LEAD ARTICLE

A Study of Prevalence of Cholesteatoma in Complications of Suppurative Otitis Media

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Abstract

Complications of suppurative otitis media are common in developing world. Cholesteatoma has been implicated as the causative factor. We studied 76 cases of suppurative otitis media presented with complications and found that only 64% cases had cholesteatoma. Granulation were present in most of the cases of intracranial complications (16.68%).

Key words

Otitis media, complications, cholesteatoma, intracranial, extracranial.

Evidence of presence of otitis media and cholesteatoma are seen in 2600 years old Egyptian mummies (Lyn 1974) and also in prehistoric Iranian skulls (Rathbut 1977). Hippocrates also stated that a discharging ear along with high grade of fever can be fatal and emphasised the significance of otitis media. Morgagni typically established the relationship between brain abscess and otitis media (Glasscock 1990). Ability of cholesteatoma to erode bone is well documented and also the significance of the same is in chronic suppurative otitis media while in acute infections, bone defects, thrombophlebitis or hematogenous route are major player in respect of complications (Ludman H 1987). Incidence of complications had decreased about 100 folds as seen in preantibiotic era (Palva et al 1985). Also awareness towards disease and presence of advance techniques for diagnosis and treatment had resulted in decrease in morbidity and mortality associated with complications. Prevalence of complications is as low as 0.04% in western world (Palva et al 1985), while same in developing world ranges from 6.45%-7.60% (Sriyanon et al 1984, Kangsanarak et al 1993).

We studied 76 patients of complications to find out the prevalence of Cholesteatoma in complicated cases as well as the type of complications.

Materials and Methods

This study was done over 76 cases presenting with suppurative otitis media along with complications to our OPD. All these cases were admitted and routine investigations were performed. X-ray mastoid Schuller's view was done in each and every case along with hemogram. In all cases suspected of intracranial complications, CSF biochemical and microscopical study was done along with bacteriological study. Blood culture was also done to rule out septicemia. All the cases having suspicion of intracranial complications (ICC) alone or in combination were given antibiotics for 48-72 hours to decrease inflammation and infection. Surgery was done in two stage, in first stage decompression and exploration was done and in second stage, after improvement in general condition of patient aural surgery was completed. In cases with extracranial complications (ECC) only immediate single stage surgery was done and in cases where intracranial complication were diagnosed

Fig.I. Photograph showing a large osteolytic lesion in Mastoid Cortex by cholesteatoma

Fig.II. CT Scan showing operated left mastoid with eroded sinus plate.

intraoperatively, again surgery is planned in two stage, as in ICC.

All the complications were divided into three groups, (1) ICC, (2) ECC and (3) cases having both ICC and ECC. The ICC and ECC were classified as described by Goycoolea and Jung (1990).

Observations

We studied 76 patients of suppurative otitis media with 77 complicated ears. In one case complications were present in both ears and both were ECC. ICC were present in 17 (22.08%) cases, ECC in 32 (41.56%) and both in 28 (36.36%) In all 168 complications were seen. Single complication was seen in 18 (23.47%) ears and multiple in 59 (79.53%) ears (Table I & II) .

Our study showed that females were more prone for complications, as were seen in 40 (52.63%) females in comparison to 36 (47.37%) males ; male female ratio was 1:1.10. Maximum number of patients were in age group of 11-20 years that is 30 (39.47%) and minimum one (1.32%) in age group of 40 years and above, with female of 45 years (Table III).

Ten cases (14.47%) came with bilateral disease and complications were present in one ear, except in a case where they were bilateral. In Bilateral cases, 4 (5.26%) had complications on left side and 5 (6.58%) on right side. Thirty cases (39.47%) had disease on left and 35 (46.05%) on right side. Safe type of disease was seen in 21 (27.63%); 6 (7.89%) on right, 9 (11.84%) on left and 6 (7.89%) on both sides, of which 5 (6.58%) cases had either acute

Table I

Table showing Distribution of Cases according to Complications

Complications	Number of Cases	Perecentage
Intracranial	17	22.08
Extracranial	12	41.56
Both	28	36.36
Total	77	100

Table II :

Table Showing Distribution of Different Complications

Complications	Cholesteatomatous	Noncholesteatomatous	Total (%)
INTRACRANIAL			
Meningitis	31	4	35 (45.45)
Cerebellar Abscess	3	3	6 (7.79)
Extradural Abscess	4	2	6 (7.79)
Perisinus Abscess	6	2	8 (10.39)
Sinus Thrombosis	3	3	6 (7.79)
EXTRACRANIAL			
Mastoiditis	34	13	47 (61.04)
Facial palsy	9	2	11 (14.29)
Mastoid Abscess / Fistula	35	10	45 (58.44)
Labyrinthitis	1	3	4 (5.19)
Total	126 (75%)	42 (25%)	168 (100)

Note : 18 patients had single complication, 32, had 2 complications, 22 had 3 complications and 5 had 4 complications.

exacerbation of acute suppurative otitis media, right in 1 (20%) and left in 4 (80%). Atticonatral disease was diagnosed in 55 (72.37%); right in 29 (38.16%), left in 21 (27.63%) and bilateral in 4 (5.63%).

Commonest presenting complaint was ear

discharge, which was present in all cases. This was followed by hearing loss in 48 (62.34%), headache 46 (59.74%) cases and earache in 45 (58.44%) ears. Facial palsy was seen in 6 (7.89%) cases and vertigo in 14 (18.42%) cases (Table III). On examination 58 (76.32%) cases were febrile and mastoiditis was present in 47

Table III

Age and Sex Distribution No. of cases : 76

No. of Cases : 76
Age Range : 3-45 Years
Male : Female : 1 : 1. 11

Age Group	Male (%)	Female (%)	Total (%)
0-11 Years	9 (25 . 00)	9 (22.50)	18 (23.68)
11-20 Years	13 (36 . 11)	17 (42.5)	30 (39.42)
21-30 Years	11 (30 . 56)	11 (27.5)	22 (28.95)
31-40 Years	3 (8.33)	2 (5.0)	5 (6. 58)
41 And Above	-	1 (2.5)	1 (1.32)
Total	36 (47 .37)	40 (52 . 63)	76 (100)

Note : One case had bilateral complications.

(61.03%), of which 37 (48.05%) had mastoid abscess. In one case each Bezold's abscess and occipital abscess were seen. Mastoid fistula was seen in 10 (14.47%) and neck rigidity in 32 (42.10%) cases while Kerning's was positive in only 30 (39.47%) patients. Cerebellar signs were present in all the cases of cerebellar abscess diagnosed by CT Scan (Table IV).

Retraction pocket was seen in 22 (28.57%) ears of which 3 (3.95%) had granulations also. Attic perforation was in 6 (7.79%) and central in 9 (11.69%) ears. Five patients have central perforation with sagging & only antero-inferior part of tympanic membrane was visible. In 3 (3.90%) ears central perforation with

granulation were seen while in one (1.30%) attic perforation was also present. Tympanic membrane was not visible in 29 (37.66%) ears, due to in polyp 7 (9.09%), sagging of posterosuperior wall and granulation in 3 (3.90%) and sagging only in 12 (25.58%) ears.

Simple cortical mastoidectomy was done in 4 (5.19%) cases, and simple incision and drainage of abscess in 2 (2.60%) cases ; one was 3 year old female and other was 45 year old female where due to anaesthetics problems mastoidectomy could not be performed. Canal wall down tympanomastoidectomy was done in remaining cases. Type I Tympanoplasty was done in 27 (35.07%) cases, while type II & III Tympanoplasty with ossicular construction

Table IV

Table Showing Sign and Symptoms in Respect of Complications

Sign & Symptoms	Intracranial	Extracranial	Both	Total
Ear Discharge	18	42	17	77
Hearing Loss	11	25	12	48 (62 . 34)
Headache	15	15	16	46 (59 . 74)
Facial Palsy	-	4	2	6 (7. 79)
Ear Ache	15	17	13	45 (58 . 44)
Swelling Behind Ear	8	21	8	37 (48 .05)
Discharge Behind ear	-	7	1	8 (10.39)
Vertigo/ Giddiness	4	7	3	14 (18. 18)
Vomiting	11	2	15	28 (36. 36)
Swelling In Neck	-	1	-	1 (1. 3)
Swelling Over head	-	1	-	1 (1. 3)
Fever	18	23	17	58 (76. 32)
Kerning's Sign + VE	13	-	17	30 (39 . 47)
Neck Rigidity	13	1	18	32 (42. 10)
Fistula Sign + VE	-	2	-	2 (2.6)
Mastoiditis	7	29	11	47 (61.03)
Cerebellar Sign	3	-	3	6 (7.79)
Mastoid Fistula	-	8	1	9 (11.69)

was done in remaining 50 (64.93%) cases to achieve maximum results. In 38 (49.45%) cases single stage aural surgery was done. In one case of mastoiditis with polyp and granulation in external ear canal, revision mastoidectomy was done. On surgery, cholesteatoma was present in 37 (48.05%) and granulation in 13 (16.88%) while both were present in 12 (15.58%) ears. Seven (9.09%) ears having safe type of disease (central perforation) had cholesteatoma on surgery. Most of the cases of ICC had granulations. Erosion of sinus plate (26) and dural plate (19) was seen in 29 (37.66%) mastoids and sinudural angle in 3 (3.90%). Lateral semicircular canal was found eroded in 4 (5.19%) cases. Attic erosion was present in 10 (13.0%) cases. In 29 (37.66%) cases of mastoid abscess frank pus was encountered on opening the mastoid antrum. Perisinus abscess and extradural abscess was present in 7 (9.09%) cases each. Three of the extradural and 4 of the perisinus abscess were diagnosed peroperatively only. In 3 (3.90%) ears sinus thrombosis was seen, all the cases were diagnosed during surgery. Ossicular erosion was seen in 49 (63.64%) ears; (Incus in all, malleus in whole or head 33 (42.86) and stapes suprastructure in 30 (38.96%). Facial ridge was eroded in 13 (16.88%) and facial palsy in 10 (13.0%) cases.

Discussion

The morbidity and mortality associated with the suppurative otitis media and its complications is well known. Destructive property of cholesteatoma also is well documented (Ludman H 1987, Shambough & Glasscock 1990). Aggressiveness of cholesteatoma and associated morbidity and mortality required permanent eradication of disease and cholesteatoma (Fisch 1982). Cholesteatoma due to its property of eating away bone can erode and damage dura, sinus, seventh nerve and bony labyrinth if not checked in time (Sheehy JL 1997); Complications of the suppurative otitis media has decreased worldwide with the exception

of developing world, where prevalence is still high 6.7%-7.6% (Kangsnarak et al 1993, Sriyanon et al 1984). Samuel et al 1986 noted high prevalence in South Africa especially in rural areas where otitis media is neglected due to poor primary medical services, this was again confirmed by Singh and Maharaj in 1993.

Intracranial complications though rare still figured high in ours as well as other studies done in developing world. Complications were usually multiple in occurrence. In our study 22.08% had ICC. 45.56% had ECC and 36.36% had both. Singh and Maharaj (1993) also reported higher incidence of extracranial complications (32%) and further higher incidence of intracranial complications (56%), though they have lower incidence of combined complications (12%). Prominence of females (52.63%) seen in our study was also supported by Shamboul KM (1992) whose study was also based on rural population. However other authors Kangsanarak et al (1993), Sriyanon et al (1984) whose study was probably from urban areas reported male predominance, Singh and Maharaj (1993) also supported these authors. However all these authors supported our view that the complications are common during the second decade of life, probably due to more active life and longer duration of cholesteatoma for which it remains active in situ (before culminating into complications) (Sheehy et al 1977), or more aggressiveness of cholesteatoma in younger age (Sade and Fusch 1994, Shenoy & Kakkar 1987).

Mastoiditis in ECC and meningitis in ICC were commonest of all complications in our study as well as documented (Ludman H 1987). Our study has 61.04% & 45.45% of mastoiditis & meningitis respectively. Predominance of mastoiditis and meningitis was also documented by Singh and Maharaj (1993), Samuel et al (1986), and Grewal et al (1994). However, Kangsnarak et al (1993) reported that though meningitis is commonest ICC, Facial palsy is commonest ECC (Sevic and Djeric (1989). Though, in our study it was seen in only 7.80% cases.

Cholesteatoma was present in about 65% cases and 75% of the complications. Higher incidence of cholesteatoma is well recorded by Shamboul KM (1992) 53%, Kangsanarak et al (1993) 73.8% and Singh and Maharaj (1993) 53%. Granulation were present in 16.68% out of which most of the cases had ICC, same was reported by Kangsanarak et al (1993) and Shamboul KM (1992) where it varies from 21-45%. Sade & Beno (1976) stated the property of granulation and inflammation to cause complications by bone destruction beside cholesteatoma. Our study had 7 cases who were diagnosed as noncholesteatomatous cases and were found to have cholesteatoma during

surgery. Our study has 9.09% cases of intracranial suppuration of which all were cerebellar abscess, again cholesteatoma was present in 65% of the cerebellar abscess, similarly in extracranial suppuration cholesteatoma was seen in 78% of cases.

Radical mastoidectomy was done in all these cases along with tympanoplasty to improve hearing. However, in cases where suspicion of recurrence of cholesteatoma in middle ear was aroused, middle ear was left open. In due course, all ears healed with healthy skin lining the cavity and no recurrence of complications was seen and ear remained safe during follow up.

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