

A Prospective Study on Surgical Sequels of Tympanoplasties in a Tertiary Care Teaching Hospital in Katihar

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ABSTRACT

Background: In treatment of mucosal sort of Chronic, suppurative otitis media, even very much experienced otologists, stay isolated regarding consolidating mastoidectomy with tympanoplasty. Here we assess the surgical results of tympanoplasties with and without cortical mastoidectomy and talk about the different pre-agent variables and post-agent subjective useful advantage of the patient. Therefore, this study was conducted to evaluate the surgical outcomes of tympanoplasties with and without mastoidectomies in terms of graft uptake and hearing improvement.

Study Design: Prospective study.

Methods: A total of 37 patients attending Department of Otorhinolaryngology, Katihar Medical College, Bihar and undergoing tympanoplasties with and without mastoidectomy were included and followed up for a period of one year.

Statistical Analysis: Chi square test.

Results: There was no significant difference in the surgical outcomes of both the surgeries in terms of graft uptake and hearing improvement. In unilateral cases Belfast rule of thumb application enables the actual hearing benefit of the patient.

Conclusion: The addition of cortical mastoidectomy to tympanoplasty did not improve the outcome of surgeries done for mucosal type of chronic suppurative otitis media.

Keywords: Tympanoplasty, Cortical Mastoidectomy, Belfast Rule.

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INTRODUCTION

Sound-related sensation is one of the imperative sensations for presence. At the point when such an extraordinary sensation is lost, life actually loses its appeal. Our nation, being a creating country with poor financial status, incessant ailments of ear records for about 5% of populace. Ceaseless suppurative otitis media is observed to be the single real reason for recoverable conductive deafness.^{1,2} Surgery for tubotympanic sort of perpetual suppurative otitis media is the commonest otological surgical method in our nation. The goal of otologists performing middle ear surgery is to make the patient free of ear discharge, correct the conductive hearing loss, to improve hearing, as well as to provide functional benefit to the patient. One-sided conductive hearing misfortune is related with different disabilities incorporating trouble in sound restriction, hearing and comprehension discourse. This is on the grounds that, listening is a binaural assignment, while advantage to the patient is dictated by variables, for example, hearing in the non-worked ear.^{3,4} Thus, the subjective assessment of the surgical outcomes talks superior to the goal strategies, which give just the specialized accomplishment of the operation. This study discusses the various pre-operative factors which play

a major role in the post-operative success of two various surgeries – myringoplasty and cortical mastoidectomy with type 1 tympanoplasty conducted in the Department of ENT in a Tertiary care Medical College Hospital in Bihar for patients presenting with chronic suppurative otitis media – tubotympanic disease. The hearing benefit is determined by Air bone gap closure and also subjective evaluation of hearing is done by applying Belfast rule of thumb.

MATERIALS AND METHODS

A prospective study was conducted in about 37 patients attending ENT OPD with chronic suppurative otitis media – mucosal disease in a Medical College in Katihar, Bihar – a tertiary care Medical College for a period of one year and the patients were followed up for a period of one year. Among them, 5 patients did not turn up for follow up and they were excluded from the study. The inclusion criteria were being the patients between 15 to 50 years of both sexes, after elimination of focal sepsis, having either wet or dry ears and pure tone audiometry showing conductive hearing loss. Patients with congenital or acquired abnormalities of ear,

unsafe ear, undergone ear surgeries previously and with pure tone audiometry showing mixed and sensorineural hearing loss were excluded from the study.

All cases were admitted, pre-operative examination done under microscopy, subjected to endoscopic eustachian tube evaluation (those with normally looking pharyngeal end of eustachian tube orifice were taken up for study) and hearing assessment done with tuning fork tests and pure tone audiogram. All patients were informed about their need for a follow up period of one year. Informed written consent to undergo surgery was obtained from all patients. Mastoid shaving and local preparation was done in the ward prior to surgery. All cases were done under GA. Premedication and local infiltration was same for all cases.

About 15 patients with dry ear for more than 6 weeks and with only conductive hearing loss, were subjected to myringoplasty and considered as Group A. About 10 patients with unilateral disease and 5 patients with bilateral disease were taken up for study. For patients with bilateral disease, worse ear was taken up for surgery. All patients were taken up for surgery under GA. Trans canal approach was followed in 10 cases and in 4 cases with narrow external auditory canal post-aural approach was followed. 2 quadrant local infiltration was given with 2% xylocaine with adrenaline premixed solution.

All cases were followed up for 3,6 months and one year for graft uptake and postoperative hearing evaluations done at 3,6 months and one year. Results of hearing benefit, compared with pre-op and post-op air bone gap and for unilateral disease Belfast rule of thumb applied.

RESULTS

Total number of cases registered in this study was 37 patients visiting Department of ENT, Katihar Medical College, Bihar with

Chronic suppurative otitis media – tubotympanic disease. Among them 5 patients did not turn up for follow up and hence they were not included in the study.

The overall graft take up rate in both the surgeries was 86.63%. The overall hearing benefit was 90%, excellent with < 10dB ABG in 58.27% and Good with < 20dB in 36.12%. There were no postoperative complications, deterioration in hearing or sensorineural hearing loss in all 32 patients. In Group A , 10 were females & 6 were males, 11 patients had unilateral and 5 had bilateral disease, 11 had medium sized central perforation and 5 had subtotal perforation, 5 had good pre-op air bone gap of 10 to 20 dBHL 10 patients had a fair pre-op air bone gap of 20 to 30 dBHL.

Overall graft take up rate was 86.6%. Otoscopic evaluation of 11 patients with medium sized perforation at the end of 2 months, revealed 9 to be intact, 2 residual perforation in the antero - inferior quadrant. In 4 patients with subtotal perforation, 2 were intact, 1 with residual perforation & 1 grafts got rejected because of post-op wound infection. Otoscopic examination at the end of 6months & 1 year revealed – for all 11 patients with medium size perforation, tympanic membrane was intact and out of 4 patients with subtotal 1 were with residual perforation & 1 with rejection of graft. Hence the size of the perforation does have a role in graft take up rate. This is statistically significant by applying chi square test with p value < 0.05.

In 5 patients with good pre-op ABG, the post-op ABG was excellent. In 10 patients with fair pre-op ABG, the post-op ABG results were, excellent in 5, good in 4 and fair in 1 patients accounting for 63.3% in excellent, 26.7% in good and 10% in fair groups. By applying Chi square test, these results are statistically significant. [Figure 1] Hence, for the patients with lesser pre-operative Air bone gap have a better post-operative hearing.

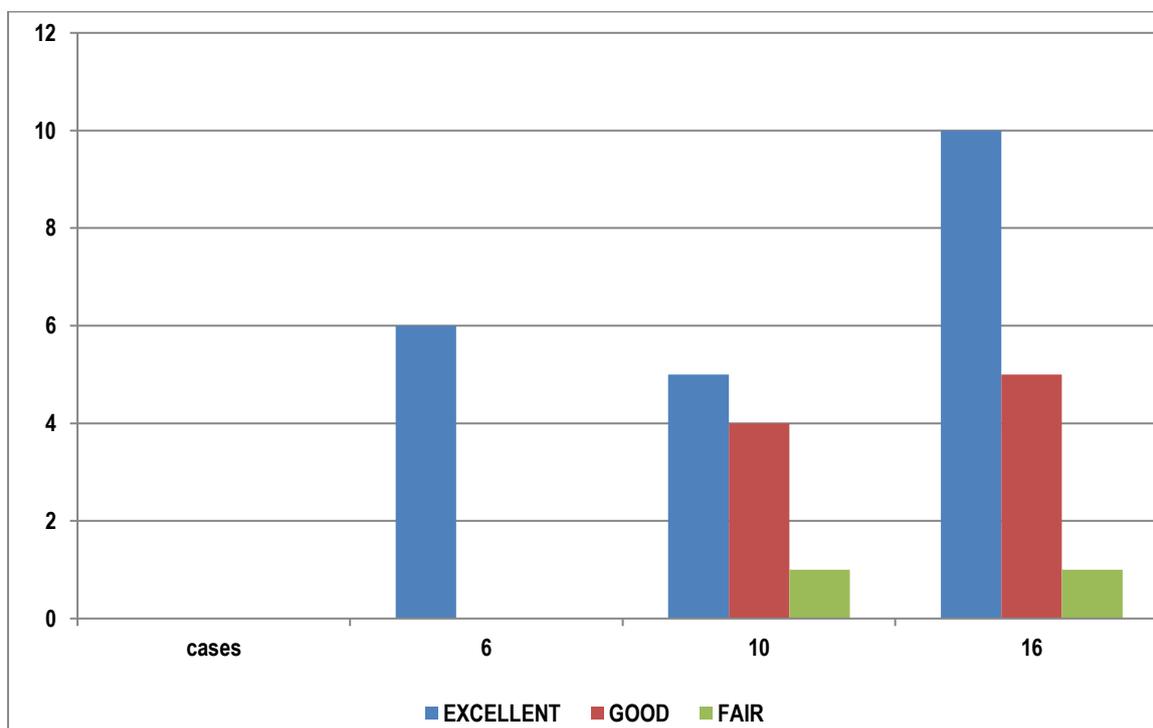


Figure 1: Relationship between Pre OP ABG and post OP ABG in Group A patients.

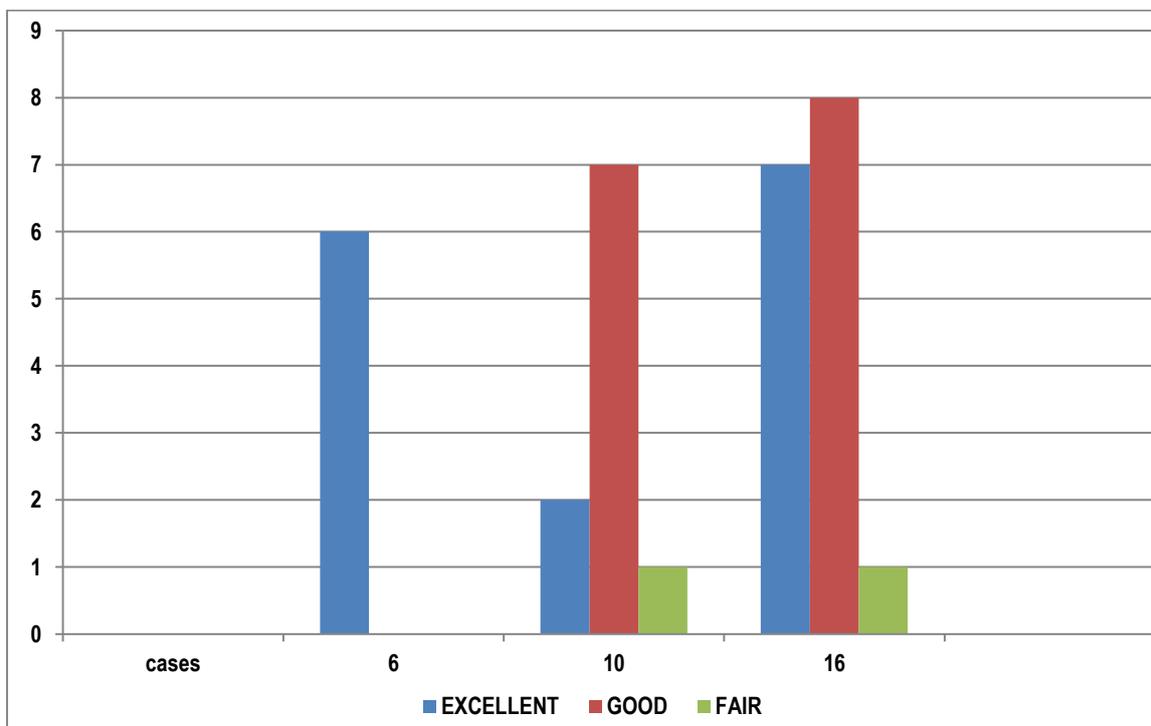


Figure 2: Relationship between Pre OP ABG and post OP ABG in Group B patients.

When Belfast rule of thumb was applied to 11 patients with unilateral disease, 9 of them with medium sized perforation, felt subjectively better and out of 2 of them with subtotal perforation, 1 felt better & 1 patient felt hearing same as the pre-operative status. These results are statistically significant with p value < 0.05, implies that Belfast rule of thumb interpret the post-operative hearing benefit in a better way than the Air bone gap, which tells about only the technical success.

The connection coefficient between the span of release and the pre-operation ABG is 0.4172 and that between the length of hearing debilitation with pre-operation ABG is 0.3821 and is factually huge. The relationship coefficient between the term of release and the post-operation ABG is 0.4544 and that between the length of hearing debilitation with post-operation ABG is 0.4489 and is measurably noteworthy, suggests that the patients with lesser span of release and hearing impedance would be wise to post-agent hearing than the patients with longer length of sickness and hearing weakness.

In Group B, 9 were females & 7 were males, 9 patients had unilateral and 6 had bilateral disease. 9 had medium central perforation and 6 had subtotal perforation, 5 had good pre-op Air bone gap of 10 to 20 dBHL 10 patients had a fair pre-op Airbone gap of 20 to 30 dBHL.

Overall graft take up rate was 89%. The relationship between Graft take up rate and size of the perforation is statistically significant by applying chi square test with person value of 0.02535. Otoscopic evaluation of 9 patients with medium sized perforation at the end of 2 months, revealed 8 to be intact, 1 residual perforation in the antero-inferior quadrant. In 6 patients with subtotal perforation, 4 were intact, 2 with residual perforation. Otoscopic examination at the end of 6 months & 1 year revealed – for all 9 patients with medium size perforation, tympanic membrane was intact and out of 6 patients with subtotal 2 were with residual perforation. Hence the size of the perforation does

have a role in graft take up rate even when cortical mastoidectomy is done along with repair of tympanic membrane.

In this study, out of 9 patients with medium sized perforation, 4 had a good & 5 had fair pre-op ABG. Out of 6 patients with subtotal perforation, 1 patient had good & 5 had fair pre-op ABG, implies that 91.7 % of the patients with subtotal perforation had pre-op ABG of 20 to 30 dB. Out of 15 patients, included in this procedure, 50% had excellent, 50% had good & 10% had fair post-op ABG. Those with medium sized perforation had better results than those with subtotal perforation.

On comparison of pre-op ABG & post-op ABG, all 5 patients with good pre-op ABG improved to excellent, out of 11 with fair ABG, 2 were excellent, 7 were good and 2 were fair post-operatively. This result is highly statistically significant with pearson value of 0.00006 [Figure 2].

Graft intake in 9 patients with disease free antrum mucosa is 100%. Out of 30 patients, 21 patients had disease in the antrum & 9 had a healthy antrum. 77.85% of the patients with healthy antrum and 9.5% of the patients with diseased antrum had good pre-op Air bone gap 90.5% with diseased and 22.2% with healthy antrum had fair preop Air bone gap. In patients with healthy antrum, the post-op ABG was excellent in 88.9% and 66.7% of the patients with diseased antrum had a good ABG post-operatively. On applying Belfast rule of thumb to 18 patients with unilateral disease, 83.3% had better hearing, implies the post-operative hearing benefit better than assessment with Air bone gap.

DISCUSSION

The overall graft take up rate in Myringoplasty in this study was 86.6%, which is within the range to the studies available. The graft take up rate in various studies were in accordance with the study conducted by Gibb, Chang et al., Black, PJ Worm al d Black, PJ Worm al d, Raj A Vedit, Kotecha et al., Yasuo, Mishiro et al., Kageyama et al., Alberrra et al.⁵⁻⁸

The graft take up rate in Cortical mastoidectomy with type 1 tympanoplasty is 90% which is also in accordance with the study conducted by Yasuo, Mishiro et al., Adnan saleem et al., McGrew et al., Rehl CM et al.⁹⁻¹³

In this study, the graft take up rate is better in medium sized perforations when compared to the subtotal perforation. In Myringoplasty series, the take up rate in medium sized perforation was 100% and in subtotal perforations the take up rate was 42.9%, rejection rate was 28.6%, re-perforation rate was 28.6%. In mastoidectomy with type 1 tympanoplasty series, the graft take up rate in medium sized perforation was 100% and in subtotal perforations the rate was 75% and re-perforation rate was 25%. These studies are similar to the results quoted by the study of Vartianien et al. and Alberra et al.^{2,14}

Graft Failure Rate

Graft failure rate in various previous studies conducted by Alberra et al., Vartianien et al., Adnan, saleem et al. were found to be from 7 to 21 %.^{2,15}

In this study, in myringoplasty series the rate of residual perforation is 6.7% and the rate of rejection of graft is 6.7%. The probable cause of residual perforation is the slippage of the graft from its position and the cause for rejection is the post-operative infection of the operated site, which is same as the reason cited by the study of Vartianien et al. and Kotecha et al. Study of Alberra et al. also includes the efficiency of the surgeon and the surgical techniques.

Pre-operative Hearing

In this study the pre-operative pure tone average in Myringoplasty series was between 30 to 40 dB with average being 38 dB and in cortical mastoidectomy with type 1 tympanoplasty series between 30 to 55 dB with average being 42.16 dB. As the perforation size increases, the preoperative hearing threshold also increases – this is consistent with the study conducted by Mehta et al., Bhusal et al., Nepal A Bhandary et al., Kageyama et al., Aiberra et al. and Saeed et al.^{1,2}

Post-Operative Hearing

In this study, the overall post-operative hearing benefit based on Air bone gap was 90% with <10 Db in 51.67% and <20db in 38.33%. As hearing benefit is better assessed with the subjective evaluation, in this study we have applied Belfast rule of thumb in patients with unilateral disease. In 11 patients with unilateral disease in Myringoplasty series, 95.7% felt significant improvement in hearing and 4.3% felt no improvement. In 9 patients with unilateral disease in Mastoidectomy with type 1 tympanoplasty series, 83.3% felt significant improvement in hearing and 16.7% felt no improvement.

CONCLUSION

The achievement of Myringoplasty as far as join take-up and hearing change is better in patients with lesser term of malady, less pre-agent Air bone crevice and with medium estimated punctures when contrasted with subtotal apertures. The accomplishment of cortical mastoidectomy with sort 1 tympanoplasty as far as join take-up and hearing change is better in patients with lesser span of illness and less pre-agent Air bone crevice. The outcomes are better with medium measured apertures when contrasted with subtotal holes and in patients with illness free mucosa of mastoid antrum. In post-agent assessment

of patients with one-sided hearing misfortune, utilization of Belfast dependable guideline empowers the real hearing advantage of the patient.

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