graft



Post aural route for tympanoplasty Temporalis fascia graft

OBSERVATION AND RESULTS

In the present study 50 ear operations were performed with temporalis fascia graft and fascia lata graft. The detailed information regarding age, sex, religion, clinical findings, pre-operative and post operative pure tone audiogram, mastoid x-ray, type of pathology, operative technique and type of tympanoplasty is given in the master chart.

1. AGE OF THE PATIENTS

In our study age of patients ranged from 15-65 years. We have divided the cases into 5 groups. The age wise distribution for each group is shown in the Table 1.A

TABLE 1.A: Age wise distribution in both groups.

AGE GROUP (YEAR)	NO. OF CASES OF TEMPORALIS FASCIA	NO. OF CASES OF FASCIA LATA GRAFT
15-25	10	11
26-35	06	09
36-45	06	03
46-55	01	02
56-65	02	00

TABLE 1B: Graft uptake in different age groups.

AGE GROUP(- YEAR)	TEMPORALIS GRAFT TAKEN UP	% OF TEMPORALIS GRAFT UPTAKE	FASCIA LATA GRAFT TAKEN UP	% OF FASCIA LATA GRAFT UPTAKE
15-25	08	80	11	100
26-35	05	83	08	88
36-45	05	83	03	100
46-55	01	100	02	100
56-65	02	100	00	100

In the present study, the youngest patients were of 15 years and the oldest patient was of 63 years. The age group 15-25 years contributed the highest number of cases both in temporalis fascia graft (20%) and fascia lata graft (22%).

2. PRE OPERATIVE AB GAP

TABLE 2: Preoperative AB gap in both groups.

PRE-OPERATIVE AB GAP(dB)	TEMPORALIS FASCIA GROUP	FASCIA LATA GROUP
00-10 dB	0	0
11-20 dB	2	1
21-30 dB	3	5
31-40 dB	6	10
41-50 dB	14	09

3. POSTOPERATIVE AIR BONE GAP

Table3: Postoperative air bone gap in both groups.

POST-OPERATIVE AB GAP(dB)	TEMPORALIS FASCIA GROUP	FASCIA LATA GROUP
00-10 dB	06	05
11-20 dB	06	17
21-30 dB	07	02
31-40 dB	03	01
41-50 dB	03	00

4. GAIN IN AB GAP AFTER OPERATION

GAIN IN AB GAP(dB)	TEMPORALIS FASCIA GROUP	FASCIA LATA GROUP
00-10 dB	04	01
11-20 dB	14	10
21-30 dB	07	14

gain in AB gap= (pre-op AB gap) minus (post-op AB gap)

In our study, the mean gain in AB gain in temporalis fascia group is 19.00 dB and in fascia lata graft group is 22.00 dB.

Standard deviation of the gain in AB gap in the temporalis fascia group is ±9.24 and that in fascia lata is ±6.12.

For finding out any significant difference in the gain in AB gap in the two groups, the students t test was calculated which was 0.00 and the degree of freedom was 98 which gave p value 100 which is >0.05.

5. GRAFT UPTAKE

TABLE5: Graft uptake in both groups.

RESULT	TEMPORALIS FASCIA GROUP	% OF TEMPORALIS FASCIA GROUP	FASCIA LATA GROUP	% OF FASCIA LATA GROUP
GRAFT SUCCESS	21	84	24	96
GRAFT FAILURE	04	16	01	04

In the temporalis fascia group there was 84% uptake rate and in the fascia lata group there was 96% uptake rate.

CONCLUSION

The conclusion drawn from our study can be summarized as

1. In the temporalis fascia group the graft uptake rate 84% was as compared to 96% in fascia lata graft group.
2. In temporalis fascia, 24% had post op AB gap in the range of 0-10 dB, 24% in 11-20 dB range, 28% in 21-30 dB range, 12% in 31-40 dB, 12% in 41-50 dB range. In fascia lata, 20% had post op AB gap in range of 0-10 dB, 68% in 11-20 dB range, 8% in 21-30 dB, 4% in 31-40 dB.
3. The mean gain in air bone gap in the temporalis fascia group is 19.00±9.24 as compared 22.00±6.12 to in the fascia lata group which is not significant (p value>0.05)
4. The graft uptake rate and the hearing were better in fascia lata groups compare to temporalis fascia group.

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