Original article

Chronic Supurative Otitis Media in relation to dehiscent of facial canal

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Background: To observe the pathological findings in CSOM-AA along with, frequency of dehiscence of facial canal and to correlate the type of pathologies found with dehiscence of fallopian canal.

Methods: It is the retrospective study conducted in the department of ENT-HNS at Tribhuvan University Teaching Hospital, Nepal of 2 yrs duration April 2004 to April 006. Patients undergoing mastoid surgeries for the CSOM-AA under general anesthesia were taken for the study. Pathological findings were divided into 3 groups which are granulation tissue, cholesteatoma or both. Special attention was given to identify the dehiscent of facial canal and its status was also followed up in postoperative period till 1 month.

Results: The pathological finding commonly encountered were cholesteatoma with granulation 75.2% (94), whereas cholesteatoma alone was 18.4% (23)and granulation tissue only was 6.4%(8) The total incidence of facial canal dehiscence was 22 % (28/125) in our study. Horizontal part of the fallopian canal was most common site for dehiscence 50% (14/28) followed by vertical part 35 % (10/28) then both part was involved in 15% (4/28). There is no statistical significance between any type of pathology and dehiscence of facial canal.

Conclusion: Cholesteatoma with granulation was the most common pathology found in CSOM-AA. Irrespective of the pathologies in the middle ear cleft during mastoid surgeries for CSOM- AA, the facial canal was found to have dehiscence which was commonly occurring at horizontal part of the facial canal with higher incidence among cholesteatoma with granulation group.

Keywords: Chronic supurative otitis media, cholesteatoma, granulations, facial canal

Introduction

CSOM-AA is one of the commonest diagnosis made in the Department of ENT. It has basically 3 different types of pathological findings i.e , cholesteatoma, granulation and both. Cholesteatoma is epidermal inclusion cyst[4] lined by squamous epithelium containing keratin debris. Granulation tissue[7] results from the non resolution of an inflammatory process. Localized area of the mucosa become hyper plastic with invasion of fibroblasts, capillaries, macrophages, plasma cells, and lymphocytes. Granulation tissue can be covered by all the mucosal types described above, but the tissue is frequently ulcerated because it does not have a mucosal covering. Both of them has tendency to erode the bone but by different mechanisms. Cholesteatoma erodes by enzymatic degradation which is the most recent theory, while granulation erodes bone via reactive osteitis. Erosion of fallopian canal and destruction of the nerve results paralysis of facial musculature. In our study we are focused on the type of pathology which is more responsible for the

erosion of the fallopian canal in the cases of CSOM-AA.

The purpose of conducting this study was since CSOM-AA is a common problem in our country and facial nerve paralysis due to CSOM is also one of the commonest complications.

Congenital defect in the fallopian canal in which CSOM develops in later life couldnot be excluded from our study.

Objective

To observe the types of pathologies in CSOM-AA during mastoid surgeries

To observe the frequency of dehiscent of fallopian canal during the mastoid surgeries for CSOM-AA.

To correlate the type of pathologies with dehiscence of fallopian.

Material and Methods

It is a retrospective study conducted in Tribhuvan University Teaching hospital, Kathmandu - Nepal. Those patients who underwent mastoid surgeries for CSOM-AA under general anesthesia were taken for the study. Charts were reviewed of the past 2 years from April 2004 to April 006. Patients' particulars, hospital admission number, detail history of blood stained ear discharge, pre and post op facial palsy, types of pathology and status of the fallopian were noted and tabulated. The intratypanic part of the facial nerve was traced from the processus cochlleariformis to the vertical segment and any dehiscence of the canal were noted. Pathological findings are divided into 3 groups which were granulation tissue, cholesteatoma or both. Status of the facial nerve was also followed up till 1 month after surgery. Cases admitted in the unit one of ENT-HNS were only taken to make uniformity in the findings noted during the surgery by two operating surgeons

Inclusion criteria

Patients underwent mastoid surgeries for CSOM-AA under general anaesthesia.

Exclusion criteria

Patients underwent mastoid surgeries other than CSOM-AA

Patients with past history of temporal bone fracture with facial nerve palsy

Age < 13 years.

Results were analyzed using statistical chi square test taking value $P < 0.05$ as significant level.

Results

Total number of patients evaluated was 125 during the period of the 2 years. Age distributions of the patients are shown in table no. 1

Table 1: age distribution

Age group	No. of patients	Percentage
13-20 yrs	61	48%
21-30 yrs	41	32%
31-40 yrs	12	9.6%
41-50 yrs	7	5.6%
51- 60 yrs	4	3.2%

In our total patients were 125 patients 70 were males (56%) and 55 females (44%).

The pathological findings noted during surgeries were tabulated in the table 2. Cholesteatoma with granulation 75.2% (94) was found to be the most common pathology followed by cholesteatoma alone 18.4% (23) and a granulation tissue 6.4% (8) alone which is shown in table2.

Table 2: Distribution of the pathology in CSOM -AA

Pathologies	Number	Percentage
Chlolesteotoma only	23	18.4%
Granulation only	8	6.4%
Cholesteotoma & granulation	94	75.2%
Total	**125**	

The site of the facial canal dehiscence was also tabulated in the Table 3. Horizontal part of the facial (fallopian) canal was the most common site (50%(14) followed by vertical part 35%(10).

Table 3: Site of dehiscence of facial canal)

Site of facial canal	Number	Percentage
Horizontal part	14	50%
Vertical part	10	35.71%
Both horizontal and vertical	4	14.28%
Total	**28**	**100%**

Total number of fallopian canal dehiscence was noted in 28/125 (22%) patients. The pathological findings of them were tabulated in the table 4. Among the existed pathology the dehiscence of facial canal was most commonly encountered in ears having both cholesteatoma and granulation.

Table 4: facial canal in different pathologies)

Type of pathology	Number	Percentage
Cholesteatoma only	4	14.28%
Granulation only	2	7.14%
Cholesteatoma & granulation	22	78.57%
Total	**28**	**100%**

The comparison of the dehiscent of facial canal with different pathologies noted during the mastoid surgery for CSOM AA were tabulated in the Table 4

Table 5: Comparisons table

Dehiscence of facial canal with different pathologies	Absent	Present
Cholesteatoma only	19	4/23
Granulation only	6	2/8
Cholesteatoma & granulation	72	22/94
Total	**97**	**28**

The web chi square test was analyzed for the distribution. Chi square value came out to be 0.4175 which was not significant. This shows that the presence of cholesteatoma or granulation or both in the middle ear cleft is not solely responsible for the dehiscent of facial canal in all cases. Although patients with dehiscence facial canal were found to have highest incidence of cholesteatoma with granulation i.e 22/28 (78%) in their middle ear cleft.

All the patients were followed up in ENT ward till 6th post operative day and then in ENT OPD till 1 month. They were examined for any signs of the facial nerve paralysis. One patient had facial palsy on 2nd post operative day who did not have any canal dehiscence noted during surgery and another one also have on the same post operative day whose canal was dehiscence at vertical part. Granulation tissue was the only pathological finding in both of the cases.

Discussion

Cholesteatoma and granulations are the commonest pathological findings in most of the cases of CSOM-AA. Different enzymes like acid phosphates, collagenase, lysozymes are suspected to be responsive for the bony erosion of the canal. Although the recent theories said that interlukin-1,6,11, matrix metalloprotein and platelet derived growth factors are also causes of the bony erosion by the cholesteatoma[5].

Those patients who had congenitally dehiscent facial canal that latter on developed atticoantral type of the disease were difficult to exclude from study.

The highest incidence of the disease was seen in the age group between 13 to 20 years in our study (48%). A study of cholesteatoma in the United States revealed an incidence of 6 cases per 100,000 population [7]. Within this population, cholesteatoma was most common in children aged 10-19 years, with an incidence of 9.2 cases per 100,000 population. Similarly male were affected more than females.

Our study shows that cholesteatoma with granulation was the most common pathology found in CSOM – AA and had also highest incidence (78%) in dehiscence of the facial canal. Study done by Bayazit YA Etal[1] reported 18 % out of 202 pateints had facial canal dehiscence and the dehiscent rate is highest among the cholesteatoma group ($p< 0.001$) followed by adhesive otitis media. While our study shows slightly higher incidence of the canal dehiscence i.e, 22%, it may be because of lesser sample size than the previous mentioned study.

Similarly study done by Ercole DM et al[2], a prospective non randomized study (n=357) comparing with the 300 temporal bone control group showed that 6.4% of intra operative dehiscence was most frequent at oval window niche with cholesteatoma surgery having the highest relative risk (RR = 4.6) of exposing facial nerve. He concluded by saying the actual dehiscence (29.3% in temporal bone) is higher than that found during surgery and surgeon must be very careful during the procedure.

Another study by the Baljosevic I etal[3] (a retrospective study) for patients operated for chronic suppurative otits media (n=19) with facial palsy in last 10 years. During the operation he noted polypoidal changes in 9 (47%), granulation tissue in 8 (42%) and cholesteatoma in 7 (37%) which contradict from our study by having higher number granulation tissue than cholesteatoma associated with facial nerve palsy. Baljosevic I etal[3] revealed 16(84%) had no visible bony defects on facial canal still having facial palsy preoperatively. Similar result is shown in one of our patient who had facial nerve paralysis on 2nd POD who did't had dehiscent facial canal and only having granulation tissue. It can explained by the fact that the facial nerve can be involved through microcracks[3] which is difficult to detect during surgeries.

In a study by Selesnick SH etal[6], a retrospective study of 59 patients with 67 surgical procedure revealed 30% dehiscent facial canal in initial procedure and 35 % of revision procedure. Although data is more than the incidence of our study but it is again common in surgery done for cholesteatoma.

Conclusion

Cholesteatoma with granulation is the commonest pathology

encountered during the surgery for CSOM-AA. Irrespective of the pathologies found in middle ear cleft in CSOM-AA , the facial canal tends to have dehiscence. There is no specific pathology which can be statistically correlated to the dehiscence of facial canal. Larger sample size may be needed in future to show the statistical significance between granulation with cholesteatoma than with isolated pathologies for facial canal dehiscence. The most common site for dehiscence was at horizontal part of facial canal from our study.

Referemces

1. Bayazit YA,Ozer E, Kanlikama M, J Laryngolol otol, 2002; **116:** 800-3
2. Ercole Di Martino, Berndt Sellhaus, Jan Haensel, Joerg-Guido Schlegel, European archives of Oto-rhino-laryngology, 2004; **262:** 120 – 126
3. Baljosevic, Micic s, Milovanovic j, Med pregl. 2000; **53:** 93-6
4. Chole AR. Sudhoff HH. Chronic otitis media, mastoiditis and petrosiits. Cummings otolaryngology Head and neck surgery. 4th edition. Philadelphia:Elsevier Mossby; 2005. 2988.
5. Chole AR. Sudhoff HH. Chronic otitis media, mastoiditis and petrosiits. Cummings otolaryngology Head and neck surgery. 4th edition. Philadelphia: Elsevier Mossby; 2005.3000-3001.
6. Selesnick SH, Lynn-Macrae AG, Otol Neurotol, 2001; **22:** 129-32
7. www.emecine.com