



RESEARCH ARTICLE

EVALUATION OF RESULTS OF MYRINGOPLASTY IN DIFFERENT AGE GROUPS

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ABSTRACT

Myringoplasty is the simple repair of tympanic membrane or drumhead. The purpose of this operation is to prevent the recurrent infection of middle ear from external canal. It converts open middle ear cavity into a closed chamber, so that there is not only prevention of recurrent infection of middle ear but also improvement of hearing with an intact ossicular chain. It is the convention to make the middle ear dry for at least more than 3-6 weeks.

This study is the comparison of response and results of myringoplasty in different age groups taking the following aims and objectives:

1. To observe the prevalence of post operative infection in younger and elderly age group.
2. To observe the "graft-take" rate in younger and elderly age group and comparison to the normal adults.
3. To evaluate the hearing-gain in both age group in terms of closure of Air Bone Gap in (dB).
4. To assess the complication rate and type of complication in both age group.

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INTRODUCTION

Chronic Suppurative Otitis Media (CSOM) is defined as the long standing non-specific suppuration of mucoperiosteal lining of middle ear cleft and is characterized by two cardinal features of deafness and ear discharge. The Ch. S.O.M. is caused by multiple micro-organism, aerobic as well as anaerobic. The common aerobic organisms are *Pseudomonas aeruginosa*, *proteus*, *E coli* and *staphylococcus aureus* (Vasihanv et al, 1980); while anaerobes commonly encountered are *Bacteroides fragilis* & anaerobic streptococci. Ch. S.O.M. in traditionally classified into two types - tubotympanic and atticofurcal. The tubotympanic disease is characterized by presence of central perforation and clinical features are variable according to the severity and extent of the disease, clinically, tubotympanic disease is subdivided into two categories (i) active disease - when the patient presents with actively discharging ears and/or deafness; (ii) inactive disease - in this condition the patient is presenting only with deafness, if the lesion is bilateral but if the lesion is unilateral patient remain symptoms free and does not seek medical advice. The deafness present in both the inactive and active categories is conductive type may be mild, moderate or severe depending upon the extent of disease.

The surgical management of uncomplicated tubotympanic Ch. S.O.M. is based on following principles

- To eradicate disease, promote the drainage and healing.
- To prevent re-infection in an ear that has remained inactive (dry ear).

- To prevent complications which would occur in active lesion.

For performance of myringoplasty age of patient plays an important roles for myringoplasty, the pros and cons of myringoplasty in extremes of age have theoretical background as following:

Theories against Myringoplasty in younger age groups

- There are more chances of recurrent upper respiratory infection and because of active lymphoid tissues in Waldeyer's ring mainly the adenoids etc.
- The Eustachian tube in children is patulous and more horizontal and can cause easy infection and blockage theory creating a negative intra Tympanic pressure with subsequent otitis media either suppurative or non suppurative resulting in failure of graft.
- Pre-operative evaluation of Eustachian tube function may not be accurate in children.
- The P.T. Audiogram in children may give false information about A-B gap and cochlear reserve.

Theories favouring Myringoplasty in younger age group

- Performance of tympanic membrane is itself a pathway of infection from exterior; therefore the closure of tympanic membrane should be done as early as possible.

- The closures of tympanic membrane perforation at an early age is going to improve the hearing status with resultant better performance of affected child.
- The perforation of tympanic membrane may serve as pathway for migration of desquamated epithelium of the deep meatal wall and tympanic membrane itself, which can be secondary cholesteatoma.
- The children if having intact tympanic membrane can participate better in recreation activities like swimming etc.

Theories against Myringoplasty in elderly age group (45 years and above)

- The reparative activity in epithelium is reduced and so also the healing process *s/is* comprised, by virtue of which the successful results are doubtful.
- There is possibility of certain systemic disease because of ageing process, which either contradict the operative procedure of the results become futile.
- There is compromised blood in these patients resulting in failure of take-up.
- There are chances of increase of neural Threshold in Elderly age group which affect the results.

Theories, which favour Myringoplasty in elderly

- The threshold for bone conductive is invariably increased in this age group of patients; therefore the reduction of threshold in air conduction will enable the patients for better speech discrimination.
- The closure of perforation will facilitate these patients to wear a HEARING AID with better results.

Aims and objectives

- To observe the prevalence of postoperative infection in younger and elderly age groups.
- To observe the "graft-take" rate in younger and elderly age groups and comparison to the normal adults.
- To evaluate the hearing-gain in both age groups in terms of closure of air bone gap in (dB).
- To assess the complication rate and types of complication in three age groups.

MATERIAL AND METHODS

The Work "Evaluation of results of myringoplasty in different age groups" was conducted in ENT Department, JLN Medical College & Hospital, Ajmer from 1.1.2005 to 31.12.2006. In this study we included 60 cases of chronic suppurative otitis media were included with dry central perforation for closure of perforations by surgery. Cases were divided into younger (8-15 years), middle (16-44 years) and elderly (45-55 years) age groups and results were compared both in terms of "GRAFT TAKE RATE" and "HEARING IMPROVEMENT IN FORM OF A-B CLOSURE IN dB". Out of total 60 cases 20 cases were of Younger age group (8-15 years), 20 cases were Middle age group (16-44 years) and 20 cases were in Elderly age groups (45-55 years). The study was conduction according to proforma. A proforma include history taking, general systemic examination, local examination, examination of nose and throat and investigation, routine haemogram, blood sugar and urea, x-ray mastoid law's lateral oblique view, x-ray chest PA

view, ECG Audiometric evaluation for hearing loss in dB in terms of 'Air-Bone gap'. Selection criteria were: (i) Central perforation (ii) Presence of good cochlear reserve, (iii) Patent Eustachian tube (iv) Activity of disease: dry (presence of no discharge), inactive disease (v) Patients having no complications. Post operative audiogram taken after the period of 2-3 months of operation for comparison of results with pre-operative audiogram.

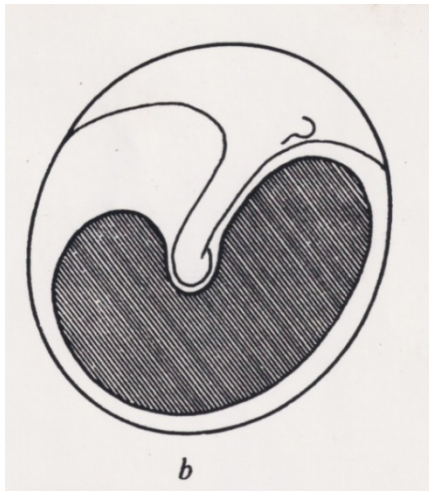
RESULTS

In this study comparison of results were done in different age group both in term of hearing gain ion dB in form of A-B closure in post-operative Pure-Tone audiogram and state of Graft-Take taking in consideration mainly the age of patients but the results were also compared according to sex, occupation of patients, incisional approach, duration of pain and discharge in affected ear and size of perforation. The present study included the equal number of cases in all age groups; and avoiding the extremes of age groups as has been postulated by Toss (1972) in study of 269 cases with better hearing gain in age group from 10- 50 years and poor in elderly patients. The similar observation has been made by bluestone et al. (1979) that the results of myringoplsty are less satisfactory in children than adults. However, Lee & Schuknecht (1971), Booth (1974) and Sade et al (1981).

DISCUSSION

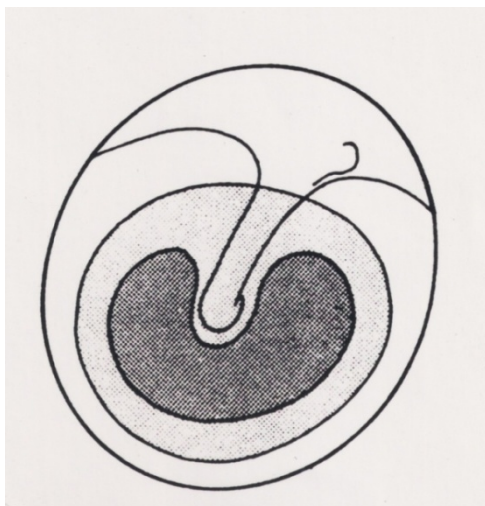
- The results of myringoplasty in this study are better in younger age group as compared to middle age and elderly age group in terms "GRAFT TAKE RATE" and A-B CLOSURE IN dB".
- Results of this study are in accordance with the studies of Adolf Wolferman (1970), Lee & Schuknecht (1971), booth (1974).
- The results of myringoplasty in both sexes were similar with no significant difference in hearing improvement in males and females in terms of A-B closures was shown to the better when post aural approach is used for graft placement.
- This study recommends that ear must be dry and free in terms of graft acceptance and hearing improvement.
- Study shows that success rate is better for large perforations regardless of age, sex, and occupation of prior morbidity of patients.
- In some patients there were the problem of residual perforations and graft rejection.
- Among the predisposing factor of Ch. S.O.M. recurrent upper respiratory infections appeared the commonest.
- For better results existing infection must be properly controlled before undertaking surgical intervention.
- Along with treatment is must in terms of duration of morbidity and level of existing hearing both by air and bone conduction, by pure tone audiogram.
- State of middle ear mucosa was also not taken as criteria for comparison because all ears were dry since 1-2½ months before surgery so state of middle ear mucosa was healthy and free from infection and moisture.
- In this study we used Temporalis Fascia as grafting material in all cases as this fascia is easily available, having low metabolic rate rendering it more resistant to infection and also this required less vascularity for survival.

- Study shows, earlier the patients presented to hospital and for surgical intervention after the disease process start, better are the results.



(A)

Perforation of the eardrum: Central or anterior perforations are usually associated with tubotympanic disease.



(B)

Onlay myringoplasty. The surface epithelium is raised or removed around the perforation

Courtesy by: Logan Turner's Diseases of the Nose Throat and Ear (10th Edition) Page No. 284, 289

Table I. Comparison of "graft take rate" according to age

| Age (Years) | Total Number of Patients | Graft Taken | Residual Perforation | Success Rate (%) |
|-------------|--------------------------|-------------|----------------------|------------------|
| 8-15 | 20 | 19 | 1 | 95 |
| 16-44 | 20 | 15 | 5 | 75 |
| 45-55 | 20 | 14 | 6 | 70 |

This table shows that success rate of myringoplasty is the highest in younger age group while success is lowest in elderly age group in comparison with the standard 15-45 years.

Table II. Comparison of "graft take rate" according to sex

| Age (Years) | Total Number of Patients | Graft Taken | Residual Perforation | Success Rate (%) |
|-------------|--------------------------|-------------|----------------------|------------------|
| Male | 18 | 17 | 1 | 94.44 |
| Female | 42 | 30 | 12 | 71.42 |

This table shows that repair of perforation in tympanic membrane graft take-rate is high in male patients as compared to female.

Table III. Comparison of a-b closure according to age on different frequency

| Age (Years) | Total Number of Patients | Mean A-B closure in dB | | |
|-------------|--------------------------|------------------------|----------|----------|
| | | 500 Hz | 1000 Hz | 2000 Hz |
| 8-15 | 20 | 21.50 dB | 13.75 dB | 15.50 dB |
| 16-44 | 20 | 16.00 dB | 12.00 dB | 13.75 dB |
| 45-55 | 20 | 10.50 dB | 9.25 dB | 3.25 dB |

This table indicated that a 500 Hz frequency hearing improvement in terms of A-B closure is better in younger age group as compared to elderly age group which at 1000 Hz frequency hearing gain in almost equal in both young and middle age groups but it is again comparatively poor in elderly age group on 2000 Hz frequency hearing gain is slightly better in younger age than middle age group but still comparatively poor in elderly age group.

Table IV. Comparison of a-b closure according to sex on different frequency

| Age (Years) | Total Number of Patients | Mean A-B closure in dB | | |
|-------------|--------------------------|------------------------|----------|---------|
| | | 500 Hz | 1000 Hz | 2000 Hz |
| Male | 18 | 16.20 dB | 12.26 dB | 4.88 dB |
| Female | 42 | 17.77 dB | 7.50 dB | 3.88 dB |

This table indicated that after myringoplasty the hearing improvement in terms of A-B closure is slightly better in females at 500 Hz frequency but at 1000 Hz, 2000 Hz frequencies mean A-B closure is better in male patients.

Table V. Comparison of a-b closure according to occupation of different frequency

| Age (Years) | Total Number of Patients | Mean A-B closure in dB | | |
|-------------|--------------------------|------------------------|----------|----------|
| | | 500 Hz | 1000 Hz | 2000 Hz |
| Student | 23 | 19.57 dB | 12.27 dB | 5.6 dB |
| Housewives | 29 | 15.52 dB | 11.55 dB | 6 dB |
| Working man | 8 | 11.25 dB | 4.37 dB | -1.88 dB |

This table indicated that improvement in hearing following myringoplasty of 500 Hz frequency and 1000 Hz frequency is best in students better in housewives but not so in working men but at 2000 Hz frequency A-B closure in students and housewives is almost equal but then is deterioration in working men.

Note: The study was conducted in Department of ENT, JLN Medical College, Ajmer.

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