ORIGINAL RESEARCH PAPER
Volume-8 | Issue-12 | December - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CLINICAL EVALUATION OF OSSICULAR STATUS IN CHRONIC SUPPURATIVE OTITIS MEDIA BOTH SAFE AND UNSAFE VARIETY AND ITS MANAGEMENT

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ABSTRACT

This project work under the heading of -clinical evaluation of ossicular status in chronic suppurative Otitis media both safe and unsafe variety and its management' was carried out in the department of otorhino laryngology, Institute Of Postgraduate Medical Education And Research (IPGME&R), Calcutta during the period of August 2009 to July 2010.This study work comprises a total of 50 cases of chronic suppurative otitis media with central, attic and postero-superior perforations of tympanic membrane se;ected from the E.N.T. out patient Department of Calcutta National Medical College and Hospital.

The cases selected for this project work are assessed meticulously and carefully, both clinically and by routine and special investigations. The cases were categorized according to site of perforation of tympanic membrane. Group A patients (25) were with central perforation, Group -B' (14patients) with attic perforation and with or without granulation tissue and cholestectoma and Group 'C' (11 patients) with postero-superior marginal perforation. An observation was made to corelate the mucous membrane pathology of the middle ear cleft with the status of the ossicular chain. The observations and results were compared with the available literature on this subject. We faced some minor immediate post-operative complications like bleeding, pain, soft tissue swelling, fever, nausea and vomiting etc. and they are tackled accordingly. This sort of complications did not influence the operative outcome. But in follow up, we faced some sorts of delayed post-operative complications like graft rejection, wound infection, adhesion and recurrence of discharge etc. As we do a comparative study of delayed postoperative complication in respect to different types of operation; it has been found that percentage of incidence of complications was higher in tympanoplasty with mastoid exploration than myringoplasty along. In Group A graft rejection was 16% where and in Group B and Group C, 28% and 27.2% respectively again adhesion were 4%, 7%7 and 9% respectively.

KEYWORDS

Ossicular Status, Otitis Media, Chronic Suppurative

INTRODUCTION

In this series of study, in its modest form with limited amount of time and experience, we have selected cases at random, from among those who have attended the out-patient department in the department of 'Ear Nose and Throat'. [1-2] The cases were managed by various methods that were available to us with the able guidance of various investigative facilities available at our disposal. A thorough work was tried to understand and note the disease process and to find out whether the disease was limited to the tubotympanic area or the atticoantral area or both and whether there was any destructive bone invading processes.

This study work has been undertaken with the following aims and objectives

1. To assess the nature and extent of pathology in middle ear cleft.
2. To assess the ossicular status as affected by suppurative infection of middle ear both safe and unsafe variety and which type of ossicle most frequently affected.
3. Audiometric evaluation-to see the hearing status of the patients suffering from this disease and to correlate it with the operative findings.
4. To plan the type of surgery for the elimination of the disease process and reconstruction of the middle ear hearing mechanism in relation to ossicular status & mucous membrane changes and to observe the effectiveness of surgical measures in various cases.

MATERIALS AND METHODS

Total fifty (50) cases were studied for observation and follow up during the above mentioned period. The selected cases were of Chronic suppurative otitis media (CSOM) with (i) central perforation, (ii) attic perforation and (iii) postero-superior marginal perforation. All the patients were subjected to detailed history taking, clinical examination, examination under microscope, radiological and audiometric evaluation, both before and after management as per following proforma (vide appendix .Hearing status of the patient was tested in both ears by whispering voice test, conversational voice test and Tuning fork test (Rinnie, Weber, ABC test). Finally, on the basis of analysis of the clinical, radiological, audiological datas were corroborating with the observation made under operating microscope and the cases were grouped in 3 groups as follows :

1. Group A - Chronic suppurative otitis media with central perforation.
2. Group B - Attic perforation with granulation/polyp or cholesteatoma.
3. Group C - Posterior-superior marginal perforation.

STATISTICAL ANALYSIS:

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. and GraphPad Prism version 5. A chi-squared test ($\chi 2$ test) was any statisticalhypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate.p-value ≤ 0.05 was considered for statistically significant.

RESULT AND OBSERVATION

We found that according to the size of perforation Group "A" cases were again divided into 3 Different sub-groups i.e. Al, A2, and A3. The distribution of cases are shown below

Our study showed that 23(46%) cases were in 5 to 15 yrs. Age group, 17(34%) of 16 to 30 yrs. age group and rest 10(20%) cases of above 30 yrs. age group.

It was found that in group A, out of 25 cases, there were 11(44%) cases in the 5 to 15 yrs. age group, 10(40%) cases in the 16-30 Yrs. age group

and 4(16%) cases in the above 30 years age group out of these maximum number were with large Central perforation (group A3).

Our study showed that in group B, out of 14 cases, there were 9 (64%) in the 5-15 yrs. age group, 4 (28%) cases in the 16-30 yrs. Age group and 1(8%) case in the above 30 yrs. group. In group C, out of 11 cases, there were 3(27.2%) in the 5-15 yrs. age group, 3(27.2%) cases in the 16-30 yrs. age group and 5(45.5%) cases in the above 30 yrs. age group.

It was found that that in group A cases, 18 out of 25 cases had hearing loss within 40dB. Only one case had hearing loss above 55dB. The hearing loss was directly proportional to the size of central perforation , maximum being in the group A3 (large central perforation) .In group B, the number of patients with hearing losing the range of 41-55 dB was 6 (42.8%) ,where as 2 patient (14.2%) had hearing loss above 60dB.

Our study showed that in group C, 5 patients (45.4%) had hearing loss in the range of 41-55 dB and 4 patients (36.3%) in 26-40 dB range.

We found that incus was the most involved ossicle being affected in 9(36%) out of 25 cases of central perforation, 11 (78.5%) out of 14 cases of attic perforation and 7(63.6%) out of 11 cases of postero-superior-marginal perforation, Malleus was involved in 6(24%) out of 25 cases of central perforation, 8(57%) out of 14 cases of attic perforation and 4 (36.3%) out of 11 cases of posterosuperior-marginal perforation, Stapes involvement was lowest (16%) in central perforation, high (42.8%) in attic perforation with granulation tissue/cholestectoma. Amongst the different types of central perforation, ossiculer chain was mostly affected in large central perforation.

We found that in the study the pathological findings of middle ear cleft in chronic supprative otitis media, showed that in group A, the mesotympanum had oedemotons mucose in 7(28%). there was in incidence of cholesteatoma.

It was found that in Group B the incidence of cholesteatoma was in 50 %(7) of total cases. In 5 cases there was granulation tissue in mesotympanum and in 7)50%) cases in attic and antrum.

In Group C, there was granulation tissue and cholesteatoma in 4(36.3%) patients each.

DISCUSSION AND CONCLUSION

In the present study "clinical evaluation of ossicular status in chronic suppurative otitis media both safe and unsafe variety and its management", fifty cases were studied.

In the present study, the number of cases studied in each group. The number of cases in Group A (CSOM with central perforation) are 25 i.e. 50% of the total cases. So in this study the commonest patrhology is CSOM with central perforation. Out of the 25 cases, depending on size of the perforation, 4 cases (16%) belong to Group A_1, 6 cases (24%) belong to Group A_2 and 15 cases (60%) belong to Group A_3. So maximum number of cases belonged to the group with large central perforation. Out of total 50 cases, 14(28%) cases belong to Group B and 11 cases (22%) belong to Group C.

In the similar study Tos (1979)[1] classified his cases as cholesteatoma, granulating otitis media, sequalae to otitis media.

Sade et al (1981)[2] in their study suggested classification of otitis media into chronic otitis media with cholesteatoma, atelactasis of middle ear, and posterior superior retraction pocket or perforation.

The 50 cases were subdivided into three different age goups, the incidence of which is in accordancewith different studies. Gulati et al (1969)[3] in his study of 200 cases of chronic suppurative otitis media found that majority of cases are in the age g roue between 0-10 yrs. As cited by Gibb (1979)[4] reported that the maximum incidence of CSOM occured in 5 to 9 yrs. of age, which was 85% of his cases. The incidence in 16 to 30 yrs. and above 30 yrs. Age group were 28% and 18% respectively. So incidence of CSOM is maximum in child-hood and decreases with increasing age.

In the present study it is seen that incidence of CSOM is gradually dropping down with increase of age i.e. 46% (5- :5 yrs.) 34% (16-30 yrs.) 20% (above 30 yrs.)

According to sade et al (1981)[2], the ossicular destruction is most commonly seen in patients above 30 yrs. In present study, the involvement of ossicles is most commonly seen in the 16 to 30 yrs. age group which is 24%. The involvement in 5-15 yrs. and above 30 yrs. age group are 20% and 12's respectively.

From table 4 it is seen that incidence in male is 70% and that of female 30%.

Vantiainen E (1998)[5] observed changes in clinical presentation of chronic otitis media from 1970 to 1995. A male predominance was noted throughout the observation.

In the present study, also the incidence in male is 70% and that in females 30%.

In our study, it was noted that patients with discharging ears were in group A 80%, group B 93% and group C 91% at first visit, while only 20% in group A, 7% in group B and 9% in group C cases have dry ear at their first visit. All the patients were subjected to conservative management and 12% cases of group A, 86% cases of both group B and group C did not respond to it and had persistent ear discharges. So respond to conservative treatment is much higher in group A cases than group B and group C cases.

Audiometric evaluation was done in all the 50 cases. It was seen that the hearing loss was proportional to the size and site of the perforation and also the status of ossicular chain.

In group A cases, i.e. with central perforation as seen in Table - 8 maximum number of patient (11-44%) had a hearing loss in the rage of 26-40 dB. The degree of loss was proportionate to the size of the porforation, minimum for the small sized perforation (Gr, A_1) and maximum for the large sized perforation (Gr. A_3) only one patient (4%) in group A had loss of more than 60 dB. This patient was found to have cholesteatoma with associated ossicular chain destruction.

In group B, in comparison to group A, maximum number of patients (6, 42.8%) had hearing loss in the range of 41-55 dB. The incidence of hearing loss above 60 dB is 14.2^{9}6. The higher degree of hearing loss in this group is because of the presence of attic perforation with granulation tissue

and cholesteatoma which lead to the maximum incidence of ossicular erosion (78.50. Two patients with cholesteatoma and ossicular chain erosion had hearing loss in the range of 20-40 dB. This was perhaps due to the cholesteatomatous mass bridging the gap of the necrosed ossicular chain.

One study showed that small and moderate (10-40% of area). Perforations had for more severe effects when placed on the posterior and superior margin than when placed o anterior and inferior margin. In the present study also, in Group C case, the maximum number of cases (45.4%) had hearing loss in the range of 41-55 dB. The incidence of hearing loss above 60 dB was 9%. Bathe the figures are higher than the corresponding percentages of Group A cases and almost at par with group B. cases, in patients who had hearing less in the range of 41-55 dB.

Radiographic examination of the mastoids in chronic middle ear disease is of limited diagonostic value. It can be helpful in diagonosing cholesteatoma or osteitis. But above structures can be better and accurately demonstrated by modern methods of tomography and CT scanning.

In this study, rediological picture shows sclerotic changer in 32 patients (64%). there was cavity in the mastoid in 6 patients (12%) and pneumatic or diploic changes in the rest 12 patients (24%). Patients with pneumatic mastoid had granulation tissue in 16.6% cases, whereas in patients with sclerotic mastoid, there was healthy mucosa in 12.5% cases. So x-ray mastoid is not always helpful in asessing the status of mucosa in the middle ear cleft. All the patients with cavity in mastoid and cholesteatoma.

We also did x-ray paranasal sinuses in some cases to note any signs of

chronic sinus infections and x-ray nasopharnx was done in some selected cases to note any enlargement of adenoid. In few cases we get positive results.

In group A cases, the mesotypanum showed healthy and oedematous mucosa in 7(28%) cases. there was granulation tissue in 3 cases (12%). Granulation tissue is a result of active mucosal disease. In all the 3 cases it was found especially around the ossicles. There was polyp in 4(16%) cass, which arises from the hyperaemic inflamed mucosa and enlarge progressively. Only in one case there was cholesteatoma (4%). The occurance of cholesteatoma in a case of chronic suppurative otitis media with central perforation is perhaps perhaps secondary to episodes of inflammation. Areas of mataplasia to squamous epithelium occur in the middle ear mucosa and these expand to creat cysts, which burst through the parstensa to create cholesteatoma.

In group B, i.e. with attic perforation, the incidence of cholesteatoma was 50% (7 out of 14 patients). In 5 cases (35.7%) there was granulation tissue in the mesotympanum and in 7 cases in attic and antrum. so the incidence of cholsteatoma and granulation tissue in group B cases is respectively about 12 and 4 times more than that in group A cases. The incidence ofoedematous mucosa was in 21.4% cases. The corresponding figure in group A cases was 28%. In group C cases, i.e. with posterior superior perforation the incidence of granulation tissue and cholesteatoma was 36.3% each.

In one in group A cases there was a tiny perforation of the parstensa, in anteroinferior quaqdrant with presence of thick tenacious glue in the posterosuperior quadrant of the mesotympanum, aditus and antrum. There was complete absence of incus and suprastructure of stapes. Perhaps theglue is the cause of ossicular destruction in this case.

Sade et al (1981)[2] in their comparative, qualitative and quantitative miscroscopy study of bone destruction in chronic otitis media showed that the frequency of ossicular destruction in cases of attic perforation cholesteatoma was 82.5%. Tos in his study in 1979[1] showed that the frequency was 74%. In the present study in group B cases the incidence of ossicular destruction was 78.5%. The most involved ossicle was incus, which was involbved in 11(78.5%) out of the 14 cases. The frequency of total destruction of incus in this group was significantly higher than in the other two groups. The second most frequently involved ossicle was stapes (57.1%) & lest frequently was ma1leus (42.8%). Sade et al (1981)[2] found destruction of incus in 40% and that of stapes in 30% cases. Schukneckt (1974)[6] in his study on the involvement of ossicles in chronic middle ear infection, showed that ossicles were involved in the same order, i.e. incus was the most involved ossicle followed by stapes and malleus.

The incidence of ossicular destruction in group C cases i.e. with posterior superior marginal perforation was 63.6% Again incus (63.3%) was the most involved ossicle followed by stapes and malleus. Sade (1981)[2] showed that, the ossicles were involved in the same order in cases with posterior superior marginal perforation. The involvement of incus (80%) was greater than that in the present study.

A relationship was seen between the site and size of perforation and ossicular destruction. The nearer the site of the perforation to the ossicular chain (attic and posteno-superior marginal perforation), the most frequent and extensive is the ossicular damage. Consequently the frequency of ossicular destruction was much more in group B (78.5% and group C (63.6% than in group A (52%). Vantiainen E (1998)[5] observed changes in clinical presentation of chronic otitis media from 1970 to 1995. He observed no significant changes was noted in the size of perforation or in incidence of ossicular destruction in patients with dry eardrum perforations.In contrast to present study, Sade et al (1981)[2] and Tos (1979)[1] showed that ossicular destruction was more in cases with posteriosuperior marginal perforation than that with attic perforation. Among the group A cases, ossicular erosion was much more in group A_3 (53.3%) than group A_1 (25%) and Group A_2 (33.3%). The primary aim of the treatment done in this project work is to restrore or improve hearing as well as to provide safe and dry ears.

16 out of 25 cases of group A with intact ossicular chain and healthy middle ear mucosa were subjected to myringoplasty. In 12 cases temporalis fascia and 4 cases tragal perichondrium were used as graft materials. Abote showed overall success rate or myringoplasty 81.2%. From this study, it is evident that the graft success rate using temporal fascia in myringoplasty in this series (83.3%) in well comparable to that of various workers. i.e.

In this study tragal perichondrium was used as graft material in 4 cases that got history of failed myringoplasty operation previously using temporalis fascia and the success rate is satisfactory and is comparable to that of other workers.

Post operative complication in this series of myringoplasty showed graft rejection in 2 cases(12.5%), reperforatin in 1 case (6.2%) and wound infection and adhesion in 1 case each (6.2%).

The remaining 9 cases of group A with ossicular destruction were subjected to mastoid exploration and tympanoplasty and selected cases ossiculoplasty. In all cases temporal fascia was used as graft material. Approach was post-auticular route.

Per-operative selection of type of tympanoplasty was made. Type 2 tympanoplasty was done in 3 cases where destruction of handle of malleus was noted but incudostapedial joint is intact and mobile. Temporal fascia graft is placed under the malleus renmant and long process of incus.

Type 3 tympanoplasty was done where destruction of incus and malleus was noted. 4 cases subjected to Type – 3 tympanoplasty. Of them in 2 cases malleus was surrounded by granulation tissue with erosion and were removed in order to erradicate the disease process. Temporal fascia was placed over intact and mobile stapes.

2 cases were subjected to ossiculoplasty where destruction of long process of incus was noted. Body of incus was used as raw material for such reconstruction. The body of incus used to bridge between the incus head and malleus handle. Temporalis fascia used as graft material.

Out of 3 cases those were subjected to mastoid exploration with type-2 tympanoplasty graft were taken up and ear become dry in 2 cases showing success rate of 66.66%.

Graft was taken up and ear become dry in 3 cases out of 4 cases these were subjected to type 3 tympanoplasty with mastoid exploration with success rate 50%. Overall success rate was 71.4%.

Cases subjected to mastoid exploration with tympanoplasty along with ossiculopalsty were 2 and out of cases graft taken up in one case with success rate 50%.

The overall success rate of tympanoplasty with mastoid exploration in this study work 71.4% and is well comparable to that of various workers. House, in his study showed success rate in type 2 and type-3 tympanoplasty, 72.7% and 70.3% respectively. But in this study failure rate 50% which, is higher. Since the data based only on 2 cases and it is unwise to comment over this reports.

Incidence of post-operative complications were higher typpanoplasty with mastoid exploration than myringoplasty. Graft rejection rate was 33.33% (1 out of 3 cases) and 25% (1 out of 4 cases) in Type - 2 and tyupe -3 tympanoplasty with mastoid exploration respectively. One study showed that incidence of post operative perforation in Type - 2 and Type -3, 27.3% and 30% respectively.

A similar finding was observed in case of post - operative ear discharge. Wound infection post –operatively observed in 66.66% cases (2 out of 3 cases), 50% (2 out of 4 cases) 50% 1 out 2 cases) in type 2, type 3, and ossiculoplasty with mastoid exploration respectively.

Patients who were subjected to myringoplasty. The pre-operative air-bone gap was within 0-25 dB in 7 cases and within 26-40 dB in 8 cases, one case had A-B gap 41-55 dB. :ost-operative result showed remarkable hearing improvement in 12 cases where closure of A-B gap was 15 dB or more and in 3 cases hearing were in the range of 26-40 dB with closure of A-B gap 5-10 dB. Patients undergone tympanoplasty Type 2 with mastoid exploration were 3. the pre-operative air-bone gap was within 26-40 dB in one case and within 41-55 dB in two cases. Post-operative result showed hearing improvement in two cases, where closure of A-B gap more than 15 dB and in one case within 41-55 dB with closure of air-bone gap within 5 dB. Type-3 tympanoplasty

with mastoid exploration done in 4 cases and of which 2 cases had A-B gap within 26-40 dB and 2 cases had within 41-55 dB. Post operatively it was seen that 2 cases had hearing improvement with closure of air-bone gap more than 10 dB and in one case A-B gap with in 26-40 dB, where closure of air-bone gap 5-10 dB. Two cases undergone tympanoplasty with ossiculoplasty and mastoid exploration. Pre-operative audiometry showed in one had air-bone gap within 41-55 dB and other ›55 dB. Post-operative observation showed not so remarkable improvement of hearing with closure of A-B gap 5-10 dB.Regarding hearing improvement different workers stated heir opinion. We have already mentioned the hearing improvement observed the this study work,. now some of the comparative references are made from different reports of previous workers. Series of tympanoplasty reported 69.2% cases having good hearing (above 25 dB average) in Type - 2 cases, 36.5% cases (above 25 dB) in type-3 cases. 50% cases with good hearing in type-2 tympanoplasty. procter (1964)[7] obtained on average of 37.7% post operative hearing gain in a series of 177 cases of tympanoplasty from type-1 type-4.

A study conducted taht long term out come of tympanoplasty in chronic suppurative otitis media with central perforation of tympanic membrane in children. They observed social hearing was improved from 49% before operation of 86% after operation and at follow up air-bone gaps were closed to within 10 dB in 67% of the cases, within 20 dB for 88% and within 30 dB for 96%

In this group 11 cases out of 14 showed ossicular destruction and management modalities were according to ossicular destruction from type 1 to type 4 tympanoplasty and ossculoplasty with mastoid exploration. All cases were done by post-auricular approach and temporal fascia used as graft meterial.

Per-operative selection of type of tympanoplasty was made. 3 out of 14 cases were subjected to type - 1 tympanoplasty with mastoid exploration showing no ossicular destruction and middle ear mucosa polypoidal with 2 cases granulation tissue in the epitympanum but no ossicular errosion. Type - 3 tympanoplasty with mastoid exploration done in 6 cases, where destruction of malleus and incus was noted. In one case incus totally absent with errosion of head of malleus. In 3 cases, there were cholesteatoma in attic and out of 3 cases in 2 cases cholesteatoma sac extent to anterior part of antrum. All disease processes were removed by atticotomy or attico antrostomy and temporal fascia was placed over intact and mobile stapes. Type-4tympanoplasty with mastoid exploration done in 3 cases, where destruction of malleus, incus and stapes crura was noted per-operatively. In two cases cholesteatoma seen to extend to anterior part of mastoid antrum and stapes with erotion of body and short process of incus, head of malleus and head with posterior crura of stapes. Granulation tissue seen in one case. After removing the disease process along with eroded ossicles temporal fascia placed as graft material on mobile stapes footplate.

2 cases were subjected to tympanoplasty with ossiculoplasty and mastoid exploration, where erotion of long process of incus noted. Granulation tissue seen near aditus to antrum and removed. Body of incus used as rawmaterial for such reconstruction to bridge between stapes head and malleus handle. Temporal fascia given as inlay technique.

The overall success rate of tympanoplasty in this group is 58.3%, in his study showed success rate of tympanoplasty was 75%. According to Livingstone and Miller (1961)[8] it was 70%. So in group B success rate of tympanoplasty lower than the other studies.The success rate of ossiculoplasty with tympanoplasty in his study is 50%. Baumann 1, one study showed overall success rate of ossiculoplasty using autologous ossicles was 79.25 which are higher. Since data based only 2 cases and it is not wise to comment over this reports.

Patients who were subjected to tympanoplasty Type – 1 with mastoid exploration 3. The pre-operative air-bone gap was within 0-25 dB in 1 case and within 26-40 dB in 2 cases. Post operatige results showed remarkable hearing improvement in 2 cases where closure of A-B gap was 15 dB or more and in one case hearing was in the range of 26-40 dB with closure of A-B gap 5-10 dB. patients undergone tympanoplasty type-3 with mastoid exploration were 6. The pre-operative air-bone gap was within 0-25 dB in one case, 26-40 dB in 2 cases and within 41-55 dB in 3 cases. post-operative result showed haring improvement in 4 cases where closure a A-B gap were 15 dB or more and in 2 cases within 41-55 dB with closure of A-B gap 5-10 dB. Patients subjected to tympanoplasty type 4 with mastoid exploration were 3. Preoperative ari-bone gap within 41-55 dB in 2 cases and > 55 dB in one case. Post-operative hearing improvement remarkable in one cawse where A-B gap 15 dB or more and in another one case within 41-55 dB and other remaining case >55 dB with closure of A-B gap 5-10 dB. Two cases undergone Tympanoplasty with ossiculoplasty with mastoid exploration pre-operative audiometry showed in one case air-bone gap within 41-55 dB and other case ›55 dB. Post-operative observation showed not so remarkable improvement of hearing with closure of A-B in one case 5-10 dB.

Different workers stated their opinion regarding hearing improvement. We have already mentioned the hearing improvement in this study work. House (1958) reported hearing improvement after Type-i tympanoplasty 69.2% cases, having good hearing above 30 dB. In type - 2 tympanoplasty operations 36.3% cases gained hearing above 30 dB. In this study 30% had good hearing in type-3 tympanoplasty. Melan' in VD, Khorov OG (1999) stated that after primary

tympanomastoidoplasty adequate hearing increased from 42% before operation, to 72% after it. Yuen AP, Hui, Y (2000)[9] stated that there were overall 55% patients with subjective hearing benifit after tympanoplaswty and the subjective sensation of hearing benifit correlated with the magnitude of the air conduction (AC) threshold reduction. Regarding post-operative complications, we considered only delayed complications as it was seen that incidence of complications higher in type-4 tympanoplasty and tympanoplasty with ossiculoplasty and mastoid exploration. Graft rejectin rate were in Type -1-66.66% (2 out of 3 cases), Type - 3-33.33% (2 out of 6 cases), type-4-66.66% (2 out of 3 cases) and tympanoplasty with ossiculoplasty -50% (1 out of 2 cases). Regarding perforation of the graft, 3 perforations out of 16 tympnoplasties from type-1 to type -4 and most of the perforations were situated antero- superiorly. Reperforation was more common in elderly patients may be due to low blood supply and low viability. In comparision, in present study incidence lower in type 1 but higher in type-3. Similar finding was obsrved in cse of post-operative ear discharge. Post-operative wound infection observed as in type-1- 33.33% (1 out of 3 cases), type-3-50% (3 out of 6 cases), type-4-66.66% (2 out of 3 cases) and tympanoplasty with ossiculoplasty 50% (1 out 2 cases).

In this group 7 cases out of 11 showed ossicular destruction. Mastoid was explored to exteriorze the pathology and various types f tympanoplasties with possible ossiculoplasty done according to ossicular destruction. All cases done by post-auricular approach and temporal fascia used as graft meterial.

Per-operative selection of type of tympanoplasty was made 4 out of 11 cases were subjected to type 1 tympanoplasty with mastoid exploration showing no ossicualr destruction and middle ear mucosa ploypoidal. 3 cases had granulation tissue in aditus and adjacent epitympanum but no sign of ossicular erosion.

Type-3 tympanoplasty with mastoid exploration done in 3 cases, where destruction of malleus and incus was noted. In two cases incus totally absent with erosion of head of melleus with granulation tissue in aditus and adjacent epi and meso tympanum also found in antrum. In other case there was cholesteatome extending from aditus to anterior part of mastoid antrum. Type 4 tympanoplasty with mastoid exploration doen in 2 cases where destruction of malleus, incus and stapes crure (posterior) was noted per-operatively. cholesteatoma seen in both cases in posterior part of meso and epitympanum and also to the antrum. In one case incus totally absent. After removing the disease process along wth eroded ossicles temporal fascia placed as graft meterial on stapes.

2 cases were subjected to tympanoplasty with ossiculoplasty and mastoid exploration where erosion of long process of incus seen. Ploypoidal middle ear mucose with Granulation tissue seen in posterior part of meso-tympanum and in mastoid antrum near-aditus. The body of incus used as raw material for such reconstruction to bridge between stapes head and the malleus handle temporal fascia used as graft meterial in inlay technique.

The over all success rate of tymponoplasty in this group was 66.66%.

In this group, like group B incidence of post-operative complications

higher in type-4 tympanoplasty and tympanoplasty with ossiculoplasty. Graft rejection rate were in type-1-25% (1 out of 4 cases), Type-3-33.33% (1 out of 3 cases), Type -4-50% (1 out of 2 cases) and tympanoplasty with ossiculoplasty - 50% (1 out of 2 cases). Post operative wound infection observed as the type-1- 50% (2 out of 4 cases), type-3-33.33% (1 out of 3 cases), type-4-50% (1 out of 2 cases) and tympanoplasty with ossiculoplasty 50% (1 out of 2 cases). Four Patients who were subjected to tympanoplasty type-1 with mastoid exploration fourair-bone gap 41-55 dB. Post operative results shows remarkable hearing improvement in two cases were closure of A-B gap was 15 dB or more. In one case hearing was in the range of 26-40 dB and in other case 41-55 dB with closure of A-B gap 5-10 dB. Type-3 tympanoplasty with mastoid exploration w as done in 3 cases. Pre-opertive air-bone gap within 26-40 dB in two cases and within 41-55 dB in one case. Post-operative audiogram showed hearing improvement in 2 cases where closure of A-B gap were 10-15 dB and in one case hearing was in the range of 41-55 dB with closure of A-B gap 5-10 dB. Patients subjected to typmanoplasty type -4 with mastoid exploration were two. Pre-operative air-bone gap within 26- 40 dB in one case and within 41-55 dB in other case. Post operative A-B gap not so remarkable only in one case closure of A-B gap 5-10. Two cases undergone tympanoplasty with ossiculoplasty with mastoid exploration pre-operative audiometry showed in one case air-bone gap within 41-55 dB aad other case >55 dB. Post-operative observation showed not so improvement of hearing with closure of A-B gap in one case 5-10 dB.In type -2 tympanoplasty cases improvement of hearing 36.3% cases and 30% in type-3 tympanoplasty. Melan in VD (1999)[10] stated that after primary tympanomastiodoplasty adequate hearing increased from 42% before the operation to 72% after it. Yuen AP; Hid, Y (2000) stated that overall 55% patients with subjective hearing benifit after tympanoplasty. The subjective sensation of hearing benifit correlated with the magnitude of the air conduction (AC) threshold reduction.

Long term and proper follow up is essential for evaluation of results of different procedures undertaken. In this study work, success rate is 81.2%. The causes of failure of myringoplasty in this study can be attributed to Eustachian tube dysfunction post-operative infection, inadequate removal of epithelium in anterior meatal angle etc. Still the success rate of myringoplasty of this study work is encouraging and comparable to that of the previous workers. This is because, statisfactory results of short term follow-up examination sometimes revals a different astonishing result in long term follow-up examination.

HEARING ASSESSMENT BY PURE TOWE AUDIO METRY

Group	Number of cases	0-25 dB	26-40dB	41-56dB	>55dB
Group A	25	7(28%)	11(44%)	6(24%)	1(4%)
Group B	14	2(14.2%)	4(28.5%)	6(42.8%)	2(14.2%)
Group C	11	1(9%)	4(36.3%)	5(45.4%)	1(9%)

PATHOLOGICAL FINDINGS UNDER OPERATION MICROSOPE IN CHRONIC SUPPURATIVE OTITIS MEDIA

GROUPS	MESOTYMPANUM				ATTIC		ANTRUM	
	Oedematous	Polyp	Granulation	Cholesteatoma	Granulation tissue	Cholesteatoma	Granulation tissue	Cholesteatoma
Group –A(25)	7(28%)	4(16%	3(12%)	1(4%	-	1(4%)	3(12%)	1(4%)
Group –B	3(21.4%)	2(18.1%)	4(36.3%)	2(18.1%)	7(50%)	7(50%)	7(50%)	7(50%)
Group-c	1(9%)	2(18.1%)	4(36.3%)	2(18.1%)	4(36.3%)	4(36.3%)	4(36.3%)	4(36.3%)
Total (50)	11(22%)	8(16%)	12(24%)	3(6%)	11(22%)	12(24%)	14(28%)	12(24%)

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