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A prospective analysis of post mastoidectomy cavity complications

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ABSTRACT

Background: The main aims of surgical treatment of chronic middle ear suppuration are elimination of disease process, reconstruction of hearing mechanism and prevention of complications. The objective of this study is to find out the incidence of cavity problems after open cavity mastoidectomy. To evaluate perioperative factors involved in the causation of cavity problems.
Methods: A prospective analytical study was conducted among 78 patients came for open mastoidectomy admitted in department of ENT. Each patient had a follow up upto three months at twice weekly intervals. In this study a borderline healing period of three months (12 weeks) was given for the complete epithelialisation of an open mastoid cavity. SPSS was used for analysis.
Results: The incidence of postoperative cavity problems in our set up is 26.92%. Youngest patient to undergo mastoidectomy was a 4-year-old boy. The youngest patient who presented with cavity problem was of 7years. 59 (75.64%) had sclerotic mastoid and 10 (12.82%) had cellular mastoid and 9 (11.53%) had diploeic mastoid. Hence out of the 21 postoperative mastoid cavity problems, 5 cases had large postoperative cavity, 18 cases had high facial ridge, 1 case had stenosis of meatoplasty, 17 cases had exposed middle ear and eustachian tube and 17 had postoperative granulations.
Conclusions: There should be complete exenteration of disease from the middle ear and mastoid. An adequately lowered facial ridge is an essential step to attain a dry cavity.

Keywords: Open mastoidectomy, Granulations, Meatoplasty, Pneumatisation, Cholesteatoma

INTRODUCTION

The main aims of surgical treatment of chronic middle ear suppuration are elimination of disease process, reconstruction of hearing mechanism and prevention of complications. This requires excision, exenteration and often exteriorisation of the disease process in the middle ear and mastoid. Controversy still exists among otolaryngologists regarding the need for exteriorisation of mastoid.[1] If the mastoid is exteriorised by taking down the posterior bony external canal wall, then an open cavity mastoidectomy is established. Avoidance of this step results in a canal wall up mastoidectomy. Supporters of open cavity mastoidectomy stress upon the future monitoring of the disease process, because even if some of the disease were left in the open cavity, that can be extruded spontaneously or can be removed during the subsequent visits.[2,3] Hence this is the surgery of choice in patients where the surgeon is not sure of the follow up status. Canal wall down technique also ensures good ventilation of cavity which has a drying effect.[4] Finally canal wall up technique needs surgical expertise for complete removal of diseased portion for avoidance of surgical complications. Usually an open mastoid cavity heals by secondary intention.[5,6] The average time for complete healing of this cavity varies according to

various authors. Failure of healing and complete epithelialisation of this open cavity leads to cavity problems including continued discharge from the cavity, impaction of wax, persistent vertigo, residual/recurrent disease, and brain fungus.[7] So, the rationale behind the study as there was lacunae in literature in the current scenario this study was planned to analyse the cavity problems post mastoidectomy.

METHODS

This study was a prospective analytical study conducted at department of ENT, Medical College, Trivandrum during the period between 1st January 2016 to 30th April, 2017. 78 patients who came for open cavity mastoidectomy were included in this study and all those patients had undergone open cavity mastoidectomy. The sampling technique used was purposive sampling technique and all the patients who were included in this study had given written informed consent.

Methodology

After getting the informed consent, each patient was included in the study according to the inclusion criteria. Each patient was evaluated according to the proforma of the study. They were assessed primarily by their complaints and then by cavity examination. Each patient had a follow up upto three months at twice weekly intervals. In this study a borderline healing period of three months (12 weeks) was given for the complete epithelialisation of an open mastoid cavity. So, any patient presenting with symptoms beyond this period was taken as a cavity problem case. The cases were studied according to the clinical symptoms. Basic clinical examinations were done. For each case, any of the proven predisposing factors, was determined by cavity examination. When required, investigations like culture and sensitivity of pus was done. Measurement of parameters like facial ridge height, size of cavity and size of meatoplasty were adopted from standard studies conducted by other authors. In this study 5 cc is taken as the volume of a large mastoid cavity, 3-5 cc, small less than 3 cc, appropriate medical treatments like topical/systemic antibiotics, aural toilet, steroids and cauterisation were given. Chemical cauterisations of granulations were attempted as an outpatient basis. Patients were followed up at intervals of 2 weeks after the treatment to assess the progress. Some cases were admitted in the ward for protracted symptoms and they were given parenteral medication. Rarely cases required surgical management.

Statistical analysis

Data from questionnaire were checked and cleaned for completeness and consistency and then analyzed using Statistical Package for the Social Science (SPSS) Version 20 statistical software (trail version). Descriptive statistics such as frequency, percentage, and mean and standard deviation were used to describe dependent and independent variables.

RESULTS

78 patients had undergone open cavity mastoidectomy in the department of ENT, Medical College, Trivandrum during the study period. 4 patients were lost to follow up before 3 months, 21 patients had postoperative cavity problems. Hence according to this study, the incidence of postoperative cavity problems in our set up is 26.92%.

Table 1: Age wise distribution of the study participants.

Age groups (years)	No. of cases	%
0-10	2	9.52
11-20	4	19.04
21-30	2	9.52
31-40	5	23.80
41-50	4	19.04
>50	4	19.04

Youngest patient to undergo mastoidectomy was a 4 year old boy. The youngest patient who presented with cavity problem was of 7 years. The oldest patient who presented with cavity problems was a 65-year-old female. Of the 78 cases, 48 patients were males and 30 patients were female. Of the 21 patients who presented with cavity problems, 11 patients were males (52.38%) and 10 patients were females (47.62%).

Table 2: Pneumatisation of mastoid, type of surgery and type of anesthesia during the procedure.

Mastoid Pneumatisation	No. of Cases	Cases with cavity problem	%
Sclerotic	59	16	27.11
Cellular	10	1	10
Diploeic	9	4	44.44

Of the 78 cases, 59 (75.64%) had sclerotic mastoid and 10 (12.82%) had cellular mastoid and 9 (11.53%) had diploeic mastoid. Of the 59 sclerotic mastoids, 16 (27.11%) had post mastoidectomy cavity problems. Of the 9 diploeic mastoid, 4 (44.44%) had postoperative cavity problems and of the 10 cellular mastoids, 1 (10%) had postoperative cavity problems. i.e., Of the 21 patients with cavity problems, 76.19% were of sclerotic mastoid and 4.76% were of cellular mastoid and19.04% were of diploeic mastoid. 26 surgeries were done under general anaesthesia. All the 78 patients underwent modified radical mastoidectomy.

Of the 21 problem cavities, 20 had prolonged discharge from mastoid cavity as the main problem (95.23%). Accumulation of wax in the cavity was present in 6 cases (28.57%). Vertigo persisting beyond the immediate postoperative period was present in 4 cases (19.04%).

Perichondritis of pinna was found in 1 case (4.76%). Persistence or/development of facial palsy in post-operative period was found in 5 cases (23.80%) and recurrent cholesteatoma was seen only in 3 cases (14.28%). 2 Cases had postoperative wound infection (9.52%).

Table 3: Post-operative problems.

Cavity problems	%
Discharge	95.23
Wax	28.57
Vertigo	19.04
Perichondritis	4.76
Facial palsy	23.80
Recurrent cholesteatoma	14.28
Post-operative wound infection	9.52

Table 4: Post-operative analysis.

Post-operative analysis	Number
Larger cavity	5
High facial ridge	18
Meatoplasty sterosis	1
Exposed middle ear and eustachian tube	17
Post-operative granuloma	17

According to Table 4, of the 78 cases, 8 cases had a large post-operative cavity. Hence out of the 21 postoperative mastoid cavity problems, 5 cases had large postoperative cavity, 18 cases had high facial ridge, 1 case had stenosis of meatoplasty, 17 cases had exposed middle ear and eustachian tube and 17 had postoperative granulations.

Treatment given includes aural toilet, topical and systemic antibiotics, steroids and cauterisation.

DISCUSSION

In the present study 21 patients had post-operative mastoid cavity problems. Hence 26.92% of the total had cavity problems, according to this study. Sade et al had 28% post mastoidectomy cavity problems and Kos et al had 30% cavity problems.[8,9] Khan et al had 26.6% problem mastoid cavities.[10] Hence, this study has almost comparable incidence of cavity problems to previous studies.[10] Maximum incidence of cavity problem was found between 31–40 years followed by 11-20 years and 41-50, according to this study. Vaid et al got the same findings in their study.[11] But Vartianen had different observations. Vartianen had maximum incidence between 20 and 30 years.[12] 23% of patients with high facial ridge had cavity problems. In the study conducted by Sade et al this was 80%.[8] Almost same value was obtained by Vaid et.al also.[11] This finding points to the need of lowering the facial ridge upto the level of floor of external auditory canal. On doing so adequate care should be taken to avoid injury to facial nerve, especially in cellular mastoids, where one can expect extensive pneumatisation onto the perifacial and retrofacial cell tracts with a deep mastoid tip. Exposed middle ear and eustachian tube areas were found to be a significant factor causing postoperative discharge from the cavity. This was proven by all the previous studies conducted by Sade et al and Castrellion et al, only 18.18% grafted cases had cavity problems whereas 30.35% cases had cavity problems when grafting was not done.[8,13] Meatoplasty stenosis was found only in 3.84% cases. According to Sade et al, only 30% of their patients with meatoplasty stenosis attained dry cavity.[8] Vartianen et al had 27.8% cases of meatoplasty stenosis.[12]

CONCLUSION

In the present study the incidence of post mastoidectomy cavity problems in this study was found to be 26.92%. Increased incidence of cavity problems was found predominantly in 31-40 age groups. There was no significant difference in the incidence of cavity problems according to the type of anaesthesia (general/local) Cavity problems were seen slightly more in sclerotic mastoids. Persistent discharge from the cavity was found to be the main cavity problem in this study. There should be complete exenteration of disease from the middle ear and mastoid. An adequately lowered facial ridge is an essential step to attain a dry cavity.

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