International Journal of Otorhinolaryngology and Head and Neck Surgery
Gayathri H et al. Int J Otorhinolaryngol Head Neck Surg. 2017 Jan;3(1):29-36
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20163648

Original Research Article

Factors influencing decision making among ENT surgeons on performance of cortical mastoidectomy for CSOM-tubotympanic disease in quiescent/active stage: an opinion based study

H. Gayathri[1]*, Krishnamurthy Balachandran[1], Ponnan Rathnasamy[1], Christina Mary Paul[2]

[1]Department of ENT, [2]Department of Community Medicine, A.C.S. Medical College, Chennai, India

Received: 05 October 2016
Accepted: 13 October 2016

***Correspondence:**
Dr. H. Gayathri,
E-mail: gaya3harish84@gmail.com

ABSTRACT

Background: As the role of cortical mastoidectomy as an adjunct to tympanoplasty in the management of CSOM tubotympanic type - quiescent stage remains controversial even today; we intend to study the factors that influence the decision of ENT surgeons on whether or not to perform cortical mastoidectomy in patients with CSOM (chronic suppurative otitis media) - active or quiescent ear.
Methods: During May to August 2016, 60 ENT surgeons within Chennai were asked to answer a pre-framed questionnaire on CSOM based on their personal surgical experience. The answers were collected by direct questionnaire method and the data subjected to appropriate statistical analysis.
Results: 65% surgeons expected a minimum dry ear period of ≤30 days before considering tympanoplasty alone (group 1) and the rest 35% members expected more than 30 days of dry ear period (group 2). Surgeons ≤40 years of age expected lesser duration of dry ear period prior to consideration of tympanoplasty alone (p =0.016). Group 2 surgeons performed cortical mastoidectomy in more number of cases (>50%) when compared to group 1 surgeons (p =0.03) for patients who presented first to them with a wet ear. There was a mixed opinion among surgeons within group 1 itself on whether or not they would do cortical mastoidectomy when they encountered patients who had congested remnant tympanic membrane, congested middle ear mucosa, myringosclerosis, ossicular chain discontinuity, sclerotic mastoids or treated septic foci in spite of the ear being dry for a month.
Conclusions: Though many surgeons consider that 30 days of dry ear period is sufficient to consider tympanoplasty alone, there is a division of opinion among themselves while facing specific clinical scenarios.

Keywords: CSOM, Cortical mastoidectomy, ENT, Tympanoplasty, Dry ear period

INTRODUCTION

Chronic suppurative otitis media (CSOM) is an important public health problem in India as it is estimated that approximately 6% of Indian population suffers from chronic ear disease which is significantly much higher than the incidence reported in Western countries which is about 1.8%.[1] Mastoid air cell system is known to play an important role in middle ear aeration and pressure regulation. There has been a clinical impression that lack of an aerating mastoidectomy at the time of the initial tympanoplasty may be a significant source of failure in patients with chronic non-cholesteatomatous otitis media, so cortical mastoidectomy along with tympanoplasty has for long been considered the surgical procedure of choice.[2]

The primary argument in favor of mastoidectomy has been an improvement in the middle ear and mastoid environment through clearance of diseased secretory mucosa, and the ventilator mechanisms of an open mastoid system.[3] Holmquist and Bergstrom first suggested that mastoidectomy improves the chance of

successful tympanoplasty for patients with poor tubal function or a small mastoid air cell system.[4] Sheehy et al recommended performing simple cortical mastoidectomy routinely for all tympanoplasties because it is "good practice" and because it's better to be safe than sorry.[5] Jackler and Schindler had stated that mastoidectomy is justified in cases of chronic suppurative otitis media which have been refractory to maximal antibiotic therapy.[6] McGrew et al conducted a retrospective study on patients who underwent surgical repair of simple tympanic membrane perforations either with or without canal wall up mastoidectomy.[7] They concluded that mastoidectomy was not necessary for successful repair of simple tympanic membrane perforations. However, mastoidectomy impacted the clinical course in patients by reducing the number of patients requiring future procedures and by decreasing disease progression. Bhat et al had conducted a single blinded randomized controlled study comparing the outcomes of mastoidotympanoplasty and tympanoplasty alone, in cases of tubotympanic CSOM in quiescent stage, in which they had found no statistically significant difference between the two groups.[8]

Mastoidectomy itself carries risk of several complications like damage to the incus, dura, sigmoid sinus, labyrinth and facial nerve.[9] Panigrahi et al stated in their study that in well selected cases, meticulously done simple myringoplasty is enough to give a dry ear and healthy neotympanum and if cortical mastoidectomy improves the graft success rate then it is worth to ignore the risks involved, otherwise it is an unnecessary adjunct procedure.[10] Many other studies as well have opined that role of cortical mastoidectomy in non-cholesteatomatous CSOM is statistically insignificant.[11-16]

Though most of the studies have shown no evidence of improved outcomes following mastoidectomy compared to tympanoplasty alone when reviewed by Eliades et al, subgroup analysis, including actively discharging ears, extensive mucosal inflammation, large or repeat perforations, or sclerotic mastoids have had overall worse outcomes and these patients have shown a nonsignificant trend towards slightly improved results with mastoidectomy.[17] Hence in this study we intend to study the factors influencing decision making among ENT surgeons on whether or not to perform cortical mastoidectomy as an adjunct to tympanoplasty in patients with CSOM-tubotympanic disease with wet or quiescent ears.

METHODS

During May to August 2016, 60 ENT surgeons within Chennai, performing microear surgery were selected by convenient sampling method and were requested to answer a pre-framed questionnaire, based on their personal clinical experience in handling patients with CSOM tubotympanic disease with wet or quiescent ears. The answers were collected by direct questionnaire method. The results of the study were tabulated in a master chart and then subjected to appropriate statistical analysis. The prevalence of individual parameter has been reported as percentages with 95% CI and associations have been tested by applying chi-square test on SPSS version 15.0 and Epi-info7.1.1.

RESULTS

Out of the 60 ENT surgeons included in our study, 36 (60%) were male and 24(40%) were female. The age of the surgeons included in the study varied from the range of 28 to 71 years (mean age- 42.78 years, SD-10.467) with 30 members (50%) aged ≤40 and the other 30 (50%) aged above 40. The surgeons who participated in the study had variable ENT experience from 2-36 years. 35% of the surgeons were working in a government tertiary healthcare facility and 65% were working for either private organizations or had only their own private practice. 56.67% had previous government medical college experience. 15% of the doctors had previous ENT hospital experience. The socio-demographic profile details have been tabulated in Table 1.

The minimum dry ear period expected to consider tympanoplasty alone without associated cortical mastoidectomy varied from 0 to 365 days. Based on the minimum dry ear period expected before considering tympanoplasty alone, the surgeons were categorized into 2 groups as presented in Table 2. Group 1 comprised of 39 (65%) members who opined that ≤30 days of dry ear period is sufficient and group 2 consisted of 21 (35%) members who expected more than 30 days of dry ear period. Group 1 surgeons were questioned regarding their preferred surgical option when faced with patients whose ears were dry for more than 30 days but who also had certain additional clinical or radiological findings viz., congested remnant tympanic membrane, edematous middle ear mucosa, in growing edges of perforation, associated ossicular chain discontinuity, tympano-sclerosis, sclerotic mastoid on X-ray and associated treated septic foci as seen in Table 3.

Pre-operatively, of the 60 members, only 31.67% checked eustachian tube function preoperatively on a routine basis. At the first visit, when a patient with tubotympanic disease presents to an ENT surgeon with a wet ear, it has been observed that most of the surgeons don't perform culture and sensitivity(93.33%) and they start the patient on empirical antibiotics, the most common one being a combination of amoxicillin with clavulinic acid (used by 60% of the participants in the study). 41.66% of ENT surgeons opined that such cases would eventually undergo cortical mastoidectomy as an adjunct procedure to tympanoplasty in 75-100% cases, where as an almost nearer 36.67% of surgeons opined that only 0-25% of such cases would land up undergoing cortical mastoidectomy as given Table 4. The association between minimum dry ear period expected by surgeons prior to performing tympanoplasty alone was tested

against certain parameters, out of which only the younger age of the surgeon ≤40 years correlated with lesser duration of dry ear period (≤30 days) expected prior to consideration of tympanoplasty alone (p =0.016). Rest of the parameters like surgeon's gender, past government college experience or total ENT experience didn't correlate as shown in Table 5. Group 2 surgeons performed cortical mastoidectomy in more number of cases (>50%) when compared to group 1 surgeons (p=0.03) when a patient presented at the first visit to them with a wet ear as seen in Table 6.

Table 1: Socio – demographic profile of the study subjects.

Variable (Classification of variable)	Number (out of 60)	Percentage
Age		
≤ 40 years	30	50
> 40 years	30	50
Gender		
Male	36	60
Female	24	40
Experience		
0 – 10 years	32	53.4
11 – 20 years	14	23.3
21 – 30 years	8	13.3
31 – 40 years	6	10
Predominant place of work at present		
Government	21	35
Private	39	65
Previous Govt.Medical College experience		
Present	34	56.67
Absent	26	43.33
Exclusive ENT hospital experience		
Present	9	15%
Absent	51	85%

Table 2: Minimum dry ear period requirement of surgeons for doing tympanoplasty alone.

Minimum dry ear period required	Number of surgeons	Percentage	95%C.I
≤ 30 days	39	65	52.93% to 77.07%
> 30 days	21	35	22.93% to 47.07%

Table 3: Preferred surgical option with 30 days dry ear period in certain situations among group 1 surgeons.

Special situation	Preferred surgical option	Number (N= 39)	Percentage
Congested remnant TM	Tympanoplasty	26	66.67
	Tympanoplasty + Cortical mastoidectomy	10	25.64
	Withhold	3	7.69
Edematous middle ear mucosa	Tympanoplasty	18	46.16
	Tympanoplasty + Cortical mastoidectomy	18	46.16
	Withhold	3	7.68
In growing edges of perforated TM	Tympanoplasty	17	43.59
	Tympanoplasty + Cortical mastoidectomy	22	56.41
Ossicular chain discontinuity	Tympanoplasty	18	46.16
	Tympanoplasty + Cortical mastoidectomy	21	53.84
Tympanosclerosis	Tympanoplasty	24	61.54
	Tympanoplasty + Cortical mastoidectomy	15	38.46
Sclerotic Mastoid on X - Ray	Tympanoplasty	19	48.72
	Tympanoplasty + Cortical mastoidectomy	20	51.28
Treated septic foci	Tympanoplasty	23	58.97
	Tympanoplasty + Cortical mastoidectomy	16	41.03

Table 4: Proportion of patients with wet ear at first clinical presentation who would end up undergoing cortical mastoidectomy according to the opinion of ENT surgeons.

Proportion of patients that will end up in cortical mastoidectomy	Number of surgeons opined (out of 60)	Percentage
0 – 25%	22	36.67
26 – 50%	4	6.67
51 – 75%	9	15
76 – 100%	25	41.66

Table 5: Association between surgeons opting for less than 30 days minimum dry ear period for performing tympanoplasty alone and certain factors.

Variable	Classification of variable (number of people in the group out of 60)	Number of surgeons opting for ≤ 30 days dry ear (out of 39)	Odds ratio (95%C.I Of odds ratio)	χ^2 value	P- value
Age	≤40 years (30)	24	4 (1.27 -12.58)	5.84	0.016*
	>40 years (30)	15	1.00		
Gender	Female (24)	18	2.14 (0.69 – 6.68)	1.73	0.19
	Male (36)	21	1.00		
Past government experience	Absent (26)	16	1.35 (0.44 – 4.18)	0.27	0.60
	Present (34)	13	1.00		
Total experience as an ENT surgeon	≤10 years (32)	24	2.6 (0.87 – 2.96)	2.96	0.085

(* - statistically significant)

Table 6: Association between surgeons opining that more than 50% of initially wet ear patients will end in cortical mastoidectomy and certain factors.

Variable	Classification of variable (number of people in the group out of 60)	Surgeons opining that more than 50% of wet ear patients will end in cortical mastoidectomy	Odds ratio (95% C.I Of odds ratio)	χ^2 value	P – value
Age	> 40 years (30)	18	1.5 (0.54 – 4.17)	0.6	0.44
	≤ 40 years (30)	15	1.00		
Gender	Female (24)	15	1.67 (0.58 – 4.78)	0.89	0.34
	Male (36)	18	1.00		
Past government experience	Absent (26)	16	1.6 (0.57 – 4.52)	0.78	0.38
	Present (34)	17	1.00		
Total experience as an ENT surgeon	> 10 years (28)	16	1.18 (0.42 – 3.27)	0.1	0.75
	≤ 10 years (32)	17	1.00		
Minimum dry ear period	> 30 days (39)	17	4.14(1.26-13.57)	4.62	0.03*

(* - statistically significant)

When questioned on any difference between hearing results between patients who underwent tympanoplasty alone and those who also were subjected to cortical mastoidectomy, 63.34% of the surgeons said that there was no difference between the 2 groups and 28.33% of them had never compared the hearing outcome of the 2 groups consciously, 3.33% surgeons felt tympanoplasty alone results in lesser SNHL whereas 5% of them had an opinion that addition of cortical mastoidectomy gave better hearing results. 94.12% with past government

medical college experience said that they follow the same protocol in both institutional and private setup. One surgeon alone (2.94%) said that she would perform cortical mastoidectomy in more cases in the private setup in order to reduce the failure rate. Another surgeon (2.94%) said that he would perform lesser cortical mastoidectomy in private practice patients due to possible complications of cortical mastoidectomy.

DISCUSSION

The trend of cortical mastoidectomy has been fading with most of the recent studies demonstrating similar results for tympanoplasty with and without cortical mastoidectomy.[8-17]

Traditionally it has been a common belief that tympanoplasty should be done in a totally dry ear to obtain a successful surgery, but slowly surgeons have started performing tympanoplasty alone even for quiescent and of late even for wet ears.[17]

In our study 65% (52.93% to 77.07% 95% C.I.) of the ENT surgeons opined that ≤30 day of dry ear period is sufficient to consider tympanoplasty alone. It was also observed that younger surgeons (≤40 years) expected lesser duration of dry ear period (> 30 days) prior to consideration of tympanoplasty alone (p= 0.016). Rest of the parameters like surgeon's' gender, past government college experience or total ENT experience were found to have no correlation with the minimum dry ear period they expected. This could probably be explained by the traditional concept of performing tympanoplasty alone only for inactive CSOM cases which influences the practice of older surgeons.

As this study is one of the first of its kind, examining the opinion poll results among ENT surgeons on management of CSOM- tubotympanic disease, there is lack of similar studies in literature for comparison. The ideal minimum duration of dry ear period expected prior to perform tympanoplasty alone and the role of cortical mastoidectomy in CSOM tubotympanic disease with quiescent ears has been a matter of debate. The duration of dryness of the ear before myringoplasty was one of several factors studied by Onal et al to determine its influence on the outcome of the operation.[18] They found that whenever the ear is dry for less than 1 month before surgery, the success rate is 60%, and if the ear is dry for more than 1 month, the success rate increases to 82%, and the difference was statistically insignificant but close to the level of significance (p =0.067), but according to a prospective study done by Tawab et al, among patients with a central perforation dry for at least 1 month, there was no significant difference in graft uptake between the myringoplasty alone group (70%) and cortical mastoidectomy group (80%) (p = 0.7).[11]

According to our study, only 5% ENT surgeons said they would do tympanoplasty alone even in a discharging ear. This could be due to the common belief that surgery in a wet ear might have a poorer result and due to the fear of the mastoid acting as a reservoir of infection which when left unaddressed may result in failure of the surgery. When Kawatra et al compared outcome of myringoplasty and myringoplasty with cortical mastoidectomy in dry and wet ears, overall failure rate was significantly higher in wet type as compared to dry type, however, odds of failure in wet cases were much higher in myringoplasty alone group as compared to myringoplasty with cortical mastoidectomy.[19] Hence they had concluded that this proportional difference in graft take up rate in both dry and wet types indicated the results to be favouring cortical mastoidectomy especially in wet cases where it reduced the odds of failure substantially.

Only 60% surgeons in our study performed a complete mastoidectomy in all cases where mastoid cortex is planned to be opened. The rest 40% performed antrotomy first and proceeded to a complete procedure only in cases of diseased antrum. A higher risk of complications associated with complete mastoidectomy, increased time consumption of the procedure and the increasing perception of importance of preservation of mucosal lining of mastoid air cells to improve the gas exchange among ENT surgeons could possibly explain the changing trend from performance of complete mastoidectomy in all indicated cases to making only an inspection hole in the mastoid by some of the surgeons.

Tawab et al recommended that CT scanning should be done for every patient with simple myringoplasty before operation to decrease the time consumed for surgery and to avoid any complications of cortical mastoidectomy in cases where the procedure is unnecessary and to decrease the rate of failure of operation by identifying the patients who would benefit from cortical mastoidectomy operation.[20] But then, this mode of investigation cannot be used on all patients undergoing tympanoplasty. This is especially true for developing and underdeveloped countries where this is not financially feasible. Also, the poor follow up of the patients would mean that revision surgery may not be possible indicating the need for a successful operation at the first instance.[21] Hence there is a need for identifying clinical indicators pointing towards probable diseased mastoid air cells, so that cases which may be benefitted by performing cortical mastoidectomy as an adjunct procedure can be identified. Otherwise, the doubt of the possibility of disease harbouring in the mastoid may make surgeons overdo the procedure as long as they are confident in performing the same.

Even if the ear hasn't been discharging for a reasonable time, quite often patients present with additional findings on clinical or radiological examination like congested remnant tympanic membrane, congested middle ear mucosa, squamous ingrowth of edges of the perforation, tympanosclerosis, ossicular discontinuity, treated or controlled septic foci (like chronic sinusitis, adeno-tonsillitis or nasal allergy) or sclerotic mastoids on X-ray.

In our study, when the surgeons in group 1 were questioned, on the surgery of choice for patients with CSOM with their ears not discharging for more than 30 days yet with a finding of congested remnant tympanic membrane on examination, 66.67% of the surgeons said that they would perform tympanoplasty alone, whereas 25.64% of surgeons opted for tympanoplasty alongwith cortical mastoidectomy, and the rest 7.69% opined that they would withhold any surgery until the congestion of the tympanic membrane would resolve and medical treatment shall be continued till then.

Similarly when the surgeons in group 1 were questioned on whether or not they would perform cortical mastoidectomy in patients with CSOM with a finding of congested middle ear mucosa in spite of the patients' ears not discharging for more than 30 days, 46.16% of the surgeons were of the view that tympanoplasty alone would be sufficient whereas an equal 46.16% were of the opinion that tympanoplasty with cortical mastoidectomy would give better results and 7.68% of surgeons had thought that it would be better to withhold any surgery until the middle ear was made dry completely by appropriate medical treatment.

Even though literature is replete with lack of any statistically significant differences in graft uptake or hearing gain between myringoplasty alone and myringoplasty with cortical mastoidectomy for patients with CSOM tubotympanic disease in their quiescent stage (with 1-6 months having elapsed since last ear discharge) with wet middle-ear mucosa or with congested perforation margins, some of the surgeons still fear doing tympanoplasty alone in an incompletely dry ear.

Tympanosclerosis, a common sequela of chronic otitis media, is characterized by hyaline changes of the lamina propria of the middle ear mucosa secondary to inflammation and calcification. It is a progressive disease, and even after surgical management, new sclerotic foci can occur.[22] In our study, 61.54% surgeons in group 1 held an opinion that tympanoplasty alone is sufficient in patients who had a 1 month dry ear but also had myringosclerosis, but the rest 38.46% were of the view that tympanoplasty with cortical mastoidectomy would give better results in such patients. Even though just removal of myringosclerotic plaque could suffice, the doubt of possible tympanosclerotic plaque blocking the antrum does exist which could favour the performance of cortical mastoidectomy by some of the surgeons in our study. Manjunath et al, on analysing retrospectively patency of aditus ad antrum with respect to presence of myringosclerosis in 43 patients of CSOM who had undergone tympanoplasty with cortical mastoidectomy, found that presence of myringosclerosis was associated with presence of aditus block ($p=0.0022$).[21]

In our study among group 1 surgeons, 46.16% of the participants considered that tympanoplasty alone would be sufficient even for patients with 1 month dry ear period with ossicular chain discontinuity whereas the rest 53.84% opined that they would perform tympanoplasty with cortical mastoidectomy for such patients. According to the study done by Kakkar et al, ossicular chain disruption was a common association in patients who were found to have mucoid discharge in the middle ear preoperatively.[23] This group of patients also had associated antral mucosal hypertrophy in all cases. As presence of ossicular discontinuity may be a predictor of disease in the mastoid, this could be a reason for consideration of cortical mastoidectomy by some of the ENT surgeons in our study for such cases.

When surgeons within group 1 in our study were questioned about surgery of choice for patients with CSOM with 1 month dry ear period with otomicroscopy showing in growing perforation edges, 43.59% of the surgeons opined that tympanoplasty alone would be enough once the ingrowing epithelium is elevated alongwith the tympanomeatal flap but the rest 56.41% favoured cortical mastoidectomy as an adjunct. Epithelial invasion theory or Habermann's theory is one of the postulated theories for origin of secondary acquired cholesteatoma.[24] According to a study by Rout et al, the prevalence of cholesteatoma in CSOM with central perforation was 3.4%.[25] The fear of co-existing cholesteatoma and the possible underlying Eustachian tube dysfunction could be the cause for consideration of cortical mastoidectomy in such cases by some of the ENT surgeons in our study.

In our study, among Group 1 surgeons, though 48.72% of them said they would perform tympanoplasty alone for patients with sclerotic mastoids with 1 month dry ear period but the rest 51.28% said they would perform tympanoplasty alongwith cortical mastoidectomy. According to the retrospective studies done by Kaur et al and Torosa et al on patients with sclerotic mastoids, there was no statistically significance between the results of tympanoplasty and tympanoplasty with cortical mastoidectomy group.[15,26] The increased volume provided by the surgical mastoid cavity is considered to have a protective buffering action over any influences that could cause sudden changes in middle ear pressure, which might be beneficial in patients with sclerotic mastoids. This could be the reason for some of the surgeons to opt for cortical mastoidectomy as an adjunct for CSOM patients with sclerotic mastoids.

Of the 60 members included in our study, only 19 (31.67%) of them said they check eustachian tube function preoperatively routinely. This indirectly reflects that eustachian tube dysfunction doesn't influence surgeons' decision on whether or not to perform cortical mastoidectomy as against the opinion of Holmquist et al[4] and Priya et al who advocated cortical mastoidectomy in patients with totally impaired ETF.[27]

In 1989 Bluestone and his colleagues studied about 40 patients of chronic otitis media active mucosal type and

found Eustachian tube dysfunction to be reason for the persistence of the disease.[28] For long, chronic sinusitis, adenoiditis, tonsillitis and allergic rhinitis have been blamed as the septic foci in development of chronic otitis media mucosal type. Hence, it is advised to control the foci of sepsis by medical or surgical treatment first before operating upon the ear. In a study by Gopalakrishnan et al, out of 60 patients, 52 patients (87%) had improved middle ear mucosal status after clearance of sinusitis.[29] The 8 patients (13%) who showed no improvement at all in the middle ear mucosal status were further investigated, three patients had hypo function of the eustachian tube as demonstrated by the dye test and 5 patients had recurrence of sinusitis due to failure of the surgical procedure. So, even after the septic foci have been treated and symptoms of the same have been controlled, it is a matter of doubt whether eustachian tube function would have reverted back to normal or not. Hence the role of cortical mastoidectomy in such cases remains an issue to be investigated. In our study, for patients with CSOM with 1 month dry ear period with associated treated septic foci, 58.97% of the Group 1 surgeons opined that tympanoplasty alone is sufficient, but the rest 41.03% favoured additional cortical mastoidectomy.

Overall, when a patient with CSOM mucosal type presented to the surgeon, with a wet ear on his first visit, 56.67% of the surgeons said that >50% of the patients will land up undergoing cortical mastoidectomy in addition to tympanoplasty even after initial treatment with antibiotics, but the rest 43.33% of the participants said that ≤50% of the patients would be getting subjected to cortical mastoidectomy in addition to tympanoplasty. The only parameter which had association with higher rate of performing cortical mastoidectomy when faced with a patient with CSOM with a wet ear was a higher (≥30 days) minimum dry ear period that the surgeon expected for considering tympanoplasty alone (odds ratio= 4.14, p=0.03). The rest of the parameters like surgeon's age, gender, total ENT experience, past government medical college experience, had no correlation with the rate of performance of cortical mastoidectomy in an initially wet ear. Most of the surgeons with past government experience said that they follow the same protocol in both institutional and private setup. When asked to opine if there was any difference in hearing outcome after tympanoplasty alone and tympanoplasty with cortical mastoidectomy, 63.34% of the surgeons in our study felt there was no difference between the 2 groups. Wehrs and Tulsa in 1981 observed that, in order to achieve a good hearing result following tympanoplasty, it is necessary to maintain an aerated middle ear space.[30] Poor Eustachian tube function is most commonly blamed in cases of failure to obtain an aerated middle ear following tympanoplasty. Aeration of the mastoidectomy cavity is also considered to be important in prevention of collapse of the posterior canal wall, retraction pockets and to ensure an adequate air reserve. But many studies have proven the other way concluding that there is no difference in hearing outcome between tympanoplasty alone and tympanoplasty with cortical mastoidectomy.[8,11,12,14,15,23]

CONCLUSION

Cortical mastoidectomy continues to be practiced by a proportion of ENT surgeons as an additional procedure for patients with CSOM in wet or quiescent stage. The minimum dry ear period expected for consideration of tympanoplasty alone is one of the important factors influencing decision on whether or not to open up the mastoid air cells. Although, many surgeons opine that ≤30 days of dry ear period is sufficient to consider tympanoplasty alone in patients with CSOM tubotympanic disease, they themselves remain divided while facing patients with specific clinical or radiological signs like congested tympanic membrane, congested middle ear mucosa, tympanosclerosis or ossicular discontinuity, sclerotic mastoids, or when patients have co-existing treated suspected septic foci. Our study comes up with certain limitations like having a small sample size, with study subjects belonging to only a particular region, but the results of the study suggest the need for a detailed randomized controlled study comparing tympanoplasty and tympanoplasty with cortical mastoidectomy groups, taking all these confounding factors into consideration, so that the benefit of cortical mastoidectomy in the presence of each of these parameters can be analysed individually and appropriate clinical practice guidelines can be framed.

ACKNOWLEDGMENTS

We would like to thank Dr. Saranya Nagalingam, Resident, Cardiac ICU, Vellamal Medical College, Madurai for her expert advice given right from planning to execution to completion of this study. We would first like to thank all our ENT surgeons who participated in this questionnaire based study by spending their valuable time answering the same.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Smyth GD. Tympanic reconstruction. Fifteen year report on tympanoplasty. Part II. J Laryngol Otol. 1976;90(8):713–41.
2. Villardo RJM, Doyle WJ. Role of the mastoid in middle ear pressure regulation. The Laryngoscope. 2011;121:404-8.
3. Sade J. The correlation of middle ear aeration with mastoid pneumatization. The mastoid as a pressure buffer. Eurn Arch Otorhinolaryngol. 1992;249:301-4.

4. Holmquist J, Bergstorm B. The mastoid air cell system in ear surgery. Arch Otolaryngol. 1978;104:127-9.
5. Sheehy JL. Surgery of chronic otitis media. In: English G, editor. Otolaryngology, Revised edition. Volume 1. Philadelphia: Harper and Row; 1985: 1–86.
6. Jackler RK, Schindler RA. Role of the mastoid in tympanic membrane reconstruction. Laryngoscope. 1984;94(4):495–500.
7. McGrew BM, Jackson G, Glascock ME. Impact of mastoidectomy on simple tympanic membrane perforation repair. Laryngoscope. 2004;114:506–11.
8. Bhat KV, Naseeruddin K, Nagalotimath US, Kumar PR, Hegde JS. Cortical mastoidectomy in quiescent, tubotympanic, chronic otitis media: is it routinely necessary? J Laryngol Otol. 2008;10:1–8.
9. Adunka OF, Buchman CA. Mastoidectomy: Otology, Neurootology and lateral skull base surgery. 1st edition. Volume 5. New York: Thieme; 2011: 295-296.
10. Panigrahi D, Das SR, Pani SK. Role of Cortical Mastoidectomy in Outcome of Myringoplasty in Active and Quiescent Stage of Tubotympanic Type of Chronic Suppurative Otitis Media. J Evol Med Dent Sci. 2015;4(69):11931-5.
11. Tawab HMA, Gharib FM, Algarf TM, ElSharkawy LS. Myringoplasty with and without Cortical Mastoidectomy in Treatment of Non cholesteatomatous Chronic Otitis Media: A Comparative Study. Clin Med Insights Ear Nose Throat. 2014;7:19–23.
12. Kamath MP, Suja S, Raghavendra R, Vinay R, Krishnam R. Success of myringoplasty: Our experience. Indian J Otolaryngol Head Neck Surg. 2013;65(4):358–62.
13. Albu S, Trabalzini F, Amadori M. Usefulness of cortical mastoidectomy in myringoplasty. Otol Neurotol. 2012;33(4):604–9.
14. Balyan FR, Celikkanat S, Aslan A, Taibah A, Russo A, Sanna M. Mastoidectomy in non cholesteatomatous chronic suppurative otitis media: is it necessary? Otolaryngol Head Neck Surg. 1997;117:592–5.
15. Kaur M, Singh B, Verma BS, Kaur G, Kataria G, Singh S, et al. Comparative Evaluation between Tympanoplasty Alone & Tympanoplasty Combined With Cortical Mastoidectomy in NonCholesteatomatous Chronic Suppurative Otitis Media in Patients with Sclerotic Bone. IOSR J Dent Med Sci. 2014;14(6):40-5.
16. Mishiro Y, Sakagami M, Takahashi Y, Kitahara T. Tympanoplasty with and without mastoidectomy in non cholesteatomatous chronic otitis media. Eur Arch Otorhinolaryngol. 2001;258:13–5.
17. Eliades SJ, Limb CJ. The role of mastoidectomy in outcomes following tympanic membrane repair: A review. The Laryngoscope. 2013;123(7):1787–1802.
18. Onal K, Uguz MZ, Kazikdas KC, Gursoy ST, Gokce H. A multivariate analysis of otological, surgical and patient-related factors in determining success in myringoplasty. Clin Otol. 2005;30:115-20.
19. Kawatra R, Maheshwari P, Bhatt R. A Comparative Study of Role of Cortical Mastoidectomy in Myringoplasty. JEBMH. 2015;2(5)556-65.
20. El-kady AS, Haroun Y, Kassem KM, Galal O. The Value of Computed Tomography Scanning in Assessment of Aditus ad Antrum Patency and Choice of Treatment Line in Revision Myringoplasty. Med. J. Cairo Univ. 2009;77(2):53-7.
21. Manjunath MK, Jyothi Swarup R, Chary G, Shadab MD. Myringosclerosis: An Indication of A Blocked Aditus; Indian J Otolaryngol Head Neck Surg. 2012;64(3):230–2.
22. Selcuk A, Ensari S, Sargin AK, Can B, Dere H. Histopathological classification of tympanosclerotic plaques. Eur Arch Otorhinolaryngol. 2008;265:409-13.
23. Kakkar V, Sharma N, Garg S, Bishnoi S, Gulati A, Malik P. Role of cortical mastoidectomy on the results of tympanoplasty in tubotympanic type of chronic suppurative otitis media: National J Otolaryngol Head Neck Surg. 2014;2(11):1-3.
24. Dhingra PL. Cholesteatoma and Chronic Suppurative Otitis Media. In: Disease of Ear Nose and Throat. 4th edition. New Delhi: Elsevier; 2007: 67.
25. Rout MR, Mohanty D, Vijaylaxmi Y, Kamalesh B, Chakradhar M. Prevalence of cholesteatoma in chronic suppurative otitis media with central perforation. Indian J Otol. 2012;18:7-10.
26. Torosa SZ, Habesoglua TE, Habesoglua M, Bolukbasib S, Naiboglua B, Karacaa CT, et al. Do patients with sclerotic mastoids require aeration to improve success of tympanoplasty? Acta Oto-Laryngologica. 2010;130(8):909-12.
27. Priya K, Karthikeyan P, Coumare VN, Sambandan AP. Evaluation of eustachian tube function in chronic suppurative otitis media (tubotympanic type) with reference to its treatment outcome. Indian J Otol. 2012;18:179-83.
28. Blue Stone CD. Assessment of Eustachian tube function. In: Jerger J, Editors. Handbook of clinical impedance Audiometry. New York: American Electormedics Corporation; 1975: 127-148.
29. Gopalakrishnan S, Kumar S. A study on chronic otitis media active mucosal type with sinusitis as focal sepsis. Otolaryngology. 2012;2(4):19-29.
30. Wehrs RE, Tulsa OK. Aeration of the middle ear and mastoid in tympanoplasty. Laryngoscope. 1981;91:1463–7.

Cite this article as: Gayathri H, Balachandran K, Rathnasamy P, Paul CM. Factors influencing decision making among ENT surgeons on performance of cortical mastoidectomy for CSOM-tubotympanic disease in quiescent/active stage: an opinion based study. Int J Otorhinolaryngol Head Neck Surg 2017;3:29-36.