



Otological Surgery in Mali: Our Experience

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Abstract

Objectives: Evaluate our experience through a review of five otological surgeries in Mali.

Material and Methods: This is an observational, descriptive and retrospective study that took place in the ENT Department - Head and Neck surgery of the University Hospital Gabriel. It took place over a period of 8 years from July 2014 to June 2022.

Results: During this period, 807 surgeries were performed 150 cases of otologic surgery accounted for 18.6%. The age group of 11 to 20 years was predominant with 34%. The sex ratio was 0.87 in favor of the female sex. Hearing loss was the main reason for consultation, 73.3% (n=110). Tympanic perforation was found in 71.3% of cases and intact in 28.7%. Myringoplasty was the type of surgery performed 65.3% followed by the installation of transtympanic aerator in 13.3%, platinectomy and platinotomy in 12.6%. Operative follow-up was reported by operative revision in 22.2% of cases of chronic cholesteatomatous mastoiditis and the tympanic closure rate was 95.2% in eighteen months compared with 4.8% failure.

Conclusion: The otological surgery in Mali is recent. It occupies a prominent place in ENT surgical activities.

Keywords: Otology; Myringoplasty; Platinotomy; Mastoidectomy; Middle ear-surgery

Introduction

The ear is the organ of hearing and balance [1]. These functions of the ear are most often affected by various otological disorders, some of which require surgical management. The anatomical complexity of the ear and the relationship with the noble structures makes the surgical management of these affections difficult [2]. Otological surgery includes all surgeries on the outer ear; medium and internal. It has made significant progress in recent years as illustrated by the subsequent history. The development in crescendo has gone through several stages of research ranging from the closure of the tympanic membrane with a fragment of pork bladder mounted on an ivory tube by Marcus Banzer in 1640 [3] to the use of the artificial tympanum by Autenrieth in 1815 [4]. The credit must go to Berthold in 1878 for having successfully achieved a closure by autograft of thin skin and innovation by regeneration of the tympanic membrane by introducing the term of myringoplasty [5,6]. Despite this improvement, some failures related to the new techniques led to a temporary halt in the 20th century [7]. Schuknecht's contribution to Germany in 1960 of otosclerosis surgery with wire prosthesis [8] was improved in France by Michel Portman and Jean Causse [9]. Nowadays, the development of surgical techniques and more particularly the contribution of oto-video-endoscopy, cochlear or brainstem implantation and new techniques of medical imaging have made it possible to improve the therapeutic management of otological pathologies. These surgical techniques are part of the treatment of deafness with the main objective of restoring the hearing closer to normal and eradicating a condition that may involve the patient's vital prognosis. The constant concern is to reintegrate the patient socially or to rehabilitate him. These notions meet the criteria of an adequate technical platform.

The frequency of otologic surgery in ENT surgery is estimated at 2%, mainly concerning myringoplasty in the N'D Jolo et al. [10], study on the practice of ENT surgery in the African environment. The advent of otological surgery is recent in Mali. In our context, work is limited and responds to the management of diseases affecting the outer and middle ear. It requires the establishment of an adequate training policy *via* postgraduate training. For this purpose, an evaluation of otological surgical activities is necessary. It is in this context that we initiated this study to evaluate our experience through a review of five years of otological activities in the operating room of the university hospital of Gabriel Touré.

OPEN ACCESS

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Received Date: 24 Jan 2024

Accepted Date: 05 Feb 2024

Published Date: 09 Feb 2024

Citation:

Coulibaly O, Koné FI, Cissé N, Traoré K, Dicko I, Dembélé Y, et al. Otological Surgery in Mali: Our Experience. *Am J Otolaryngol Head Neck Surg.* 2024; 7(1): 1255.

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Material and Methods

Type of study: This is an observational, descriptive and retrospective study that took place in the ENT-Head and Neck surgery department of the university hospital Gabriel Touré.

Framework of the study: It took place over a period of 8 years from July 2014 to June 2022.

Population and place of study: Any patient who underwent otologic surgery at the Gabriel Touré University Hospital Center in the ENT Head and Neck Surgery department of the University Hospital of Gabriel Touré with a complete medical file was our sample.

Inclusion criteria: We included all age-confounded patients with middle ear surgery.

Exclusion criteria: The diseases of the inner ear and patients lost to follow-up have been excluded, the affections concerning the inner ear and the outer ear.

Variable: The diagnostic method was based on clinical examination data, tympanometry, tonal audiometry, computed tomography and pathological examination. All of our patients were operated under a microscope. The variables studied included age, sex, signs of consultation, duration of disease progression, tympanic membrane status, basal state, tympanometry data, degree of preoperative hearing loss and postoperative auditory gain, the result of computed tomography. Operative follow-up was established over a period of eighteen months. The data were recorded on a survey card designed for this purpose after reviewing clinical observations, operative reports and hospitalization.

Statistical analysis: The data was entered into the SPSS Version 19 software containing an entry mask established from a survey form.

Result

During this period, 807 surgeries were performed at the university hospital of Gabriel Touré, of which 150 cases of otological surgeries were 18.6%. The age group of 11 to 20 years was predominant with 34% of cases. The sex ratio was 0.87 in favor of the female sex. Hearing loss was the main signs of consultation, 73.3% (n=110) followed by tinnitus in 11.3% (Table 1). The duration of evolution was greater than 3 months in 98.7% of patients. Tympanic perforation was found in 71.3% of cases and intact in 28.7%. Total perforation, subtotal and punctiform, represented respectively 46.7%, 41.1%, 12.1%. Anterior perforation accounted for 25.2%, posterior in 42.1% and central in 32.7%. Tonal audiometry revealed transmission deafness (81.3%), perception (9.3%), mixed (8.7%) and normal (0.7%). The degree of loss in decibels of 40 db to 70 db was 39.3% (Table 2). Diagnosis has concerned seromucous otitis in 16.1%, chronic simple otitis media in 58.63%, otosclerosis in 12.6%, retraction pockets in 6.67%, cholesteatomatous otitis in 3.3%, chronic mastoiditis in 2.7%. The myringoplasty was the type of surgery performed 65.3% followed by the trans-tympanic aerator in 16.1%, and platinectomy and platinotomy in 12.6% (Table 3). The postoperative course was reported by operative revision in 22.2% (2 cases) of cases of chronic cholesteatomatous mastoiditis and the tympanic closure rate during myringoplasty was 95.2% in eighteen months compared with 4.8% failure. The 60-day postoperative hearing gain after myringoplasty was 11 db to 30 db in 59.1%. In 16.3% no gain was obtained for myringoplasty. Hearing gain 60 days postoperatively after

Table 1: Signs of consultation.

Signs	Effective	Percentage
tinnitus	17	11.30
Hearing loss	110	73.30
Otorrhea	16	10.70
Traumatism of the external auditory canal	4	2.70
Language disorders	1	0.70
Post auricular swelling	2	1.30
Total	150.0	100.00

Table 2: Hearing loss preoperatively.

Average hearing loss in decibels	Effective	Percentage
20-40	49	32.7
40-70	59	39.3
70-90	30	20
90-120	6	4
>120	6	4
Total	150	100

Table 3: Surgical procedures performed.

Operative indications	Effective	Percentage
Transtympanic Aerator	24	16.1
Masto-atticotomy	9	6
Myringoplasty	98	65.3
Platinotomy and Platinectomy	19	12.6
Total	150	100

stapedectomy 16 db to 30 db in 78.9%. In 21.1% no gain was obtained for stapedectomy. We found that after placing the transtympanic aerator in 24 patients that 5 patients had postoperative otalgia 25%, 13 patients (or 65% of patients) had normal hearing and the 6 patients found a different hearing improvement preoperatively.

Discussion

The recurrence of otological surgery activities is an observation in our current work environment over the last five years. It allowed setting follow-up rules to follow the postoperative evolution of our patients. This recurrence of otological activities in ENT surgical activities has been evaluated at 2.5% by some authors [10]. In our study, this prevalence is estimated at 18.6%. Our activities are close to other centers having reported 5% to 15% of otological activities [11,12]. The observation joins that of Salisu [13]. This prevalence illustrates the diversity of operative indications and the crescendo evolution of the number of ENT surgeons in our country. The predominance of the female sex in our sample is admitted by some [10] in Africa with 52.7%. A predominance of the male sex was found in the series of Salisu [13]. The female predominance is the prerogative of certain diseases in ENT such as otosclerosis, it was found in 17 women for two men. In our series, the average age was 15.5 years with extreme 4 years and 74 years. The age group of 11 to 20 years was the most affected, 34% of cases. It is the same with Skandour [14] who obtained a rate of 31.67% for the age group of 10 to 19 years. The age limit seems to be an essential factor in the surgical decision of tympanic perforations. For others, there is no interest [15,16]. Age seems to be a factor influencing the occurrence of certain conditions such as seromucous otitis. According to some authors, it influences the result

of myringoplasty, for others the result has no connection with the result of myringoplasty [17,18]. Hearing loss was the main reason for consultation with 73.3%, the same finding was made by Salisu [13]. Tinnitus is quite frequently described in otosclerosis according to Gersdoff [19]. We found in our study that the reason for consultation is most often a function of the type of pathology encountered. The ear being the organ of hearing and balance, the first discomfort is that of hearing loss. The delay of consultation is reported by the literature in developing countries, it may be due to the absence of a family doctor, but especially an intellectual and socioeconomic level of parents who are often low, who start self-medication often unsuitable for an underestimated otorrhea. The duration of evolution longer than 3 months was found in 98.7%. Ezzahra Abdala reported an average duration of evolution at 4 years [20]. Myringoplasty was performed in 65.30%. It constitutes the final layer of all otological interventions. The high incidence of myringoplasty in otologic surgeries was reported in the Karela series [21] at 91.5%, 80% for Benzarty [22]. The anatomical success rate was evaluated at 95.2% in nine months, the successful rate in the Shekharappa study was 93% in 28 patients by six months [23]. This rate of anatomical success varies in the literature between 71% to 90.2% of the operated patients and up to 100% [24-29]. The criteria for success of myringoplasty are anatomical and functional according to some authors [30-32]. For Emir [33] in addition to the integrity of the graft, requires a gain greater than 10 db and an average residual audiometric Rinne less than 25 db. In our study we found an improvement of 11 db to 30 db in 49.9%. The 4.8% failures were due to super infections of the ear. Seromucous otitis came in second place after Otitis open tympanitis with 13.3%. It is the preserve of children [31]. All series place the frequency peak between 2 and 7 years with an average age of 5 years [34-41]. Our study corroborates that of Ezzahra Abdala [20] found two peaks 5 to 7 years and the other between 13 to 15 years. This finding is shared by Klopp Dutote [42]. Hearing loss was the predominant symptomatology as in other series. This treatment is based on a surgical procedure, but also requires a regular and prolonged follow-up by the ENT until the ablation of the aerators and well beyond to detect the secondary complications. This surgery was done on the basis of a hearing loss of 30 db. We found that after the installation of transtympanic aerator in 24 patients that 5 patients had postoperative otalgia 25%, 13 patients (or 65% of patients) had normal hearing and the 6 patients found a different hearing improvement preoperatively.

The authors noted the high incidence of otosclerosis in the Caucasian race and its rarity in the black race [43]. It accounted for 12.7% in our study. The incidence of clinical otosclerosis varies from 0.1% to 2.1% worldwide [44]. In Tunisia, its prevalence ranges from 0.4% to 0.8%, with a predominance of women [45-47]. The average age of onset is between 20 and 40 years [48]. The age group of 21 to 30 years was found in our study with 5.3%. As in the series of Achour I [49]. Hearing loss was the main sign in our study in 100% of cases. Unlike the Achour series where tinnitus accounted for 85% of cases [49]. The success of otosclerosis surgery should not be judged only in the short term but also on the maintenance of auditory results and benefit during the patient's life. In our study the percentage of Rinne's closure was 94.4%, the gain at 1 year was 21.1 db and air conduction remained stable in 3 to 5 years. This result is comparable to that reported in the literature [50]. The frequency of tinnitus is variably estimated in the series. Of the 19 patients, 3 patients represented tinnitus postoperatively. According to the authors tinnitus improvement is remarkable in patients who have undergone

a partial platinectomy or platinotomy in those who have had a total platinectomy which is the case of our series. In our study mastoiditis accounted for 2.7%. Mastoiditis was isolated without being associated with other extra cranial or intracranial complications. The evolution was favorable in all our cases with a decrease of 1 year. Surgical revision was performed for 22.2% of patients.

Conclusion

The introduction of otological surgery in Mali is recent. It holds an important place in ENT surgical activities. However, myringoplasty is the most commonly performed procedure in Otolaryngology and is the final layer of most otitis media interventions for chronic otitis media. The Myringoplasty was the type of surgery performed 65.3% followed by the trans-tympanic aerator, platinectomy and platinotomy. Its practice requires the support of several corollary propelling factors of a promising outcome. Otological surgery still recognizes many challenges in our context. The different diagnostic methods still suffer from shadows due to the inadequacy of the technical platform.

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