

CHOLESTEATOMA PRESENTATION TRENDS IN KOHAT DIVISION

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ABSTRACT

Objective: To discuss the presentation stages of Cholesteatoma in patients of various areas of Kohat division.

Study Design: Case series study.

Place and Duration of Study: Combined Military Hospital Kohat, from Nov 2015 to Nov 2017.

Methodology: A total of 60 patients having Chronic Suppurative otitis media with Cholesteatoma were selected from outpatient department. Disease process was evaluated by otomicroscopy as well as radiologically. Perioperative disease spread pattern was also assessed and documented.

Results: Out of 28 patients with pars tensa cholesteatoma 28.5% were in stage II and 53.5% were in stage III disease. Out of 32 patients with pars flaccid cholesteatoma, 3.1% presented with stage 1 disease, 37.5% with stage II disease, 50% with stage III disease and 9.3% with stage IV disease.

Conclusion: Appropriate measures should be taken for training of general physicians as well as otologists at National level to help early diagnosis and better outcome.

Keywords: Cholesteatoma, CSOM, Complications of cholesteatoma, Kohat division, Staging of cholesteatoma.

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INTRODUCTION

Cholesteatoma is a destructive disease in the middle ear which may extend to mastoid and air cells system and if not interrupted may lead to mastoid abscess or erosion of dural and/or sinus plate leading to fatal intracranial complications.

It is diagnosed usually by otoscopy and is treated by exploration of mastoid bone. The cholesteatoma may be congenital or acquired. A lot of work has been done for the diagnosis and treatment of cholesteatoma and still a lot is to come. Different theories presented for the origin of cholesteatoma include.¹

Congenital Cholesteatoma

Invasion of misdirected ectodermal cells within external auditory canal migrate through tympanic isthmus into middle ear. Embryonic rest remnants form epithelial tissue.

The Acquired Cholesteatoma are of two Types

1. Primary acquired cholesteatoma occurs because of improper Eustachian tube dysfunction leading to retraction and cholesteatoma formation.

2. Secondary acquired cholesteatoma occurs due to migration of epithelium from external auditory canal or tympanic membrane through a defect in tympanic

membrane.¹

Origin of Cholesteatoma

Several theories have been presented. Ruedi suggested that under the influence of infection, changes occur in the basal cells of the germinal layer of the skin. Habermann suggested that the epithelium from outside the ear drum moves inside the perforation to form cholesteatoma. Wittmaack suggested retraction pocket theory.²

The improper function of the Eustachian tube causes negative pressure changes in the middle ear and retraction of tympanic membrane occurs that leads to cholesteatoma. Another problem with cholesteatoma is that there is no blood circulation in it, systematic antibiotics cannot reach to the center of the affected area so topical drops can be effective. Otorrhea over time leads to reduce the effectiveness of drops and surgery becomes the only option.²

Though cholesteatoma has been staged by various authors, no staging system has gained universal acceptance. People have classified cholesteatoma on the basis of age, involvement of structures and place of origin. A lot of cases of cholesteatoma reporting to ENT outpatient department were observed to be in pretty bad shape and an attempt was made to stage the disease in our setup. We followed the following staging system for acquired cholesteatoma by Tonoetal,³

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to study the stage of disease in patients presenting in ENT department, CMH Kohat. The staging is as follows:

Pars Flaccida Cholesteatoma

Stage-I: Cholesteatoma localized in the tympanic cavity.

Stage-Ia: A retraction pocket with epithelial self-cleaning function

Stage-Ib: A retraction pocket with persistent accumulation of keratin-debris

Stage-II: Cholesteatoma involving two or more sites

Stage-III: Cholesteatoma with intratemporal complications and/or pathologic conditions

Stage-IV: Cholesteatoma with intracranial complications.

Pars Tensa Cholesteatoma

Stage-I: Cholesteatoma localized in the tympanic cavity.

Stage-Ia: Epithelial invasion confined to the underside of the pars tensa.

Stage-Ib: Epithelial invasion extending to the tensor tympani tendon and the promontrial wall.

Stage-II: Cholesteatoma involving two or more sites.

Stage-III: Cholesteatoma with intratemporal complications and/or pathologic conditions.

Stage-IV: Cholesteatoma with intracranial complications.

We placed our patients according to the above-mentioned staging system to see which stage mostly our patients fall into. No such study has ever been conducted at Kohat division, neither we have seen such cases being operated at peripheral hospitals therefore a need was felt to study the stages of disease presentation so that awareness about the disease its patterns and stages of presentation can be emphasized amongst the general as well as ENT practitioners of the division. This will help in early diagnosis, prompt referral, better treatment and acceptable auditory outcome for these patients.

METHODOLOGY

This descriptive case series study was conducted at CMH Kohat from November 2015 to November 2017, after the approval of Hospital Ethical Committee. A total of 60 patients were picked up by convenient sampling technique (Non-Probability), who presented with chronic otitis media with cholesteatoma universal

sampling was carried out. They were diagnosed clinically. X-ray mastoid and CT scan temporal bone with contrast was carried out in all cases. We do CT Scan to see low lying dura, high jugular bulb, anterior lying sigmoid sinus, facial nerve dehiscence and other situations like ossicular state, brought about by the destructive nature of the Cholesteatoma. Pure tone audiometry was carried out in all cases. Congenital cholesteatoma was not included in the study. All patients were subjected to surgery and a mastoid exploration was carried out. Following types of surgeries were performed.

Modified Radical Mastoidectomy, Radical mastoidectomy, Second look Mastoidectomy. Perioperatively disease extent was also noted. The data was analyzed using SPSS-24 and used to calculate frequency of variables used in the study by using descriptive analysis in detail.

RESULTS

A total of 60 patients were included in the study. Twenty (33.33%) patients were females and 40 (66.66%) were males. The included ages ranged between 15-60 years with a mean of 39 years (Standard deviation ± 11.43).³ Patients had bilateral ear disease. Twenty-eight patients (46.6%) presented with pars tensa cholesteatoma and 32 (53.3%) patients presented with pars flaccida cholesteatoma.

Out of 28 patients with pars tensa cholesteatoma, three (10.7%) patients presented with stage I disease, eight (28.5%) patients with stage II disease, fifteen (53.5%) patients with stage III disease and two (7.1%) patients with stage IV disease.

Out of 32 patients with pars flaccida cholesteatoma, one (3.1%) patient presented with stage 1 disease, 12 (37.5%) patients with stage II disease, 16 (50%) patients with stage III disease and 3 (9.3%) patients with stage IV disease T (Table-I).

Table-1: Percentage stage presentation of the disease.

Type	n	Stage-I	Stage-II	Stage-III	Stage-IV
Parstensa Cholesteatoma	28	3 (10.7%)	8 (28.5%)	15 (53.5%)	2 (7.1%)
Pars flaccida Cholesteatoma	32	1 (3.1%)	12 (37.5%)	16 (50%)	3 (9.3%)

Out of 60 patients, 6 patients (10%) reported from Kohat city, 15 from Thall (25%), 20 from Shakardara (33.3%), fifteen from Takht-e-Nasrati (25%) and 4 patients from Karak (6.7%) (Figure-2).

Patients were operated upon and mastoid exploration was carried out. Provisional Stage II and

stage III were finalized on the basis of per-operative findings. Cases which were in stage IV presented with headache along with other symptoms and on CT scan they were found to have dural plate involvement with cholesteatoma. They were operated upon and the dural plate was also cleaned. They responded to treatment well. Postoperatively followup was advised to all patients. They were called after one week for stitches removal and 2nd follow up visit was advised on 15th postoperative day for BIPP (dressing) removal for which all reported. 3rd follow up was advised after one month and 2 months for having a look into the mastoid cavities and for hearing evaluation by Pure tone audiometry as in these cases of advanced cholesteatomas mostly patients present with mixed hearing loss and usually, they require hearing aid postoperatively. Out of 60 patients only 27 (45%) patients had 3 follow up visits after wound healing. Fortunately, they were all having dry mastoid cavities and they were advised hearing rehabilitation.

stage, the more difficult it is to treat involving radical surgery and consequently increased hearing loss. As the disease advances there are chances of intracranial complications.⁴

Patients in outpatient department describe their symptoms from near past however upon probing the start of disease is usually found to have been kept for years. Total duration varies significantly which is a clear indicator of the fact that either due to the lack of knowledge the patient did not seek advice from medical setup or the cholesteatoma is still a less known entity amongst the general practitioners. The fact that there is no otology setup in Kohat Division also resulted in conservative treatment of an otherwise surgical disease for years and therefore the patients usually presented late in advanced stages of their disease.

Jose *et al* in BJORL describes that their patients reported to the hospital for the first time in ENT after 6-15 years of their symptoms,⁵ which appear to be quite late keeping in view the advanced countries and their education level of general population. In Kohat area the patients reported to the ENT clinic for the first time even after 30 years after the start of disease process which was discovered after a probing history from the patients. Even after reporting for the first time to general/ENT practitioners they were treated for Chronic Suppurative Otitis Media and not for Cholesteatoma and only conservative management was instituted.⁶ The reason may be social setup or economical constraints or lack of technical expertise whatsoever but the diagnosis of the disease was late and so it had the consequent effects on the patient's outcome of the disease.

Studies at developed countries clearly show that the disease is readily picked up and treated at an earliest stage due to better patient/doctor education level and early diagnosis and referral by general practitioner. At referral centers disease is readily picked up by Radiologist on CT Scans,^{7,8} and patient is given due treatment this is why the advancements in the treatment plan is appearing like Endoscopic removal of cholesteatoma or conservative surgeries including canal wall up procedures.^{9,10} What is most effective for the treatment of cholesteatoma is debatable, however in our study it was noted that since the presentation was mostly delayed these patients were mostly managed with canal wall down procedures as shown in Figure-1. In the surgical plan for cholesteatoma the 2 most important factors are the eradication of disease and preventing the recurrence of cholesteatoma. Consi-

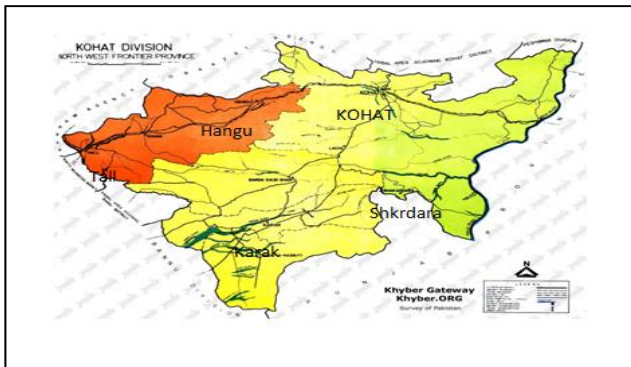


Figure-1: Kohat Division Map.

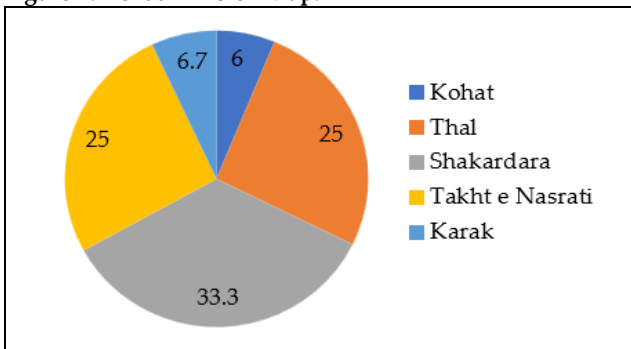


Figure-2: Percentage patient presentation from various cities in Kohat Division.

DISCUSSION

Cholesteatomas are one of the most complex yet fascinating diseases in ENT. Stage of presentation of disease is important as the treatment response depends upon the stage of disease. The more advanced the

dering these two factors in our cases the canal wall down procedure was adopted. It was observed that canal wall down procedure worked well in these cases due to, Removing the large surface area on which the cholesteatoma was adherent. Removing the barriers behind which the cholesteatoma was hiding. The instrumentation can be easily carried out at the time of surgery or later on.

Thus canal wall down procedure provided the most effective strategy for achieving the primary aim of cholesteatoma surgery. But as per the result, the functional impairment is also important. Surgery is generally safe. However, as with any operation, there are risks as well as benefits. The most common risks are:

Recurrence of the cholesteatoma, Hearing loss or failure to improve hearing. The need for more than one operation. In postoperative care, we had to look for the cavity care and use of hearing aids. It is worth mentioning that not a single case qualified for atticotomy or atticostomy which are conservative procedures with relatively better auditory outcome.

A radical clearance of cholesteatoma was also attempted as there were chances that patient may not turn up for followup due to poor education level and low socioeconomic status, making it yet another reason that a conservative approach was not attempted 0.05 patients had automastoidectomies. Only few patients from nearby areas reported for follow-up but a large number despite clear instructions did not report for the followup which makes it a reason to go for radical surgery in this area. A lot of education and awareness is required to increase the turnout of patients for follow-ups. Postoperative follow up of mastoid cavities after these radical surgeries did not reveal recurrence till 6 months,^{11,12} and hence hearing rehabilitation was advised.¹³

In 5 of the cases in which the disease process was found at the stage IV, advice from neurosurgeon was also sought. The headache was the sole symptom which brought these cases to the hospital otherwise ear discharge and decreased hearing were there for the past so many years and the patients were not referred to the ENT Setup. Since the CT Scan showed only local involvement of the meninges around the dural plate the patients were operated upon and drainage was established and the antibiotic cover was given to patients in ITC setup and they all recovered without any major sequelae.¹⁴

Present trend is heading towards reconstruction of the posterior wall after canal wall down mastoidectomies with either titanium sheeting or soft reconstruction but we could not follow such trends owing to poor followup.¹⁵⁻¹⁷ Patients with cholesteatoma usually have hearing loss prior to surgery. We tried to reconstruct the hearing whenever possible. This usually resulted in hearing improvement, but not always. Inflammation and scar tissue can sometimes prevent a good hearing result. A second-stage operation can be attempted in the future provided patients report for follow up at regular interval. Hearing loss can often be restored to some degree. If the disease prevents effective hearing restoration, a smaller operation in the future may be the best way to improve the hearing.

Even in the best of hands, cholesteatoma may recur, and additional surgery may be necessary in the future. A few patients started out with very good hearing as our attempt was always to preserve the hearing, but this was not always possible, so a partial hearing loss resulted in most of the cases. There was a small risk to the facial nerve with radical surgery. Fortunately no facial paralysis was observed in any case. Early detection and conservative approach are important in reducing morbidity associated with such procedures and good hearing rehabilitation.¹⁸

CONCLUSION

Cholesteatoma is a potentially life-threatening condition. If not diagnosed early it may lead to a great degree of morbidity as well as mortality. Appropriate measures should be taken for training of general physicians as well as otologists at National level to help early diagnosis and better outcome. Early detection of cholesteatoma helps in adopting conservative surgical approach to the patient and helps in effective hearing rehabilitation.

Conflict of Interest: None.

Authors' Contribution

MWA: Direct Contribution, SSUW: Intellectual, MA: Intellectual, SM: intellectual, MR: Proof reading, AA: Intellectual.

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