ORIGINAL RESEARCH PAPER
Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

"INTERLAY MYRINGOPLASTY - A COMBINATION OF UNDERLAY AND OVERLAY TECHNIQUE"

Otolaryngology

Sachin Jain Associate Professor, Department of E.N.T., MLN Medical College, Allahabad, U.P., India.

Dr Dinesh Kumar* Senior Resident, Department of E.N.T., MLN Medical College, Allahabad, U.P., India. *Corresponding Author

Mohd Aftab Associate Professor, Department of E.N.T.,MLN Medical College, Allahabad, U.P., India.

Ramsiya Singh Lecture, Department of E.N.T., MLN Medical College, Allahabad, U.P., India.

ABSTRACT

Objective: To describe the technique and evaluate the advantages of Interlay myringoplasty.
Method: A retrospective analysis of 48 cases of simple perforation of tympanic membrane was undertaken. The graft was sandwiched posteriorly between the remnants of tympanic membrane and meatal skin-tympanic membrane epithelium flap.
Result: 44 cases out of 48 were successful (91.6%), having an intact tympanic membrane and hearing improvement.
Conclusion: In the described interlay technique, posterior annulus is not elevated, so blood supply of the posterior part of tympanic membrane remains intact and a large area is available for better take-up of graft. Tucking the anterior lip of the graft under the annulus greatly minimizes the chances of lateralization of graft, rounding off of the anterior canal recess, thus preventing the residual perforation of the anterior part of tympanic membrane. Rapid healing process and early epithelization of graft leads to less chances of failure.

KEYWORDS

Myringoplasty; Graft; Tympanic membrane perforation

Introduction:
Myringoplasty is a routine surgical procedure for repair of tympanic membrane defect where the ossicular chain is intact and mobile. The concept of onlay sandwich myringoplasty was introduced by House and Sheehy[1] and Sheehy and Glasscock.[2] Later on underlay technique introduced by Shea[3] and Tabb[4] gained more popularity. Results of various types of underlay and overlay technique have been analyzed by several otologists. The disadvantages of onlay technique are the risks of incomplete removal of squamous epithelium and subsequent cholesteatoma pearl formation, lateralization of the graft and blunting of anterior angle.[5] Underlay myringoplasty gained more popularity because of its superiority over the overlay technique as it avoids the above mentioned shortcomings of overlay technique. Underlay technique also has an advantage of allowing the inspection of ossicular chain and division of any intratympanic adhesions. Its disadvantages, however, are the risks of medial prolapse of the graft and retraction of anterior angle.[6] The time for complete epithelization is shorter for underlay technique than for overlay technique.[7] In the present study an interlay technique is designed to combine the merits and eliminating the disadvantages of both underlay and overlay procedures. The overall results of the technique are discussed below.

Material and methods:
The study is based on retrospective cases where a posteriorly sandwiched graft technique was used in 48 cases of simple perforation of tympanic membrane over a period of last three years. The operated cases were in age group of 14 to 44 years.

Selection of cases and preoperative evaluation: Cases of dry central perforation were taken up for surgery. All the cases had a thorough ENT examination. Any patient having associated significant systemic disease or nasal and throat involvement was excluded from the study. The ear should be preferably dry with acceptable eustachian tube function. Preoperatively audiogram followed by Patch test was used to confirm the presence of an intact ossicular chain and an adequate cochlear reserve. Cases with inadequate cochlear reserve, abnormal eustachian tube function and ossicular discontinuity were excluded.

Surgical procedure: Majority of the patients were operated under local infiltrative anaesthesia with systemic sedation. Few apprehensive patients required a general anaesthesia. The ear was irrigated with physiological saline solution to remove cerumen and debris from external auditory canal. A post-aural approach was used to expose the ear canal (Figure I). The superior part of skin incision was extended vertically over the temporal region and a suitable sized fascia graft was harvested.

Margins of the tympanic membrane perforation were excised with the help of needle and cup forceps. The skin flap from the posterior meatal wall from 6 o'clock position inferiorly and 12 o'clock position superiorly was raised from lateral to medial till the annulus is reached (Figure- II). The epithelium over the remnants of posterior half of the tympanic membrane is carefully raised in continuity with meatal skin without elevating the annulus (Figure-III and IV). Thus a raw area is created as the bed over the posterior bony meatus and posterior half of remnant of tympanic membrane. Hemostasis was secured by placing the adrenaline soaked cotton balls in the canal and over the tympanic membrane remnants. The handle of malleus was denuded all around if it was projecting into the perforation. The temporalis fascia graft was fashioned with a lip anteriorly as shown in Figure-V. With the help of a cup forceps and repositor the lip of graft was tucked under the anterior edge of the perforation and the rest of the graft was placed over the raw area on posterior part of tympanic membrane remnant and the adjacent bony external auditory canal. Anteriorly the lip of the graft was supported by placing few pledgets of gel foam to prevent its falling medially in the middle ear. The meatal flap along with the epithelial layer of the tympanic membrane remnant was reposited over the graft carefully (Figure-VI). The meatus was packed with antibiotic soaked gel foam. The post aural wound was closed and a mastoid dressing applied.

Post operative care: Patients were put on systemic antibiotics, antihistamines and decongestants. Sutures were removed on day 7 and gel foam after 3 weeks. The patients were seen for 4 – 6 weeks for follow-up examination.

Results:
The criterion for success was restoration of an intact tympanic membrane and improvement in the hearing. All the cases were followed up for at least 6 months after surgery. Success was achieved in 44 cases out of 48 cases (91.6%). In the entire successful cases, the air-bone gap improved at least by 10dB. The failures were due to immediate or early post operative infection and rejection of graft. None of the patients had deterioration of hearing or post operative sensorineural hearing loss. The success results were not influenced by the site and size of perforation. Formation of post operative epithelial pearls, lateralization or medialisation of graft was not noted in any of the patient.

Discussion:
In myringoplasty procedure various factors are responsible for a successful graft take up. Proper support or fixation of the graft and adequate blood supply for its survival are two important factors.

Breakdown of a tympanic membrane graft due to inadequate blood supply may lead to post operative perforation. This is surprising in view of the fact that in many cases a large area of graft lies unsupported in space and the surface area from which the blood supply is derived is relatively small. It may be possible that some of the primary graft failures may be related to poor blood supply.[8] Initially in myringoplasty graft was placed on outer surface of tympanic membrane remnant. When graft is placed laterally, there are chances of rounding off of the anterior canal recess, lateralization of graft and formation of post operative epithelial pearls due to trapping of squamous epithelium.5 Later on otologists began to prefer underlay technique3 where the graft is placed medial to the tympanic membrane. In this technique, the posterior annulus is raised cutting off the blood supply of the tympanic membrane in its posterior part. This leads to delayed epithelization of the graft [7] and post operative perforation. [8] In interlay procedure, the posterior part of the graft is sandwiched between the vascular bed and the posterior flap. Thus, a sufficiently large raw area is available to serve as the vascular bed providing adequate blood supply to the graft placed on it. The average time of epithelization of graft in interlay technique is much shorter than other techniques, healing rate is superior and gain in hearing is more [6,7,9] in comparison to other techniques.

Conclusion:

In the described interlay technique, posterior annulus is not elevated, so blood supply of the posterior part of tympanic membrane remains intact and a large area is available for better take-up of graft. Tucking the anterior lip of the graft under the annulus greatly minimizes the chances of lateralization of graft, rounding off of the anterior canal recess, thus preventing the residual perforation of the anterior part of tympanic membrane. Rapid healing process and early epithelization of graft leads to less chances of failure.

Figure-1: Ear canal being exposed by post-aural approach

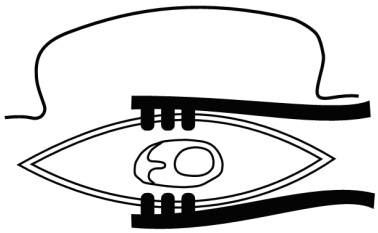


Figure-2: Skin flap being raised from posterior meatal wall

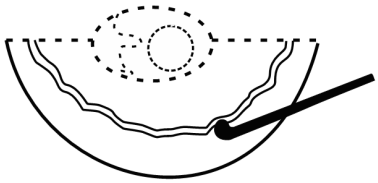


Figure-3: Epithelium over posterior half of tympanic membrane being raised

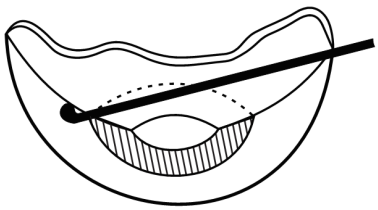


Figure-4: Epithelium over posterior half of tympanic membrane being raised without elevating the annulus

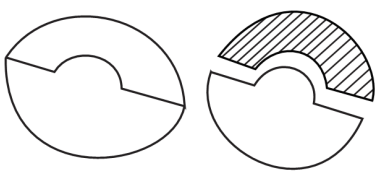


Figure-5: Temporalis fascia graft being tucked under the anterior edge of perforation

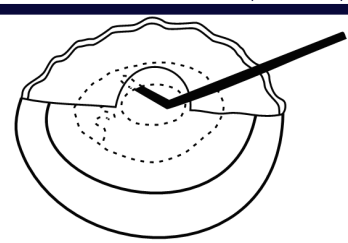
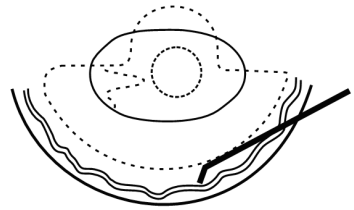


Figure-6: The metal flap and epithelial layer of tympanic membrane remnant being reposited over the graft.



References:

1. Sheehy JL, Glasscock ME. Tympanic membrane grafting with temporalis fascia. Arch Otolaryngol.1967;86:391-402
2. House WF, Sheehy JL. Myringoplasty. Use of ear canal skin compared with other techniques. Arch Otolaryngol.1961; 73:407-15.
3. Shea JJ Jr. Vein graft closure of eardrum perforations. J Laryngol Otol. 1960; 74:358-62.
4. Tabb HG Closure of perforations of the tympanic membrane by vein grafts. A preliminary report of twenty cases. Laryngoscope 1960; 70:271-86.
5. Raghavan U, Malki DS, Mahmoud NA. Myringoplasty: update on onlay pedicle skin flap and temporalis fascia sandwich graft.J Laryngol Otol 2000; 114:174-7.
6. Singh M, Rai A, Bandyopadhyay S, Gupta SC. Comparative study of the underlay and overlay techniques of myringoplasty in large and subtotal perforations of the tympanic membrane.J Laryngol Otol 2003; 117 :444-8.
7. Komune S, Wakizono S, Hisashi K, Uemura T. Interlay method for myringoplasty. Auris Nasus Larynx 1992; 19:17-22.
8. Gibb AG, Chang SK. Myringoplasty (A review of 365 operations). J Laryngol Otol 1982; 96:915-30.
9. Pagnini P, Scarpini L, Fanfani F, Norberti A. Sandwich-graft myringoplasty: the authors' personal technic and results Acta Otorhinolaryngol Ital 1992; 12:153-63.