ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF THE ETIOLOGICAL FACTORS OF FAILURES OF MYRINGOPLASTY- A OBSERVATIONAL STUDY

ENT

Sushil K. Sharma Senior Resident, Department of E.N.T., Government Medical College, Ambedkarnagar, U.P., India.

Dinesh kumar* Assistant Professor, Department of E.N.T., MLN Medical College, Prayagraj, U.P., India. *Corresponding Author

Ramsiya Singh Assistant Porofessor, Department of E.N.T., MLN Medical College, Prayagraj, U.P., India

Ved P. Upadhyay Junior Resident, Department of E.N.T., MLN Medical College, Prayagraj, U.P., India.

Abhishek K. Dubey Junior Resident, Department of E.N.T., MLN Medical College, Prayagraj, U.P., India.

ABSTRACT

Background: The Study entitled "study of the aetiological factors of failures of myringoplasty" was planned to find the various aetiological factors causing failure of myringoplasty and suggests remedial steps to improve the results in future.

Methods: This observational study was carried in the Department of E.N.T, on patients who had undergone myringoplasty from Jan 2013 to June 2016. Total 905 patients operated in the above mentioned duration. 685 patients were operated during Jan 2013 to June 2015, who were studied retrospectively (only 540 came for follow up), and 220 patients were operated during June 2015 to June 2016 were studied prospectively. The patients who came to the OPD for follow up, were thoroughly reviewed and the re-perforation was seen in 53 patients.

Results: Total nine factors causing myringoplasty failure were studied, 4 factors i.e. size of perforation, site of perforation, eustachian tube function, and surgeons experience significantly affects the surgical outcome of myringoplasty while age, tympanosclerotic patch, type of anaesthesia, wet or dry graft placement, and deviated nasal septum does not affects the myringoplasty failure.

Conclusions: For improvement of result in future, Eustachian tube dysfunction, symptomatic deviated nasal septum should be corrected before the surgery. Anterior and larger perforation should be operated by experienced surgeon.

KEYWORDS

Myringoplasty failure, risk factors, re-perforation.

INTRODUCTION

Myringoplasty is the term used to describe the surgical repair of the perforated tympanic membrane. The primary goal in myringoplasty is the restoration of the integrity of the tympanic membrane. Though very common established procedure and despite several known prognostic factors, failures have been reported in the literature.

In literature, some of the factors that affect re-perforation were taken in consideration like age, sex, perforation size, while the other factors that also causes the re-perforation like deviated nasal septum, tympanosclerotic patch, allergic condition, type of anaesthesia, condition of middle ear mucosa, experience of surgeon, dry or wet graft material, and surgical techniques were not taken in to consideration though these factors affects the failure in myringoplasty. The quest is to improve the results further by studying the different factors that could possibly affect the outcome. Therefore present study was planned to see the various etiological factors in Indian scenario that affects the re-perforation and try to improve the result in future.

METHODS

The present study was included 53 cases of re-perforation from the 760 cases of myringoplasty who were operated in ENT department, during the period of Jan 2013 to June 2016.

Total 905 patients were operated in the above mentioned duration, 685 patients were operated during Jan 2013 to June 2015, who were studied retrospectively (only 550 patients were followed successfully with 42 re-perforation), and 220 patients (with 11 re-perforation) were operated during June 2015 to June 2016 were studied prospectively.

For retrospective patients:-

Case sheet of the retrospective patients was collected from Record Keeping Section, their address, phone number obtained and the patients were called by letters/phones. Total 685 patients were operated during January 2013 to June 2015, out of 685 only 540 patient turned up for follow-up. Their pre-operative status was recorded from the case sheet. On oto-scopic examination, 42 patients had re-perforation, were thoroughly examined, investigated and motivated for revision surgery.

For prospective patients:- A total of 220 patients were operated during June 2015 to June 2016. All the prospective patients were examined preoperatively, intra-operatively, and post-operatively and the relevant findings were noted. In the subsequent follow-up period 11 patients had re-perforation.

Procedure:- All the cases (retrospective as well as prospective) were properly examined underwent pure tone audiometry was done to see the hearing threshold and inflation deflation test and valsalva to see the eustachian tube function, X-ray mastoid for the status of mastoid pneumatization, X-ray Nose and PNS for deviated nasal septum. Post auricular approach and temporalis fascia was used as a graft material in inlay techniques of Myringoplasty under general/local Anaesthesia. Gel foam was used as the support material in the middle ear. Follow up of the patients done weekly in first operative month, bi-weekly for next two month followed by final visit up to six months. Outcome of surgery was regarded as successful if the ear gets dry, the tympanic membrane healed, intact and mobile. At every follow up, patients were examined under otoscope/microscope to check the graft uptake and look for the failure (re-perforation) if present. Results were statistically analyzed using SPSS (statistical package for social sciences). Various risk factors and myringoplasty failure were compared by utilizing Chi square test. Statistical significance was accepted as $p<0.05$.

RESULTS

Rate of re-perforation is more in patients in the age group of 29 -44 yrs as compare to 13-28 yrs, followed by age range of 07-12 years. The relationship between age and re-perforation is found to be statistically insignificant (p value >0.05) as shown in table no. 1.

Table 1- Factors insignificantly affecting the outcome of myringoplasty

S. no.	Factors affecting re-perforation		Outcome			Statistics
	Factors		Failure	Success	Total	P value (>0.05)
1	Age	07-12 yrs	02 (3.33%)	58 (96.67%)	60	0.0534
		13-28 yrs	42 (8.94%)	428 (91.06%)	470	
		29-44 yrs	06 (4.80%)	119 (95.20%)	125	
		45-60 yrs	03 (2.86%)	102 (97.14%)	105	

2	Tympanosclerotic Patch	Present	30 (8.98%)	304 (91.02%)	334	0.0543
		Absent	23 (5.40%)	403 (94.60%)	426	
3	Type of Anaesthesia	General	10 (6.37%)	147 (93.63%)	157	0.7390
		Local	43 (7.13%)	560 (92.87%)	603	
4	Wet vs Dry graft	Wet	16 (5.99%)	251 (94.01%)	267	0.4344
		Dry	37 (7.52%)	456 (92.49%)	493	
5	Deviated Nasal Septum	Present	33 (8.11%)	374 (91.89%)	407	0.1874
		Absent	20 (5.67%)	333 (94.33%)	353	

Rate of re-perforation is more in patients with deviated nasal septum as compare to without deviation in septum. And there is no significant relationship between Deviated nasal septum and re-perforation (p value >0.05) as shown in table no. 1.

The rate of re-perforation is more in patients operated in local anaesthesia as compared to general anaesthesia. There is no statistically significant relationship present between type of anaesthesia and myringoplasty failure (p value>0.05) as shown in table no. 1.The rate of re-perforation is more in the patients with tympanosclerotic patch. And there is no significant relationship between tympanosclerotic patch and failure rate (p value>0.05) as shown in table no. 1.

The rate of re-perforation is more in dry graft placement as compared with wet graft placement. And relationship between dry/wet graft placement and graft failure is not significant (p value>0.05) as shown in table no 1.

The rate of re-perforation is more in large and subtotal perforation as compared to medium size and small size perforation. There is a significant relationship between the size of perforation and failure (p value <0.05) as shown in table no. 2 (figure 1).

Table-2 Factors significantly affecting the outcome of myringoplasty

S. no.	Factors affecting re-perforation		Outcome			Statistics
	Factors		Failure	Success	Total	P value (<0.05)
1	Size of perforation	Small	06 (3.53%)	164 (96.47%)	170	0.0206
		Medium	10 (4.65%)	205 (95.35%)	215	
		Large	21 (10.09%)	187 (89.91%)	208	
		Subtotal	16 (9.58%)	151 (90.42%)	167	
2	Site of Perforation	Anterior	32 (11.23%)	253 (88.77%)	285	0.0002
		Posterior	09 (5.81%)	146 (94.19%)	155	
		Central	12 (3.75%)	308 (96.25%)	320	
3	Eustachian Tube Function	Normal	20 (4.41%)	434 (95.59%)	454	0.0007
		Abnormal	33 (10.78%)	273 (89.22%)	306	
4	Experience of Surgeons	Consultant	16 (4.64%)	329 (95.36%)	345	0.0306
		Resident	37 (9.78%)	378 (90.22%)	415	

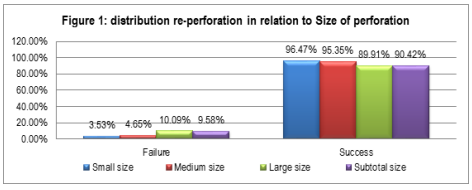

Figure no-1 Distribution of re-perforation in relation to size of perforation.

The rate of re-perforation is more in the repair of anterior perforation as compared to posterior and central perforation. The relationship between site of perforation and rate of failure was found to be statistically significant (p value <0.05) as shown in table no. 2 (figure 2).

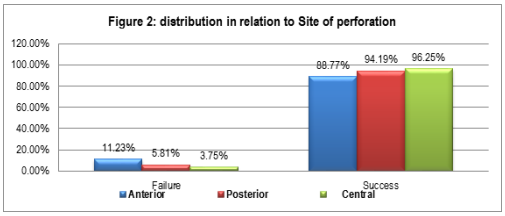

Figure no-2 Distribution in relation to site of perforation.

The rate of re-perforation is more in the patients having abnormal eustachian tube function as compared to patients having normal eustachian tube function The relationship between eustachian tube function and re-perforation was found to be statistically significant(p value <0.05) as shown in table no.2 (figure 3).

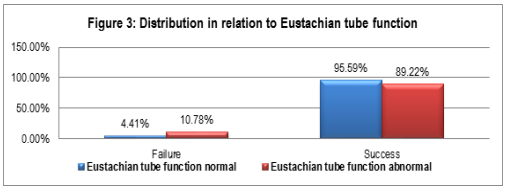

Figure no- 3 Distribution in relation to Eustachian tube function.

Chance of re-perforation is more in patients who were operated by resident doctor as compared to consultant. Relation between experience of surgeons and failure of myringoplasty was found to be statistically significant (p value <0.05) as shown in table no. 2 (figure 4).

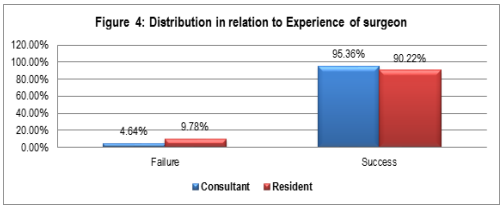

Figure no- 4 Distribution in relation to experience of surgeon.

DISCUSSION

Myringoplasty is often regarded as one of the easier operation in otology. Though very common, established procedure and despite several known prognostic factors that may affects the surgical outcome, failures have been reported in literature. Surgical outcome was measured on the basis of re-perforation. In our study, nine preoperative factors were studied to know the aetiological factors causing re-perforation. Size and site of perforation, eustachian tube dysfunction, and surgeon's experience have significant relationship with myringoplasty failure.

M. Yung, et al. (2007)[1] concluded that patient`s age did not influence the surgical success of tympanoplasty. Lassaletta Atienza L et al. (1999)[2] found no co-relation between the outcome of surgery and age. In another study, Joao Carlos Rebeiro et al. (2011)[3] found that tympanoplasty is a valid treatment modality for tympanic membrane perforation in the pediatric population and a tympanic membrane perforation can be closed at any age. In our study, there was no significant relation between the age and failure in myringoplasty which was similar to other study. There is no age limit below which perforation should not be closed[4]. However, a recent study by R.R. Joshi et al. (2013)[4] concluded that the graft takes rate was better with the advancing ages.

Lee et al (2002)[5] and Onal K et al. (2005)[6] demonstrated a higher success rate with perforations smaller than 50%,Sedman et al. (2008)[7] mentioned that larger perforations are often associated with lower success rate, perhaps due to the extent of problem and the surgical

difficulty it entails[8]. However, no significant association was found between perforation size and myringoplasty failure in recent studies[2,9]. In our study rate of re-perforation is higher in large (10.09%) and subtotal perforation (9.58%) and there is a significant relationship present between size of perforation and failure (p value <0.05) which is similar to other study[9].

According to literature, anterior perforation has more chance of re-perforation[4]. Anterior perforations are technically more difficult to access and the blood supply is also poorer. Bhat NA et al. (2000)[10], Gersdorff M et al. (1995)[11] was found success rate depend on site of perforation. Singh et al. (2005)[12] showed that graft integration rate was 34 % in anterior perforations, 91 and 100 % in inferior and posterior perforations respectively. In our study re-perforation is more in anterior perforation (11.32%), posterior (5.81%), and central perforation has least rate of re-perforation (3.75%), this difference is statistically significant (p value <0.05) which is similar to previous studies[10,11,12]. However some study[3] shows that perforation location does not influence the surgical outcome of myringoplasty.

According to Vartianen and Nuutinen (1993)[13]the most decisive factor influencing myringoplasty results appeared to be the surgeon's experience. A study by Black (1995)[14] showed that operative success as defined by graft integrity was significantly affected by grade of surgeon performing the procedure. Consultants had 90.6% success rate while registrars had 67.2% success rate in his study. He suggested that myringoplasty is a beneficial procedure in the hand of a skilled and experienced surgeon. According to Emir et al (2007).[15] the senior surgeons had better results with large perforations and older patients. In our study failure rate was more in the patients operated by residents (9.78%) as compared to consultant(4.64%) which was statistically significant (p value <0.05).

However according to Blanshard (1990)[16] grade of surgeon carrying out the operation had no statistically significant influence on the success rate or the audiological outcome.

CONCLUSIONS:

For improvement of result in future, Eustachian tube dysfunction, symptomatic deviated nasal septum should be corrected before the surgery. Anterior and larger perforation should be operated by experienced surgeon.

Steps to improve the results in future

1. Age is non-modifiable cause of re-perforation, so myringoplasty should be avoided in younger age.
2. Eustachian tube dysfunction should be corrected before surgery.
3. Symptomatic deviated nasal septum should be corrected before surgery.
4. Since wet graft placement has better result compared to dry graft, wet graft placement is preferred if surgeon is quite comfortable.
5. Surgery is learning graph, so beginner should assist the senior surgeon for atleast 50-75 cases to know the basics of surgery.
6. Anterior and larger perforation should be operated by experienced surgeons.

DECLARATIONS

Funding: *none*
Conflict of interest: *no*
Ethical approval: *yes*

REFERENCES

1. Yung M, Neumann S, Vowler L: A longitudinal study on pediatric myringoplasty. Otology Neurotology. 2007Apr;28(3): 353–55.
2. Lassaletta Atienza L, Villafruela Sanz MA, Ballesteros Garcia A, Granell Naverro J, Alvarez Vincet JJ. Prognostic factors in pediatric myringoplasty. A review of 90 cases. ActaOtorrinolaryngol Esp. (1999) Jan –feb;50(1):1-5.
3. Joao Carlos Ribeiro, Cerejeira Rui, Silvestre Natercia, Romao Jose, Paiva Antonio. Tympanoplasty in children: a review of 91 cases. Auris Nasus Larynx 38 (2011) ,21–25.
4. Joshi RR, Jha AK, Rijal AS, Dhungana A and Shrestha KK. Hearing evaluation after myringoplasty at Nepal medical and teaching hospital. Journal of Nobel Medical College. 2013;2 (3): 36-42.
5. Lee P, Kelly G, Mills RP. Myringoplasty: does the size of the perforation matter? Clinical Otolaryngology Allied Sciences. 2002 oct; 27(5):331–4.
6. 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 otolaryngol.2005Apr, 30(2):115-20.
7. Seidman D: Anterior trans canal tympanoplasty: a novel technique to repair anterior perforations. Otolaryngol, Head Neck Surg. 2008 Feb;138(2):242-45.
8. Warren Y. Adkins, and Benjamin White. Type 1 tympanoplasty: influencing factors. The laryngoscope. July 1984; vol 94(7).pp: 916-918.
9. Fadl FA. Outcome of type-1 tympanoplasty. Saudi Med J. 2003 Jan;24(1):58-61.
10. Bhat NA, Ranit De .Retrospective analysis of surgical outcome, symptom changes, and hearing improvement following myringoplasty. Journal of Otolaryngology. 2000 ; 29(4):229–232.
11. Gersdorff M, Garin P, Decat M, Juantegui M. Myringoplasty: long-term results in adults and children. Am J Otol. 1995 Jul;16(4):532-5.
12. Singh GB, Sidhu TS, Sharma. Tympanoplasty type 1 in children: an evaluative study. Int J PediatrOtorhinolaryngol. 2005Aug; 69(8):1071–1076.
13. Vartiainen E, Nuutinen J. Success and pitfalls in myringoplasty: follow-up study of 404 cases. Am J Otol. 1993May;14(3):301–5.
14. Black JH, Wormald PJ. Myringoplasty-effects on hearing and contributing factors. South African Medical Journal. 1995 Jan; 85(1):41-43.
15. Emir H, Ceylan K, Kizilkaya Z, Gocmen H, Uzunkulaoglu H, Samim E. Success is a matter of experience: type 1 tympanoplasty: influencing factors on type 1 tympanoplasty. Eur Arch Otorhinolaryngol. 2007June; 264(6):595-599.
16. Blanshard J. D., Robson A. K., Smith I, A.R. Maw. A long term view of myringoplasty in children. Journal of laryngology Otology. 1990Oct;104(10):758–762.