ORIGINAL ARTICLE

INTRACRANIAL COMPLICATIONS OF CHRONIC SUPPURATIVE OTITIS MEDIA: CLINICAL PRESENTATION AND OUTCOME OF SURGICAL PROCEDURES

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ABSTRACT

Background: Chronic suppurative otitis media is a common disease of younger ages which may lead to fatal and other dreadful complications. The objective of this study was to describe the clinical presentation of intracranial complications of chronic suppurative otitis media and outcome of various otological surgical procedures in management of these complications.

Material & Methods: This descriptive study was conducted at Department of ENT, Hayatabad Medical Complex, Peshawar, from January 2007 to December 2011. All admitted cases of intracranial complications due to chronic suppurative otitis media of any age and gender were included. Cases of intracranial complications due to acute suppurative otitis media were excluded from the study. After confirmation of complications by computed tomography, a multidisciplinary approach was followed by medical, neurosurgical and ENT departments, including initial treatment by intravenous systemic antibiotics to the definitive final treatment of mastoid surgery.

Results: With total 35 patients, mean age was 25.43±9.67 years, range 10-50 years and male to female ratio was 2:1. The most frequent symptom, general sign, otological sign, intracranial complication, surgical procedure and morbidity were otorrhoea 35(100%), raised temperature 27(77.14%), cholesteatoma 24(68.57%), meningitis 14(40%), radical mastoidectomy 23(65.71) and epilepsy 3(8.57%) respectively with no mortality.

Conclusions: Meningitis is the commonest intracranial complication of chronic suppurative otitis media followed by brain abscess. Early surgical intervention in combination with broad spectrum antibiotics provides a good outcome.

Key Words: Suppurative otitis media, Meningitis, Brain abscess, Atticotomy, Mastoidectomy.

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INTRODUCTION

Chronic suppurative otitis media (CSOM) is defined as chronic otorrhoea (> 12 weeks) through a perforated tympanic membrane. The cycle of infection, inflammation, granulation tissues, polyp and cholesteatoma formation continues, destroying surrounding bony margins and ultimately leading to the various complications of CSOM.[1] Both aerobic and anaerobic bacteria are found in chronic discharging ears. Pseudomonas aeruginosa (50-90%) is the most commonly recovered organism followed by Staphylococcus aureus. Remainders of infections are caused by Klebsiella, Proteus, and E. coli species.[2,3] Despite the availability of newer antibiotics, CSOM can still lead to major complications in developing countries.[4] CSOM with cholesteatoma can spread beyond middle ear, leading to extra cranial and intracranial complications.[5] Various intracranial complications of CSOM are meningitis, extra-dural abscess, sub-dural abscess, brain abscess, sigmoid sinus thrombosis, and otitic hydrocephalus.[6]

The objective of this study was to describe the clinical presentation of intracranial complications (ICCs) of CSOM and outcome of various otological surgical procedures in management of these complications.

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MATERIAL AND METHODS

This descriptive study was conducted at Unit B, Department of ENT, Hayatabad Medical Complex, Khyber Girls Medical College, Peshawar, from January 2007 to December 2011. A written informed consent containing terms about inclusion in study, benefits and risks involved, was obtained from each patient. All admitted cases of single or multiple ICCs due to CSOM of any age and gender were included. Cases of intracranial complications due to acute suppurative otitis media were excluded from the study.

A thorough history was taken and detailed otological, neurological, ophthalmological, and general physical examination was carried out and recorded on a proforma. Pure tone audiogram, CT-Scan of brain & temporal bone, lumber puncture and complete blood count were done in all patients. Every patient on admission was put on intravenous broad spectrum antibiotics and dexamethasone 4 to 8 mg to reduce brain edema. Patients with brain abscess were treated first by the neurosurgery department and then shifted back to our unit.

Selection of surgical procedure on ear was done according to the type and extent of disease

Table 1: Frequency of symptoms and signs in patients with intracranial complications of chronic suppurative otitis media

S. No.	Variables	Frequency	Ratio (%)	S. No.	Variables	Frequency	Ratio (%)
Symptoms				**General signs**			
1.	Otorrhoea	35	100	7	Raised temperature	27	77.14
2.	Decreased hearing	35	100	8	Kerning/Brudzinski positivity	21	60
3.	Headache	28	80	9	Nuchal rigidity	15	42.85
4.	Fever	25	71.42	10	Papilloedema	15	42.85
5.	Vomiting	22	68.85	11	Confused	5	14.28
6.	Fits	9	25.71				

Table 2: Frequency and ratio of otological signs and intra cranial complications.

S. No.	Variables	Frequency	Ratio (%)	S. No.	Variables	Frequency	Ratio (%)
Otological signs				**Intracranial complications**			
1.	Cholesteatoma	24	68.57	1	Meningitis	14	40
2.	Granulation tissues	18	51.42	2	Brain abscess	10	28.57
3.	Attic perforation	15	42.85	3	Extradural abscess	9	25.71
4.	Polyp	12	34.28	4	Lateral sinus thrombosis	1	2.85
5.	Anterior marginal perforation	8	22.85	5	Otitic hydrocephalus	1	2.85
6.	Total/Subtotal perforation	7	20				
7.	Posterior marginal perforation	5	14.28				

Table 3: Frequency of surgical procedures and morbidity and mortality.

S. No.	Variables	Frequency	Ratio (%)	S. No.	Variables	Frequency	Ratio (%)
Surgical Procedures				Morbidity/Mortality			
1.	Radical mastoidectomy	23	65.71	1	Epilepsy	3	8.57
2.	Modified radical mastoidectomy	7	20	2	Hemiparesis	1	2.85
3.	Atticotomy	3	8.57	3	Death	0	0
4.	Revision mastoidectomy	2	5.71				

and included atticotomy, radical or modified radical mastoidectomy, with or without tympanoplasty. Patients with persistent disease and recurrent foul smelling otorrhoea, marginal and attic perforation, and cholesteatoma were selected for mastoid exploration. Age in years and gender were demographic and independent variables. The data was analyzed manually as frequencies and ratios.

RESULTS

A total of 35 patients with ICCs due to CSOM were included in the study. The mean age of the patients was 25.43±9.67 years range 10-50 years. Males 21 (60%) out-numbered females 14 (40%) with a ratio of 2:1.

Table 1 shows frequency & ratio of Symptoms & General Signs. Otorrhoea and decreased hearing were the most common symptoms. While raised temperature was the most common general sign.

Table 2 shows frequency & ratio of Otological Signs & Intra Cranial Complications. Cholesteatoma was the most common otological sign. While meningitis was the most common intra cranial complication.

Table 3 shows frequency & ratio of Surgical Procedures & Morbidity & Mortality. Radical mastoidectomy was the most common otological surgical procedure performed. While epilepsy was the most common morbidity. No mortality occurred in our study.

DISCUSSION

In the pre-antibiotic era the incidence of complications of CSOM was very high i.e. 2.3% of the cases. Although the incidence has decreased to 0.15-0.04% with the development of effective antibiotics and with recent surgical techniques, it is still high in the underdeveloped countries like Pakistan.[7] In our study majority of the patients were in their first and second decade of life, which is also supported by another local study.[8] On the other hand in the study by Baig et al, majority of the patients were in third decade of life.[9] Our study reveals male predominance with male to female ratio of 2:1 which is consistent with other studies.[7,8] But another local study has reported a female predominance.[10] The predominance of male patients in our study is probably due to the fact that female patients are not brought out of their homes, and do not get the preferential treatment.

Meningitis was the most common ICC of CSOM in our study, as reported by literature.[7,9,11,12] In contrary, other studies have reported brain abscess to be the commonest ICC.[8,13] Temporal lobe abscess was more common than the cerebellar abscess with proportion of 3:1. This finding is also supported by other studies as well.[7,14] The presence of brain abscess is considered a sign of a negative prognosis because of the high mortality rate (33%) and some authors have suggested extensive investigations and early treatment of patients presenting with ear discharge, fever, and stiffness in the nape of the neck.

The symptoms in descending order of frequency were otorrhoea, decreased hearing, headache, fever, and vomiting in complicated CSOM patients as supported by findings of the other studies.[7,14] Site of the headache may point to the site of brain abscess. The picture of an otogenic intra-cranial complication is emerged when a patient with ear discharge develops headache, vomiting, neck rigidity, and papilloedema.

Cholesteatoma, granulation tissues and attic perforation were the common otological findings in the study patients. Cholesteatoma was present in 80% of the patients studied by Ajmal et al, as compared to 68.57% in the present study population.[7] CT-Scan of the temporal bone and brain with contrast, was the main diagnostic modality in all the

patients, as reported by Ibrahim et al as well.[15]

The primary goal of the surgical treatment of chronic suppurative otitis media is its complete eradication in order to provide the patient with a safe, dry ear. This can be achieved by meticulously removing all of the cholesteatoma, diseased bone, granulation tissues, and irreversibly diseased mucosa.[16] The most common procedures performed on the ear(s) were radical and modified radical mastoidectomy with or without tympanoplasty. The selection of a specific operative technique should be determined by the extent of the cholesteatomatous invasion in conjunction with the clinical assessment of Eustachian tube function, the degree of mastoid pneumatization and the anatomic configuration of the mastoid. Damage to the ossicular chain was noted in 73% cases. A study by Jacob Sade and Fuch's shows that erosion of the ossicular chain in CSOM is 49%, which is higher figure to our results.[17] The long process of the incus was involved in all the cases as supported by another study.[16]

Family physicians, as well as public at large, should be made aware of the seriousness of middle ear suppuration as this account for a high rate of morbidity and mortality in our country.

CONCLUSIONS

Meningitis is the commonest intracranial complication of CSOM followed by brain abscess. CT-Scan is the most relevant investigation in establishing diagnosis and follow-up. Complication should be treated first followed by treatment of the ear. Early surgical intervention in combination with broad spectrum antibiotics provides a good outcome.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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None declared.