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Over-Underlay technique of myringoplasty.

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ABSTRACT… Objective: To observe the success rate of Over-underlay technique of myringoplasty in patients with inactive tubo-tympanic type of CSOM. **Study Design:** Descriptive, Observational study. **Setting:** ENT Department Fauji Foundation Hospital Rawalpindi. **Period:** December 2018 to December 2019. **Material & Methods:** A total of 80 patients with inactive tubo-tympanic type of CSOM, from both genders, within age range of 15-45 years, having pure conductive hearing loss with an Air-Bone gap of not less than 15 dB were selected by convenient sampling technique. Hearing assessment was done by Pure Tone Audiometry through both air and bone conduction. Temporalis fascia graft myringoplasty was done in all these patients by over-underlay technique, and they were discharged on 5th post-operative day, and were followed up in ENT OPD after 3 weeks. Status of graft was seen under surgical microscope after removing the BIPP. After three months the patients were reviewed for graft status and hearing assessment. Successful outcome was taken as those patients in whom graft uptake was successful with complete closure of perforation, and secondly, closure of the Air-Bone gap by at least 10 dB. Data was analyzed by SPSS 19. **Results:** Mean age of the patients (n = 80) was found to be 30.8 Years. Gender distribution showed 57 (71.25%) Males and 23 (28.75%) Females with a M:F ratio of 2.5:1. Success rate was found significantly better among younger aged males. Graft uptake was successful in 74 (92.5%) of the patients. With respect to closure of A-B gap, post-operative mean difference in Air-Bone gap was found to be 9.6 dB ± 3.9 SD as compared to preoperative mean A-B gap of 28.5 dB ± 4.2 SD, thus a closure of A-B gap by 18.9 dB ± 2.4 SD. **Conclusion:** Over-underlay technique is found to be a successful technique for myringoplasty in terms of graft uptake and improvement in hearing thresholds in the patients with inactive tubo-tympanic type of CSOM.

Key words: Chronic Suppurative Otitis Media, Myringoplasty, Over-underlay Technique.

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INTRODUCTION

Chronic Suppurative Otitis Media (CSOM) is defined as inflammation of the middle ear cavity and the mastoid, and is characterized by a perforation in the Tympanic membrane along with persistent or recurrent ear discharge for duration of at least 03 months.[1] CSOM has high incidence rate in developing countries probably owing to a low socioeconomic status.[2] However, differences in rates of CSOM cannot be fully explained by socioeconomic status as there is considerable heterogeneity in prevalence rates in areas of similar socio-economic status within a given region.

Around 31 million new cases of CSOM emerge per year worldwide, with nearly one-quarter occurring in children less than 5 years of age.[3] Etiological factors include Acute Otitis Media, Otitis Media with Effusion during childhood, Eustachian tube dysfunction and craniofacial abnormalities.[4] CSOM is broadly classified into attico-antral (squamous type) and tubo-tympanic (mucosal type) types, each of which is further sub classified into active and inactive types. Atticoantral disease is marked by the perforation or retraction pocket in the Pars Flaccida, while tubotympanic disease is featured by a perforation in the Pars Tensa of the tympanic membrane.[5]

CSOM, besides persistent or recurrent otorrhoea, is also accompanied with varying degree of

hearing loss as well. Hearing loss may be purely conductive or mixed one and varies in intensity depending upon the site and size of perforation and involvement of middle ear mucosa and the ossicles.[6]

Myringoplasty is the surgical procedure to restore tympanic membrane integrity. Graft material commonly used includes autologous temporalis fascia, perichondrium, tragal cartilage, adipose tissue, fascia lata. Myringoplasty is done by end aural, post aural and transcanal per meatal approaches. Various surgical techniques have been devised for myringoplasty, among them overlay and underlay are the commonly practiced ones.[7] Underlay technique is better in terms of graft uptake and hearing improvement. However, there are risks of medial displacement of graft, decreased mesotympanic space and atelectasis. Overlay technique bears the risks of graft lateralization, stenosis of external auditory canal, delayed healing and iatrogenic chloestetoma formation.[8]

To minimize the disadvantages of these two procedures, another technique, over-underlay myringoplasty has been devised having minimum risks of reduction of middle ear space, graft lateralization and formation of epithelial pearls. In this technique, graft is placed over the handle of malleus and under the annulus. This procedure offers excellent exposure of anterior middle ear and is ideal for perforation of all sizes and types.[9] Prognostic factors influencing the outcome of myringoplasty include graft material, Eustachian tube function, presence or absence of active infection of upper respiratory tract, site, size and etiology of perforation, age of patient, skills of surgeon and surgical approach.[10]

MATERIAL & METHODS

A study was carried out in ENT Department, Fauji Foundation Hospital Rawalpindi, from December 2018 to December 2019 to observe the success rate of Over-underlay technique of myringoplasty in patients with inactive tubo-tympanic type of CSOM.

A total of 80 patients with inactive tubotympanic type of CSOM, from both genders were selected through convenient sampling technique. Inclusion criteria were an age range of 15-45 years, pure conductive hearing loss of not more than 25 dB and existence of a central perforation.

Patients having an active ear disease or previous history of ear surgery, marginal or attic perforation, an active sinus or Upper Respiratory Tract disease were excluded from the study.

Approval for the study was taken from the Hospital Ethical Committee, and an Informed consent was also obtained from the patients for including them in this study.

Complete general and head-neck examination was done after taking history. Patients' ears were examined under surgical microscope to see the perforation in the TM, condition of middle ear mucosa and the integrity and mobility of the ossicles. Hearing assessment of all these patients was done by Pure Tone Audiometry carrying out both air and bone conduction.

The selected patients were admitted a day prior to their surgery. Under the Operating microscope, Temporalis fascia graft myringoplasty was done in all these patients by post aural approach while adopting underlay-overlay technique, and the patients were discharged from hospital on 5th post operative day. They were followed up in ENT OPD after 3 weeks and BIPP was removed and status of graft was seen under surgical microscope. After three months the patients were reviewed. Hearing and graft status were assessed by Pure Tone Audiometry and examination under surgical microscope respectively. Successful surgery was considered in those patients in whom graft uptake was successful and ear drum perforation had closed completely, and secondly, the Air-Bone gap had closed by at least 10 dB.

Data Analysis by SPSS 19: Mean and standard deviation for age and Air-Bone gap were figured out. Frequency and percentages were presented for categorical variables like gender and success of graft uptake.

RESULTS

Mean age of the patients (n = 80) was 30.8 Years. Gender distribution as given in Figure: 1 shows an M:F ratio of 2.5:1.

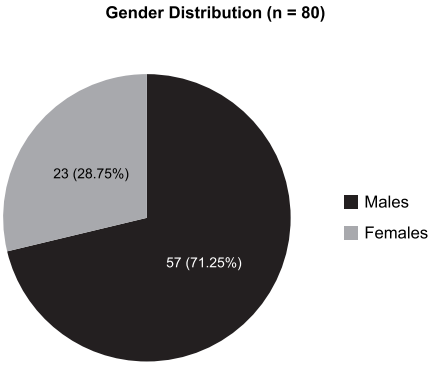

Figure-1. Gender distribution

Graft uptake was successful in 74 (92.5%) of the patients. In the rest of 6 (7.5%) patients, the perforation persisted.

With respect to closure of A-B gap, post-operative mean difference in Air-Bone gap was found to be 9.6 dB ± 3.9 SD as compared to preoperative mean A-B gap of 28.5 dB ± 4.2 SD thus getting a closure of A-B gap by 18.9 dB ± 2.4 SD.

DISCUSSION

CSOM is a very common ailment especially among the children which results in a social nuisance due to persistent or recurrent aural discharge and also causes an embarrassing disability of deafness. Myringoplasty is an operative procedure, in which the tympanic membrane defect is repaired, provided there is no other pathology including ossicular discontinuity.[11] Various surgical techniques have been devised for myringoplasty, among them overlay and underlay are the commonly practiced ones.[12] To minimize the disadvantages of these two procedures, another technique, over-underlay myringoplasty has been devised for a better outcome in terms of hearing improvement and graft uptake.[13] In this technique the graft is placed under the tympanicus annulus but over the handle of the malleus, thus avoids the disadvantages of the plain underlay or overlay techniques. Present study was designed to assess the success of this technique among patients of Chronic Otitis Media, tubotympanic, inactive mucosal disease in terms of graft uptake and mean hearing improvement.

Panchal et al (2015) carried out myringoplasty using the over-underlay technique and compared it with conventional technique. Their results revealed that graft success rate was 95% in the patients who underwent over-underlay technique.[14] They further demonstrated that a difference in AB gap of 18.7 ± 5.3 in these patients. These results are comparable with the present study results.

Kartush et al (2002) coined the term over-underlay technique to emphasize that the graft was placed over the handle of malleus but under the residual drum and annulus. Their study showed a success rate of 100% as far as graft uptake was concerned, but achieved closure of A-B gap by 5.3 dB.[15] The probable reason why they achieved a closure of A-b gap of only 5.3 dB was their inclusion criteria. They had included all the patients having CSOM, even if they had cholesteatoma, adhesions, ossicular necrosis etc.

Stage & Bak-Pederson (1992) in a study of 39 ears reported that it was advantageous to place the graft lateral to the handle of malleus and under the annulus with graft uptake of 97% and marked closure of A-B gap, again similar to results of our study.[16]

Aslam & Aslam (2009) in their study showed the graft uptake in 94.1% of the patients undergoing over-underlay technique with a closure of A-B gap by 10.8 dB. They had concluded that this technique is as good as the conventional underlay technique.[17]

Ahmed et al (2005) in a similar study reported graft uptake of 97% and closure of A-B gap of 12.6 dB.[18]

Yigit et al (2005) reported success in the over-underlay group to be 94.9% with closure of A-B gap by 16.96 dB.[19]

All the above mentioned studies show a very high

rate of success with over-underlay technique of myringoplasty in terms of graft uptake as well as closure of A-B gap. So it should be considered as an effective myringoplasty technique.

CONCLUSION

Over-underlay technique is found to be a successful technique for myringoplasty in terms of graft uptake and improvement in hearing thresholds in the patients with inactive tubo-tympanic type of CSOM.

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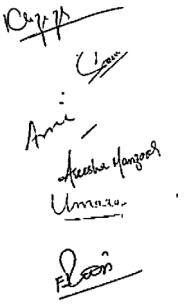
1	Mirza Khizar Hameed	Author	
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