

CSOM with Sclerotic Mastoids: Does Cortical Mastoidectomy Offer any Benefit Vis a Vis Graft Uptake and/or Hearing Outcome

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Abstract

Background: Chronic suppurative otitis media (CSOM) without cholesteatoma is a common diagnosis in otologic practice. Although opinions vary regarding the definition of chronic otitis media, most consider middle ear disease to be chronic if present for longer than 6 weeks. In cases of an actively discharging ear, it has been shown that mastoid exenteration frequently, but not always results in disease resolution. In quiescent chronic otitis media studies have shown that good outcomes are possible, irrespective of whether mastoidectomy was added to tympanoplasty or not.

Objectives: Does mastoidectomy improves hearing and/or graft uptake rates in CSOM with sclerotic mastoids.

Procedure: This is a prospective comparative study were patients with safe type of CSOM with dry ear for 1 month and having radiological evidence of mastoid sclerosis were included. Patients were divided randomly into two Group A and B with 32 and 40 cases respectively. Group A Patients underwent type 1 tympanoplasty with cortical mastoidectomy. While as Group B patients were offered standard type 1 tympanoplasty only.

Results: The observations with respect to post-operative graft uptake rates in two groups under comparative study were quite similar and comparable with p value of 0.873. Although the graft uptake rate in group A (84%) was seen on higher side compared to that in group B (80%). There was significant improvement in post-operative AB Gap in both groups with p value of < 0.0001. Moreover, no significant statistical difference was noted in post-operative AB Gap between the two groups at an average follow up period of 6 1/2 months.

Conclusion: We concluded that mastoidectomy hardly offers any additional benefit with respect to graft uptake and hearing improvement in sclerotic mastoids. So, the author doesn't recommend the routine addition of mastoidectomy for sclerotic mastoid unless there are other compelling indications.

Keywords: Sclerotic Mastoid; CSOM; Tympanoplasty; Cortical Mastoidectomy

Background

Chronic suppurative otitis media (CSOM) without cholesteatoma is a common diagnosis in otologic practice. Although opinions

vary regarding the definition of chronic otitis media, most consider middle ear disease to be chronic if present for longer than 6 weeks [1]. According to the status of the middle ear, non-cholesteatoma

chronic otitis media may be Active, Inactive or Healed [2]. A perforated tympanic membrane exposes the middle ear to possible colonization by organisms from the external ear canal, and frequently results in a recurrent or continuous discharge from the middle ear [1]. In quiescent chronic otitis media studies have shown that good outcomes are possible, irrespective of addition of cortical mastoidectomy to tympanoplasty [3-5]. It is believed that in such cases, the secretory diseased mucosa will normalize spontaneously once the tympanic membrane perforation has been repaired, and that any residual mucous will be of low viscosity that can easily be cleared into the nasopharynx via the Eustachian tube [5]. However, it has been seen that mastoid exenteration frequently, but not always results in disease resolution in ear active disease (presence of granulation tissue and/or polypoid mucosa) [6,7]. The primary argument in favour of mastoidectomy has been an improvement in the middle ear and mastoid environment through clearance of diseased, secretory mucosa and improved ventilator mechanism of an open mastoid system. The mastoid air cell system thought to function at least in part, as a buffer to changes in pressure within the middle ear. According to Boyle’s law, an increase in the volume available to the middle ear space through a surgically opened mastoid would be protective for the TM in response to middle ear pressure changes. Size of perforation may affect hearing outcome, as hearing improvement post repair, has been seen directly proportional to the size of the perforation pre-operatively [8].

Objective of the Study

The objective of our study was to study whether the addition of mastoidectomy improves graft uptake rates and/or hearing in CSOM with sclerotic mastoids.

Procedure

This is a prospective comparative study where cases with safe type of chronic suppurative otitis media with dry ear for one month and having radiological evidence of mastoid sclerosis were included. It was conducted in the Department of Otorhinolaryngology, Head and Neck Surgery Hamdard institute of medical sciences New Delhi for a period of 2 years from January 2016 to January 2018. Total of 72 Patient full filled inclusion criteria laid down for the study. Detailed clinical history and examination was done including oto-microscopy and baseline audiometry besides tuning fork tests. All patients were advised for x-ray of mastoids with Towne’s view to look for mastoid pneumatisation. Patients were divided randomly into two Group A and B with 32 and 40 cases respectively. Group

A patients underwent type 1 tympanoplasty with cortical mastoidectomy. While as Group B patients were offered standard underlay type 1 tympanoplasty only. All patients were operated either under general or local anaesthesia using post aural approach. Temporalis fascia was used as the graft material in all surgical procedures. Results were measured in terms of the graft success rate and improvement in conductive hearing loss at average follow up period of 6 ½ months. Post-operative hearing outcomes were considered successful, when the postoperative air bone gap was within 20 db for the pure tones at 0.5, 1, and 2 khz.

Observations and Results

Majority of patients presented between 2nd to 3rd decade of life. Mean age at presentation was 26.56 ± 9.43 year. Females were more common with Male Female ratio of 1:1.3. The two most common chief complaints were impaired hearing (100%) and Intermittent ear discharge (> 90%). 1/3rd patients had subjective Tinnitus. Right ear (55%) was predominantly involved. The majority of tympanic membrane perforations were of medium size (68%). The maximum number of patients 54.16% (39) had air bone (AB) GAP or hearing loss within the range of 20 to 30 db. The overall range of hearing loss was between 20 to 50 decibels (Table 1).

AB Gap	No	Percentage
0 - 10 db	0	0%
11 - 20 db	0	0%
21 - 30 db	39	54.16%
31 - 40 db	28	38.88%
41 - 50 db	5	6.95%

Table 1: Average preoperative air bone (AB) GAP or hearing loss.

There was significant improvement in post-operative AB Gap in both groups with p value of < 0.0001. However, No significant statistical difference was noted in post-operative AB Gap between the two groups at an average follow up period of 6 and ½ months (Table 2).

The graft uptake rate of 84% was seen in group A which was higher than graft uptake rate seen in group B where it was 80%. However, it was statistically insignificant with p value of 0.873. The graft failure rate of 16% (5) and 20% (8) were seen in group A and B respectively (Figure 1 and 2).

Air Conduction hearing threshold (db)	Group A			Group B		
	Pre op	No.	%	Pre op	No.	%
0 - 10 db	0	17	53%	0	17	42.5%
11 - 20 db	0	10	31.5%	0	15	37.5%
21 - 30 db	18	4	12.5%	21	8	20%
31 - 40 db	12	1	3%	16	0	0%
41 - 50 db	2	0	0%	3	0	0%
Total	32	32	100	40	40	100

Table 2: Pre and post-operative Air Bone Gap in Decibels (db) at an average follow up period of 6 ½ months.

The post-operative complications were somewhat similar in both groups and we did not noticed any major complication in either group. The table 3 demonstrates the postoperative complications seen.

Postoperative Complications	Group A N = 32	Group B N = 40
Infection	2 (6%)	3 (7.5%)
Residual Perforation	5 (16%)	6 (15%)
Reperforation	0 (0%)	2 (5%)
Perichondritis	0	0
Worsening Hearing Results	0	0
Mild Retraction of TM	3 (9%)	6 (15%)
Iatrogenic facial nerve injury	0	0

Table 3: Postoperative complications.

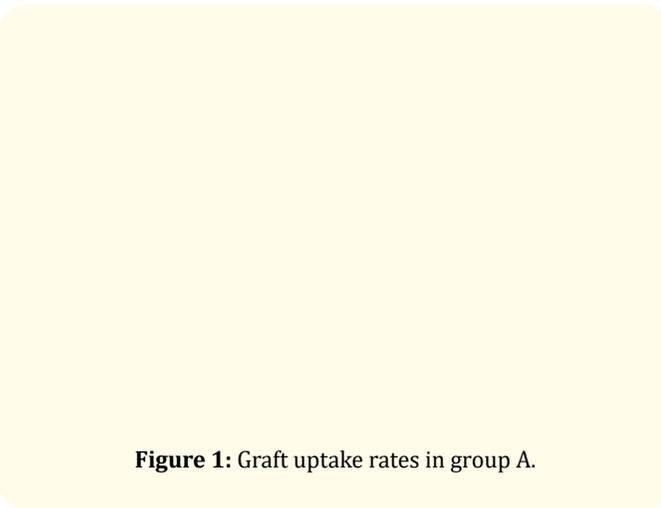


Figure 1: Graft uptake rates in group A.

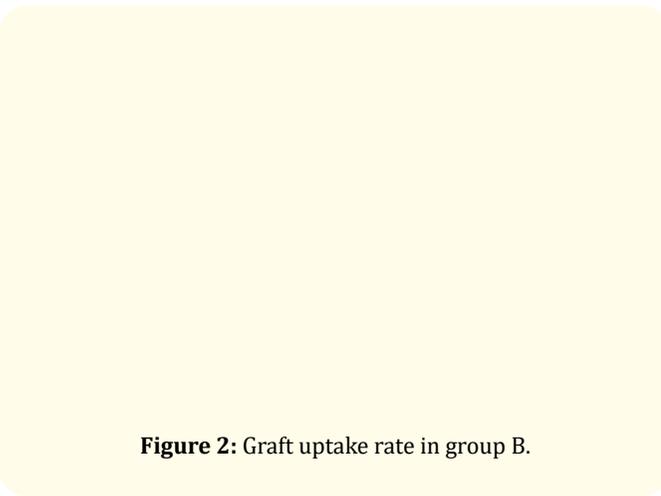


Figure 2: Graft uptake rate in group B.

Discussion

The observations with respect to post-operative graft uptake rates in two groups under comparative study were quite similar and comparable (p value = 0.873). There was no statistical significant difference between two groups, although higher rates (84% vs 80%) were seen in Group A where mastoidectomy was added to tympanoplasty compared to that in group B were only type 1 tympanoplasty was performed. These findings were similar to study by Hazem Mohammed., *et al* [9]. Who in his study observed that Graft success rates were higher in group where mastoidectomy was added to myringoplasty (80%) compared to myringoplasty only group (70%). They concluded that there is no significant difference statistically between two groups with P value 0.7. KL Shivakumar., *et al.* [10] in his study 'role of cortical mastoidectomy in inactive, mucosal type of chronic otitis media' found that graft take up was higher in tympanoplasty with cortical mastoidectomy group (92%, n = 46) compared to tympanoplasty without cortical mastoidectomy group (88%, n = 44), although the results were statistically insignificant (p = >0.05). Similar results were confirmed by many other studies like that of Albu S., *et al.* [11] and Toros., *et al.* [12].

However, a study by Yasuo Mishiro., *et al.* [13] has contrasting results as against to our study though their results are statistically insignificant. They retrospectively analysed 251 ears with non-cholesteatomatous chronic otitis media and found that graft success rate was higher (93.3) in tympanoplasty group compared to tympanoplasty with cortical mastoidectomy group (90.7%) with p value of 0.318 (statistically insignificant).

Conclusion

The current study concluded that mastoidectomy hardly offers any additional benefit with respect to graft uptake and hearing improvement in CSOM with sclerotic mastoids. So, the author does not recommend the routine addition of mastoidectomy in CSOM with sclerotic mastoid unless there are other compelling indications.

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