



ADVANTAGES OF ENDOSCOPIC ASSISTED MYRINGOPLASTY (EAM) VERSUS MICROSCOPIC ASSISTED MYRINGOPLASTY (MAM).

Dr G. Hari Krishna

Associate Professor, Government Ent Hospital, Andhra Medical College, Visakhapatnam, AP.

Dr T.V.V.Vinay Kumar*

Senior Resident, MIMS Medical College, Nellimarla, Vizianagaram, AP.
*Corresponding Author

KEYWORDS :

AIM OF STUDY

To determine the advantages of endoscope as compared to microscope in myringoplasty surgery

INTRODUCTION

Chronic suppurative otitis media (CSOM) is a long standing infection of a part or whole of the middle ear cleft. CSOM is characterized by ear discharge, a permanent perforation, and impairment of hearing. Statistics shows that in our country, there are about 5 crores of CSOM patients. Corrective surgery of CSOM provides dry ear with the improvement of hearing in the majority of patients. The introduction of endoscopy into middle ear has opened up new opportunities for minimally invasive temporal bone surgery. Endoscopy imaging provides dramatic new vistas to the otologist, and we are just in the early phase of developing the appropriate applications and supporting instrumentation. The endoscope brings the surgeon's view into the depth of operative field and can provide a wide field of view with perspectives not possible with a surgical microscope. Operating microscopes provide magnified images in a straight line extending from the objective lens. Many deep recesses within temporal bone cannot be directly seen without the surgeon taking measures to expand the operative procedure. Endoscopes have an immediate advantage with an inherently wide field of view that extends from the tip of instruments lens. Additional angulation of view is accomplished by placing prisms into the tip. Endoscopes therefore offer the surgeon the capability of wide fields of view with minimal exposure, looking behind the obstructions or overhangs, and peering into recesses with much less requirement for surgical exposure than demanded by conventional techniques. Surgical morbidity and operating time can be substantially reduced.

MATERIALS AND METHODS

The cases for this study were taken from the inpatient cases of the Department of Otorhinolaryngology, for prospective study during January 2017 to October 2017. Thirty cases were taken for the study under each group.

INCLUSION CRITERIA

Patient having small, medium, and large dry central perforation of TM. Patient not having the evidence of active infection of nose, throat, and paranasal sinuses.

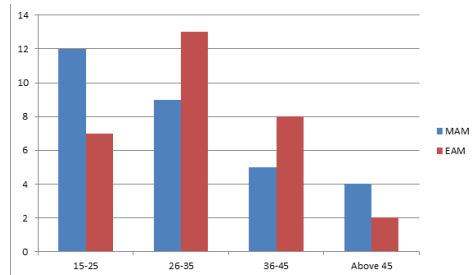
EXCLUSION CRITERIA

Patients having hearing loss of sensorineural type or mixed type. Ossicular abnormality in preoperative or during surgery. Patient with clinical and radiological evidence of atticofacial disease. Patients with a history of the previous surgery for chronic otitis media.

OBSERVATIONS AND RESULTS

TABLE 1: AGE DISTRIBUTION AMONG TWO GROUPS.

AGE	MAM (%)	EAM (%)
15-25	12 (40)	07 (25)
26-35	09 (30)	13 (42)
36-45	05 (17)	08 (26)
Above 45	04 (13)	02 (7)



In microscope-assisted myringoplasty group, it is observed that 12 cases (40%) had an average conductive hearing loss (CHL) of 11–20 dB and 18 cases (60%) had an average CHL of 21–30 dB. Almost 100% of group had an average CHL of range 11–30 dB Postoperatively in the same group after 6 months follow-up, we noticed improvement with decrease in average CHL with 07 cases (25%) having an average between 0 and 10 dB and 19 cases (65%) having an average of 11–20 dB CHL. Almost 90% of postoperative group has an improvement in CHL with average between 0 and 20 dB CHL.

TABLE 2: SEX INCIDENCE

SEX	MAM (%)	EAM (%)
Male	18 (60)	20 (67)
Female	12 (40)	10 (33)

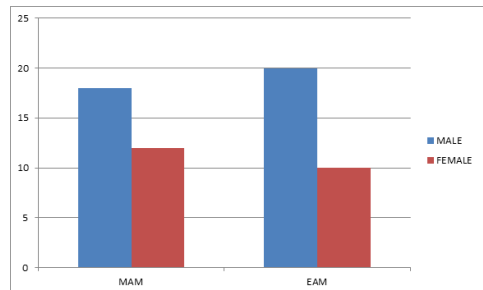


TABLE 3: SIZE OF THE PERFORATION

SIZE OF PERFORATION	MAM (%)	EAM (%)
Small	12 (40)	16 (53)
Medium	15 (50)	12 (40)
Large	03 (10)	02 (7)

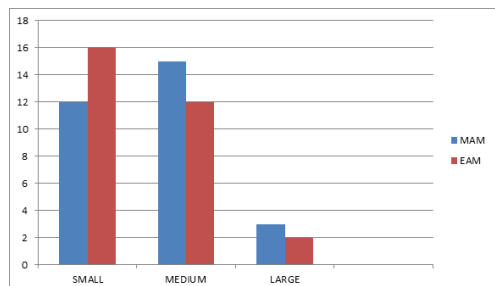
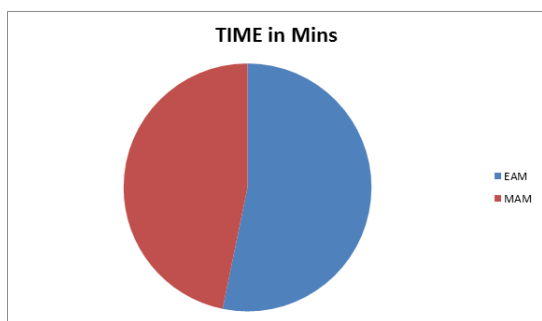


TABLE 4: TIME TAKEN IN MINUTES

EAM	Average 132 Min	Range 90-180 Min
MAM	Average 116 Min	Range 80-150 Min



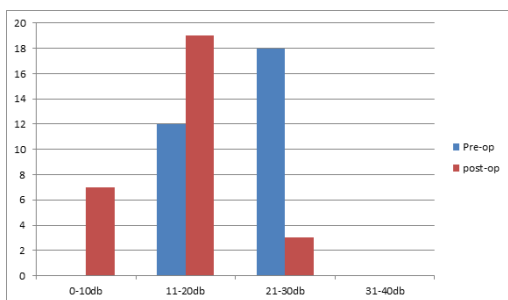
In EAM group, it is observed that 12 cases (40%) had an average CHL of 11–20 dB and 15 cases (50%) had an average CHL of 21–30 dB. Almost 90% of group had an average CHL of range 11–30 dB. Postoperatively in the same group after 6 months follow-up, we noticed improvement with decrease in average CHL with 14 cases (46%) having an average between 0 and 10 dB and 13 cases (44%) having an average of 11–20 dB CHL. Almost 90% of postoperative group has an improvement in CHL with average between 0 and 20 dB CHL.

SUBJECTIVE COSMETIC RESULT

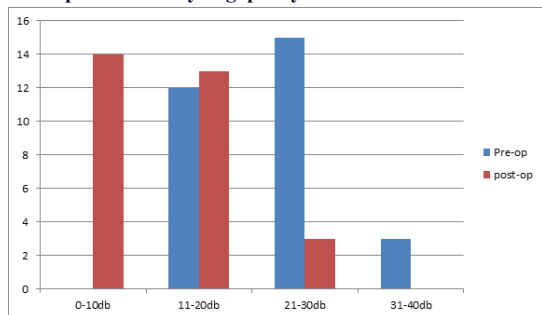
At the end of 6 months, all (100%) patients in the endoscope group rated their cosmetic result as excellent whereas in the microscope group 06 (20%) patients rated their cosmetic result as poor, 15 (50%) rated the cosmetic result as satisfactory, and 9 (30%) patients rated their cosmetic result as excellent. Objective analysis revealed that in endoscope group none (0%) of the patients had a visible scar, whereas in the microscope group, 21 (70%) patients had a visible scar and in 9 (30%) patients, the scar was not visible. 6 months follow-up, 26 (88%) patients had a successful outcome in the endoscope group and 27 (90%) patients had a successful outcome in microscope group.

TABLE 5: AUDIOLOGICAL EVALUATION

Average CHL (dB)	MAM (%)		EAM	
	preoperative	Postoperative	preoperative	Postoperative
0-10	0(0)	7(25)	0(0)	14(46)
11-20	12(40)	19(65)	12(40)	13(44)
21-30	18(60)	3(3)	15(50)	3(10)
31-40	0(0)	0(0)	3(10)	0(0)



Microscope- assisted myringoplasty



Endoscope-assisted myringoplasty to the conventional operating microscope in myringoplasty surgery.

Variations of external auditory canal such as stenosis, tortuosity, bony overhangs, etc., hamper the view of TM when visualized through microscope. Therefore, a need to manipulate the patients head or the microscope repeatedly to visualize all the parts of TM. Sometimes, in spite of manipulation, TM will not be fully visualized, and canaloplasty has to be done. This in turn may increase the operative type. In sharp contrast, the endoscope brings the surgeons eye to the tip of the scope. The wide angle of zero degree scope visualizes the entire TM. There is no need to frequently adjust the patients head or to do canaloplasty thereby saving operative time.

TABLE 6: SUBJECTIVE COSMETIC RESULT

COSMETIC RESULT	EAM	MAM
Poor	0	6
Satisfactory	0	15
Excellent	30	9

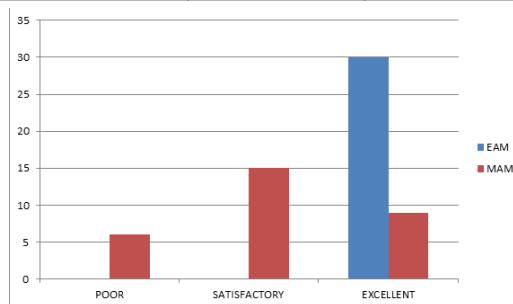
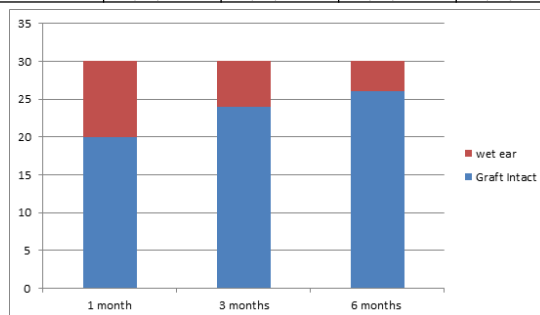
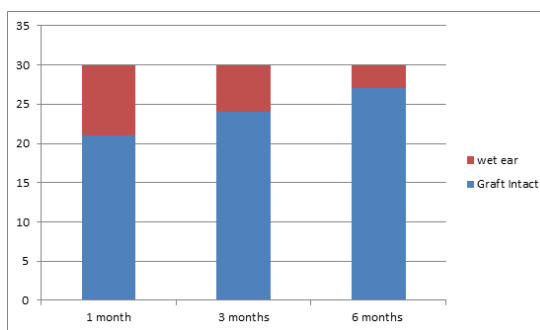


TABLE 7: GRAFT STATUS AND COMPLICATION

	EAM (%)		MAM (%)	
	Graft Intact	Wet ear	Graft Intact	Wet ear
1 month	20(68)	10(32)	21(70)	09(30)
3 months	24(80)	06(20)	24(80)	06(20)
6 months	26(88)	04(12)	27(90)	03(10)



Endoscope-assisted myringoplasty



DISCUSSION

With angled endoscopes, reported that it is possible to visualize other structures such as round window niche, Eustachian tube orifice, incudostapedial joint

By avoiding postaural incision in endoscope group, there is less dissection of normal tissues, less intraoperative bleeding, less

incidence of postoperative pain, and better cosmetic result. Avoiding postaural route also reduces the chance of auricular displacement and asymmetry of pinna. Our observation has found that positioning the graft was much easier and faster with the endoscope as it gives a wide-angled view which includes the entire TM, the graft, and medial end of external auditory canal. Unlike the microscope, the endoscope is easily transportable and hence is ideal for use in ear surgery camps conducted in remote places. Endoscopic ear surgery is one-handed technique. Scope has to be held in one hand, and other hand is free to operate, and this becomes cumbersome when there is excessive bleeding, which can be managed easily in microscope-assisted ear surgery where one hand can be used to suction the blood and simultaneously the other hand can be used to operate. This problem can be solved by developing a stand for endoscope which will fix it in desired position so that both the hands will be free to operate. Another disadvantage of endoscope is that even a small amount of blood can totally obscure the view of operative field. Meticulous hemostasis is therefore a must in endoscopic ear surgery. Arm fatigue by the weight of the scope, neck strain and back ache can be solved by developing a stand for scope. Endoscope provides monocular vision which leads to loss of depth perception compared to the binocular vision provided by microscope, and this will be noticed more by a beginner. Extra care to be taken to ascertain that the graft had been lifted enough to make contact with edges of perforation.

CONCLUSION

The wide angle, telescopic, magnified view of the endoscope overcomes most of the disadvantages of the microscope. In our study, the success rate of EAM was comparable to that of MAM. Regarding cosmetically endoscope produced superior results. Loss of depth perception and one-handed technique are some of the disadvantages of the endoscope that can be easily overcome with practice. Endoscope is ideal for ear surgery camps held in remote places. We feel that endoscope has a definite place in myringoplasty.

REFERENCES

1. Wullstein H. Technic and early results of tympanoplasty. *Monatsschr Ohrenheilkd Laryngorhinol* 1953;87:308-11.
2. Zollner F. Surgical technics for the improvement of sound conduction after radical operation. *Arch Ital Otol Rinol Laringol* 1953;64:455-68.
3. Committee on Conservation of Hearing, American Academy of Ophthalmology and Otolaryngology. Standard classification for surgery of chronic ear disease. *Arch Otolaryngol* 1965;81:204.
4. Hamilton J. Chronic otitis media in childhood. In: Gleeson M, editor. *Scott-Brown's Otorhinolaryngology and Head and Neck Surgery*. London: Hodder Arnold; 2008. p. 929.
5. Fliss DM, Dagan R, Meidan N, Leiberman A. Aerobic bacteriology of chronic suppurative otitis media without cholesteatoma in children. *Ann Otol Rhinol Laryngol* 1992;101:866-9.
6. Sweeny G, Picozzi GL, Browning GG. A quantitative study of aerobic and anaerobic bacteria in chronic suppurative otitis media. *J Infect* 1982;5:47-55.
7. Maji PK, Chatterjee TK, Chatterjee S, Chakrabarty J, Mukhopadhyay BB. The investigation of bacteriology of chronic suppurative otitis media in patients attending a tertiary care hospital with special emphasis on seasonal variation. *Indian J Otolaryngol Head Neck Surg* 2007;59:128-31.
8. Saini S, Gupta N, Aparna, Seema, Sachdeva OP. Bacteriological study of paediatric and adult chronic suppurative otitis media. *Indian J Pathol Microbiol* 2005;48:413-6.
9. Nikakhlagh S, Khosravi AF, Fazlipour A, Safarzadeh M, Rashidi N. Microbiological findings in patients with chronic suppurative otitis media. *J Med Sci* 2008;8:503-6.
10. Tarabichi M. Endoscopic middle ear surgery. *Ann Otol Rhinol Laryngol* 1999;108:39-46.