

# Comparative study of temporalis fascia graft, tragal cartilage graft and fascia lata in tubotympanic type of CSOM

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## Abstract

**Background:** Chronic Suppurative Otitis Media (CSOM) is frequently associated with symptoms of inflammation like discharge from the ear or pain. Tubotympanic type of chronic suppurative otitis media is characterized by a perforation of pars tensa, while marginal & attic perforations are pathognomonic of attico-antral variety. **Objectives:** To compare outcome of various graft material like temporalis fascia, fascia lata and tragal cartilage in Chronic Suppurative Otitis Media (CSOM) in tympanoplasty surgery **Material and Methods:** Total of 45 patients selected randomly as per inclusion criterias. Adequate history was taken, clinical, otoscopic and microscopic examination were done. Type I tympanoplasty was done in all patients using various graft materials. The results were evaluated in the form of rate of graft success, hearing gain, and the pre and post-operative Air Bone gap using SPSS vs 20. **Results:** In temporalis fascia graft 80% cases had infectious etiology, tragal cartilage graft group had 73.3% infectious etiology while in fascia lata group 86.7% cases had infectious etiology. The Fascia lata group and tragal cartilage group had 80% success rate while highest 86% success was seen with temporalis fascia graft group with only 14% failure rate in the same. All of the graft materials were having significantly low failure rate. All the graft methods were associated significantly in lowering the air bone gap. Tragal and temporalis graft had 1 early failure each, tragal group had most 2 cases with late failure and only 1 case of retraction seen which was present in temporalis fascia graft group. **Conclusions:** The post-operative hearing improvement depends not only on the graft material used and the type of tympanoplasty but also on the pre-operative status of the ossicular chain. **Key Word:** CSOM, Temporalis fascia graft, Tragal cartilage, fascia lata, Otitis media

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## INTRODUCTION

CSOM is one of the common otological conditions in India for which patients seek advice from an

otorhinolaryngologist. Poverty, illiteracy, poor hygiene, overcrowded living conditions and nutrition are all factors which play an important role in causation of this disease and wide-spread prevalence of CSOM in developing countries.<sup>1</sup> The incidence of COM is higher in developing countries. In India, the overall prevalence rate is 46 and 16 persons per thousand in rural and urban population respectively.<sup>2</sup> Rural population is affected more due to poor socio-economic standard, poor nutrition, poor hygiene, lack of healthcare facilities and lack of health education. The disease usually a sequel of acute otitis media which may manifest as early as in children following acute upper respiratory tract infection. It affects both the sexes and all age groups. COM contributes single most leading cause of hearing impairment in rural

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population.<sup>3</sup> CSOM has been classified into Tubo-Tympanic and Attico-Antral disease. Tubo-Tympanic Type of CSOM is characterized by a perforation of pars tensa, while Marginal & Attic perforations are pathognomonic of Attico-Antral variety.<sup>4,5</sup> Tympanoplasty is a procedure to eradicate the disease in the middle ear cleft and to reconstruct the hearing mechanism. The first reports about the reconstruction of the sound conduction apparatus by Wullstein and Zöllner.<sup>6,7</sup> Nowadays temporalis fascia is the most commonly used graft material. Other materials used being tragal perichondrium, tragal cartilage, conchal cartilage, vein graft and fascia lata. Such abundance of materials implies that there is no clear cut favorite and the choice of graft material depends on individual surgeon's preference.<sup>8,9</sup> There was lack of data available in this area regarding surgery with various graft and its outcome, so we done a comparative study to evaluate outcome of various graft material in surgery at our hospital.

### MATERIAL AND METHODS

This was comparative prospective follow up study done at Department of Otolaryngology, JIUS Indian Institute of Medical Science and Research Medical College, Warudi,

Badnapur, Jalna. Total of 45 cases were selected randomly presenting to ENT OPD during last 1 year. Patients aged 15 to 50 years were included after fulfilling inclusion and exclusion criterias. Detailed personal, clinical, otoscopic and microscopic examinations were done after taking informed consent from all the cases/gaurdians. All the necessary preoperative precautions were done, operative procedure was explained to the cases. Type 1 tympanoplasty was done in all patients using various graft materials. 15 cases each were allotted to temporalis (Group A), tragal (Group B) and fascia lata (Graft C) graft groups. In all the patients inlay technique of graft placement was done. The results were evaluated in the form of rate of graft success, hearing gain, and the pre and post-operative Air Bone gap. Data was collected and compiled using SPSS vs 20.0.

**Audiometric data:** All the cases were asked for regular follow-up once per week for 1 month and fortnightly for 3 months, then after 6 months and 1 year. In the present study, hearing improvement was evaluated by use of Air Bone gap (AB gap) in pure tone audiometry (PTA) at 500Hz, 1000HZ and 2000Hz The pre-operative AB gap and post-operative AB gap (i.e. 3 months after surgery) was taken into account.

### RESULTS

**Table 1:** Etiology of perforation in ears included in study In

Etiology	Temporalis fascia (%)	Tragal cartilage (%)	Fascia lata (%)
Infection	12 (80)	11 (73.3)	13 (86.7)
Trauma	3 (20)	4 (26.7)	2 (13.3)
Total	15 (100)	15 (100)	15 (100)

temporalis fascia graft 80% cases had infectious etiology, tragal cartilage graft group had 73.3% infectious etiology while in fascia lata group 86.7% cases had infectious etiology. Overall 80% cases had infection as a cause for erforation.

**Table 2:** Graft success and failure rates with respect to various graft materials

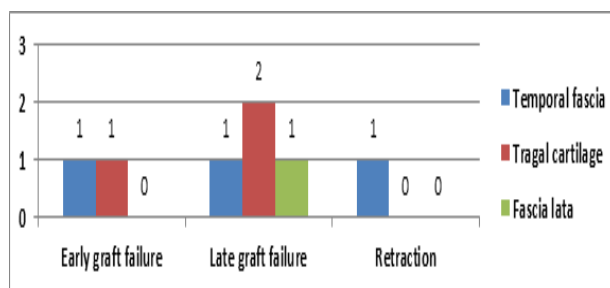
Graft Material	Total	Graft Success	% Graft Success	Graft Failure	% Graft Failure	P value
Temporalis fascia	15	13	86	2	14	<0.05
Tragal cartilage	15	12	80	3	20	<0.05
Fascia lata	15	12	80	3	20	<0.05

The Fascia lata group and tragal cartilage group had 80% success rate while highest 86% success was seen with temporalis fascia graft group with only 14% failure rate in the same. All of the graft materials were having significantly low failure rate.

**Table 3:** Improvement in Air-Bone gap in different graft materials

Graft Material	Mean Pre-op ABG(db)	Mean Post-op ABG(db)	Mean Gain in Hearing (db)	P value
Temporalis fascia	24.16±8.91	10.6±3.12	13.56±5.79	<0.05
Tragal cartilage	25.4±9.19	13.82±6.62	11.58±2.57	<0.05
Fascia lata	24.44±8.63	12.25±3.88	12.19±4.75	<0.05

All the graft methods were associated significantly in lowering the air bone gap.



**Table 6:** Distribution as per postoperative complications

Tragal and temporalis graft had 1 early failure each, tragal group had most 2 cases with late failure and only 1 case of retraction seen which was present in temporalis fascia graft group.

## DISCUSSION

In the present study, we have done a comparative study of Temporalis fascia (group-1), Tragal cartilage (group-2) and Fascia lata (group-3) grafts used for the repair of tympanic membrane perforation using underlay technique. Total of 45 cases with 15 in each group were studied. There was usually no age which is immune from incidence of chronic suppurative otitis media. The incidence of CSOM in this study was found to be highest in the age group of 26-35 yrs. Accounting 43.12% in the present study which is consistent with Harkare VV *et al.*<sup>10</sup> Vineetha *et al.*<sup>11</sup> and Loy *et al.*<sup>12</sup> The incidence of CSOM in this study was found to be higher in males (64.53%) than females (35.47%), similar male dominance was seen with studies done by Harkare VV *et al.*<sup>10</sup>, Rao *et al.*<sup>13</sup> and Vijaya *et al.*<sup>14</sup> study. The male predominance may be because of their more exposed way of life, outdoor working patterns. In the present study 36 (80%) cases out of 45 were having infectious etiology. Similar was concluded by Raj *et al.*<sup>15</sup> Harkare VV *et al.*<sup>10</sup> who also concluded that the leading cause of chronic otitis media was infection followed by trauma, which is in accordance to our study. The success rate of tympanic membrane closure with Temporalis fascia (group-1), Tragal cartilage (group-2) and for Fascia lata (group-3) was 86%, 80% each respectively. Above results was statistically significant in their respective groups but not significant when compared to each other, suggesting that the type of graft material does not influence the successful graft take-up. This finding was comparable with study done by Indorewala *et al.*<sup>16</sup>, Mohamed *et al.*<sup>17</sup>. The mean gain in hearing of group-1 was 13.56±5.79, in group-2 was 11.58±2.57, in group-3 was 12.19±4.75dB, with an overall gain in hearing of 12.34±4.37dB. The significant association (P value = <0.05) has been observed between two parameters. Similar results were noted in studies done by Harkare VV *et al.*<sup>10</sup>, Dornhoffer<sup>18</sup> and Yetiser *et al.*<sup>19</sup> Temporalis fascia and tragal cartilage graft groups showed 1 case each of early graft failure similar was seen with Harkare VV *et al.*<sup>10</sup>

## CONCLUSION

Myringoplasty is effective in tubotympanic disease for achieving dry ear as well as improvement of hearing. The graft success rate was maximum with temporalis fascia graft sp does hearing restoration, which was maximum with Temporalis Fascia graft, Temporalis Fascia remains the Gold standard and the most popular grafting material for its unique qualities like low metabolic rate hence less oxygen requirement, resistant to infection, graft can be obtained in ample amount from same incision with good anatomical and functional results with minimal complications.

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