

Study of tympanometry in post – operative Myringoplasty Cases

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Received: November 2019

Accepted: November 2019

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ABSTRACT

Background: Tympanometry is a quick, non invasive test and is very useful in audiological evaluation. It is a technique that allows one to measure the compliance of eardrum, ossicular chain and finally it helps in diagnosis of the middle ear problems. **Methods:** In this paper, results of 66 cases of tympanometry findings in post-operative Myringoplasty cases, who were operated by Onlay technique using tragal perichondrium at Nalanda Medical College & Hospital Patna Period of 1 1/2 years (between Nov- 2017 to May 2019 are discussed. **Results & Conclusion:** In this study it has been observed that though the tympanometry is an important diagnostic tool, more than one type of curve is possible in one disease. Hence the shape of the curve should always be correlated with history, clinical, otoscopic and pure tone audiometric findings.

Keywords: Tympanometry, Myringoplasty.

INTRODUCTION

Tympanometry is the measurement of the acoustic emittance of the ear as a function of ear canal air pressure. It is quick, noninvasive and easily tolerated by most of the patients. It was developed by Terkildsen the patients. It was developed by Terkildsen and his colleagues Terkildsen and Thomson 1960) they proposed this technique as method for assessing middle ear pressure. Since their pioneer work, tympanometry has been used in variety of ways in audiology and otologic assessment. The test includes checking of the nobility of tympanic membrane and associated ossicles, fluid and air pressure in the middle ear as well as Eustachian tube funcions. Depending upon the various patterns observed in tympanogram, pathological conditions are determined. Jerger (1970) has recommended a coding system for interperation of various petterns of tympanogram, which are used in most of the clinics in India and throughout the word till date.

- i. **A type:** Normal Tympanogram
- ii. **As type:** unusual high peak in cases of Ossicular abnormality.
- iii. **As type:** Otosclerosis and Tympanosclerosis.

- iv. **B type:** Flat type Tympanogram ocures in presence of middle ear and other space occupying lesion of middle ear.
- v. **C type:** Showing negative pressure. Occurs in the cases of Eustachian tube dysfunction.
- vi. **D type:** Sharp notching characteristic is of hypermobile tympanic membrane.

Though a number of studies have been reported in literature regarding various patterns of tympanometric curve observed in middle ear diseases, very few studies have been reported regarding tympanometric findings in post-operative myringoplasty cases. So, the objective of our study was to know the various patterns observed in post-operative myringoplsty cases and to know the outcome of the surgery.

MATERIALS AND METHODS

The present retrospective study of 66 tymanograms and audiological evaluation in post-operative myringoplasty (by Onlay technique using tragal perichondrium) cases was carried out from Nov-2017 to May -2019 over the period of 1 1/2 years in E.N.T Dept. of Nalanda Medical college & Hospital, Patna.

Analysing the cases records we observed that all the patients had attended our E.N.T. O.P.D for the complaints of (i) recurrent ear discharge of different duration and (ii) different degree of hearing loss. The

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age range of the patients was 12 to 57 years. Out of 66 cases, 30 males and 36 were female sex ratio was 5:6. The main aim of the surgery was to control the infection and to make the ear safe and dry: secondly, to restore or improve the hearing. In order to achieve these external auditory canal and tympanic membrane were checked with otoscope to rule out any external and middle ear problem. This was followed by a tuning fork test with a tuning fork of 512 cps. A clinical audiometer, Arphi model 700

MKIV was used to deliver the tone of different frequencies from 250 800 Hz from 250 – 8000 Hz. Hearing thresholds were determined to assess the pre and post-operative hearing gain and status. Impedance audiometer model Zodiac 901 of Madsen Electronics with 226Hz probe tone was used to record the tympanograms.

RESULTS

Table 1: This table shows age & sex distribution of all 66 cases of myringoplasty (n-66)

| Age Range | Male | | Female | | Remarks |
|-------------|-------------|-------|-------------|-------|-------------------------------------|
| | No of cases | % | No of cases | % | |
| 12 – 19 yrs | 14 | 21.22 | 10 | 15.15 | n = 47 (71.21%) n = 19 (28. 79%) |
| 20 – 29 yrs | 8 | 12.12 | 15 | 22.72 | |
| 30 – 39 yrs | 2 | 3.03 | 4 | 6.03 | |
| 40 – 49 yrs | 2 | 3.03 | 4 | 6.06 | |
| 50 – 57 yrs | 4 | 6.06 | 3 | 4.55 | |
| Total | 30 | 45.46 | 36 | 54.54 | |

Table 2: Degree of Hearing Loss. (Pre-Operative)

| No. of cases | % | Pre – op AB gap | Type of HL |
|--------------|-------|-----------------|---------------------------------------------------------------|
| 31 | 46.97 | 10 – 20 dB | Mild conductive hearing loss. |
| 17 | 25.97 | 20 – 45 dB | Moderate degree of cond. HL. |
| 12 | 18.18 | 40 – 60 dB | Severe degree of mixed HL. |
| 6 | 9.09 | BC –NR | Severe to profound degree of SNHL. With H/O of ear discharge. |

Table 3: This table shows results of Tympanometry & audiological evaluation in post-operative myringoplasty cases. (n = 66)

| S. No | No. of cases Graft Taken up | % | Type of curve | Rinne Test | Average Gain of Hearing |
|-------|------------------------------|----------|---------------|------------|-------------------------|
| 1 | 28 | 42.42 | A type | + ve | 5 – 15 dB |
| 2 | 18 | 27.27 | C type | - ve | 15 – 20 dB |
| 3 | 11 | 21.21 | B type | - ve | 21 – 27 dB |
| 4 | 3 | Graft | - | - ve | No again |
| 5 | Could not come for follow up | Rejected | - | - | - |

DISCUSSION

In the present study we have observed that out of the total 66 patients myringoplasty. In 60 (90.91%) patients graft had well taken up during one to three months of their followup, in 3 (4.55%) patients graft were rejected due to reoccurrence of middle ear effusion and infection they were subjected to revision myringoplasty.^[3] (4.55%) had profound degree of sensorineural hearing loss superimposed upon conductive hearing loss and among all 66 patients 3 patients could not come for follow up due to some reason.

In 28 (24.42%) patients A type of typanogram was observed, Rinne's test became positive, hearing thresholds reached within normal limit. The presence of air in the middle ear cavity. The presence of air in the middle ear was positive prognostic sign that indicated high probability of spontaneous recovery. Even though the graft was intact post operatively B & C type of tympanograms were observed in 14 (21.21%) and 18 (27.27%) patients of myringoplasty respectively. These were observed mainly due to negative or low pressure in the middle ear cavity and in middle ear effusion. In these cases even though their hearing thresholds improved, they had average

gain of hearing 15 – 20 dB. Rinne's test was found to be negative but their audiograms reveled conductive hearing loss.

C type tympanogram was observed in 18 (27.27%) of our cases indicative of Eustachian tube dysfunction, vermaet. Al (1986). In their study of 216 cases also found and reported C type of tympanogram in 41% their cases with Eustachian tube dysfunction. While A type tympanogram 28% and B type tympanogram 31% of their patients. It shows that though the Eustachian tube dysfunction does cause negative pressure in middle ear, but A type tympanogram also observed if the pressure is not significantly altered. C type of curve occurs only when there is existence of more than 100 mm H₂O negative pressure.

In the present study we have seen B type of curve in 14 (21.21%) cases but normal tympanogram was also observed in 28 (42.42%) of our post-operative myringoplasty cases. 'Grimaldi' (1975) also found different type of curves similar to present study and stated that impedance correlates less well with middle ear findings and impedance test is virtually valueless as a predictor of middle ear effusion. Best et. Al. (1986) in their study of audiometric, impedance and otoscopic findings have also reported

different types tympanometric curves even in normal ear.

CONCLUSION

In our experience of 66 cases of myringoplasty most of cases improved in hearing and graft had well taken up. There was variation in tympanogram in post-operative myringoplasty cases.

Approximately half of the patients showed A type tympanogram and rest.

B & C type. No doubt, tympanometry is an important diagnostic tool. But the shape of curve should always be correlated with history & clinical findings.

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How to cite this article: Raushan EA, Kumar A. Study of tympanometry in post – operative Myringoplasty Cases. Ann. Int. Med. Den. Res. 2020; 6(1):EN01-EN03.

Source of Support: Nil, **Conflict of Interest:** None declared