MVP Journal of Medical Sciences, *Vol 1(1), 7–12, January 2014*

Retrospective Study of Clinical Profile of Patients with Chronic Suppurative Otitis Media at a Tertiary Health Centre

Shreeya Kulkarni[1], Kiran S. Burse[2], Devashri Patil[3*], Chaitanya Bharadwaj[4], Vandana Sancheti[4] and K. Manu Bharath[3]

[1]Professor, ENT Department, Dr. Vasantrao Pawar Medical College and Hospital, India; kshreeya@hotmail.com
[2]Professor & HOD, ENT Department, Dr. Vasantrao Pawar Medical College and Hospital, India; ksburse@gmail.com
[3]PG Resident, ENT Department, Dr. Vasantrao Pawar Medical College and Hospital, India; devu_patil15@yahoo.co.in; manukhareedhi@yahoo.co.in
[4]Lecturer, ENT Department, Dr. Vasantrao Pawar Medical College and Hospital, India; chaithanyab@gmail.com, vpsanchethi@gmail.com

Abstract

Introduction: Chronic Suppurative Otitis Media (CSOM) is frequently associated with symptoms of inflammation like discharge from the ear or pain. In many cases, patients suffer from hearing loss causing communication problems and social withdrawal. Tubotympanic type of chronic suppurative otitis media is characterized by a perforation of pars tensa, while marginal & attic perforations are pathognomonic of attico–antral variety. The latter category is usually associated with the presence of cholesteatoma. In cases of cholesteatoma, complications like facial nerve paralysis, meningitis, cerebellar abscess, sigmoid sinus thrombosis may develop and potentially threaten the patient's life. The aim of this study was to retrospectively perform analysis of patients suffering from Chronic Suppurative Otitis Media, visiting our Tertiary Health Centre, Nashik. **Materials and Methods:** This was a retrospective study, conducted in a tertiary care medical college hospital over a period of 5 years. The study group comprised 528 patients in and around Nashik District and were subjected to Tympanoplasty or Mastoid surgery. **Results:** Complete data records from 528 patients were available for statistical analysis. Maximum numbers of patients were in age group 21–40. High prevalence of CSOM was found in females. 408 patients had CSOM of Safe type. 97 patients had CSOM of unsafe type, whereas 23 patients had unsafe CSOM with complications. 381 patients underwent Type 1 Tympanoplasty, while 31 patients underwent Modified Radical Mastoid Surgery. 61 patients were operated for MRM with Tympanoplasty and 28 patients were operated for MRM with Myringostapediopexy. 27 patients were operated for revision tympanoplasty. Different methods of tympanoplasty were performed. Simple underlay was done in 123 patients. Maximum patients about 245 were operated by cartilage support method of tympanoplasty. Anterior tucking was done in 40 patients. Myringostapediopexy was done in 28 patients. Ossiculoplasty with tragal or conchal cartilage was done in 61 patients. Graft was not placed in 31 patients. Temporalis fascia was used in maximum patients. In 90.9% of patients temporalis fascia was used. Fascia Lata was used in 3.2% of patients. **Conclusion:** Retrospective study of patients with CSOM shows: females were affected more than males. Majority of patients were in age group of 21 to 40 years. The reason could be that this age group is socially active and health conscious. 77.3% of patients had safe CSOM while 22.7% of patients had unsafe CSOM. 2.27% of patients had extra–cranial complication, and 2.08% of patients had intracranial complications. 5.1% of patients underwent revision tympanoplasty surgery. Temporal is fascia as a graft material was used for tympanoplasty in maximum patients, and cartilage support method of tympanoplasty was used in majority of patients. Maximum patients were operated in year 2012. This was due to conduction of camps in peripheral areas around Nashik City which shows that CSOM is more common in patients of lower socioeconomic group, overcrowding, sub–standard hygiene and under resourced health care.

Keywords: Chronic Suppurative Otitis Media, Cartilage Tympanoplasty, Modified Radical Mastoidectomy Surgery.

**Author for correspondence*

1. Introduction

CSOM is one of the common otological conditions in India for which patients seek advice from an otorhinolaryngologist. Poverty, illiteracy, poor hygiene, overcrowded living conditions and nutrition are all factors which play an important role in causation of this disease and widespread prevalence of CSOM in developing countries[1].

It is defined as a persistent discharge from the middle ear through a tympanic membrane perforation for more than 12 weeks[2].

CSOM has been classified into Tubo–Tympanic and Attico–Antral disease. Tubo–Tympanic Type of CSOM is characterized by a perforation of pars tensa, while Marginal & Attic perforations are pathognomonic of Attico–Antral variety. The latter category is usually associated with the presence of cholesteatoma[3,4]. The middle ear cholesteatoma, most often acquired than congenital, occurs from the ingrowth of keratinising squamous epithelium from external auditory canal skin to middle ear, through the tympanic membrane[5].

CSOM is associated with significant functional limitations of hearing. This frequently results in communication problems impeding social interaction and professional life[6].

In addition, further symptoms of CSOM such as persistent discharge from the ear, pain, etc., may result in an impairment of the patient's health. In cases of cholesteatoma, complications like facial nerve paralysis, meningitis, cerebellar abscess, sigmoid sinus thrombosis may develop and potentially threaten the patient's life[6]. This study was conducted to know the number of patients with CSOM getting operated and also to know the clinical profile of patients with CSOM, visiting our tertiary health centre of Nashik City.

2. Materials and Methods

Patients were diagnosed as CSOM by detailed history, thorough ear, nose & throat examination. Further, data on age, gender, unilateral or bilateral disease were collected. Clinical examination included general ENT examination, microscopy of the ear, tuning fork test, audiological test and facial nerve examination.

Total number of patients in this study was 528. Patients of all age group were included in this study. In patients with Safe CSOM, Tympanoplasty was performed. In maximum cases, Post Auricular Wildes Incision was taken, while in some cases endaural approach for tympanoplasty was performed. In cholesteatoma cases, 'Canal Wall Up' or 'Canal Wall Down' procedures were performed according to the extension of the disease. For reconstruction of tympanic membrane, we used Temporalis Fascia and in some cases Fascia Lata was used. Different Techniques of tympanoplasty was performed like Underlay, Cartilage Support, and Anterior Tucking. In Unsafe CSOM, graft was placed lateral to handle of malleus in cases of suprastructure of stapes, while in some cases where disease removal from sinus tympani was not possible graft was not placed.

Patients having Unsafe CSOM with complications like mastoid abscess, meningitis, sigmoid sinus thrombosis, and cerebellar abscess etc., their complication were first managed medically or surgically and latter ear surgery was performed.

Data about the study conducted is as follows:

Type of study: Retrospective study

Place of study: Department of Otorhinolaryngology, Head & Neck Surgery, MVPS Dr Vasantrao Pawar Medical College, Nashik.

Period of study: From January 2009 to June 2013.

Study population: Patients of CSOM admitted in Otorhinolaryngology, Head and Neck Surgery, attending in Otology Clinic, MVPS Medical College, Nashik.

Sample size: 528 patients having CSOM.

2.1 Selection of Patients

2.1.1 Inclusion Criteria

1. All patients of CSOM (tubo–tympanic and attico–antral).
2. All patients of CSOM with complications.
3. Revision surgery for CSOM.

2.1.2 Exclusion Criteria

1. Otitis externa.
2. Otosclerosis.
3. Tumours of ear.

3. Results

Figure 1 shows distribution of patients according to their age. Age range was 1 to 70 years. Majority of patients were among the age group 21–30 years, 193(36.6%). 18

patients (3.4%) below 10 years of age were affected by Unsafe CSOM and were operated by Modified Radical Mastoidectomy Surgery.

In this study, 225(42.61%) cases were male and 303 (57.39%) were females. Female to male ratio was 1.34:1 (Table 1).

Figure 2 shows patients with Unsafe CSOM. 97(81%) patients had unsafe CSOM without any complications. Unsafe CSOM with complications like mastoid abscess was seen in 10% of cases, meningitis was seen in 4% of cases, cerebellar abscess was seen in 3.3% of cases, sigmoid sinus thrombosis was seen in 1.6% of cases (Table 2 & Table 3).

Maximum patients operated for Type 1 Tympanoplasty were 381(72.2%). 31(5.8%) patients underwent MRM and graft was not placed in these patients. 61(11.6%) patients underwent MRM with Tympanoplasty. MRM with Myringostapediopexy was done in 28(5.3%) patients. Revision tympanoplasty was done in 27(5.1%) patients (Table 4).

Graft was placed by underlay method in 123(23.3%) patients. 245(48.1%) patients were operated by Cartilage Support Tympanoplasty. Anterior tucking was done in 40(7.5%) patients. While in 28(5.4%) patients graft was placed on suprastructure of stapes. Graft with Ossiculoplasty using cartilage was done in 61(11.6%) patients. Graft was not placed in 31(5.8%) patients. Canal wall up procedure was done in 61 patients and canal wall down procedure in 59 patients (Table 5).

Table 6 shows Temporalis Fascia was used in 480 (90.9%) patients and Fascia lata was used in 17(3.2%). In 31 patients (5.8%) graft was not placed.

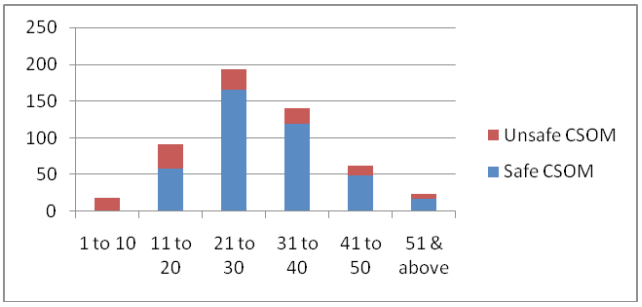

Figure 1. Distribution of patients by age.

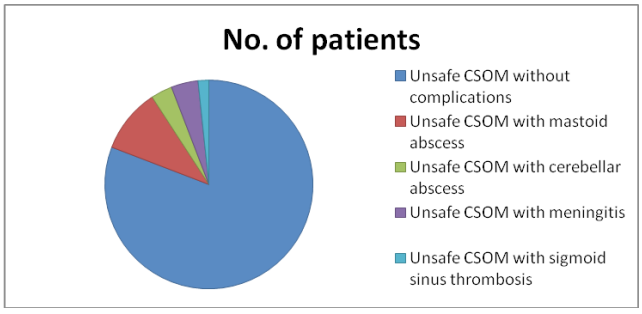

Figure 2. Type of unsafe CSOM.

Table 1. Sex distribution of patients of CSOM

Sex	Safe CSOM	Unsafe CSOM	Total no. of patients
Male	165	60	225 (42.61%)
Female	243	60	303 (57.39%)
Total	408	120	528

Table 2. Types of CSOM

Type of CSOM	Right Ear	Left Ear	Total (%)
Safe CSOM	192	216	408 (77.3%)
Unsafe CSOM	61	59	120 (22.7%)
Total	253	275	528

Table 3. Type of unsafe CSOM

Type of Unsafe CSOM	Right ear	Left ear	Total	Percentage
Unsafe without complications	46	51	97	80.83%
Unsafe CSOM with mastoid abscess	6	6	12	10%
Unsafe CSOM with cerebellar abscess	1	3	4	3.33%
Unsafe CSOM with meningitis	3	2	5	4.1%
Unsafe CSOM with sigmoid sinus thrombosis	1	1	2	1.66%
Total	57	63	120	100

Table 4. Distribution of patients according to type of ear surgery performed

Type of Surgery	No. of Ear operated	Percentage
Type 1 Tympanoplasty	381	72.2%
MRM	31	5.8%
MRM with Tympanoplasty	61	11.5%
MRM with Myringostapediopexy	28	5.3%
Revision Tympanoplasty	27	5.1%
Total	528	100

Table 5. Distribution of patients according to method of tympanoplasty performed

Method of Tympanoplasty	No. of Patients Operated	Percentage
Underlay	122	23.1%
Cartilage support method	245	48.1%
Tucking	40	7.5%
Graft on Suprastructure of Stapes	29	5.4%
Graft with Ossiculoplasty using cartilage	61	11.6%
No Graft placed	31	5.8%
Total	528	100

Table 6. Material used for tympanoplasty

Material used for tympanoplasty	No. of patients operated	Percentage
Temporalis Fascia	480	90.9
Fascia Lata	17	3.2
No graft placed	31	5.8
Total	528	100

Table 7. Type of anaesthesia used for surgery

Type of Anaesthesia	No. of Patients operated	Percentage
Local	374	70.8%
General	154	28.2%
Total	528	100

Table 8. Total number of surgeries performed between 2009–2012

Year	No. of surgeries	Percentage
2009	80	15.2
2010	97	18.3
2011	94	17.8
2012	169	32.0
2013	88	16.7
Total	528	100

Table 8 shows 528 patients operated from 2009 to 2013. Number of patients operated in 2009 was 80. In 2010, 97 patients were operated. In 2011, 94 patients were operated and in 2012, 169 patients were operated for CSOM. In the first six months of 2013, 88 patients have been operated.

4. Discussion

CSOM is an infection commonly associated with poor socio–economic status or poverty related conditions such as malnutrition, overcrowding, substandard hygiene, frequent upper respiratory tract infections, and under–resourced health care[1].

In this series of 528 patients of CSOM, majority of patients were in age group of 21 to 40 years. It was found in a study[3,7,9] that maximum people with CSOM were in the age group of 21–30 years. The reason could be that this age group is socially active and health conscious.

In paediatric patients, CSOM of unsafe type was more common. 18 paediatric patients had unsafe CSOM, out of which 5 had mastoid abscess and 2 had meningitis with unsafe CSOM.

The reported overall extra cranial complication and intracranial complication rates related to CSOM vary from 0.7% to 3.2%. The extra–cranial and intracranial complication rates alone vary from 0.5% to 1.4% and from 0.3% to 2% respectively. The most common extra–cranial complications include facial paralysis, sub periosteal abscess, mastoiditis and labyrinthitis with a reported incidence of 13% to 58%, 40% to 68%, 14% to 74% and 7% to 34% of each extra–cranial complication respectively. The most common intracranial complications are meningitis, cerebral abscess, lateral sinus thrombosis, extradural abscess, otic hydrocephalus and encephalitis with reported incidence of 21% to 72%, 18% to 42%, 2% to 26%, 7% to 16%, 5% to 11% and 2% of each intracranial complication respectively[10].

While in our study of 528 patients of CSOM, 2.27% of patients had extra–cranial complication, and 2.08% of patients had intracranial complications. These

complications were seen in patients with unsafe CSOM. 12 patients had mastoid abscess, 4 patients had cerebellar abscess, 5 patients had meningitis, and 2 patients had sigmoid sinus thrombosis.

In our study, 57.39% were females and 42.61% were males, where females were more affected than males. In the study done by Murat Karaman et al[11] on 100 patients of CSOM, female:male ratio was 1.7:1. Alireza Karimi-Yazdi et al[12] in their study observed, male:female ratio as 1:2. Mohammed Shafiqul Islam et al[3] in their study on 150 patients of CSOM observed 89 cases of males (59.33%) and 61 cases of females (40.67%). In our study, females outnumber males in the ratio of 1.34:1. This was also seen in other studies.

There are a number of materials for closure of tympanic membrane perforations like skin[13], perichondrium[14,15], vein[16], temporalis fascia[17], dura[18] and cartilage[19]. In our institution, temporalis fascia was used as a graft material in maximum patients. In 480(90.9%) patients temporalis fascia was used. In 17(3.2%) patients fascia lata was used. The temporalis fascia is the gold standard graft material for tympanoplasty. Maximum hearing improvement is achieved with temporalis fascia. Temporalis fascia graft has certain advantage like absence of elastic tissue with no problem of shrinkage makes graft take up better and structure of temporalis fascia graft is similar to the missing tunica propria of the tympanic membrane[20]. Jyothi P Dhabolkar et al studied that temporalis fascia achieved a graft take up of 84% and satisfactory hearing improvement in 76% of the patients[21].

In cases of large central perforation, subtotal perforation and anterior quadrant perforation, tragal cartilage was used for tympanoplasty. In this technique a small piece of tragal cartilage cut in a semilunar shape is inserted medial to small anterior margin of tympanic membrane. Temporalis fascia graft is placed between this cartilage support and perforation margin. 245(48.1%) were operated by cartilage method of tympanoplasty. In 40(7.5%) patients graft was placed by anterior tucking method. In this method anterior tympanomeatal flap was elevated. The graft was placed medial to the annulus but lateral to the handle of malleus. Graft was placed by underlay method in 122(23.1%) patients.

In cases where MRM was done, graft was placed depending on the ossicular status. In 61(11.5%) patients graft was placed by underlay, where ossiculoplasty was done using tragal or conchal cartilage and temporalis fascia graft was placed by underlay technique. In 29(5.3%) patients graft was placed directly on the stapes suprastructure. It is called Myringostapediopexy or Columella Tympanoplasty. In 31 patients, MRM was performed and graft was not placed, these patients were advised second stage surgery for ossicular reconstruction and hearing improvement.

In 27 patients revision tympanoplasty was done. Revision tympanoplasty is done in cases where previous tympanoplasty is failed and patients had re–perforation of tympanic membrane. The specific causes of failure in tympanoplastic surgery are varied and not easily classified. In case of certain bacterial infections with organisms resistant to antibiotics, ears will continue to suppurate in spite of radical temporal bone surgery. Proteus vulgaris are particularly most difficult to handle. There may be atrophy or deficiency of middle ear mucosa. Patients having eustachian tube dysfunction are also prone to failure[22].

In our institution, tympanoplasty is done under local anaesthesia, while MRM is done under general anaesthesia. 374(70.8%) patients were operated under local anaesthesia while 154(28.2%) patients were operated under general anaesthesia (Table 7).

Maximum surgeries were performed in the year 2012 which consisted of 169 ear surgeries. This may be because the study was conducted in the peripheral areas around Nashik city in 2012, where maximum patients were reported to be suffering from CSOM. In 2009, 2010, 2011 and 2013, 80, 97, 94 and 88 ear surgeries were performed respectively.

5. Conclusion

Our study shows us that females are more affected than males. Most common age group affected by CSOM was between 21 to 40 years. Maximum patients in pediatric age group are affected by unsafe CSOM and also complications of CSOM are seen more frequently in this age group. Temporalis fascia as a graft material shows good success rate and used in maximum patients in our study. Maximum patients were operated in the year 2012 because of camps in peripheral areas. This shows us that CSOM is more common in patients of lower socioeconomic group, overcrowding, sub-standard hygiene and under resourced health care.

6. References

1. Maharjan M, Kafle P, Bista M, Shrestha S, Toran KC. Observation of hearing loss in patients with chronic

suppurative otitis media tubotympanic type. Kathmandu Univ Med J. 2009 Oct–Dec; 7(28):397–401.
2. Tong MCF, Van Hasselt CA. Scott-Brown's Otorhinolaryngology Head and Neck Surgery. 7th ed. London: Edward Arnold; 2008. Chapter 237, Otitis media with effusion in adults; p. 3388–93.
3. Islam MS, Islam MR, Rahman Bhuiyan MA, Rashid MS, Datta PG. Pattern and degree of hearing loss in chronic suppurative otitis media. Bangladesh J Otorhinolaryngol. 2010; 16(2):96–105.
4. Rupa V, Jacob A, Joseph A. Chronic suppurative otitis media: prevalence and practices among rural south Indian children. Int J Paediatr Otorhinolaryngol. 1999 May 25; 48(3):217–221.
5. Santosh UP, Siddalingappa SM, Mathew S, Bhat V, Janardhan D. A study of the correlation of the clinical features, radiological evaluation and operative findings in chronic suppurative otitis media with cholesteatoma. Otolaryngol Head Neck Surg. 2011 April; 8(1):17–19.
6. Baumann J, Gerendas B, Plinkert PK, Praetorius M. General and disease–specific quality of life in patients with chronic suppurative otitis media–a prospective study. Health Qual Life Outcomes. 2011 June 29; 9:48.
7. Alam J, Udaipurwala IH, Jailisi M. Surgical management of CSOM: experience at civil hospital, Karachi. Pak J Otolaryngol. 2000; 16:36–39.
8. Memon MA, Matiullah S, Ahmed Z, Marfani MS. Frequency of un–safe chronic suppurative otitis media in patients with discharging ear. J Liaqat Uni Med Health Sciences. 2008 May–August; 7(2):102–105.
9. Lin YS, Lin LC, Lee FP, Lee KJ. The prevalence of chronic otitis media and its complication rates in teenagers and adult patients. Otolaryngol Head Neck Surg. 2009 Feb; 140(2):165–170.
10. Karaman M, Tek A. Does middle ear pathologies have relationship with hearing level in chronic suppurative otitis media? Medical journal of Umraniye. 2009; 2(3–4):99–110.
11. Yazdi AK, Saedi B, Fayezizadeh M, Seifmanesh H. Association between audiometric profile and intraoperative findings in patients with chronic suppurative otitis media. Iranian Journal of Otorhinolaryngology. 2011; 23(2):37–42.
12. Berthold E. Uber Myringoplastic. Med–chir central. 1879; 14:195–207.
13. Goodhill V. Articulated polyethylene prosthesis with perichondrial graft in stapedectomy. Rev Laryngol Otol Rhinol (Bord). 1961 May–Jun; 82:305–320.
14. Linde RE. The cartilage–perichondrium graft in the treatment of posterior tympanic membrane retraction pockets. Laryngoscope. 1973 May; 83(5):747–753.
15. Tabb HG. Closure of perforations of the tympanic membrane by vein grafts: a preliminary report of 20 cases. Laryngoscope. 1960; 70:271–286.
16. Storrs L. Myringoplasty with the use of fascia grafts. Arch Otolaryngol. 1961; 74:45–49.
17. Yetiser S, Tosun F, Satar B. Revision myringoplasty with solvent–dehydrated human mater. Otolaryngol Head Neck Surg. 2001 May; 124:518–21.
18. Heermann J, Heermann H, Kopstein E. Fascia and cartilage palisade tympanoplasty. Arch Otolaryngol. 1970; 91:228–41.
19. Sing BJ, Sengupta A, Das S, Ghosh D, Basak B. A comparative study of different graft materials used in myringoplasty. Indian J Otolaryngol Head Neck Surg. 2009 Apr–Jun; 61(2):131–134.
20. Dabalkar JP, Vora K, Sikdar A. Comparative study of underlay tympanoplasty with temporalis fascia and tragal perichondrium. Indian J Otolaryngol Head Neck Surgery. 2007 Apr–Jun; 59(2):116–119.
21. Finerman WB. Causes of failure in tympanoplasty. J Natl Med Assoc. 1964 Mar; 56(2):136–138.