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Original Research Article

Cholesteatoma of the middle ear: about 50 cases in Donka University Hospital

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ABSTRACT

Background: Cholesteatoma of the middle ear remains a dangerous chronic otitis that can potentially lead to serious complications. The treatment remains exclusively surgical. The aim of the study was to describe the epidemiology and anatomical functional results of surgery for middle ear cholesteatoma.
Methods: This was a cross-sectional study of retrospective data collection over 5 years (from 01 January 2016 to 30 December 2020) and conducted at the ENT and head and neck surgery department of Donka University Hospital.
Results: We collected 50 cases of cholesteatoma. The prevalence was 1.33%. The mean age was 33.58±18.07 years. The sex ratio was 0.92. Purulent otorrhea (96%) and hearing loss (84%) were the main symptoms. We noted 56% pocket retraction and 36% tympanic perforation. Conductive hearing loss accounted for 76% of cases. The CT scan of the rocks noted 69.89% of filling associated with the lysis of the walls of the middle ear. Masto-atticotomy associated with tympanoplasty was performed in 78.89% of cases. Encapsulated cholesteatoma was the most frequent (66%). The epitympanum was its elective seat (44%). The ossicular chain was lysed in 76%. The incus was the most affected ossicle (66%). Ossiculoplasty was performed in 66%. The postoperative course was simple (74%). Medium and long-term follow-up revealed normal anatomical restoration of the neo-tympanum in 94%. Hearing improvement was noted in all our patients with an average hearing gain of 10-30 dB in 52%.
Conclusions: The treatment was exclusively surgical. However, we obtained largely satisfactory anatomical and functional results.

Keywords: Cholesteatoma, Chronic otorrhea, Mastoidectomy, Sub-Saharan Africa

INTRODUCTION

Cholesteatoma of the middle ear is a chronic otitis described as dangerous because of the risks evolving towards potentially serious complications.[1] It is characterized by the presence within the cavities of the middle ear of a keratinized squamous epithelium endowed with extensive, invasive and lytic potential. It can be congenital or acquired.[2] Hearing loss often goes unnoticed, especially in the youngest, and can be responsible for language delay or school failure. The treatment of this lesion is surgical, based on the complete eradication of all epidermal lesions invading the middle ear.[3] Recurrence is a real problem in cholesteatoma surgery; and therefore, it is necessary to closely monitor any patient operated on for cholesteatoma.[4]

The aim of the study was to describe the epidemiology and the anatomical functional results of middle ear cholesteatoma surgery in a sub-Saharan environment.

METHODS

This was a cross-sectional study with retrospective data collection. It took place in the ENT and head and neck surgery department of the Donka University Hospital over a period of 5 years (from 01 January 2015 to 30 December 2020).

We included all cases of middle ear cholesteatoma that underwent surgical treatment. We excluded all cases of middle ear cholesteatoma that were not operated. We conducted a comprehensive recruitment of all cases meeting the inclusion criteria.

Data were entered and analyzed by SPSSv21. An Amplaid audiogram (A177 Plus) was used to assess the patient' hearing.

The following parameters were evaluated: epidemiological, diagnostic, therapeutic and evolutionary. We obtained the approval of the ethics committee of the Donka University Hospital. The data were collected anonymously. Medical secrecy was the rule. The results were used for purely scientific purposes.

RESULTS

We identified 50 cases (1.33%) of middle ear cholesteatoma. The average age was 33.58±18.07 years with extremes ranging from 05 to 73 years. We found a sex ratio of 0.92 (Table 1).

Regarding the history, 47 (94%) patients had a history of recurrent otitis, 44% of allergic rhinitis and 4% of cholesteatoma. The delay before consultation was 3 years with extremes of 1 year and 6 years. Symptoms were represented by purulent otorrhea (96%) and hearing loss (84%). The otological examination found 56% retraction pocket, 42% polyp of the external acoustic meatus, 36% postero-superior marginal tympanic perforation, 32% wide non-marginal perforation, 26% erosion of the bone walls of the eardrum and 6% normal eardrum. Pure tone audiometry was performed in all our patients. They had a hearing loss greater than 20 dB.

Conductive hearing loss accounted for 44.12% (15 cases), mixed hearing loss 8.8% (3 cases) and sensorineural hearing loss 5.9% (2 cases). Hearing was normal in 41.18% (14 cases). All patients underwent preoperative CT scan (Figure 1 and 2). The analysis found filling of the eardrum in all patients, 10% labyrinthine fistula and 4% cerebral extension. The lysis of the ossicular chain was demonstrated in 28 (56%) patients and of the wall of the cubicle in 38 (76%) patients. Modified mastoidectomy associated with open technique tympanoplasty was performed in 78.89% of patients. Ossiculoplasty was performed in 66% of cases. Intraoperatively (Table 2), encapsulated cholesteatoma accounted for 66% (Figure 3). The ossicular chain was lysed in 86% intra-operatively. The incus was affected in 74% of cases. Posterior meatoplasty was performed in 2 (4%) patients. The tragus and the temporal aponeurosis were used in all patients. Functionally, 47 (94%) patients had a normal eardrum and 3 (18%) presented with otorrhea. Pure-tone audiometry was performed in 34 patients, 17 (50%) of whom had conductive hearing loss at the 3rd postoperative month; the other 16 were lost of sight (no follow-up). An improvement in average hearing gain of 10 to 30 dB was found in 52% of the cases. With a follow-up of 6 months, we noted a hearing gain between 10 and 30 dB in 52% (Table 3).

The post-operative course was simple in 74% (37 cases) and complicated in 26% of cases (13 cases). Peripheral facial paralysis accounted for 8% (4 cases). Dizziness was present in 09 cases (18%). The medium-term follow-up of our patients (1 to 6 months) made it possible to note the anatomical restoration of the tympanic membrane (graft) in normal position (94%) of the cases and favored the ablation of 2 residual cholesteatomas. With a follow-up of 12 months, the anatomical restoration was 94% (Table 4).

Table 1: Distribution of cases by demographics.

Demographics	N=50	%
Age range (years)		
0-15	9	18
16-30	17	34
31-45	10	20
46-60	9	18
61-75	5	10
Sex		
Men	24	48
Women	26	52

Table 2: Distribution of patients operated on for middle ear cholesteatoma according to intraoperative findings.

Intra-operative findings	N	%
Macroscopic appearance		
Encapsulated	33	66.0
Diffused	17	34.0
Location		
Epitympanum or attic	22	44.0
Mesotympanium	11	22.0
Retrotympanium	7	14.0
Mastoid	10	20.0
Lysis of the ossicular chain	38	76.0
Intact chain	12	24.0
Anvil lysis	33	66.0
Hammer lysis	18	36.0
Stirrup Lysis	3	6.0
Lysis of compartment wall	28	56.0
Denuded facial nerve	6	12.0

Table 3: Distribution of patients operated on for middle ear cholesteatoma according to postoperative hearing gain (6 months).

Hearing gain (in dB)	N	%
1-5	5	10.0
6-10	3	6.0
11-15	11	22.0
16-20	9	18.0
25-30	6	12.0
Total	34	68.0

Table 4: Distribution of patients operated on for middle ear cholesteatoma according to otoscopy at 6 months post-operatively.

Post-operative otoscopy	N	%
Normal eardrum	47	94.0
Epidermal debris	9	18.0
Otorrhea	3	6.0
Myringitis	3	6.0
Retraction pocket	2	4.0
Tympanic perforation	2	4.0

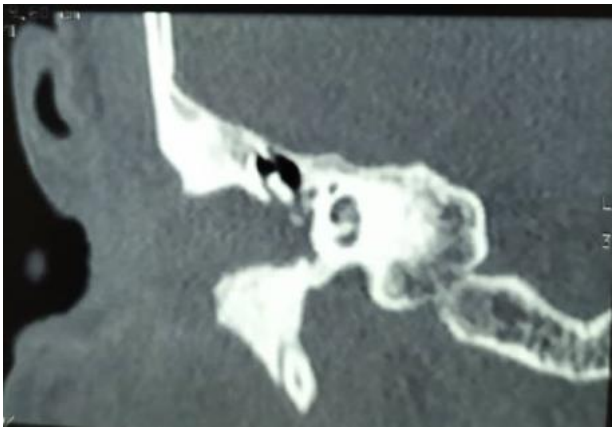

Figure 1: Sagittal section of a CT scan of the rocks showing tissue filling of the tympanic cavity and the right acoustic meatus in favor of a cholesteatoma.

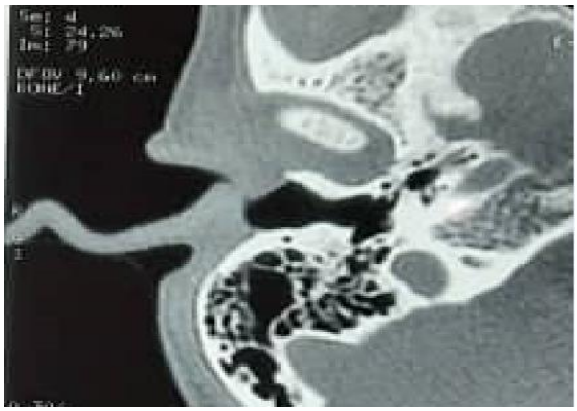

Figure 2: Axial section of a rock CT scan showing lysis of the log wall.

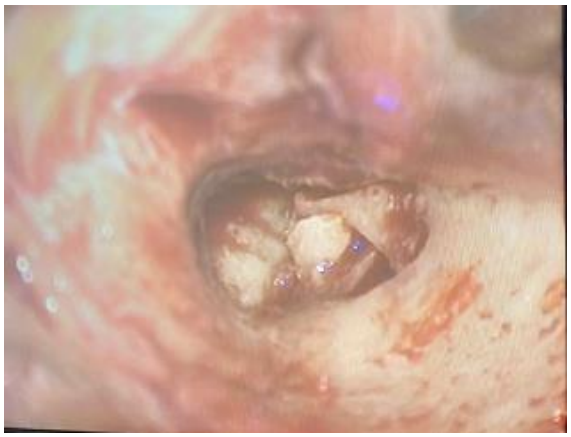

Figure 3: Intra-operative view of a whitish mass in the tympanic cavity in favor of a cholesteatoma.

DISCUSSION

In the present series, the insufficiency of the technical platform in our context and the low socioeconomic level of the patients marked the limitations. However, we obtained satisfactory results in the management of middle ear cholesteatoma in the sub-Saharan environment.

Cholesteatoma is considered a dangerous ear infection and its prevalence varies from one series to another.[1,5] However, our prevalence (1.33%) is significantly lower than that of Mustafa's team (33.5%).[6] The delay in consultation and the ignorance of patients about ear surgery on the one hand, the ignorance of this pathology by general practitioners on the other hand would justify our result. Our average age of 33.58 years is similar to those of Bouaity et al and Keita et al which listed 35 years and 33 years respectively.[5,7] However, in the literature, the age of onset of cholesteatoma is between 35 and 43 years old. Our finding is related to the predominance of acquired cholesteatoma. The sex ratio (equal to 0.92) was in favor of women in the present series. The same observation was made by Lima and al.[8] The Boko et al team found a male predominance (sex-ratio=2.5).[9] However, we do not have a dominance of cholesteatoma according to gender in the literature.

A history of chronic otitis dominated this series (94%). This result is superior to that of Di Lella et al who reported 62.92%.[10] The delay in consultation and the low socio-economic level of patients in our African regions would justify our result. However, purulent otorrhea (96%) and hypoacusis (84%) were the main symptoms. For Chamoli et al otorrhea and hypoacusis accounted for 100% and 81% respectively.[11] Our result is consistent with the literature. Indeed, purulent otorrhea, particularly fetid, is an important sign in the diagnosis of middle ear cholesteatoma.[1] The delay in diagnosis explains our long delay in consultation (3 years). The average delay before consultation depends on the series.[2,5] Our otoscopic results are close to those of Darrouzet et al who listed 52% of retraction pocket, 22% polypoid lesion, 22% wide marginal tympanic perforation.[12] The severity of the

lesions resulting from the delay in management justifies our observation, which is shared with many authors.

Concerning the preoperative assessments, tonal audiometry was performed in all patients who had a deficit greater than 20 dB. The interest of audiometry and the hearing loss objectified by audiometry have been described in other series.[3,4] Modern imaging currently occupies a prominent place in the pre and postoperative management of middle ear cholesteatoma. CT scan of the bones is an almost unavoidable examination for the assessment of extension, the search for certain complications and for the operative strategy by objectifying the anatomical particularities.[1] However, it was contributory in our series, showing a predominance of lysis of the cell wall (76%) and the ossicular chain (56%). Lesinskas and al who found lysis of the cubicle wall in 55% of cases.[13] Gamra et al. found ossicular lysis in 76% of cases.[14] Certainly, these destructive lesions are due to the power of migration, desquamation and erosion of the cholesteatoma. The delay in the management of cholesteatoma having favored the total or partial lysis of the chain of ossicles and/or the walls of the middle ear, motivating surgery.

The open technique of masto-atticotomy associated with tympanoplasty was the most used in this series (94%). Petersen's team, used the same technique in 75.2%.[15] The preference for the open technique is due to the fact that it creates a single cavity which unites all the antro-attico-mastoid cavities with the external auditory canal by removing the posterior wall and the wall of the cubicle. However, the surgical technique depends on the indication and the experience of the surgeon. In peroperative, macroscopically the encapsulated cholesteatoma was dominant (66%). This result is superior to that of Darrouzet et al found 51% encapsulated cholesteatomas.[12] The epitympanum (Attica) was the most frequent site of cholesteatoma in our series. Gaillardin et al found the same attical location.[16] The relationship between the pars flacida and the attic justifies this elective location of the cholesteatoma. The ossicular chain was lysed in 76% intraoperatively. The incus was the most affected ossicle. Tal et al found ossicular lysis in 60% of cases.[17]

The tragus cartilage and the temporal aponeurosis were the grafts. In the series by Bouaity et al reconstruction by the temporal aponeurosis (44.1%), the conqual cartilage (11%) and both in 10% of cases.[5] This preference would be justified by the ease of sampling, not involving additional dissection, the availability in sufficient quantity but also the size and the easy modeling, making it easy to handle and place it after spreading and drying, on the one hand; and the choice of the surgeon on the other hand. Ossiculoplasty was performed in 66% of cases. Our finding is similar to that of Tall (61%).[17] Posterior meatoplasty was performed in 2 cases (4%). A fragment of the aponeurosis of the temporal fascia was used to line the cavity. While, Tall et al reported 3 cases of meatoplasty performed in their series.[17]

Simple post-operative follow-ups dominated our series. De Corso made a similar observation.[18] However, complications were dominated by facial paralysis. It is the most frequent complication according to the literature.[15] The improvement of the technical platform would justify our result. Medium-term follow-up (1 to 6 months) revealed the anatomical restoration of the tympanic membrane (94%). However, Boko et al, Chamoli et al and Tall et al obtained similar results.[7,9,17] We obtained satisfactory anatomical results with an average follow-up of 12 months. Functional restoration was assessed by control audiometry (68%). With a follow-up of 3 months, we obtained a hearing gain of between 10 to 30 dB (52%). Mak et al had hearing gain of more than 10 dB (51%) in their series.[19] This anatomical and functional restoration would depend on the quality of the graft, the improvement of the technical platform, the surgeon's experience and compliance with the instructions given to patients after surgery.

CONCLUSION

Middle ear cholesteatoma remains a dangerous and underdiagnosed chronic otitis in our context. It can potentially lead to serious complications, the treatment of which remains exclusively surgical. However, we obtained satisfactory anatomical and functional results after surgery.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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