Original Article

SURGERY FOR OTITIS MEDIA WITH CHOLESTEATOMA: CANAL UP VERSUS CANAL DOWN PROCEDURES

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ABSTRACT

OBJECTIVES: To compare and evaluate the results of surgery for Otitis Media with cholesteatoma by canal up versus canal down techniques in our set up.
DESIGN: A descriptive study.
SETTING: Ear Nose Throat Department, Liaquat University Hospital, Hyderabad from January 2000 to December 2001.
METHODS: This study included 80 cases of otitis media with cholesteatoma. Patient were aged between 05 to 45 years. All cases operated under Zeiss microscope adopting two surgical techniques, i.e. canal up and canal down. The cases followed_up till 02 years for the recurrence of disease and any complication.
RESULTS: Majority of cases were male adults belonging to rural areas. In patients, operated with canal up procedure, high risk of disease recurrence and complications was seen as compared to the patients operated with canal down procedure.
CONCLUSION: In closed or canal-up procedures, there is more risk of recurrence of disease. Cholesteatoma has a tendency to recur if it is not properly eradicated. The canal down procedure are more reliable and safe for the patients irrespective of their age. Moreover, for follow-up the response by patients is poor due to lack of health awareness and facilities in the rural areas. . Thus, no chance should be given to the disease to recur in any case of otitis media with cholesteatoma.

KEY WORDS: Cholesteatoma. Surgery..

INTRODUCTION

Otitis media with cholesteatoma is regarded as non-malignant destructive ear disease[1]. It was first described in 1829 as a pearly tumor[2]. According to Brown J S (1982)[3], it is a bone eroding skin-lined cavity filled with concentric layers of desquamated epithelium. Because of its eroding character, cholesteatoma has been regarded as an unfavorable pathological disorder in the history of otitis media[4]. Surgery for the cholesteatoma is still a challenge for otologists due to impending extra cranial and intracranial complications. The surgical procedures are aimed at not only for eradication and removal of the disease completely but also to provide a complication free ear for rest of life[5]. Two surgical techniques are considered worldwide for this disease process: i) Open cavity mastoidectomy i.e. canal wall down and ii) Closed cavity mastoidectomy i.e. canal wall up procedure. The choice depends upon the age of patient, extent of disease and the pneumatisation of mastoid bone[6].

PATIENTS AND METHODS

80 cases of chronic otitis media with cholesteatoma were included in this study. Selection was done on the basis of otoscopic assessment of the cases otitis media, Confirmation of cholesteatoma / granulation under microscope was done. Cases with central and sub-totals perforation were excluded. The patients were operated between January 2000 to December 2001 at Ear Nose and Throat Department of Liaquat University Hospital, Hyderabad. Patients belonged to both sexes with age range of 05 to 45 years. Each patient underwent thorough examination of Ear, Nose and Throat. Hearing was assessed by pure tone audiometry before and after the procedure to exclude nerve deafness. Routine investigations; culture and sensitivity of purulent material from the deep external auditory canal, blood picture, urine analysis and conventional radiography were done for every patient. CT scan of temporal bone was done only in few cases with post-aural sinuses and mastoid abscess. The age from 05 to 15 years was considered as children and above 15 years as adults. Surgical decision was based on the proposal described by Austin 1989[7] i.e. “an intact canal wall (closed cavity) procedure is initially considered for all patients, but after exploration of mastoid the procedure may be extended to open cavity method depending on the extension of disease and the erosion of bony margins”. In cases of mastoid abscess, initially, the abscess was incised and

drained followed by mastoid exploration after four week .In open cavity procedures, the Modified Radical Mastoidectomy and Radical Mastoidectomy was performed while in closed cavity procedure, Attico-antrostomy, Intact canal mastoidectomy and Combined Approach Tympanoplasty and extended Cortical Mastoidectomy was done under Zeiss microscope. All patients were followed-up postoperatively for 02 years with an interval of 06 months. The non-recurrence of disease was considered as criteria for the assessment of results of the surgical procedure.

RESULTS

Majority of cases were male adults belonging to rural areas **(Table I)**. Sixty cases were found with only cholesteatoma and in 20 cases cholesteamtoma with granulation was seen. The granulation was seen encircling around the cholesteatoma. In cases with the mastoid abscess and post-aural sinus, there was necrosis and erosion of mastoid cortex and posterior meatal wall with natural cavity formation. The distribution of areas involved with cholesteatoma is given in **Figure I**. On otoscopic examination, attic perforation with cholesteatoma was seen in 10 cases while thirty cases had posterior perforation with cholesteatoma **(Figure II)**. On radiology, mastoid sclerosis was seen in 40 patients while 15 patients were having partial pneumatisation of mastoid bone and in 10 patients, there were natural cavitations in mastoid bone. In 15 cases, there were bony erosions around the mastoid antrum. In these cases, CT scan was done to confirm the intra cranial extension of disease . Deafness and purulent foetid blood stained discharge from the external meatus were the presenting symptoms in all cases. Headache and giddiness were seen in 10 cases. Ten cases were admitted with huge mastoid abscess while 10 cases with post-aural mastoid sinus **(Figures III and IV)**. There were four patients with complications; two with existing facial paralysis **(Figure V)** and two with neck rigidity and vomiting. The ossicular chain erosion was seen in all cases; incus erosion in 30 cases, malleus erosion in 10 cases, both incus and malleus in 20 cases while all ossicles were eroded in 20 cases. Among these 20 cases, there was erosion of mastoid cortex as well as posterior bony meatal wall in 5 cases. Lateral semi circular canal fistula was seen only in 03 cases while bony facial canal was eroded in 02 cases. Lateral sinus bony wall erosion was seen in 05 cases and 05 cases were found with visible duramater due to eroded tegmen antri. In 60 cases (75%), open mastoid cavity was designed by removing the posterior bony wall of external canal. Only 20 cases were completed as closed procedure keeping intact posterior bony wall. Among 60 cases with open cavity, Modified Radical Mastoidectomy was done in 36 cases and 24 cases were treated by Radical Mastoidectomy. Among 20 cases of closed procedure, Attico-antrostomy was done in 8 cases and intact canal mastoidectomy in 12 cases.

All patients underwent follow-up in the ward for any immediate complication. In cases operated by canal down procedure, facial paresis was seen in 5 cases. Three cases recovered completely and in 2 cases, facial paralysis persisted. Seven cases reported back after 3 months with residual and recurrence of the disease. As a whole, only 15% recurrence rate was seen. In cases of canal up procedure, 6 cases reported back after 6 months; two with mastoid abscess and 4 with recurrence of disease. Hence, 30% recurrence was seen in closed technique. All these cases underwent revision mastoidectomy.

TABLE I:

Sex		Age		Location	
Male	Female	05-15 years	15-45 years	Rural	Urban
50	30	25	55	60	20
62.5%	37.5%	30%	70%	75%	25%

AGE AND SEX DISTRIBUTION OF PATIENTS (n=80)

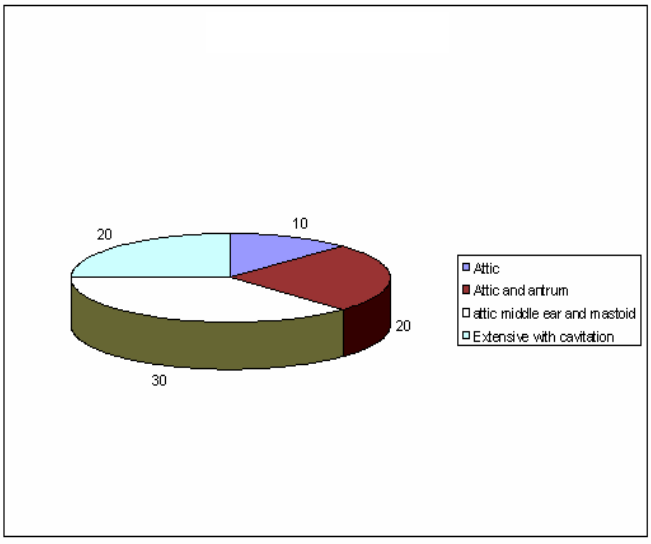

FIGURE I:
OPERATIVE FINDINGS OF THE PATIENTS (n=80)

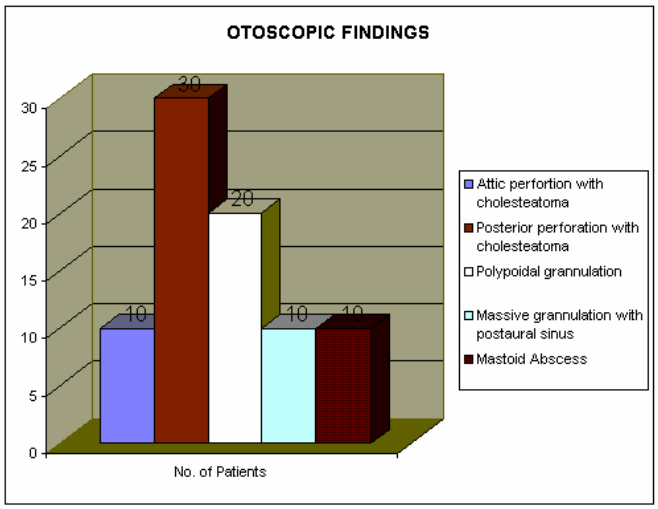

FIGURE II:
OTOSCOPIC FINDINGS OF PATIENTS

FIGURE III:

POSTAURAL SINUS WITH GRANULATIONS IN A PATIENT

FIGURE IV:
POSTAURAL FISTULA IN A PATIENT
FIGURE V:
FACIAL PARALYSIS IN A PATIENT

DISCUSSION

Surgery for chronic otitis media with cholesteatoma has two aims. Firstly, the eradication of disease to achieve a stable and safe ear life long. The preservation or improvement of hearing is considered secondary[8]. Removal of only cholesteatoma without creating a radical cavity leaving behind the posterior wall intact is the choice as reported by House and Sheehy[9]. However, Shambugh[10] states that this procedure is suitable only for small sac cholesteatoma, not for an extensive cholesteatoma. Meanwhile, Symth[11] is in favor of forming a cavity by doing radical mastoidectomy in cases of invasive cholesteatoma as open surgical procedure provides a good and safe access to all parts of middle ear and mastoid cellular system. The extent of cholesteatoma graded by Marres[12] still has considerable values in selecting the surgical procedures. It categorizes the cholesteatomatous invasion in four grades which include Grade-I (Only attic involved), Grade II (Attic and middle ear), Grade III (Attic and mastoid) and Grade IV (Attic, middle ear and mastoid). But in this study, we found even more extensive cholesteatoma with natural cavitations forming a mastoid bowl in cases with mastoid abscess and post-aural mastoid sinus. This condition reflects the illiteracy, poor socio-economic condition and even the lack of treatment facilities in rural areas. In a recent study by Khan I[13] of 52 cases of mastoiditis, 77% cases of mastoid abscess belonged to the areas where poor literacy rate and treatment facilities were present. This is definitely a serious condition that must not be ignored

by the surgeon, as chances of intracranial complication are always high in such circumstances.
The success of surgery depends when there is danger free, safe, stable ear with fewer chances of recurrence and residual disease. The incidence of recurrent cholesteatoma after intact canal (closed) surgery is up to 35%[14]. In this study, the intact canal wall mastoid procedure was also less successful in eradicating the disease and 30% recurrence was seen. However, with open canal surgery, there was only 15% recurrence, which is comparable with findings of another study[3].

CONCLUSION

Due to nature and behavior of cholesteatoma, canal wall-up procedure should be considered when disease is limited to attic and antrum only and the ossicles are less involved. However, in case of extensive cholesteatoma with ossicles involvement and erosins of surrounding bony walls then no chance should be given for disease to recur and complicatios by doing a radical surgery. Moreover, in close cavity surgical procedure, where cholesteatoma could not be removed properly from all areas, especially from middle ear, there always remains a chance of recurrence and complication. Due to illiteracy, environmental conditions and low socio-economic condition along with poor compliance of patients, follow-up in our set up is not effective. Therefore, a radical open surgical procedure is suitable and should be advised for all ears with cholesteatoma irrespective of the age of patient.

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