



## MASTOID SURGERY: Clinical Findings, Radiological findings & Technique of Mastoid Surgery in Khartoum ENT Hospital and Omdurman military hospital

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### Abstract

**Background :** The aims of mastoid surgery were to maintain safe, dry and disease free ear.

**Objectives:** To study the clinical, radiological findings and techniques of mastoid surgery.

**Methods:** This is a prospective descriptive analytical Study conducted in Khartoum ENT hospitals and Omdurman military hospital during the period may 2015 to may 2016.

**Results:** Sixty one patients were enrolled in this study, the age ranged from 7 years to 62 years. The main presenting symptoms was ear discharge in 49 patients (80%), followed by hearing loss in 45 patients (73%).

**Conclusions:** The preoperative CT scan imaging in cases of cholesteatomatous COM have good correlation with intraoperative findings.

**Keywords:** mastoid surgery, clinical, radiological findings, CT scan imaging.

### Arabic abstract

**خلفية:** الهدف الأساسي لعملية خزع الخشاء للعظم الصدغي هو المحافظة على الأذن سليمة وجافة وخالية من الأخماج.  
**الأهداف :** توضيح العلامات السريرية المؤدية لاجراء عملية خزع الخشاء للعظم الصدغي وانماطها هذا بالإضافة لحساب الصلة بين نتائج التصوير الإشعاعي قبل العملية مع النتائج السريرية أثناء العملية.  
**منهج البحث:** هذه دراسته متقدمة وصفية تحليلية اجريت بمستشفى في الخرطوم للأذن والأنف والحنجرة و المستشفى العسكري أم درمان لكل المرضى الذين اجريت لهم عملية خزع خشاء العظم الصدغي من الفترة بين مايو 2015 الي مايو 2016 .  
**النتائج:** شملت الدراسة واحد وستين مريضاً تتراوح اعمارهم ما بين 7 سنة الي 62 سنة ونسبه الاناث الي الذكور 1.1:1 . وكانت اكثر الاعراض شيوعاً هي الثر الأذني المتواصل (80%)، تليها ضعف السمع (73%).  
**الخلاصة:** وجد ان التصوير بالأشعة المقطعية قبل العملية يتناسب تناسب طردي مع النتائج أثناء العملية.

## Introduction

Otitis media is defined as an inflammatory disease of the middle ear cleft that may be infected or not with focal or generalized pathology. The course of disease may be acute with a tendency towards total resolution and a return to normal, or it may be chronic with permanent sequelae<sup>(1)</sup>.

The disease course is more than 3 months in duration, associated with otorrhea and tympanic membrane perforation in most cases and Histopathologically it is associated with irreversible tissue changes.

The incidence of CSOM is higher in less developed countries. Malnutrition, poor hygiene, poor quality of housing, and overcrowded are factors that are associated with higher incidence of middle ear infections<sup>(2)</sup>.

The surgical approach is suitable for both CCOM and COMWC and encompasses tympanoplasty, canal wall-up (CWU) and canal wall-down (CWD) mastoidectomy<sup>(3)</sup> and its variations, including modified radical mastoidectomy or Bondy's procedure. The choice of technique remains controversial and is usually decided based on the presence or absence of cholesteatoma, its location, the state of the middle ear mucosa, and auditory thresholds.

## Objectives

To highlight the clinical, radiological findings and techniques of mastoid surgery in Khartoum ENT hospital and Omdurman military hospital; To establish clinically, the indications for performing each type of mastoid surgery and the role of the CT scan in detecting and evaluating cholesteatomatous chronic otitis media and selection type of surgery.

## Methodology

This is a prospective descriptive analytical Study conducted in Khartoum ENT hospitals and Omdurman military hospital during the period may 2015 to may 2016. Sixty one patients underwent mastoidectomy were included; Patients whose have CSOM with intracranial complication was excluded. All data were entered into the Statistical Package for Scientific Studies (SPSS) version 20 and graph charts and table designed by the use of Microsoft Office Excel 2007.

## Results

Sixty one patients were enrolled in this study, all patients were underwent mastoid surgery in Khartoum ENT hospital and Omdurman military hospital.

Their age ranged between 7 years to 62 years, with high incidence in age group (31-40) years were 18 patients (29.5%) and a mean age of 32.45 ±SD.

The main presenting symptoms was ear discharge in 49 patients (80%), followed by hearing loss in 45 patients (73%), dizziness found in 21 patients (34.4%), ear pain in 15 patients (24.6%), facial asymmetry in 12 patients (19.7%), post auricular swelling in 11 patients (18%), retroorbital pain in 2 patients (3.3%) and deplopia in 1 patients (1.6%).

The Otological findings all patients had tympanic membrane perforation (100%); granulation tissue was found in 16 patients (26.2%), polypoid middle ear mucosa in 8 patients (13.1%), sagging of posterior canal wall in 7 patients (11.5%), post auricular scar in 17 patients (27.9%), post auricular fistula in 9 patients (14.8%) & positive fistula sign in 9 patients (14.8%).

CT scanning findings revealed soft tissue density & bone erosion in 20 patients (32.8%), bone erosion in 16 patients (26.2%), soft tissue density in 15 patients (24.6%), cloudiness in 7 patients (11.5%) & sclerotic change in 3 patients (4.9%).

According to indications for surgery were cholesteatoma in 36 patients (59%), continuous otorrhea in 13 patients (21.3%), mastoid abscess in 6 patients (9.9%), facial nerve palsy in 5 patients (8.2%) and petrositis in 1 case (1.6%).

Surgical exploration was done through post auricular incision in 57 patients & transcanal endoscopic surgery in 4 patients, 44 of them were primary procedures and 17 patients were revisions, cortical mastoidectomy was done in 28 patients (45.9%), modified radical mastoidectomy in 20 patients (32.8%), radical mastoidectomy in 9 patients (14.8%), & atticotomy performed in 4 patients (6.6%).

## Discussion

Mastoid surgeries constitute the vast majority of otological procedures; they were originally developed for the treatment of suppurative disease<sup>4</sup>

In this study the common age group for mastoid surgery was from 31-40 year and more than 52.5% of our patients were from rural areas; of low socioeconomic class, with female to male ratio 1.1:1 which differ from the ratio obtained by Lasisi and Afolabi<sup>5</sup> which was 2:3.

The main presenting symptoms in our study was otorrhea which present in 49 cases (80%) and hearing loss was present in 45 cases (73%), other clinical features such as dizziness were present in 21 cases (34.4%), otalgia in 15 case (24.6%), facial paresis in 12 cases (17.9%), and post auricular swelling in 11 cases (18%) each these clinical features were coincident with the presentation described in the literature by Seiden et al and Balleneger who reported that ear discharge and hearing loss are the main presenting symptoms of patients with cholesteatoma; hearing loss varies from mild to severe<sup>6</sup>.

The common surgical technique in our study were cortical mastoidectomy was done in 28 cases (45.9%) most of them with non cholesteatomatous chronic otitis media, in literature there has been a considerable debate whether cortical mastoidectomy is required in the management of non cholesteatomatous chronic otitis media. Some authors believe that mastoidectomy is not necessary for treatment of all non cholesteatomatous ears<sup>7</sup>. However, some believe that addition of mastoidectomy greatly increases the success of tympanoplasty<sup>8</sup>. Some authors prefer to add cortical mastoidectomy in cases with congested, polypoidal, moist or discharging ear<sup>9</sup>. Ruhl and Pensak opine that mastoidectomy should be considered in all failed cases of tympanic membrane reconstruction and also if the pre operative imaging shows poorly pneumatized mastoid or those with evidence of soft tissue in the mastoid, aditus or epitympanum. The second surgical technique was modified radical mastoidectomy which done in 20 cases (32.8%), followed by radical mastoidectomy which conducted in 9 cases (14.8%) all of them with cholesteatomatous chronic otitis media 2 cases complicated by facial palsy and by petrositis similar to the result of Thapa and Shrivastav whom they showed in their studies that (87.8%) patients underwent MRM, 14 patients (6.09%) underwent radical mastoidectomy.

The exact role of CT in the preoperative assessment of patients with chronic otitis media is controversial<sup>10</sup>. Some authors have reported a high degree of accuracy in the pathological diagnosis of ossicular chain and inner ear conditions<sup>11</sup> and others have concluded that CT has poor ability to diagnose cholesteatoma and should not be relied on to visualize abnormalities of the previously mentioned structures<sup>12</sup>. The results of this study suggest that cholesteatoma can be accurately diagnosed by CT which revealed At surgery, cholesteatoma was present in 41 out of 61 patients (67.2%). There were 36 patients (59%) in whom the cholesteatoma was diagnosed correctly by the CT scan, and 25 patients (41%) where it was excluded correctly. In 5 patient (8.2%) it was excluded by CT scan but

was present at surgery, this outcome was similar to result of Mafee et al reported in his series of 48 patients with cholesteatoma that 46 of them (96%) were diagnosed correctly using preoperative HRCT scans.<sup>13</sup> the hallmarks of cholesteatoma on CT scan are the bone erosion and smooth expansion with soft tissue mass. Conversely, one should be aware of the limitations of CT to pick out early or limited disease, since it is difficult to diagnose cholesteatoma on the scan if the soft tissue mass is not associated with bone erosion<sup>14</sup>

## Conclusion

The preoperative CT scan imaging in cases of cholesteatomatous COM have good correlation with intraoperative findings, CT of the temporal bone is useful guide to the surgeon in managing patients with COM. We believe that CT is a guide as to the nature of the disease and possible complications and this information can assist the surgeon in the choice of surgery to be performed (simple or radical mastoidectomy, with or without tympanoplasty).

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