

Original Research Article

Audit on results of tympanoplasty: experience at a tertiary centre

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ABSTRACT

Background: Chronic otitis media can be associated with various extracranial and intracranial complications. It has led to rise in number of people living with discharging ear and reduced hearing.

Methods: Authors have shared their 3 years' experience of a single tertiary institute regarding disease burden and management and results. This is a retrospective study including 500 cases of mucosal type of chronic otitis media and underwent tympanoplasty at the study institute. Follow-up records were kept for at least 6 months.

Results: Graft uptake rate after 6 months follow-up was 86.2%. Cartilage tympanoplasty was performed for revision cases and had good results. Average air-bone gap closure was 17 dB. It is a simple surgery which can be performed in day care OT without any significant intra-op or post-op complication.

Conclusions: Surgical treatment is significantly useful to reduce the disease burden due to chronic otitis media.

Keywords: Chronic otitis media, Smoking, Socioeconomic status, Tympanoplasty

INTRODUCTION

Chronic otitis media (COM) constitutes a large disease burden in developing countries, especially among population of rural areas and poor socioeconomic status due to malnutrition, poor hygiene, ignorance and difficulty to access for medical treatment. It is a chronic inflammation of middle ear cleft and leads to reduced hearing and many other complications, including, intracranial complications. It is more common among younger age-group due to recurrent acute middle ear infections, enlarged adenoids leading to eustachian tube blockage and inflammation. This population is the main working population and coming future living with discharging ear, hearing loss and many other complications.¹

With lot of progress in medical field, introduction of antibiotics and advanced surgeries, disease burden has been reduced to some aspect. But those living with

poverty, illiteracy, malnutrition and ignorance, these advances are difficult to access.

Authors are, here, sharing their experience at a tertiary institute regarding disease burden, mode of presentations, associated factors, associated complications and results of surgical treatment.

METHODS

This is a retrospective study including cases who underwent tympanoplasty from 2015 to 2018 at the study institute. 500 cases of mucosal type of chronic suppurative otitis media who underwent tympanoplasty and at least 6 months follow-up records were available, were included in this audit. All of them underwent tympanoplasty under local anesthesia. Those with lack of follow-up, squamous disease, acute inflammation, sensorineural hearing loss or any chronic systemic illness were excluded. Written informed consent was taken from

all the cases. Permission was taken from the ethical committee of the institute.

Thousands of patients per month, with chronic otitis media, visit out-patient department for medical treatment but most of them don't want surgical treatment, may be due to lack of money or ignorance. Many of those undergoing surgery, didn't come for follow-up. Pediatric age group was treated conservatively, unless surgery was must. So, all such cases were excluded from study. Tympanoplasty is defined as successful when the graft is accepted and intact after 3 months. Delayed failure was defined as perforation or atelectasis that occurred after 3 months.

RESULTS

In this study, 500 cases of safe type of chronic suppurative otitis media were included. The patients ranged between 11 to 60 years; most of them were less than 30 years (78.2%), 276 were females (55.2%) and 224 were male (44.8%), most of them belonged to rural areas 397 (79.4%) and were from lower socioeconomic group 329 (65.8%), 185 (37%) of them were smokers (Table 1).

Table 1: Distribution of cases according to demography.

Demography	No. of cases	Percentage
Age		
< 30 years	391	78.2%
30 years or more	109	21.8%
Sex		
Male	224	44.8%
Female	276	55.2%
Residence		
Rural	397	79.4%
Urban	103	20.6%
Socio-economic status		
Lower	329	65.8%
Middle	121	24.2%
Upper	50	10%
Smoking		
Yes	185	37%
No	315	63%

Table 2: Distribution of cases according to symptoms.

Symptom	No. of cases	Percentage
Otorrhoea	411	82.2%
HOH	286	57.2%
Tinnitus	57	11.4%
Earache	43	8.6%

Common presenting symptoms were ear discharge in 411 (82.2%), decreased hearing in 286 (57.2%), tinnitus in 57 (11.4%) and earache in 43 (8.6%) cases (Table 2).

Table 3: Distribution of cases according to ear status.

	No. of cases	Percentage
Laterality		
Unilateral	316	63.2%
Bilateral	184	36.8%
Otorrhoea		
Wet	48	9.6%
Intermittently wet	341	68.2%
Dry >6 months	111	22.2%
Duration of disease		
<1 year	167	33.4%
>1 year	333	66.6%
Size of perforation		
Small	99	19.8%
Medium	189	37.8%
Large	212	42.4%
Ossicular status		
Intact	389	77.8%
Incus absent	58	11.6%
Malleus absent	43	8.6%
Ossicular chain necrosed (except footplate)	8	1.6%
Ossicular chain fixed	2	0.4%
Middle ear mucosa		
Normal	424	84.8%
Granulation/oedematous	76	15.2%
Revision surgery		
No	491	98.2%
Yes	9	1.8%

Out of them, 184 cases (36.8%) cases had bilateral disease while 316 cases (63.2%) had unilateral disease. 48 (9.6%) and 341 cases (68.2%) had persistently wet and intermittently wet ear, respectively, while 111 cases (22.2%) had dry ear for more than 6 months. 333 cases (66.6%) had disease for more than 1 year, while 167 cases (33.4%) had disease for less than a year. Most of them had large perforation (42.4%), followed by medium (37.8%) and small perforation (19.8%). Ossicular chain was intact and mobile in maximum cases (389 cases, 77.8%), incus or lenticular process of incus was eroded in 58 cases (11.6%), malleus was eroded in 43 cases (8.6%), all ossicles except stapes footplate were absent in 8 cases (1.6%) while ossicles were fixed in 2 cases (0.4%). Those with ossicular discontinuity, underwent ossicular reconstruction with autograft (cartilage) or artificial Teflon prosthesis, while those with stapes fixation, underwent myringoplasty and were planned for stapedotomy as staged procedure. Middle ear mucosa was normal in 424 cases (84.8%) whereas, in rest 76 cases (15.2%), mucosa was edematous or granulations were present. It included primary surgery in 491 cases, whereas, in 9 cases, it was revision surgery. Cartilage tympanoplasty was performed by consultants in revision cases and had 100% graft uptake after 6 months (Table 3).

Table 4: Graft acceptance rate at 3 and 6 months.

Results of surgery	No. of cases	Percentage
Graft uptake <3 months	416	83.2%
Graft failure <3 months	84	16.8%
Graft uptake >6 months	431	86.2%
Graft failure >6 months	69	13.8%

Table 5: Average Air-bone gap (in decibel) at speech frequencies (500, 1000 and 2000 Hz).

Average Air-bone gap	
Average pre-op air-bone gap	34
Average post-op air-bone gap	17
Average air-bone gap closure	17

Patients were asked for follow-up after 7 days, 20 days, 6 weeks, 3 months and 6 months. They underwent suture removal after 7 days. Gelfoam was removed from external auditory canal on day 20. Pure tone audiometry was repeated 3 months after surgery. After 3 months of surgery, graft was found intact in 416 cases (83.2%), while residual perforation was found in 84 cases (16.8%). Those with small residual perforation, underwent fat myringoplasty or patch myringoplasty, while those with large residual perforation, were planned for revision surgery after 3 months. On follow-up after 6 months, overall graft uptake was in 431 cases (86.2%) (Table 4). Average pre-operative air-bone gap at speech frequencies (500 Hz, 1 KHz and 2 KHz) was approximately 34 decibels (d B), average post-operative air-bone gap was approx. 17 d B and average air-bone gap closure was 17 d B (Table 5).

Table 6: Distribution of cases according to post-operative complications.

Complications	No. of cases	Percentage
Wound gap	37	7.4%
Granulations	9	1.8%
Persistent discharge	35	7%
Facial paresis	23	4.6%
Dizziness	13	2.6%
Loss of taste sensation	3	0.6%

No significant intra-operative complication was noticed. 23 cases had partial facial paresis, noticed in intra-operative or immediate post-operative period. Stat dose of intravenous steroid was administered and dressing was loosened. It was likely due to deep infiltration of local anesthesia and recovered within few hours of surgery. Dizziness was complained by 13 cases in post-operative period. It was more common among elderly population and females and resolved within few hours or maximum next day. Other post-operative complications include wound gap after suture removal in 37 cases and required resuturing or redressing. Granulations were found in external auditory canal in 9 cases, may be due to improper tympanomeatal flap reposition, followed by

infection. It resolved with oral and topical fluoroquinolones. Persistent discharge due to residual perforation or granulations occurred in 35 cases. Loss of taste sensation or altered taste sensation occurs due to intra-operative injury to chorda tympani branch of facial nerve. It was complained by 3 patients. All of them had underwent bilateral ear surgery (Table 6).

DISCUSSION

Chronic otitis media contributes to a significant disease load, especially among the poor population with low socioeconomic status. It is more common among the younger age-group. The early presentation among younger population may be due to increased awareness to health issues and difficulty in hearing affecting the work efficiency, may lead them to seek early medical intervention.² There was no sexual predisposition, roughly equal proportion of male and female patients, female being slightly in majority, were noticed. This may be due to good education and economic status of females in present day society.³

Majority of the cases were from the rural areas with poor socioeconomic status, due to, overcrowding, lack of hygiene and malnutrition, which made them more prone to different forms of infection, including the ear infections, upper respiratory tract infections, leading to high incidence of Eustachian tube dysfunction and chronic suppurative otitis media.⁴

Most common presentation was discharging ear and hearing difficulty. Other symptoms like tinnitus, vertigo or complications were rare, since authors included mucosal type of disease, whereas, complications are more in squamous or unsafe disease.⁵

Mostly cases had unilateral disease with intermittent discharge, since people are now-a-days, more cautious and timely seeking medical advice.⁶ Maximum cases had large perforation in this study. Variable trends had been noted by various authors like Lerut B et al.⁷

Most of the cases had intact ossicular chain. Hearing loss in such cases can be due to large perforation. In case of ossicular erosion, most common was incudostapedial joint discontinuity. It can be explained due to tenacious blood supply of lenticular and long process of incus.^{8,9}

Unhealthy middle ear mucosa was seen in 15% cases and was associated with chronic or recurrent discharging ear.¹⁰ Revision surgery was performed by consultants and graft uptake rate in such cases was 100%.

After 3 months follow-up of surgery, graft was found intact in 83.2% cases. Those with small residual perforation underwent patch myringoplasty or fat myringoplasty, using cigarette paper or fat from ear lobule, respectively. Those with large perforation or recurrent perforation were planned for cartilage

tympanoplasty after 3 months. After 6 months follow-up, overall graft uptake rate was 86.2%.¹¹

Mean pre-op air-bone gap and post-op air-bone gap were 34 dB and 17 dB, respectively. So, average air-bone gap closure was 17 dB.¹¹

No significant intra-op or post-op complication occurred. Patients were discharged on the same day or day next to surgery. Wound gapping after suture removal occurred in 7.4% cases, resuturing was done. Granulations and discharge from wound were noticed in 1.8% cases. Residual perforation was seen in 13.8% cases. They were conservatively managed with oral antibiotics, topical fluoroquinolones and anti-histamines. Persistent discharge was noticed in 7% cases. Immediate post-op facial paresis was seen in 4.6% cases, which was due to deep infiltration of local anesthesia and it resolved within an hour. Dizziness was complained by 2.6% cases in post-op period, most of them were female patients. It resolved within 1 or 2 days. Loss of taste sensation occurred in 0.6% cases, who had got opposite ear already operated.¹²

CONCLUSION

COM causes discharging ear and hearing loss and can even cause various other complications, including intracranial, especially in squamous type of disease. Tympanoplasty is a simple beneficial procedure which can lead to eradication of the disease with significant hearing improvement. Successful outcomes can be obtained in significant number of cases, depending on the experience of surgeon and various local factors. Results obtained in this study were comparable to previous studies.

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