

Original Article

Surgical Outcomes of Chronic Suppurative Otitis Media

Lt Col Mohammed Sirazul Islam¹, Lt Col Mohammad Delwar Hossain², Lt Col Md Zakir Hossain³, Lt Col Kazi Mostafa Kamal⁴, Md Monjurul Alam⁵

Abstract:

Objectives: The purpose of this study is to observe the surgical outcomes of chronic suppurative otitis media.

1. To assess the result of surgical procedure to obtain dry and safe ears.
2. To assess the hearing levels after surgery.
3. To observe the complications that occur during the operation and in the immediate postoperative period

Methods: A total 60 patients with CSOM (active squamous variety) who underwent tympanomastoid surgery studied in a period of 1 year from July 2013 to June 2014 at CMH Dhaka.

Results: The maximum patients were from 15-24 years (35%) age group, male to female ratio was 1.2:1. Highest number of patients (39%) was from middle class family. All the 60 patients presented with discharge from ear and hearing impairment. Maximum (40%) were with attic and postero-superior marginal perforation along with granulation tissue.

In 1st post op month, 53 (88.33%) manifested dry ear and in 3rd month after operation 52 (90%) patients manifested dry ear. 7 (11.66%) patients showed discharge from the ear after 1st month which decreased to the 0% after 3rd month. Graft was taken successfully in 56 (93.33%) patients after the first month of operation which reduced to 51 (85%) after third month of operation. Hearing status of the patients before operation proclaimed that 48% patients suffered from moderate hearing loss, 22% and 17% patients suffered from mild and moderately severe loss respectively. 13% patients suffered from severe hearing loss

After surgery 86% patients' condition was improved, 4% patients' condition deteriorated and 10% patients' condition remain unchanged.

The mean preoperative air-bone gap was 32.10 dB and mean postoperative air-bone gap was 19.10 dB.

Key Word: COM, Active squamous, Attico-antral, Cholesteatoma, CWDT

-
1. Classified Specialist in Otolaryngology- Head & Neck Surgery, BGB Hospital, Peelkhana, Dhaka.
 2. Classified Specialist in Otolaryngology- Head & Neck Surgery, CMH Dhaka.
 3. Classified Specialist in Otolaryngology- Head & Neck Surgery, CMH Rangpur.
 4. Classified Specialist in Psychiatry, BGB Hospital, Peelkhana, Dhaka.
 5. Professor, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka.

Address of Correspondence: Dr.(Lt Col) Mohammed Sirazul Islam, Department of ENT and Head-Surgery, BGB Hospital, Peelkhana, Dhaka. Mobile No:01711730201

Introduction

Chronic suppurative otitis media has been an important cause of middle ear disease since prehistorical time.¹ It is a worldwide health problem and is still prevalent in the modern antibiotic era.² It is one of the most common ear disease in developing countries.³ Chronic otitis media (COM) is an inflammatory process in the middle ear space that results in long-term, or more often, permanent changes in the tympanic membrane including atelectasis, dimmer (formerly "monomer") formation, perforation, tympanosclerosis, retraction pocket development, or cholesteatoma.⁴

In Bangladesh, chronic otitis media (COM) is a common disease in clinical practice. Poor hygiene, malnutrition, lack of health education and inadequate health care all have been suggestive as a basis for the widespread prevalence of chronic otitis media in our country.⁵ CSOM & its complication are a major health problem in Bangladesh.² Prevalence of CSOM on developing countries represents a wide range- 0.4% to 33.3%. In Bangladesh it's prevalence is 12.44, 7.39.⁶

Hearing loss arising from COM is a matter of serious concern because of its long-term effects on communication, language development and educational process.⁵ An estimated 2/3rd of the world's hearing impaired population are believed to be distributed among developing countries.⁶ In Bangladesh 16.95% of mild to moderate conductive hearing loss in children and young adult was due to CSOM.² The degree of hearing loss varies with size and position of tympanic membrane defect, impairment of ossicular chain and presence of middle ear pathology.⁵

There are many different surgical techniques for managing active squamous COM, which can be categorized as open cavity (canal wall down) and closed cavity (intact canal wall) mastoidectomy. The principle aim of surgery

for active squamous COM (cholesteatoma) is to completely remove disease and minimize the risk of recurrence, but, in addition, the ear should be returned to as near normal as possible. The ear should be self-cleansing and should not require regular aural toilet and the hearing should be restored.⁷ Now, canal wall down tympanoplasty (CWDT) are widely performed, recurrences are reduced in CWDT and hearing outcome is not sacrificed.²

Tympanomastoid surgery is a new method of surgery which is one stage mastoidectomy with tympanoplasty. It has been in a state of constant evolution from the early 1980's. The original technique has gradually been moulded and improved as newer methods of ear surgery.²

The outcome of the surgery depends on diagnosis category of CSOM (with cholesteatoma and without cholesteatoma), pathogenic organisms, extent of mastoid pneumatization, regional factors such as associated mucosal disease of the nose & paranasal sinuses and systemic factors such as diabetes.⁸ Hearing gain after tympanomastoid surgery is 10-25 dB & recurrent rate is 5-71%.⁹

When indicated mastoidectomy might improve tympanoplasty results and prevent graft failure. Relative indications for mastoidectomy during tympanoplasty are a history of profuse otorrhoea especially purulent otorrhoea, a previous tympanoplasty failure, secondary acquired cholesteatoma and severe tympanic membrane that is not respectable without further exposure provided by mastoidectomy.¹⁰ The extent of disease often will determine the aggressiveness of surgery approach.

Aims & Objectives

General Objective

To observe the outcome of surgical management of chronic suppurative otitis media (active squamous variety)

Specific Objectives:

4. To assess the result of surgical procedure to obtain dry and safe ears.
5. To assess the hearing levels after surgery.
6. To observe the complications that occur during the operation and in the immediate postoperative period

Materials & Methods

- Type of study** : Prospective clinical study
- Sampling method** : Simple random sampling.
- Sample size** : 60
- Study population** : CSOM with active squamous disease who Underwent tympanomastoid surgery.
- Study period** : 01 July 2013 to 30 June 2014 (One year)
- Place of study** : Department of Otolaryngology & Head- Neck Surgery, CMH Dhaka

Inclusion criteria:

- 1) Patients with CSOM with active squamous disease who underwent operative treatment.
- 2) Patients more than 5 years & below 50 years of age .

Exclusion criteria:

- 1) Tubotympanic variety of CSOM.
- 2) Patients need revision surgery.
- 3) Patients dropped out from follow up.
- 4) Patient unfit for general anesthesia due to other medical causes.

Data collection:

The data were collected by the active participation of the patients' interview by the

performed proforma of data collection sheet and then data were gathered, decorated & tabulated after data cleaning and edition. Then the results were found and presented in graphical and tabular form. Detail history, physical examination and relevant investigations were done pre-operatively and post-operatively. Post operative follow up after 1 month, 2 months and 3 months were done.

Data analysis:

Data were compiled, analyzed by manual calculator, computer software.

Results

The present study was conducted among the indoor patients of Otolaryngology ward Combined Military Hospital, Dhaka from 1st July 2013 to 30th June 2014 with an ultimate view to observe the outcome of surgical management of active squamous variety of chronic suppurative otitis media (CSOM). Besides, this study also was aimed at to assess the results of surgical procedure to obtain dry and safe ears. The study also tried to assess the hearing levels after surgery as well as the peroperative and immediate postoperative complications.

In this study, 60 patients were selected using the purposive sampling method. Then according to age, sex, educational status , socioeconomic status, area of residence, presenting symptoms, signs, postoperative follow up and surgical outcomes -data were gathered, tabulated, analysed.

Table I
Age distributions of patients (n=60)

SL	Age Group (Years)	No of patients	Percentage
1)	14-5	9	15%
2)	24-15	21	35%
3)	34-25	15	25%
4)	44-35	12	20%
	45d"	3	5%
6)	Total	60	100%

Table-I shows maximum age group between 15-24 years(35%).

Figure I: Sex distribution of study population (n=60)

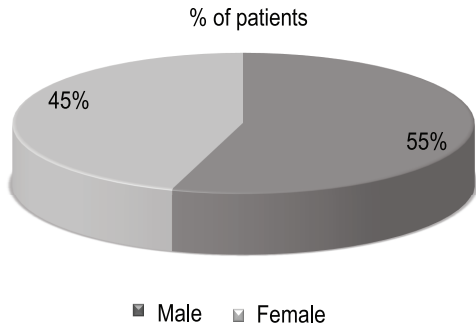


Fig.-1: Shows male prepondance

Table II

Presenting signs of the study population (n=60).

SL Signs	No of Patients	Percentage
1) Attic perforation	40	66.66%
2) Postero- superior marginal Perforation	20	33.33%
3) Discharge	60	100%
4) Granulation Tissue	17	28.33%
5) Aural Polyp	13	21.66%

Table II Shows all patients presented with aural discharge and maximum site incidence of TM perforation in the attic region.

Table III

Post-operative follow up & results (except hearing status) (n=60).

SL	Finding	1st Month after Operation	3rd Month after operation
1)	Dry ear	53 (88.33%)	54 (90%)
2)	Discharging ear	7 (11.66)	6 (10%)
3)	Granulation tissue	0%	0%
	Total	60	100 %

Table III: Shows dry ear achieve 88.33% at 01 month & 90% at 03 months post op.

Fig.-2: Shows improved hearing after surgery in 86% cases.

Fig.-3: Post operative hearing status after 3 months (n=60)

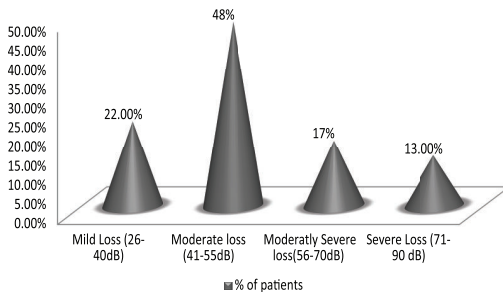


Fig.--2: Hearing status before operations (n=60)

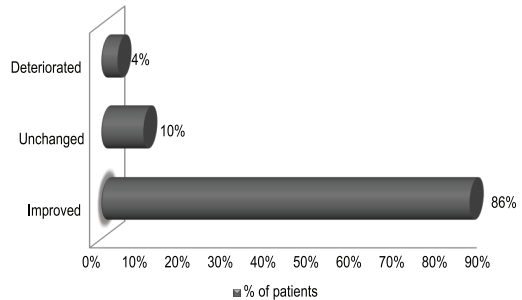


Fig.-3: Showed most of the patients with moderate hearing loss

Table IV

Preoperative and postoperative air- Boneconduction gap and hearing improvement (n=52)

[As 2 patients condition deteriorated and 6patients condition remain unchanged]
conduction gap and hearing improvement(n=52)[
As 2 patients condition deteriorated and 6patients condition remain unchanged]

Preoperative Air	Post Operative Air	Hearing Improvement/
Bone (AB)Gap	Bone (AB) Gap	Closer of AB Gap
Mean (dB)	Mean (dB)	Mean (dB)
AC=52.45dB	AC = 37.35	
BC=18.35dB	BC = 18.25	13dB
AB Gap = 32.10dB	AB Gap=19.10	

Table-IV: shows significant hearing improvement after surgery.

Discussion

In this study 60 cases of CSOM with active squamous disease underwent modified radical mastoidectomy with type-III tympanoplasty and results were assessed in post op follow-up period.

The principle aim of surgery for active squamous COM (cholesteatoma) is to complete removal of disease and minimize the risk of recurrence, but, in addition, the ear should be self-cleansing and should not require regular aural toilet and the hearing should be restored.⁷ Now a days, canal wall down tympanoplasty (CWDT) are widely performed, recurrence are reduced and hearing outcomes not sacrificed.²

CSOM with cholesteatoma is more common among younger age group (11-20 years). The younger age group suffers more as because of cellular mastoid, horizontal position of Eustachian tube and enlarged adenoid². In our study, the highest number of cases belong to the 15-24 years age group (35%) which correlate with other study. The age groups in close proximity to this peak were 25-34 years (25%) and 25-34 years (20%). This may be

due to the main bulk of patients from active military service. This result is commensurate with Shill¹¹ and Islam¹ who has worked in CombinedMilitaryHospital, Dhaka.

In different studies, it was shown that CSOM affected more in male than female^{2, 4,5,6,12,13}. This might be due to increase prevalence of CSOM among the male or it might be simple reflection of overall high male attendance in hospital. Female are also reluctance to come forward for treatment on our country.²² Here, this study showed male (55%) and female (45%) with male & female ratio 1.2:1 which might reflect the overall improved health cautiousness and easy access to the specialist doctor by the patient entitled in CombinedMilitaryHospital

Majority of cases of CSOM with cholesteatoma is more in low socio-economic class worldwide due to overcrowding, poor hygiene, poor sanitation, malnutrition^{2,4,5,6,13}. In my study majority of the patients came from middle class family (65%) and significant number came from poor class family (30%).

Illiterate, day labourer, rural people, who used to take bath in river and ponds are affected more in CSOM^{2,4,5,6}. This reflects that lack of knowledge and awareness about the consequence of the diseases, inadequate

health care facilities, improper practice of hygiene². In my study, only entitled patients to get treatment facilities from Combined Military Hospital were taken. Among these, rural people, primary & secondary high school level educated people, service & house wives and who taking bath in tube well and shower were affected more by CSOM with active squamous disease (cholesteatoma) which differ a little bit with above mentioned studies.

The common clinical symptoms in CSOM with active squamous disease (cholesteatoma) are malodorous scanty aural discharge and impairment of hearing¹⁴. In our study, malodorous scanty aural discharge and impairment of hearing were found in all the cases which correlated with above study. Other variable symptoms were otalgia, fever, headache, facial weakness & vertigo^{2, 14}. In our study the above symptoms were variable in frequency and intensity which consisted with above studies.

The common clinical signs in CSOM with active squamous disease (cholesteatoma) are foul smelling scanty discharge may be with blood stained with attic or marginal perforation in almost all cases^{2, 14}. In our study the foul smelling scanty aural discharge was found in almost all cases, attic perforation in 66.66% cases and marginal perforation in 33.33% cases which also correlated with above studies. Other signs include cholesteatoma pearl, facial palsy, granulation tissue, aural polyp in variable extent.¹⁴

A canal wall down mastoidectomy with Wullstein type-III tympanoplasty was done in 21 cases of CSOM with ossicular erosion resulting the mean hearing gain was 5 dB.⁹ In our study, results of 60 cases of modified radical mastoidectomy with type -III tympanoplasty in CSOM with cholesteatoma was almost similar result of above study.

Lee et al. Palva and Ramsay¹⁵ studied on 261&281 cases and mean hearing improvement were 8.1dB & 8.0dB respectively. In our study, mean hearing improvement was 13 dB which was significant clinically and overall success rate was 86% (52 out of 60). The surgical failure in eight cases (14%) was characterized by evidence of a graft failure at the last follow-up visit. Four patients condition deteriorated in later follow up period and total failure was observed in 8 (14%) patients. Graft failure occurred during the first 4 weeks in 2 of the 8 cases.

The pre-operative mean Air conduction threshold was 48.45 dB and bone conduction was 18.35dB. The pre-operative mean air bone gap was 24.29 dB⁹. In our study, pre-operative mean air conduction was 52.45 dB and bone conduction was 18.35, air bone gap 32.10dB. This result is almost similar to above mentioned study.

Post-operative air conduction was 25-55 dB, mean 39.29 dB, the bone conduction was 15-35 dB, mean 20.23 dB, post-operative air bone gap 10-35 dB, mean 19.29 dB⁹. In our study, air conduction was 37.35 dB, bone conduction was 19.10 dB, and air bone gap was 19.10 dB, which is also correlate with above mentioned study. The mean hearing gain was 5 dB⁹. In our study, mean hearing gain was 13 dB which is significantly higher than the other study.

Ajalloueyar Met al showed hearing improvement better than 40 dB in 42% patients, between 40-60 dB in 39% and 4% patients with poor hearing¹⁶. In another study was shown hearing improved in 30%, remained unchanged in 55% and worsened in 15%. The mean hearing gain was only 5 dB¹⁷. In our study, hearing threshold remained unchanged in 33.33% cases, hearing was improved by 10-19 dB in 86% cases, 20-29 dB in 10% cases and more than 29 dB in 4%

cases. Thus hearing threshold was improved in 86% cases and hearing deterioration occurred in 4% cases.

In post-operative follow-up of patients with CSOM with cholesteatoma, 20-25% patients were discharging ear.¹⁸ In our study, post-mastoidectomy discharging ear was 0% after 3rd month which showed significant better results.

In open cavity mastoidectomy, recurrence of cholesteatoma was 12.8%¹⁹. In our study, recurrence of cholesteatoma was 5% which also showed significantly better results.

Conclusion

Chronic supportive otitis media is a common health hazard in ENT practice all over the world. Cholesteatoma erodes ossicular chain and result in loss of hearing. Hearing loss arising from COM is a matter of serious concern because of its long-term effects on communication, language development and educational process. Early diagnosis and intervention by skilled Otologist is recommended to regain hearing as well as to prevent disability and complications.

References

1. Mills RP. Management of Chronic Suppurative Otitis Media. In: Booth JB. Editor. Scott-Brown's Otolaryngology, 6th ed. Vol-3, Butterworths London, 1997; 3/10/6-8
2. Hossain MA, Sarker MZ, Bhuiyan MAR, Alam KMN, Harun MAA, Hanif MA. Results of Tympanomastoid Surgery in CSOM with Cholesteatoma (Attico-Antral Variety)-A Study of 30 Cases. Bangladesh journal of Otorhinolaryngology 2014;20(1): 20-26.
3. Shenoj PM. Management of Chronic Suppurative Otitis Media. In: Kerr AG, Booth JB, editors. Scott-Brown's Otolaryngology, 5th ed. Butterworths, London, 1987; 215-237.
4. Gopen Q. Pathology and Clinical Course of the Inflammatory Diseases of the Middle Ear. In: Gulya AJ, Minor LB, Poe DS. Editors. Glasscock-Shambaugh's Surgery of the Ear, 6th ed. People's Medical Publishing House-USA; Shelton, Connecticut, 2010. p-427-428.
5. Alam KMN, Ali MI, Huq MM, Hanif MA. Prognostic factors influencing anatomical and functional outcome of Myringoplasty. Bangladesh journal of Otorhinolaryngology 2013;19(1): 18-23.
6. Islam MS, Islam MR, Rahman MA, Bhuiyan MAR, Rashid MS, Datta PG. Pattern and degree of hearing loss in chronic suppurative otitis media. Bangladesh journal of Otorhinolaryngology 2010;16(2): 96-105.
7. Swan IRC, Canter R, McKerrow W. Natural history, Management and Outcomes, Chronic otitis media. In: M Gleeson, editor. Scott-Brown's Otorhinolaryngology, Head and Neck Surgery, vol-3, 7th ed. Hodder Arnold; London, 2008. p-3420-3438.
8. Merchant SN, Wang PC, Jang CH, Glynn RJ, Rauch SD, McKenna MJ, Nadol JB. Efficacy of tympanomastoid surgery for control of infection in active chronic otitis media. Laryngoscope, 1997; 107.872-877.
9. Lasisi, AKeem O. Hearing outcome after canal wall down mastoidectomy and Wullstein type III tympanoplasty: East and central African Journal of surgery, 2007; 12 (12): 44-47.
10. Austin DF. Anatomy of the ear. In: Ballanger JJ, Snow JB, editors. Otolaryngology And Head-Neck surgery. 15th ed. Philadelphia: Williams and Wilkins, 1996: 838-857.

11. Shill, AK. Management of Chronic Suppurative Otitis Media. Dissertation, Bangladesh College of Physicians and Surgeons. 1993.
12. Islam MMT. Outcome Assessment of Surgical Management of Chronic Otitis Media. Dissertation, Bangladesh College of Physicians and Surgeons, 2006.
13. Underbrink M, Cholesteatoma. [http://www.utmb/Grand round](http://www.utmb/Grand%20round) (acc.nov2008)
14. Choudhury MA, Alauddin M. Comparative Study between Tubotympanic and Atticoantral types of chronic suppurative otitis media. Bangladesh Med. Res. Counc. Bull, 2002; 28(1): 36-44.
15. Lee P, Kelly G, Mills RP. Myringoplasty: Does the size of the perforation matter? *Clinical Otolaryngology & Allied Sciences* 2002; 27(5): 331-34
16. Ajalloueyar M, Experience with surgical management of cholesteatomas. *Archives of otolaryngology Head & Neck surgery*, 2006; 132: 931-933.
17. Vartiainen E & Vartiainen J. Hearing results of surgery for acquired cholesteatoma. *Ear Nose Throat J.* 1995 mar; 74(3): 160-164.
18. Browning GG et al. Chronic otitis media. In: M Gleeson, editor. *Scott-Brown's Otorhinolaryngology, Head and Neck Surgery*, vol-3, 7th ed. Hodder Arnold; London, 2008.p -3395-3438.
19. Harkness P, Brown P, Fowler S, Grant H, Ryan R & To pham J. Mastoidectomy audit : results of the Royal college of surgeons of England comparative audit of ENT Surgery, *Clin. OtoLaryngol*, 1995; 20,89-94.