

FACTORS INFLUENCING THE SUCCESS RATE OF MYRINGOPLASTY

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ABSTRACT

Objective: To know the factors influencing the success rate of myringoplasty.

Material and Methods: This descriptive study was conducted at Lady Reading Hospital Peshawar, from June to December, 2004. Fifty patients of central perforations in the tympanic membrane with dry ears for at least 6 months and no focus of infection in ear, nose, sinuses or throat were included in the study. Twenty-five patients underwent Underlay technique while in 25 patients Onlay technique was carried out.

Results: Graft was taken up successfully in 80% (40/50) cases. Success rate was 84% in patients with underlay technique (21/25) and 76% in patients with onlay technique (19/25). The graft take up rate was 83.3% where temporalis fascia (30/36) was used and 71.4% where tragal perichondrium (10/14) was used as a graft material. The success rate was 100% in cases of traumatic perforation (6/6) and 77.3% in perforation caused by chronic suppurative otitis media{CSOM}(34/44); 87.5% in patients with medium sized perforation (14/16) and 83.3% in patients with large central perforation (20/24); 71.4% in patients with sclerotic mastoid (20/28) and 91% with cellular mastoid (20/22); 97.5% in patients with good Eustachian tube function (39/40) and 10% in diseased Eustachian tube (1/10).

Conclusion: The success rate of myringoplasty is affected by various factors especially age, nature and size of perforation, the type of graft used, cellularity of mastoid and good functioning eustachian tube. Graft take up was better in cases of traumatic perforation than the perforation caused by CSOM.

Key Words: Myringoplasty, Perforation, Trauma, Size, Matoid, Underlay Technique, Onlay Technique.

INTRODUCTION

Myringoplasty is an operation performed to repair or reconstruct the tympanic membrane.¹ Myringoplasty is also known as tympanoplasty type I, where pre-operatively middle ear structures are exposed and checked for functional integrity.² Damage to the tympanic membrane is commonly the result of chronic ear disease. However damage can also occur from various forms of trauma, direct physical injury, burns, scalds, pressure effect and head injuries. Iatrogenic damage by inserting ventilatory tube can also occur. Most perforations heal spontaneously such as those caused by trauma and acute suppurative otitis media.³ Long standing perforation leading to recurrent ear discharge needs myringoplasty using various grafts. Myringoplasty thus not only helps in improving hearing but also protection of middle ear, external ear and even inner ear from suppuration etc. There are wide range of grafts but the most commonly used is

temporalis fascia⁴, fat plug⁵, perichondrium⁶ and amniotic membrane.⁷ The techniques employed for the repair include are *onlay*, *underlay*⁸, *through and reverse through*. The pre-requisites for successful outcome of myringoplasty are good eustachian tube function⁹, dry ear, no focus of infection in nose, throat, sinuses and a functioning cochlea.¹⁰ Myringoplasty is an established procedure, however the quest is on to improve the results further by studying the different factors that could possibly affect the outcome.¹¹ This study was conducted to know the factors influencing the success rate of myringoplasty in our patients.

MATERIAL AND METHODS

This descriptive study was conducted in the Department of Ear, Nose, Throat; Head & Neck Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. A total of 50 cases were included who underwent myringoplasty.

SEX-WISE DISTRIBUTION OF PATIENTS (n=50)

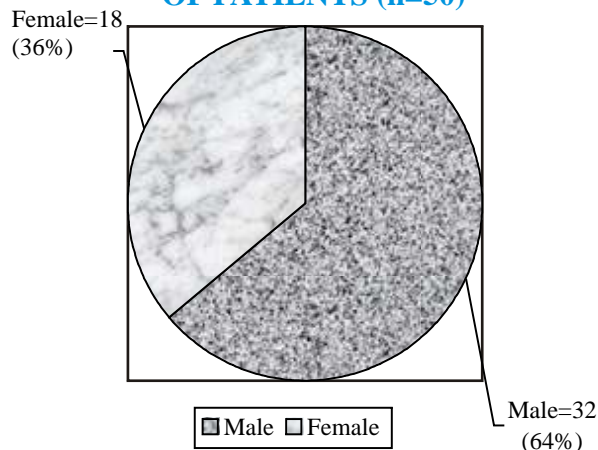


Figure No. 1

The following *inclusion criteria* was used for the selection of patients:

1. Patients with dry ears for at least six months.
2. Central perforations in the tympanic membrane.
3. Disease free mastoids.

The following *exclusion criteria* were used:

1. Age less than 8 years.
2. Patients having ears with acute discharge.
3. Focus of infection in their nose, sinuses or throat,
4. Chronic ear disease with granulations or cholesteatoma.
5. Patients suffering from sensorineural hearing loss.

On admission detailed medical history was recorded for each patient. All the patients were complaining mainly of recurrent ear discharge and hearing loss. Ear, nose and throat were examined thoroughly of each patient. Ear examination included otoscopic and microscopic examination. The site and size of perforation was noted for each case and was graded as small, medium, large or subtotal. The status of middle ear mucosa was assessed through the perforation. Each patient was checked for fistula test, facial weakness, nystagmus. Tuning fork test including Rinne's, Weber and ABC (absolute bone conduction) tests were carried out. Beside ENT examination, systemic examination was carried out in each patient.

Following investigations were carried out; pure tone audiogram, Toynbee's test for Eustachian tube function and record of pressure changes on manometer. X-rays mastoid, X-ray paranasal

sinuses, X-ray chest PA view in selected patients, Hb%, bleeding time (BT), and clotting time (CT), urine complete examination, HBsAg and Anti HCV were performed. The operation was carried out under local or general anesthesia depending on the preference of individual surgeon and condition of the patient. After scrubbing, the ear concerned was re-examined under the microscope and reassessment made in each case regarding the presence or absence of infection and status of external auditory meatus, the status of tympanic membrane perforation, and of middle ear mucosa. As a graft material temporalis fascia or tragal perichondrium was taken and put on glass slide to get dry. Permeatal route was selected for all onlay technique under microscope using proper magnification and proper size of ear speculum was fixed in the external auditory meatus. Underlay technique was performed via endaural as well as permeatal route. All the patients were closely observed during recovery for the first 24 hours. Intravenous antibiotics were given. Weber test, spontaneous nystagmus and facial nerve were checked routinely. Meatal pack and stitches were removed on the 5th day. All the patients were advised to avoid straining, coughing and forceful nose blowing postoperatively. All the patients were called for follow up at 2 weeks, 4 weeks and then at monthly interval for the 1st 6 months. At each visit the ear was examined with otoscope and tuning fork test performed. Audiograms and tympanogram were performed in successful cases. Descriptive statistics like frequency, percentages, mean, ratio, standard deviation etc. was computed for data presentation. Data was analyzed by using Computer program SPSS version 12 for windows.

RESULTS

A total of 50 patients were studied. 32 (64%) were male patients and 18 (36%) were female patients with male to female ratio of 1.77: 1 (Figure No. 1). Ten (20%) of them belonged to age group 10-14 years while remaining 40 (80%) were in the age range of 15-40 years with mean age of $22.60 \pm S.D 8.40$ years (Table No.1).

Out of total 50 cases graft was taken up successfully in 40 (80%) cases. 6 (60%) out of 10 were below the age of 15 years while 34 (85%) out of 40 cases were above 15 years of age. Success rate was 84% in patients with underlay technique (21/25) and 76% in patients with onlay technique (19/25) as shown in Table 2. Of 6 (12%) out of 50 cases the graft take up rate was 100% where the perforation was due to trauma (table 2). While out of the remaining 44 cases the graft take up rate was in 34 (77.3%). The cause of perforation in this group was chronic suppurative otitis media. Success rate was 83.3% in cases

AGE RANGES OF PATIENTS (IN YEARS) (n=50)

Age-Range (in years)	No. of Patients	Percentage
10-14	10	20%
15-40	40	80%
TOTAL	50	100%

Table 1

where temporalis fascia (30/36) was used while 71.4% in cases where tragal perichondrium (10/14) was used. Regarding the type of anesthesia 20 (40%) cases were operated under general anesthesia while 30 (60%) cases were operated under local anesthesia. Among the 30 cases operated under local anesthesia the graft were taken up in 26 (86.7%) cases while 14 of 20 cases (70%) who were operated under general anesthesia proved successful. Regarding size of perforation, out of 16 cases with medium sized perforation 14 (87.5%) cases had a successful take up rate. While

among the 24 patients with large central perforation 20 (83.3%) patients had successful myringoplasties. In the other group of 10 patients who were having subtotal perforation only 6 (60%) were successful. Out of the total 50 cases, 28 (56%) patients were having sclerotic mastoid in whom 20 (71.4%) gained success. While in another group of 22 (44%) patients who were having cellular mastoid 20 (91%) patients had successful myringoplasty. Forty (80%) patients were having good Eustachian tube function while 10 (20%) were unable to equalize their middle ear pressure on Toynbee's maneuver. In the former group the graft was taken in 39 (97.5%) cases successfully; while in the latter group the success rate was 10% (1 out of 10).

DISCUSSION

Myringoplasty is a reconstructive operation of tympanic membrane performed to prevent recurrent ear discharge and to improve

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Variable		Success Rate	
		Frequency	%age
Technique	Underlay (n=25)	21	84
	Onlay (n=25)	19	76
Cause of perforation	Trauma (n=6)	6	100
	chronic suppurative otitis media (n=44)	34	77.3
Graft Material	Temporalis fascia (n=36)	30	83.3
	Tragal perichondrium (n=14)	10	71.4
Type of anesthesia	General anesthesia (n=20)	14	70
	Local anesthesia (n=30)	26	86.7
Size of perforation	Large sized perforation(n=24)	20	83.3
	Medium sized perforation(n=16)	14	87.5
	Subtotal sized perforation(n=10)	6	60
Type of Mastoid	Sclerotic mastoid (n=28)	20	71.4
	Cellular mastoid (n=22)	20	91
Eustachian tube function	Good (n=40)	39	97.5
	Affected (n=10)	1	10

Table 2

hearing loss caused by tympanic membrane perforation¹². The overall success rate in our study was 80%. This can be favorably compared with the results reported in local and international literature which range from 70 to 90 percent.¹³⁻¹⁷ The success rate for children below 15 years of age was 60% in our study in contrast to 85% in patients above the age of 15 years. Thus the success rate is less in children than the adults. The cause may be recurrent upper respiratory tract infection and poor eustachian tube function in those patients. Similar results have been reported by Caylan R et al.¹⁸. Thus some of the surgeons prefer to delay grafting of tympanic membrane in children due to above mentioned reasons. But still reasonable number of patients benefit to improve hearing and speech. Only 40% of children will remain handicapped who can be benefited by a repeat surgery. So surgery is recommended in children above 10 years of age especially in those who have bilateral tympanic membrane perforation.¹⁹ The success rate for subtotal perforation was 60% and was less as compared to the kidney shaped, medium sized central perforation and large central perforation, i.e. 87.5% and 83.3% respectively. Similar results have been reported by Rafi T in a local study². The success rate for onlay technique was 76% as compared to 84% for underlay technique while 83.3% with temporalis fascia in contrast to 71.4% of tragal perichondrium. There was slight difference in the success rate for different techniques and for different grafts. However the major factor influencing the graft uptake is detected by experience of the surgeon. Similar results have been reported in the international literature.²⁰⁻²⁴ The success rate in patients with good eustachian tube function was far better (97.5%) than those with poor Eustachian tube function (10%). Similar results have been reported by El Guindy A.²⁵ In those patients operated under local anesthesia with sedation the take up rate was 86.7% as compared to 70% in those operated under general anesthesia. Postoperative tympanometry performed 6 months after the operation in successful cases showed normal compliance for both underlay and onlay techniques. This disproves the claims of some authors that the graft in underlay technique narrows the middle ear space and thus reduces the drum compliance.²⁶

CONCLUSION

In this study of 50 patients the influencing factors for successful myringoplasty were evaluated and the conclusion drawn is:

Results were better in age group of more than 15 years.

Graft take up was much better in cases of

traumatic perforation than the perforation caused by chronic suppurative otitis media.

Results of myringoplasty performed under local anesthesia were better than those done under general anesthesia.

Size of perforation affected the success of myringoplasty inversely.

More cellular the mastoid, better were the results.

Success rate of myringoplasty was much more dependent on good functioning eustachian tube.

Success rate achieved was more gratified when temporalis fascia was used as graft material as compared with tragal perichondrium.

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