

## Case Series

# Complications of Cholesteomatous Otitis Media (About 18 cases)

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**Summary**

**Aim:** To present the incidence of complications of chronic cholesteatomatous otitis media (CCOM) and share our experience in their management.

**Methods:** This was a retrospective study of patients hospitalized in the ENT department of Hassan II University Hospital, Fez, who presented with complicated cholesteatomatous chronic otitis media, over a period from January 2013 to September 2018.

**Results:** We managed 112 cases of CCOM of which 18 patients had a complication and benefited from medical-surgical treatment. The most frequent complication was encephalic abscess found in 6 patients, followed by otomastoiditis and labyrinthitis. No recurrences or deaths were reported.

**Conclusion:** The management of cholesteatoma is well codified; however, the management of cholesteatoma complications remains a subject of controversy in the literature. Early detection and management of pre-cholesteatoma conditions can help reduce the incidence of complications and prevent severe forms of the disease.

**INTRODUCTION**

Cholesteatoma is defined by the presence of keratinized squamous epithelium in the middle ear cavities, with the potential for desquamation, migration and erosion [1,2]. Complications related to cholesteatoma extension can have a significant impact on functional and vital prognosis, although their incidence has decreased with the advent of antibiotic therapy [3]. The aim of our study is to analyze the clinical, paraclinical and therapeutic characteristics of complications of cholesteatoma chronic otitis media (CCOM).

**MATERIALS AND METHODS**

Our work is based on a retrospective study of patients hospitalized at the ENT Department of the Hassan II University Hospital, Fez, for cholesteatomatous chronic otitis media (CCOM) associated with a complication. We included in our study cases of acquired cholesteatomatoma of the middle ear, associated with one or more complications that were managed in our department between January 2013 and September 2018. Non-inclusion criteria were: noncholesteatomatous chronic otitis media, uncomplicated OMCC and congenital cholesteatoma. Patients with missing data in their medical records were excluded from this series.

The following parameters were reviewed for each of these entities: age, sex, age of otitis disease, radiological and bacteriological data, medical or surgical treatment, induced morbidity and mortality. Progression was judged on clinical (functional symptomatology), anatomical and audiometric data.

**RESULTS**

During a 6-year study period, we managed 112 cases of cholesteatoma, 18 of which presented one or more complications, corresponding to a rate of 16.1%. The mean age of our patients was 26 years, with extremes of 9 and 50 years. There was a slight male predominance, with a sex ratio of 1.57. Chronic otorrhea was prominent in 27% of cases, and 11.1% had a history of ear surgery.

The most frequent functional signs were otorrhea (18 cases) and hypoacusis (15 cases) (Table 1).

The physical examination of our patients, carried out in the emergency department, revealed a preserved general condition in 15 patients and an altered condition in 3 patients (Table 2).

Baseline tonal audiometry, to assess the impact on hearing of the underlying otitis pathology and/or complication, was normal

**Table 1:** Distribution by reason for consultation

Motif de consultation	Nombre de cas
Otorrhée	18
Hypoacousie	15
Céphalées	12
Fièvre	9
Douleur retro-auriculaire	4
Vertige	3

**Table 2:** Distribution according to clinical signs of severity

Signe clinique de gravité	Nombre de cas
Signe de la fistule positif	2
Tuméfaction rétro-auriculaire	4
Syndrome vestibulaire périphérique	3
Paralysie faciale périphérique homolatérale	3
Syndrome méningé	2
Signes d'hypertension intracrânienne	3

in 2 cases. Conductive hearing loss was observed in 14 cases, and mixed hearing loss in two. The mean threshold was 38.4 decibels.

Rock scans were performed in all patients. It showed antro-attical filling in 66% of cases. The results of the analysis of coronal and axial CT images are presented in the following table: Table 3

Injected brain scans, performed as an emergency procedure, revealed intracranial abscess in 6 cases and lateral sinus thrombosis in 3 (Table 4).

Extra-cranial complications were the most frequent (13 cases), dominated by otomastoiditis. This manifests as a retroauricular inflammatory swelling with detachment of the auricle, associated with abundant and persistent otorrhea.

Labyrinthitis was diagnosed in 4 cases in our series, and is manifested by cochlear signs (tinnitus, deafness) and vestibular signs (vertigo, positive fistula sign), with a high risk of definitive cophosis.

Facial paralysis is often progressive when complicating chronic otitis. It is the third most frequent extra-cranial complication in our series (3 cases), followed by petrositis (2 cases) (Table 5).

Encephalic abscess is the most frequent endocranial complication in our series. The causative germs are most often Staphylococcus, Klebsiella, as well as anaerobes. It clinically associates signs of sepsis and intracranial hypertension in severe forms. Secondly, we find venous thrombosis, subdural empyema and meningitis.

All our patients benefited from medical treatment based on probabilistic antibiotic therapy, including a third-generation cephalosporin, ceftriaxone, administered at a dose of 50 to 100 mg/kg/day, in combination with metronidazole in 15 cases, with the aim of covering a broad spectrum of potential germs. In three cases, amoxicillin combined with clavulanic acid was used. Dosage was 80 mg/kg/day in 3 doses for children and 2 g/day in 2 doses for adults. The duration of parenteral treatment ranged

**Table 3:** Results of CT image analysis

Signe radiologique	Nombre de cas
Lyse de la chaîne ossiculaire	6
Lyse du tegmen tympani	4
Lyse du mur de la logette	4
Lyse du tegmen Antri	2
Lyse de la paroi post du conduit auditif externe	2
Lyse du canal facial	3
Fistule labyrinthique	4

**Table 4:** Distribution of our cases according to intracranial complications

Complication endocrânienne	Effectif	
Abscess intracrânien	Temporal	4
	Cérébelleux	2
Empyème de la Fosse cérébrale postérieure	2	
Empyème pariéto-occipital	1	
Thrombose de sinus latéral	3	
Signes d'hydrocéphalie	1	

**Table 5:** Distribution of extra-cranial (intra-temporal) complications

Complications	Effectif
Otomastoidite	4
Labyrinthite	4
Paralysie faciale périphérique	3
Pétrosite	2

**Table 6:** Percentage of different complications

Séries	Cas	Complication intracrânienne%	Complication extra crânienne %
Osma [6]	93	41.9%	-
K.Leskinen [16]	50	82%	-
N. Sharma [28]	45	-	55 %
Camacho [7]	5	-	60%
Be. Mostapha[29]	422	50%	50%
Notre Série	18	48%	52%

from one to several weeks, depending on the clinical course of each patient. Once improvement was observed, treatment was continued orally.

In addition, local treatment was administered in the form of antibiotic drops, in combination with repeated otological aspirations. In cases where patients had peripheral facial paralysis, corticosteroid therapy was prescribed. Three patients were treated with 1 to 1.5 mg/kg corticosteroids per day for around ten days. In addition, to alleviate symptoms such as dizziness and nausea, patients received antivertigo drugs such as dramamine/acetyl leucine, as well as antiemetics such as chlorpromazine. It's important to stress that these treatments were tailored to each patient's individual condition and the severity of their symptoms.

In terms of surgical treatment, different procedures were carried out depending on the patients' specific pathologies. In cases of otomastoiditis, an incision and flattening were performed to treat the abscessed collection. For patients with encephalic abscesses, drainage was performed by craniotomy in six cases, in collaboration with the neurosurgical team. One case of hydrocephalus was treated by external shunt.

For cholesteatoma, 66.6% of cases were operated on using an open technique, while 33.3% opted for a closed technique. The decision to perform an open tympanoplasty is considered in cases where a cholesteatoma has developed within a small-volume condensed mastoid, particularly in the presence of associated procidences of the sigmoid sinus and/or tegmen, or where the ear has been operated on several times.

The average post-operative follow-up time was 18 months, with extreme cases ranging from 8 months to 5 years. No postoperative recurrences or deaths were reported.

## DISCUSSION

The literature highlights the role of cholesteatoma in the development of complications in chronic otitis media [4,5]. Thanks to early diagnosis and the increasing use of antibiotic therapy, the complication rate of cholesteatoma otitis media has decreased [3]. In international studies [5,6], the complication rate of chronic otitis varies from 5% to 18.3%. They appear to be more frequent in older children and adults [7], and male predominance is often observed in most studies [8,7]. Analysis of the literature reveals variable percentages of complications and a high frequency of association of several complications in the same patient [8,6].

Otomastoiditis is the most common extra-cranial complication [9]. It is characterized by destructive osteitis of the mastoid intercellular septa. Mastoid subperiosteal abscess, particularly of cholesteatomatous origin, does not respond to medical treatment and usually requires mastoidectomy [10,11].

Facial paralysis is considered the second most common extracranial complication in other studies [12]. Its natural mechanism involves direct destruction of the bone of the Fallopi canal, usually in its second portion [13,14], by the cholesteatoma. Decompression of the facial nerve during mastoidectomy is the subject of debate. According to Osma [6] and Yetiser [14], it is systematic and leads to complete regression in 60-75% of cases.

In the series by Abada [15], labyrinthitis is the third most frequent complication, accounting for 6.3%. However, in the series by K. Leskinen [16], it accounts for 32% of all intratemporal complications, while in the series by Osma [6], it reaches 12.8%.

Meningitis is the most common meningoencephalic complication associated with cholesteatoma [17]. Its occurrence is partly attributed to the presence of the cholesteatoma, which comes into contact with the dura after destruction of the tegmen attic or antrum [9]. Meningitis is suspected in the presence of fever, headache and cervical inflammatory signs, particularly in the setting of chronic otitis. In the presence of concomitant complications, a CT scan is essential to document these complications before considering lumbar puncture [18]. Third-generation cephalosporins, such as ceftriaxone or cefotaxime, remain the medical treatment of choice, to be subsequently adapted according to the results of the antibiotic susceptibility test [19]. Mastoidectomy after the meningeal episode is of

crucial importance in reducing morbidity and mortality [19]. Sensorineural hearing loss is the most frequent sequela of purulent meningitis of otogenic origin [20].

Brain abscess is the most severe complication of chronic otitis media (CMM) [9]. According to Abada's series [15], it is the second most frequent complication, while it is the first complication in Maky's series [21]. Abscesses can be localized in different ways, at the sustentorial, temporal, parietal or cerebellar level [22]. Temporal localization is more frequent [9]. This predominance may be explained by the typical path of extension of cholesteatomas, which generally pass through the attic-antral region before reaching the lateral sinus and posterior cerebral fossa. Cerebral computed tomography (CT), with axial sections through the rock, remains the preferred examination for visualizing the abscessed lesion and the lytic process caused by the cholesteatoma [23]. Neurosurgical drainage of the abscess is performed prior to or simultaneously with ENT surgery [24,25]. Parenteral antibiotic treatment, followed by prolonged oral therapy, is combined with surgery [25]. Mortality in otogenic abscesses varies considerably, from 8% to 50% [26-29].

Subdural and extradural empyemas are generally regarded as rare conditions [22]. However, this rarity is called into question in the series by Modak V. B. [4], where it was found to be the most frequent complication. Clinical symptoms are often limited, usually manifesting as localized headache [20]. Delayed treatment can lead to abscess formation. The prognosis depends mainly on the patient's neurological condition at the time of treatment [25] (Table 6).

## CONCLUSION

Complications of cholesteatomatous chronic otitis media represent serious clinical situations. Early and appropriate management is essential to prevent and treat these complications. A multidisciplinary approach involving specialists in ENT, neurology and neurosurgery is often required to ensure optimal results, reduce functional sequelae and the risk of mortality.

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