Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value [ICV] = 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Permeatal sandwich tympanoplasty and postaural underlay technique of tympanoplasty- A comparative study

Jagveer Singh Yadav

Associate Professor, Department of E.N.T., Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India

ABSTRACT:

Background: Over the period of time, tympanoplasty has undergone notable changes. The present study was conducted to compare permeatal sandwich tympanoplasty and postaural underlay technique of tympanoplasty. **Materials & Methods:** 120 cases suffering from chronic suppurative otitis media were divided into 2 groups of 60 each. Group I were treated with permeatal sandwich tympanoplasty and group II were treated with postaural underlay technique of tympanoplasty. Size of perforation and hearing loss were compared. **Results:** Group I had 20 males and 10 females and group II had 18 males and 12 females. Size was large central was 15 in group I and 18 in group II, moderate central 10 in group I and 6 in group II and small 5 in group I and 6 in group II. The difference was significant ($P< 0.05$). Results showed that in group-1, time period of surgery was 78.0 ± 4.2 min while in group-2, it was 60.1 ± 2.8 min. Less amount of time taken in per-meatal approach tympanoplasty in comparison with post-aural approach tympanoplasty. P-value was found significant i.e. < 0.001. **Conclusion:** Permeatal Sandwich technique demonstrated better results as compared to Postaural approach.

Key words: Suppurative otitis media, Permeatal Sandwich technique, postaural underlay technique.

Received: 24 November, 2018 Accepted: 2 January, 2019

Corresponding author: Dr. Jagveer Singh Yadav, Associate Professor, Department of E.N.T., Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India

This article may be cited as: Yadav JS. Permeatal sandwich tympanoplasty and postaural underlay technique of tympanoplasty- A comparative study. J Adv Med Dent Scie Res 2019; 7(1): 180-183.

INTRODUCTION

Chronic otitis media is defined as the prolonged infection of middle ear cavity which leads to perforation of tympanic membrane, persistent ear discharge, conductive hearing loss and other complications. Chronic otitis media with perforation of the tympanic membrane is a common cause of hearing loss and ear discharge.[1-3] The development of antibiotics along with the improvement of knowledge about tympanic membrane helped in understanding the disease in a better way, which facilitated more effective treatment of chronic otitis media. In 1953, Zollner et al developed a new surgical method called tympanoplasty, which is described as a reconstructive surgery which helps to improve hearing function of the patient and to maintain a dry ear. It is considered as the final surgical step for the treatment of conductive hearing loss and persistent otorrhoea caused by chronic otitis media. Various factors, such as type of graft, disease activity, eustachian tube function, surgical approach, and technique of graft placement will affect the surgical outcome.

Wullstein classified Tympanoplasty into five different types, originally described by in 1956.

Type 1 involves repair of the tympanic membrane alone, when the middle ear is normal. A type 1 tympanoplasty is synonymous to myringoplasty.

Type 2 involves repair of the tympanic membrane and middle ear in spite of slight defects in the middle ear ossicles.

Type 3 involves removal of ossicles and epitympanum when there are large defects of the malleus and incus. The tympanic membrane is repaired and directly connected to the head of the stapes.

Type 4 describes a repair when the stapes foot plate is movable, but the crura are missing. The resulting middle ear will only consist of the eustachian tube and hypotympanum.

Type 5 is a repair involving a fixed stapes footplate.

There are two popular surgical techniques, the underlay and overlay methods for tympanoplasty. The underlay technique is quicker and easier to perform, and the creation of a tympano-meatal flap with elevation of the annulus allows inspection of the ossicular chain.[4] However, there is a risk of medial displacement of the graft, especially in large and/or anterior perforations. The overlay technique avoids this pitfall, but there is a risk of keratin pearl formation within the tympanic membrane, and also a risk of blunting of the angle between the drum and the anterior meatal wall.[5] A number of other techniques of tympanic membrane repair have been described. The term 'sandwich technique' was coined by Farrior in 1983 to describe a method in which sheets of areolar fascia were placed medial and lateral to the drum, with the fibrous layer as the 'meat' in the sandwich.[6]

The present study was conducted to compare permeatal sandwich tympanoplasty and postaural underlay technique of tympanoplasty.

MATERIALS & METHODS

The present study was conducted among 120 cases suffering from chronic suppurative otitis media (CSOM) of both genders. All were informed regarding the study and their consent was obtained.
Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 30 each. Group I were treated with permeatal sandwich tympanoplasty and group II were treated with postaural underlay technique of tympanoplasty. Size of perforation and hearing loss were compared. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS:

Table I Distribution of patients

Groups	Group I	Group II
Technique	Permeatal sandwich tympanoplasty	Postaural underlay tympanoplasty
M:F	40:20	36:24

Table I shows that group I had 40 males and 20 females and group II had 36 males and 24 females.

Table II Size of perforation

Perforation	Group I	Group II	P value
Large central	30	36	0.05
Moderate central	20	12	
Small	10	12	

Table II shows that size was large central was 30 in group I and 36 in group II, moderate central 20 in group I and 12 in group II and small 10 in group I and 12 in group II. The difference was significant (P< 0.05).

Table III Post-op assessment of hearing

Hearing loss	Group I		Group II		P value
	Pre- op	Post- op	Pre- op	Post- op	
Normal hearing	0	8	0	10	0.04
Slight hearing loss	3	26	8	20	0.02
Mild hearing loss	16	14	14	24	0.01
Moderate hearing loss	28	12	30	6	0.05
Moderately severe hearing loss	10	0	8	0	0.24
Severe hearing loss	0	0	0	0	0.001
Profound hearing loss	0	0	0	0	0.001

Table III shows significant difference in pre- op and post- op cases of hearing loss in both groups (P< 0.05).

Table-IV. Comparison of duration of surgery between post-aural and per-meatal approach tympanoplasty

Tympanoplasty	Mean duration of Surgery (Minutes)	P-value
Post-Aural	78.0 ± 4.2	<0.001
Per-Meatal	60.1 ± 2.8	

Table-IV Showed comparison of duration of tympanoplasty in post-aural and permeatal approach tympanoplasty. In group-1, time period of surgery was 78.0 ± 4.2 min while in group-2, it was 60.1 ± 2.8 min. Less amount of time taken in per-meatal approach tympanoplasty in comparison with post-aural approach tympanoplasty. P-value was found significant i.e. < 0.001.

DISCUSSION

Tympanoplasty is a surgical procedure defined as reconstruction of the hearing mechanism with reconstruction of tympanic membrane.[9] Various approaches have been described but with the advent of otoendoscopes the surgery has become quite simplified. The things to be considered which might have resulted in the difference in results between the two techniques is, first and foremost its tissue trauma which is much more in postaural approach compared to permeatal approach.[10] Secondly handling of the tympanomeatal flap by elevating it from the bony external auditory canal also leads to edema and delayed post-operative healing which is prevented in permeatal technique. Lastly, the preservation of vascular strip comes into consideration which is not affected during the permeatal technique but there are chances of it getting damaged while raising the tympanomeatal flap, these all factors lead to more complications and affect wound healing.[11] The present study was conducted to compare permeatal sandwich tympanoplasty and postaural underlay technique of tympanoplasty.

In present study, group I had 40 males and 20 females and group II had 36 males and 24 females. We found that size was large central was 15 in group I and 36 in group II, moderate central 20 in group I and 12 in group II and small 10 in group I and 12 in group II.

Singh et al[12] compared the graft take up and complications associated with the Permeatal Sandwich Tympanoplasty performed with the use of Otoendoscope and traditional Postaural Underlay technique of Tympanoplasty. A total of 100 patients were included in the study and the overall graft take was 92.3% in cases of Permeatal Sandwich technique as compared to 64.58% in the case of postaural underlay technique, with a majority of the failures in the large central perforation group rendering a p = 0.021 for patients operated for Large perforations, p = 0.036 for moderate perforations and p = 0.476 for small perforations. The overall p = 0.000649 which is highly significant. On comparing the complications there were only 2 cases in Permeatal Sandwich Technique compared to 25 cases in Postaural Underlay technique rendering a highly significant. There was a difference in hearing improvement with majority of the cases improving to the range of 16-25 dB in Permeatal Sandwich technique compared to 26-45 dB in Postaural Underlay technique.

We observed that there was significant difference in pre- op and post- op cases of hearing loss in both groups (P< 0.05). Our study results showed that in group-1, time period of surgery was 78.0 ± 4.2 min while in group-2, it was 60.1 ± 2.8 min. Less amount of time taken in per-meatal approach tympanoplasty in comparison with post-aural approach tympanoplasty. P-value was found significant i.e. < 0.001.

Aftab et al., reported in his study that time period consumed in trans-canal approach tympanoplasty was 62.37 minutes and in post-aural approach tympanoplasty, it was 72.15 minutes. P-value was <0.001 which is significant Time duration of per-meatal approach tympanoplasty was a lesser amount as compared to post-aura approach tympanoplasty. This study is also correlating with our study.[13]

Usami et al[14] reported on 22 myringoplasty patients treated with endoscopic assistance with a follow-up time of 24.5 months. The rate of perforation closure was 81.8% and improvement in ABG after surgery was 14.8 dB. Karhketo et al[14] evaluated 29 myringoplasty patients treated with the aid of rigid otoendoscopes with a follow-up time of one year. The rate of perforation closure was 80% and improvement in ABG after surgery was 7 dB.

CONCLUSION

Permeatal Sandwich technique demonstrated better results as compared to Postaural approach.

REFERENCES

1. Dhanasekaran SV, Nair JS, Raja K, Gopalakrishnapillai GK, Chandran AK, Radhakrishnan S. A clinical study on the influence of sinusitis in chronic suppurative otitis media. Bengal Journal of Otolaryngology and Head Neck Surgery. 2016 Aug 26; 24(2):49-53. 3. Patel J, Aiyer RG, Gajjar Y, Raval J, Suthar PP.
2. Endoscopic tympanoplasty vs microscopic tympanoplasty in tubotympanic csom: A comparative study of 44 cases. International Journal of Research in Medical Sciences. 2017 Jan 10; 3(8):1953-7
3. Sharp JF, Terzis TF, Robinson J. Myringoplasty for the anterior perforation: experience with the Kerr flap. J Laryngol Otol. 1992;106:14-6.
4. Jay B. Farrior sandwich graft tympanoplasty: a technique for managing difficult tympanic membrane perforation. Oper Tech Otolaryngol Head Neck Surg. 1995;6:27-32.
5. Farrior JB. The anterior tympanomeatal angle in tympanoplasty: surgical techniques for the prevention of blunting. Laryngoscope. 1983;93:992-7.
6. Raghavan U, Malik DSI, Mahmoud NA. Myringoplasty: update on onlay pedicle skin flap and temporalis fascia sandwich graft. J Laryngol Otol. 2000;114:174-7.
7. Wehrs R. Grafting techniques. Otolaryngol Clin N Am. 1999;32:443-55.
8. Millwski C. Composite graft tympanoplasty in the treatment of ears with advanced middle ear pathology. Laryngoscope. 1993;103:1352-6.
9. Kartush J. TM Patcher: a new device to close tympanic membrane. Perforations in an office setting. Am J Otol. 2000;21:615–20.

10. Mohindra S, Panda NK. Ear surgery without microscope; is it possible. Indian J Otolaryngol Head Neck Surg. 2010;62:138-41.
11. AL- Guindy A. Endoscopic transcanal myringoplasty. The journal of laryngology and otology. 1999;106(6):493-95.
12. Kumar S, Trivedi A, Verma N, Panwar A, Kumar P. Evaluation of the serum levels of nitric oxide among diabetic patients and its correlation with lipid profile as well as oxidative stress in north indian setting. Journal of clinical and diagnostic research: JCDR. 2016;10(5):OC44.
13. Ahmed A, Alam S, Hashmi SF, Hasan SA. A Prospective study comparing the results of endoscope assisted versus microscope assisted myringoplasty. Global Journal of Otolaryngology. 2016;1(4):5-9.
14. Usami S, Iijima N, Fujita S, Takumi Y. Endoscopic-assisted myringoplasty. ORL J Otorhinolaryngol Relat Spec. 2001;63:287Y90.