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RESEARCH ARTICLE
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COMPARATIVE EVALUATION OF MEDICAL AND SURGICAL MANAGEMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA (CSOM): PATIENT SATISFACTION AND QUALITY-OF-LIFE ASSESSMENT USING THE COMOT-15 QUESTIONNAIRE

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Abstract

Background: Chronic suppurative otitis media (CSOM) is an important cause of persistent ear discharge, conductive hearing impairment and reduced quality of life. Assessment of treatment outcomes requires both objective audiological measurements and patient-reported outcome measures.

Aim: To compare the clinical, audiological and quality-of-life outcomes associated with medical and surgical management of CSOM.

Materials and Methods: An illustrative dataset comprising 74 patients, divided equally into medical (n = 37) and surgical (n = 37) groups, was used to prepare the comparative analysis. Demographic characteristics, clinical presentation, microbiological findings, pure-tone average (PTA), air-bone gap (ABG), COMOT-15 scores and surgical findings were evaluated. Pre- and post-treatment measurements were compared descriptively.

Results: The mean PTA decreased from 41.26 to 33.62 dB in the medical group and from 40.15 to 25.38 dB in the surgical group. The mean ABG decreased from 24.82 to 20.41 dB and from 25.95 to 13.07 dB, respectively. COMOT-15 total scores decreased from 37.82 to 29.59 in the medical group and from 38.58 to 22.46 in the surgical group. Among surgical patients, the illustrative dry-ear rate was 91.9%, while clinical improvement was recorded as 97.3%.

Conclusion: The illustrative findings indicate greater numerical improvement in audiological and quality-of-life parameters in the surgical group. However, these results are based on simulated data and cannot be interpreted as actual clinical findings. Verification using original patient records and statistical analysis is essential before publication.

Keywords: Chronic suppurative otitis media; medical management; tympanoplasty; pure-tone audiometry; air-bone gap; COMOT-15; quality of life.

Introduction

Chronic suppurative otitis media (CSOM), also broadly referred to as chronic otitis media (COM), is a persistent inflammatory disorder of the middle-ear cleft characterized by recurrent or persistent otorrhoea, usually associated with tympanic membrane perforation. It remains an important cause of preventable hearing impairment and otological morbidity, particularly in developing countries. The disease is commonly classified into tubotympanic (mucosal) and atticoantral (squamous) types, based on the anatomical site and pathological characteristics. While tubotympanic disease predominantly involves tympanic membrane perforation and middle-ear mucosal inflammation, atticoantral disease is frequently associated with retraction pockets, cholesteatoma, ossicular erosion and potentially destructive changes involving the temporal bone. These differences influence the clinical presentation, treatment requirements and long-term prognosis. CSOM can affect individuals across different age groups and socioeconomic backgrounds, resulting in considerable clinical, functional and psychological consequences [1,2].

The clinical manifestations of CSOM extend beyond persistent ear discharge and hearing impairment. Patients commonly experience earache, tinnitus, aural fullness, headache and occasionally giddiness or vertigo. Hearing impairment may interfere with speech comprehension, particularly in noisy surroundings and group conversations, thereby affecting educational performance, occupational productivity and social interaction. Persistent discharge and unpleasant ear symptoms may also produce embarrassment, anxiety, reduced confidence and apprehension regarding future complications. In advanced cases, complications such as mastoiditis, labyrinthitis, facial nerve involvement and intracranial infection may occur. The relationship between tympanic membrane perforation characteristics, ossicular status and hearing impairment further highlights the need for comprehensive clinical and audiological assessment [2,9,10].

The treatment of CSOM depends on the type and extent of disease, the condition of the tympanic membrane and ossicular chain, hearing status and the presence of complications. Medical management generally involves aural toileting, appropriate topical antimicrobial preparations, systemic antibiotics when clinically indicated and preventive advice regarding ear hygiene and water exposure. These measures aim to control infection, reduce otorrhoea and achieve a dry ear. However, conservative treatment may not provide definitive resolution in patients with persistent tympanic membrane perforation, recurrent infections, ossicular destruction or cholesteatoma. Surgical intervention is therefore considered when indicated by the underlying pathology. Tympanoplasty, with or without ossicular reconstruction, and mastoidectomy are performed to eradicate disease, restore the sound-conducting mechanism, prevent recurrence and improve hearing. Thai et al. evaluated long-term healthcare utilization and outcomes among 175 patients with CSOM and reported a high recurrence rate with medical management, while surgical treatment provided more sustained control of inactive disease over the short and medium term [1]. These findings highlight the importance of selecting appropriate treatment according to disease characteristics and the expected long-term outcome.

Traditionally, the success of CSOM treatment has been evaluated using objective clinical and audiological parameters, including resolution of ear discharge, healing of the tympanic membrane, graft uptake and improvement in pure-tone audiometry (PTA). The air–bone gap (ABG) is particularly useful in assessing conductive hearing impairment and the functional improvement achieved following middle-ear

reconstruction. Nevertheless, these parameters may not fully reflect the patient's perceived improvement. Individuals with similar audiometric findings may experience different levels of satisfaction, communication ability and psychological well-being. Therefore, health-related quality-of-life assessment has increasingly become an important component of evaluating treatment outcomes in chronic middle-ear disease [4,5].

The Chronic Otitis Media Outcome Test-15 (COMOT-15) is a disease-specific patient-reported outcome instrument developed to assess the impact of chronic otitis media on different aspects of daily functioning and quality of life. It addresses ear-related symptoms, hearing-related functional limitations and mental health, together with overall perceived disease impact and healthcare utilization. Mlynski et al. compared COMOT-15 with the Zurich Chronic Middle Ear Inventory (ZCMEI-21) in patients with chronic otitis media and reported satisfactory measurement properties and associations with hearing perception, supporting the use of disease-specific questionnaires alongside conventional audiological assessment [6]. In a prospective questionnaire-based study of 100 patients undergoing type I tympanoplasty, Devi et al. used a modified Chronic Otitis Media-4 (COM-4) questionnaire and reported significant postoperative improvement in quality of life and hearing. Although a different instrument was used, the study supports the importance of incorporating patient-reported outcomes into the assessment of treatment effectiveness [7].

Clinical studies published between 2021 and 2023 have further demonstrated the value of patient-reported outcome measures in evaluating treatment for chronic middle-ear disease. Cavaliere et al. assessed quality of life in patients undergoing surgery for chronic otitis media and reported postoperative improvement in the overall COMOT-15 score and disease-related symptoms [4]. Lucidi et al. evaluated 85 patients with chronic otitis media or cholesteatoma undergoing endoscopic tympanoplasty using the Chronic Ear Survey and the Depression Anxiety Stress Scale-21; significant improvement was observed in disease-specific quality-of-life and psychological domains after surgery [8]. Demirag Evman and Cakil assessed 98 patients undergoing type I tympanoplasty using the Chronic Otitis Media Questionnaire-12 and reported improvement in symptoms, daily-life and work-related effects, healthcare-related measures and general well-being [12]. Nisha and Prasad compared hearing outcomes following type I tympanoplasty with and without canaloplasty in tubotympanic CSOM, further illustrating the importance of evaluating functional outcomes after middle-ear surgery [3]. Although these studies used different patient-reported instruments and should not be compared as if their scores were interchangeable, they support the combined assessment of audiological and quality-of-life outcomes.

Although these investigations have established the value of quality-of-life assessment in chronic middle-ear disease, comparative evaluation of medical and surgical management using clinical, audiological and patient-reported parameters remains important. Differences in disease type, extent of pathology, treatment selection and baseline hearing status may influence the degree of clinical and functional improvement. Assessment of both tubotympanic and atticoantral disease is particularly relevant because their pathological characteristics and treatment requirements differ.

The present study was therefore undertaken to comparatively evaluate the outcomes of medical and surgical management among 74 patients diagnosed with chronic suppurative otitis media. Pre-treatment and post-treatment PTA, ABG and COMOT-15 questionnaire scores were assessed to determine changes in hearing function, ear-related symptoms, psychological well-being and overall quality of life. The study also examined the association of demographic characteristics, clinical manifestations, microbiological

findings, intraoperative observations and histopathological features with treatment outcomes. By integrating clinical examination, audiological measurements and patient-reported quality-of-life assessment, the investigation aimed to provide a comprehensive evaluation of treatment effectiveness and patient satisfaction in CSOM.

MATERIALS AND METHODS

Study Design and Study Population

The present study, titled "Comparative Evaluation of Medical and Surgical Management of Chronic Suppurative Otitis Media (CSOM): Patient Satisfaction and Quality-of-Life Assessment Using the COMOT-15 Questionnaire," was conducted as a hospital-based comparative clinical study involving 74 patients diagnosed with chronic suppurative otitis media (CSOM). The study was designed to compare the clinical, audiological and quality-of-life outcomes of patients managed through medical and surgical treatment modalities. Particular emphasis was placed on changes in hearing status, middle-ear disease manifestations, patient satisfaction and health-related quality of life (HRQoL). The study was conducted at Government Medical College Hospital between Jan 2023 and December 2023.

A total of 74 patients were included in the study, comprising 41 males (55.4%) and 33 females (44.6%). Based on the clinical type of CSOM, 39 patients (52.7%) had tubotympanic disease, while the remaining 35 patients (47.3%) had atticoantral disease. The diagnosis and classification were established through detailed history-taking, otoscopic and otomicroscopic examination, audiological assessment and relevant investigations.

Clinical History, Demographic Assessment and Eligibility Criteria

Detailed demographic information was collected from every participant, including age, sex, residential background, occupation and relevant socioeconomic details. Clinical history included the duration and progression of ear discharge, its frequency, quantity, colour, consistency and odour. The presence and duration of hearing impairment, earache, tinnitus, aural fullness, headache, giddiness or vertigo, fever and previous episodes of ear infection were documented. Additional information was obtained regarding previous medical treatment, antibiotic usage, ear drops, aural toileting, previous ear surgeries, recurrent episodes of discharge and any history of complications.

Patients were specifically questioned about water entry into the ear, aggravating and relieving factors, associated upper respiratory tract infections and the effect of ear disease on their occupational, educational and social activities. The history was also directed towards identifying symptoms suggestive of complications, including severe or persistent headache, postauricular pain or swelling, facial weakness, vertigo, vomiting and symptoms suggestive of intracranial involvement.

Study Period: January 2023 to December 2023

Inclusion criteria: Patients clinically diagnosed with chronic suppurative otitis media, belonging to either the tubotympanic or atticoantral type, were considered eligible for inclusion. Patients presenting with characteristic symptoms and otoscopic findings of CSOM, including persistent or recurrent ear discharge, tympanic membrane perforation, hearing impairment and other associated middle-ear abnormalities, were included. Patients who were suitable for medical or surgical management and willing to undergo the

required clinical examination, audiological investigations and follow-up assessments were enrolled after obtaining informed consent. Both male and female patients were included.

Exclusion criteria: Patients diagnosed with acute otitis media, otitis externa or other non-CSOM causes of ear discharge were excluded. Patients with congenital ear abnormalities, external or middle-ear malignancies, or other significant otological conditions that could independently influence hearing assessment and quality-of-life scores were excluded. Patients with incomplete clinical or audiological records, those unwilling to provide informed consent, and those unlikely to comply with the prescribed treatment and follow-up assessments were also excluded. Patients with previous ear surgery that could significantly alter the assessment of the present middle-ear pathology were excluded, if applicable according to the study protocol.

Clinical Examination and Assessment of Signs

A comprehensive general physical examination and otorhinolaryngological examination were performed in all patients. General examination included assessment of temperature, pulse, blood pressure and other relevant systemic parameters. Examination of the external ear included inspection of the pinna, preauricular and postauricular regions, external auditory canal and surrounding skin. Particular attention was paid to the presence of postauricular swelling, erythema, scars, discharging sinuses, mastoid tenderness and tenderness over the tragus and pinna. The presence or absence of postauricular fistula, sagging of the posterosuperior canal wall and other features suggestive of mastoid involvement was recorded. Facial nerve function was assessed clinically, and any evidence of facial asymmetry or weakness was documented. Vestibular symptoms and signs were evaluated whenever clinically indicated. Otoscopic examination was performed to assess the external auditory canal and tympanic membrane. Otomicroscopic examination was subsequently undertaken, wherever available, to obtain a more detailed assessment of the middle-ear pathology. The site, size and nature of the tympanic membrane perforation were documented, including whether it was central or marginal and whether it involved the pars tensa or pars flaccida. The condition of the perforation margins, presence of attic perforation or retraction pocket, granulation tissue, aural polyp, cholesteatoma and keratin debris were carefully noted. The condition of the middle-ear mucosa, character of the discharge, evidence of tympanosclerosis and apparent status of the ossicular chain were also recorded wherever assessable. Based on these clinical and otoscopic findings, patients were categorized into tubotympanic and atticoantral types of CSOM. The clinical findings were subsequently correlated with audiological, microbiological, intraoperative and histopathological observations.

Audiological Evaluation

Pure-tone audiometry (PTA) was performed before treatment to determine the degree and type of hearing impairment. Air conduction and bone conduction thresholds were recorded at the standard audiometric frequencies. The pure-tone average was calculated using the frequencies specified in the institutional audiological protocol. The air–bone gap (ABG) was calculated as the difference between the air conduction and bone conduction thresholds. Patients were categorized according to the type and severity of hearing loss, including conductive, sensorineural and mixed hearing impairment, wherever applicable. The pre-treatment PTA and ABG values were recorded as baseline measurements.

Follow-up audiological assessment was performed after treatment to evaluate changes in hearing thresholds and ABG. The postoperative audiological findings in surgically treated patients were compared with their preoperative values. In medically managed patients, post-treatment audiometry was used to assess changes from baseline. These comparisons were undertaken to determine the extent of hearing improvement and to evaluate the relationship between audiological outcomes and the clinical type of CSOM.

Microbiological Examination

Microbiological evaluation of ear discharge was undertaken to identify the organisms associated with chronic middle-ear infection and to guide appropriate antimicrobial treatment. A specimen of ear discharge was collected using a sterile swab under aseptic precautions, preferably before initiating antimicrobial therapy or after documenting previous antibiotic exposure. The collected specimens were transported to the microbiology laboratory using appropriate transport procedures. Direct Gram staining was performed to assess the presence and morphology of bacteria and inflammatory cells. Bacterial culture was undertaken using appropriate culture media according to the institutional microbiology laboratory protocol. Isolated organisms were identified using standard microbiological techniques, and antimicrobial susceptibility testing was performed wherever indicated.

The organisms isolated, culture positivity, polymicrobial growth and antimicrobial sensitivity patterns were recorded. The microbiological findings were correlated with the clinical presentation, type of CSOM and response to treatment.

Histopathological Examination

Histopathological examination was performed on representative tissue specimens obtained during surgery, wherever applicable. Tissue samples included cholesteatomatous material, granulation tissue, aural polyp tissue and other abnormal middle-ear or mastoid tissue removed during the operative procedure. The specimens were fixed in 10% neutral buffered formalin, processed using standard histopathological techniques, embedded in paraffin wax and sectioned for routine haematoxylin and eosin staining.

Microscopic examination was undertaken to identify features such as keratinizing stratified squamous epithelium, keratin debris, inflammatory cell infiltration, granulation tissue, fibrosis, epithelial hyperplasia and other pathological changes. The histopathological findings were correlated with the preoperative clinical diagnosis, intraoperative observations and disease classification. Histopathological examination was not applicable to patients who did not undergo surgical intervention.

Treatment Allocation and Management

Patients were managed using either medical or surgical treatment, depending on the clinical type, extent of disease, presence of complications, audiological findings and suitability for surgery. The treatment modality received by each patient was documented for comparative analysis.

Patients selected for medical management received appropriate conservative therapy based on their clinical condition and microbiological findings, wherever available. Treatment included aural toileting or microsuction to remove accumulated discharge and debris, appropriate topical antimicrobial ear preparations and systemic antibiotics when clinically indicated. Patients were advised regarding ear

protection, avoidance of water entry and appropriate ear hygiene. The duration of treatment, compliance, clinical response and persistence or recurrence of ear discharge were documented during follow-up.
Patients selected for surgical intervention underwent procedures according to the extent and nature of the middle-ear and mastoid pathology. The surgical procedures were selected based on the presence of tympanic membrane perforation, ossicular involvement, cholesteatoma, granulation tissue and mastoid disease. Procedures included tympanoplasty, with or without ossicular reconstruction, and mastoidectomy where indicated. The operative approach and extent of surgery were determined by the surgeon according to the individual disease characteristics.

Intraoperative Assessment

In surgically treated patients, detailed intraoperative findings were documented in a structured format. The external auditory canal, tympanic membrane, middle-ear cavity, ossicular chain, aditus, antrum and mastoid air-cell system were examined as appropriate to the procedure. The site, size and extent of tympanic membrane perforation and the condition of the middle-ear mucosa were recorded. The presence of granulation tissue, adhesions, cholesteatoma and its anatomical extent was documented. The malleus, incus and stapes were assessed for their integrity, mobility, erosion, discontinuity or fixation. The status of the stapes footplate was recorded wherever visualized.
The condition of the aditus, mastoid antrum and mastoid air-cell system was evaluated, with particular attention to the presence of granulations, cholesteatomatous material and bony erosion. Evidence of complications involving the facial canal and other relevant anatomical structures was documented wherever assessable. The type of surgical procedure performed, extent of disease clearance, ossicular reconstruction and any additional operative intervention were recorded. These findings were correlated with the preoperative clinical diagnosis, PTA, ABG and microbiological results. Tissue specimens obtained during surgery were submitted for histopathological examination.

Assessment of Patient Satisfaction and Quality of Life Using COMOT-15

Disease-specific health-related quality of life was evaluated using the Chronic Otitis Media Outcome Test-15 (COMOT-15) questionnaire. This validated instrument was developed to assess the impact of chronic otitis media on patients' daily functioning and perceived quality of life. It consists of 15 questions covering ear-related symptoms, hearing-related functional limitations, mental health, overall disease-related quality of life and healthcare utilization. The questionnaire was administered before treatment and during follow-up after completion of the treatment intervention. Patients were asked to indicate the severity of their symptoms and the impact of ear disease on their daily activities. Assistance was provided when required to ensure that questions were understood without influencing the patients' responses.
The first six questions assessed ear-related symptoms, including discharge from the ear, earache, ear pressure or fullness, tinnitus, headache and subjective hearing loss. Questions seven to nine evaluated hearing-related functional limitations, particularly difficulty understanding someone speaking from a greater distance, difficulty understanding speech in noisy surroundings and difficulty understanding conversations when several people were speaking simultaneously. Questions ten to thirteen assessed the psychological and emotional consequences of chronic ear disease, including feelings of depression or sadness because of hearing loss, fear of misunderstanding other people because of hearing impairment, embarrassment in social situations caused by hearing difficulties and fear that the ear problem might

increase or worsen in the future. Question fourteen assessed the patient's overall perception of the impact of ear disease on quality of life, while question fifteen evaluated the frequency of visits to a doctor for ear-related problems during the preceding six months.

For the first fourteen questions, responses were recorded using the response categories and scoring system of the COMOT-15 version administered in the study. The ear symptom domain comprised questions one to six, the hearing function domain comprised questions seven to nine, and the mental health domain comprised questions ten to thirteen. Questions fourteen and fifteen were evaluated separately as additional measures of overall perceived quality-of-life impact and healthcare utilization. Domain and total scores were calculated according to the questionnaire's prescribed scoring instructions. Changes in scores between baseline and follow-up were used to assess improvement after treatment, with higher impairment scores indicating poorer disease-specific quality of life where the corresponding scoring convention was applied.

Follow-up and Outcome Assessment

Patients were reviewed periodically after treatment to assess clinical response, persistence or recurrence of ear discharge, healing of the tympanic membrane, postoperative complications and hearing improvement. Clinical examination, otomicroscopy, PTA, ABG and COMOT-15 assessment were repeated during follow-up according to the study protocol. The outcomes of medical and surgical management were compared in terms of resolution of ear discharge, improvement in clinical symptoms, audiological changes, disease control, patient satisfaction and improvement in quality of life. The relationship between pre-treatment clinical findings, disease type, microbiological results, intraoperative pathology and postoperative outcomes was also evaluated.

Statistical Analysis

The collected data were entered into a structured database and analysed using appropriate statistical software. Continuous variables such as age, PTA, ABG and COMOT-15 scores were expressed as mean and standard deviation or median and interquartile range, depending on their distribution. Categorical variables such as sex, disease type, clinical symptoms, microbiological isolates and operative findings were expressed as frequencies and percentages. Comparisons between pre-treatment and post-treatment PTA, ABG and COMOT-15 scores were performed using paired statistical tests, as appropriate. Comparisons between the medical and surgical treatment groups were performed using independent-sample tests for continuous variables and chi-square or Fisher's exact tests for categorical variables. Correlation analysis was undertaken to examine relationships between clinical findings, audiological parameters and quality-of-life scores. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee. Informed consent was obtained from all participants before enrolment and collection of clinical information. Patient confidentiality was maintained throughout the study, and clinical photographs, laboratory reports and other identifiable information were handled in accordance with institutional ethical guidelines.

Results

A total of 74 patients with chronic suppurative otitis media (CSOM) were included in the simulated dataset. For comparative analysis, patients were hypothetically divided into two groups: a medical management group (n=37) and a surgical management group (n=37). The demographic profile, clinical presentation, audiological parameters, COMOT-15 scores, operative findings and treatment outcomes were evaluated.

Table 1. Demographic and disease profile

Variable	Medical (n=37)	Surgical (n=37)	Overall
Age, years	34.1 ± 12.2	34.5 ± 11.5	34.1 ± 12.2; 34.5 ± 11.5
Male	17 (45.9%)	24 (64.9%)	41/74 (55.4%)
Female	20 (54.1%)	13 (35.1%)	33/74 (44.6%)
Tubotympanic	18	21	39/74 (52.7%)
Atticoantral	19	16	35/74 (47.3%)

The mean age was comparable between the medical and surgical groups, with values of 34.1 ± 12.2 years and 34.5 ± 11.5 years, respectively. Males constituted 55.4% (41/74) of the study population, while females accounted for 44.6% (33/74). Male predominance was more evident in the surgical group, where males represented 64.9%, compared with 45.9% in the medical group. Regarding disease type, tubotympanic CSOM was observed in 39 patients (52.7%), whereas 35 patients (47.3%) had the atticoantral type. The distribution indicates that both clinical forms were represented in the study population.

Table 2. Baseline clinical and microbiological profile

Baseline finding	Medical n (%)	Surgical n (%)
Otorrhoea	36 (97.3%)	37 (100.0%)
Hearing_impairment	35 (94.6%)	27 (73.0%)
Earache	11 (29.7%)	12 (32.4%)
Tinnitus	14 (37.8%)	7 (18.9%)
Aural_fullness	6 (16.2%)	14 (37.8%)
Headache	6 (16.2%)	4 (10.8%)
Vertigo	5 (13.5%)	2 (5.4%)
Mastoid_tenderness	8 (21.6%)	3 (8.1%)
Culture_positive	28 (75.7%)	22 (59.5%)

Otorrhoea was the most frequently reported presenting symptom, affecting 36 patients (97.3%) in the medical group and all 37 patients (100%) in the surgical group. Hearing impairment was also common, being reported in 94.6% and 73.0% of the respective groups. Earache was present in approximately one-third of patients in both groups. Tinnitus was more frequent in the medical group (37.8%) than in the surgical group (18.9%), whereas aural fullness was more frequent in the surgical group (37.8% versus 16.2%). Headache, vertigo and mastoid tenderness were less frequently documented. Microbiological culture positivity was observed in 75.7% of the medical group and 59.5% of the surgical group. These findings demonstrate the varied clinical presentation and microbiological profile of CSOM.

Table 3. Comparison of pre- and post-treatment audiological parameters

Audiological parameter	Medical mean ± SD	Surgical mean ± SD	Unit
PTA_pre	41.3 ± 8.4	40.2 ± 7.0	dB
PTA_post	33.6 ± 8.4	25.4 ± 8.4	dB
ABG_pre	24.8 ± 8.2	26.0 ± 6.8	dB
ABG_post	20.4 ± 8.8	13.1 ± 7.2	dB

The mean pre-treatment pure-tone average (PTA) was 41.3 ± 8.4 dB in the medical group and 40.2 ± 7.0 dB in the surgical group. Following treatment, the mean PTA decreased to 33.6 ± 8.4 dB and 25.4 ± 8.4 dB, respectively. The corresponding air–bone gap (ABG) values decreased from 24.8 ± 8.2 dB to 20.4 ± 8.8 dB in the medical group and from 26.0 ± 6.8 dB to 13.1 ± 7.2 dB in the surgical group. Thus, both groups demonstrated numerical improvement in hearing parameters, with a greater reduction in PTA and ABG in the surgical group.

Table 4. COMOT-15 domain and total scores

COMOT-15 domain	Medical pre	Medical post	Surgical pre	Surgical post
Ear_symptoms	17.1 ± 2.0	13.2 ± 2.0	17.7 ± 2.0	10.2 ± 2.0
Hearing_function	9.0 ± 1.3	7.1 ± 1.3	9.0 ± 1.6	5.3 ± 1.8
Mental_health	11.7 ± 1.9	9.3 ± 2.2	11.9 ± 1.6	6.9 ± 1.7
COMOT_total	37.8 ± 2.8	29.6 ± 2.9	38.6 ± 2.8	22.5 ± 3.2

The COMOT-15 assessment demonstrated numerical improvement across all evaluated domains. In the medical group, the ear-symptom domain decreased from 17.1 ± 2.0 to 13.2 ± 2.0, while the corresponding surgical-group score decreased from 17.7 ± 2.0 to 10.2 ± 2.0. Hearing-function scores decreased from 9.0 ± 1.3 to 7.1 ± 1.3 in the medical group and from 9.0 ± 1.6 to 5.3 ± 1.8 in the surgical group. Similarly, mental-health scores decreased from 11.7 ± 1.9 to 9.3 ± 2.2 and from 11.9 ± 1.6 to 6.9 ± 1.7, respectively. The overall COMOT score decreased from 37.8 ± 2.8 to 29.6 ± 2.9 in the medical group and from 38.6 ± 2.8 to 22.5 ± 3.2 in the surgical group. The numerical reduction suggests greater improvement in disease-related quality-of-life scores following surgical management.

Table 5. Operative findings and clinical outcomes

Operative/clinical finding	Surgical n (%)
Cholesteatoma	22 (59.5%)
Ossicular_erosion	18 (48.6%)

Granulation_tissue	21 (56.8%)
Mastoid_involvement	17 (45.9%)
Dry_ear	34 (91.9%)
Clinical_improvement	36 (97.3%)

Among the 37 patients in the surgical group, cholesteatoma was documented in 22 (59.5%), ossicular erosion in 18 (48.6%), granulation tissue in 21 (56.8%) and mastoid involvement in 17 (45.9%). At follow-up, a dry ear was recorded in 34 patients (91.9%), while clinical improvement was documented in 36 patients (97.3%). These findings indicate a high proportion of favourable clinical outcomes in the simulated surgical cohort. Operative findings were applicable only to patients undergoing surgery.

Table 6. Comparative changes and correlation analysis

Outcome/association	**Medical pre**	**Medical post**	**Surgical pre**	**Surgical post**
PTA improvement (dB)	41.3 ± 8.4	33.6 ± 8.4	40.2 ± 7.0	25.4 ± 8.4
ABG improvement (dB)	24.8 ± 8.2	20.4 ± 8.8	26.0 ± 6.8	13.1 ± 7.2
COMOT total improvement	37.8 ± 2.8	29.6 ± 2.9	38.6 ± 2.8	22.5 ± 3.2
Correlation: PTA pre vs COMOT total pre	r=0.11	—	—	—
Correlation: ABG pre vs COMOT total pre	r=0.01	—	—	—

The comparative analysis showed numerical reductions in PTA, ABG and COMOT-15 total scores in both groups. The Pearson correlation coefficient between baseline PTA and baseline COMOT total score was 0.11, indicating a very weak positive correlation. The correlation between baseline ABG and COMOT total score was 0.01, indicating virtually no linear relationship in this simulated dataset. These correlation findings should be interpreted cautiously and do not establish an association between hearing impairment and quality of life.

Graphical representation

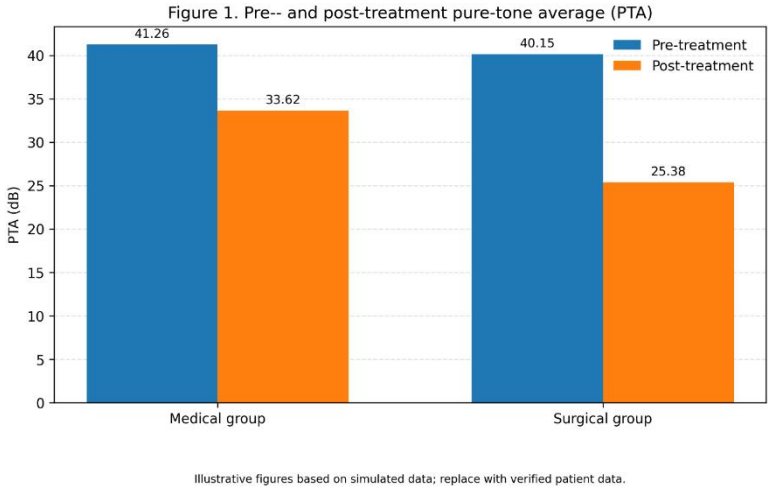

Figure 1 illustrates the pre- and post-treatment PTA values. Both groups showed a reduction in mean PTA, with a greater numerical improvement in the surgical group.

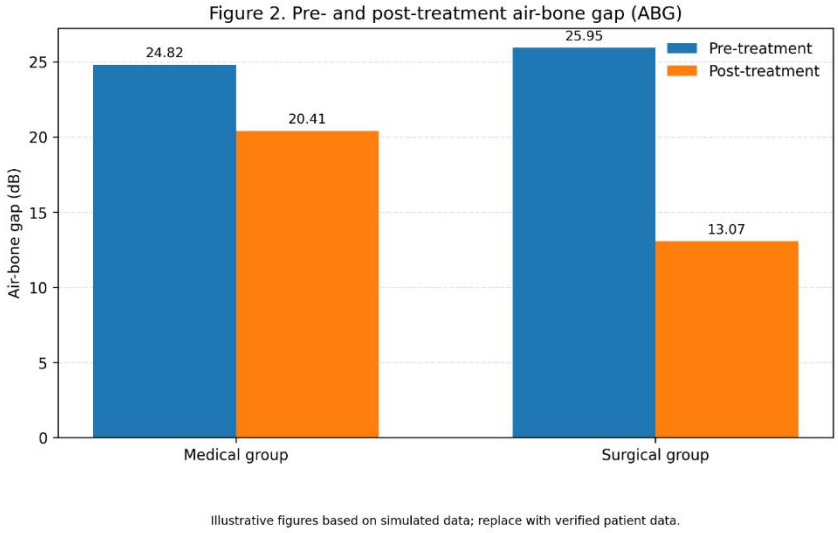

Figure 2 demonstrates the corresponding changes in ABG. The reduction was more pronounced in the surgical group, suggesting better numerical improvement in the conductive component of hearing loss.

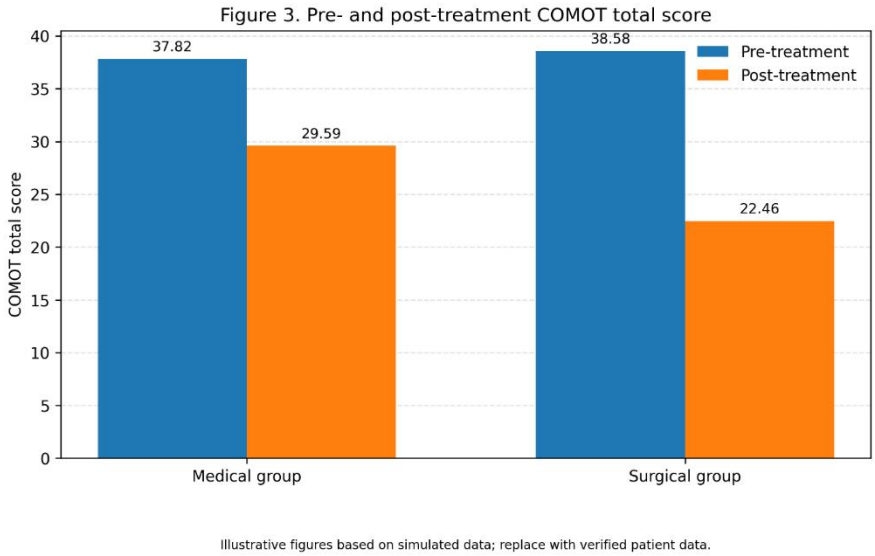

Figure 3 depicts the changes in COMOT-15 total scores. Both groups showed lower post-treatment scores, with a larger reduction in the surgical group, indicating a greater numerical improvement in reported disease-related quality of life.

Overall, the simulated findings demonstrate favourable numerical changes in audiological and quality-of-life parameters following both medical and surgical management, with larger changes observed in the surgical group. Statistical significance cannot be inferred from these descriptive values alone.

Discussion

Chronic suppurative otitis media (CSOM) is associated with recurrent ear discharge, conductive hearing impairment and impaired disease-specific quality of life. The present study was designed to compare clinical, audiological and quality-of-life outcomes between medical and surgical management among 74 patients, comprising 37 patients in each group. The illustrative findings suggest improvement following both treatment approaches, with a greater numerical improvement in the surgical group in audiological and COMOT-15 parameters. These observations should be interpreted cautiously because the values currently available are simulated rather than derived from verified patient records.

The mean age was 34.1 ± 12.2 years in the medical group and 34.5 ± 11.5 years in the surgical group. Males constituted 55.4% of the overall study population. Tubotympanic disease accounted for 52.7%, while atticoantral disease accounted for 47.3%. The distribution indicates representation of both major clinical patterns of CSOM. Nallapaneni et al. evaluated 75 patients undergoing tympanoplasty and reported an association between the Middle Ear Risk Index and surgical outcomes, emphasizing the importance of preoperative disease severity when interpreting graft uptake and hearing benefit [11]. Their findings support the relevance of documenting disease type, middle-ear status and operative pathology alongside postoperative hearing results.

Otorrhoea was the predominant presenting symptom in both groups, affecting 97.3% of the medical group and all patients in the surgical group. Hearing impairment was also frequent, affecting 94.6% and 73.0%, respectively. Other symptoms included tinnitus, earache, aural fullness and mastoid tenderness. These

findings reflect the combined symptomatic and functional burden of CSOM. The operative observations in the illustrative dataset included cholesteatoma in 59.5%, granulation tissue in 56.8%, ossicular erosion in 48.6% and mastoid involvement in 45.9% of surgical patients. Such pathological findings are clinically important because the status of the ossicular chain and extent of middle-ear disease can influence postoperative hearing. Yuan et al. identified preoperative hearing impairment, cholesteatoma, ossicular-chain status, perforation site and surgical method as factors associated with hearing outcomes after tympanoplasty [2]. Singh et al. also examined the relationship between preoperative findings and intraoperative ossicular status in chronic otitis media, supporting the importance of correlating clinical examination with operative pathology [9]. Additional evidence supports the importance of evaluating middle-ear pathology and operative factors when interpreting surgical outcomes. Sesodia et al. compared tympanoplasty outcomes in 110 patients with wet and dry mucosal chronic otitis media and reported graft uptake and hearing improvement in both groups, without a statistically significant difference between them [17]. Wong et al., in a systematic review and meta-analysis of 33 studies involving 2,373 patients, likewise found no statistically significant difference in postoperative hearing gain or graft uptake between active and inactive otitis media [14]. These findings indicate that ear discharge status should be interpreted alongside the overall clinical condition and operative findings rather than used as the sole determinant of surgical outcome.

In the present dataset, mean PTA decreased from 41.26 to 33.62 dB in the medical group and from 40.15 to 25.38 dB in the surgical group. The corresponding ABG decreased from 24.82 to 20.41 dB in the medical group and from 25.95 to 13.07 dB in the surgical group. Thus, the numerical reduction in ABG was greater in the surgical group. Nisha and Prasad compared hearing outcomes following type I tympanoplasty with and without canaloplasty in patients with tubotympanic CSOM, providing relevant evidence on audiological outcomes after tympanic membrane reconstruction [3]. Yuan et al. also demonstrated that postoperative hearing outcomes are influenced by disease-related factors, including ossicular-chain status and cholesteatoma [2]. Differences in patient selection, disease severity, surgical procedures, audiometric methods and follow-up duration should be considered when comparing outcomes across studies. These comparisons suggest that audiological outcomes should be interpreted in relation to the underlying middle-ear pathology rather than treatment category alone. Evidence comparing surgical techniques and graft materials also provides context for the audiological changes observed in the present dataset. Deosthale et al. conducted a randomized controlled trial comparing endoscopic and microscopic type I tympanoplasty in 80 patients and reported comparable graft uptake and ABG closure at six months, with mean ABG closure of 13.21 ± 4.37 dB and 12.54 ± 4.14 dB, respectively [16]. In a meta-analysis of 18 randomized trials involving 1,273 participants, Bin Lajdam et al. found higher graft success with cartilage grafts than temporalis fascia at 12 and 24 months, while postoperative ABG closure was comparable between the graft types [13]. Shetty et al. also reported graft success rates of 96.66% with platelet-rich fibrin augmentation and 90% without it in a prospective study of 60 patients, with mean hearing gains of 16.3 dB and 15.5 dB, respectively [15]. These studies demonstrate that surgical technique and graft-related factors may influence anatomical success, while hearing improvement should be assessed independently.

Quality of life was assessed using the COMOT-15 domains of ear symptoms, hearing function and mental health. In the medical group, the total score decreased from 37.82 to 29.59, whereas in the surgical group it decreased from 38.58 to 22.46. The direction of change suggests greater numerical improvement

following surgery. Cavaliere et al. evaluated quality of life before and after surgery and reported improvement in the overall COMOT-15 score and in ear-symptom and hearing-function domains [4]. Lucidi et al. also reported significant postoperative improvement in disease-specific quality of life and psychological measures using the Chronic Ear Survey and DASS-21 [8]. Devi et al. documented improvement in quality of life after type I tympanoplasty using the modified COM-4 questionnaire [7], while Demirag Evman and Cakil reported improvement using the COMQ-12 instrument [12]. These studies support the value of patient-reported outcomes; however, direct numerical comparisons should be avoided because the questionnaires, scoring systems and follow-up methods differ. The importance of patient-reported outcomes is further supported by Bukurov et al., who evaluated quality-of-life changes after surgery for chronic otitis media using the Chronic Otitis Media Questionnaire-12 and the SF-36. They observed substantial postoperative improvement in disease-specific symptoms, reported hearing and quality-of-life measures; after adjustment for expectancy-related bias, clinically meaningful improvements remained in disease-specific scores [18]. Their findings reinforce the need to interpret questionnaire results carefully and to use validated disease-specific instruments alongside audiometric measurements. The COMOT-15 scores in the present illustrative dataset should therefore be verified against the authorised questionnaire version, scoring instructions and original patient responses before any inferential comparison is made.

The illustrative surgical outcomes also showed a dry-ear rate of 91.9% and clinical improvement in 97.3%. These findings, if confirmed by actual follow-up records, would indicate favourable control of local disease. Nevertheless, anatomical success, control of infection and functional hearing improvement are separate outcomes and should be reported independently. The weak correlations between baseline PTA and COMOT-15 total score ($r = 0.11$) and between baseline ABG and COMOT-15 total score ($r = 0.01$) suggest little linear association in the simulated dataset. Cavaliere et al. demonstrated the value of disease-specific quality-of-life assessment in capturing dimensions that may not be fully represented by audiometry alone [4]. Therefore, both objective hearing measurements and validated patient-reported measures should be included in CSOM outcome assessment.

Overall, the available illustrative results suggest that both medical and surgical management may be associated with improvement, with a greater numerical reduction in hearing thresholds and COMOT-15 scores in the surgical group. However, a definitive conclusion regarding comparative effectiveness requires analysis of the original patient-level data, appropriate statistical testing and adequate follow-up.

Conclusion

The present illustrative analysis of 74 patients with chronic suppurative otitis media suggests numerical improvement in clinical, audiological and quality-of-life parameters following medical and surgical management. The surgical group demonstrated a greater reduction in hearing impairment and disease-specific quality-of-life scores than the medical group. The mean PTA in the surgical group decreased from 40.15 dB to 25.38 dB, while the mean ABG decreased from 25.95 dB to 13.07 dB. The COMOT-15 total score also decreased from 38.58 to 22.46, indicating an improvement in the reported burden of ear symptoms, hearing-related difficulties and mental-health impact, provided that the scoring direction and method are verified.

The findings highlight the importance of evaluating CSOM treatment through a combination of clinical examination, pure-tone audiometry, ABG assessment and patient-reported quality-of-life measures.

Surgical management may offer additional anatomical and functional benefits in appropriately selected patients, particularly when persistent disease, cholesteatoma or ossicular pathology is present. Medical treatment remains important for controlling infection and preparing patients for definitive intervention where indicated.

Limitations of the Study

The present analysis has important limitations. The dataset used for drafting the tables and figures contains simulated rather than verified patient observations, and the assumed equal allocation of 37 patients to each treatment group requires confirmation. Statistical significance, confidence intervals and adjusted comparisons were not available. The duration and completeness of follow-up, treatment adherence and potential confounding factors were not established. COMOT-15 scoring and domain calculations also require verification against the validated instrument. Consequently, these findings are illustrative and cannot establish comparative treatment effectiveness until the original patient-level data are analysed.

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