

Underlay Myringoplasty made Easy by Three Step Modification - A Mini Review

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INTRODUCTION

Myringoplasty is the surgery advocated for repair of tympanic membrane perforation. Various methods for Myringoplasty are underlay, overlay and interlay techniques each having its advantages and disadvantages. Over the years, many surgeons have modified Myringoplasty in term of approaches, types of canal wall incision to make flaps, type of graft material, techniques of grafting. Several types of canal wall incisions were used in Myringoplasty. Each carries their own merits and demerits. This study proposed a modification of the traditional approach of giving canal wall incision to make tympano-meatal flap and reported a high success rates in terms of graft uptake and hearing improvement for closure of all types of perforation by underlay technique.

This study was a prospective observational study involved 40 COM patients between the ages 18 to 60 years with central perforation undergoing Myringoplasty at Tata motors hospital, Jamshedpur, Jharkhand. Myringoplasty was done only if ear was dry for at least 3 weeks by post aural route underlay technique using temporalis fascia graft. Patients were classified based on degree of hearing loss. Patient were categorized in 4 groups viz. less than 10 dB loss, 10 to 20 dB loss, 20 to 30 dB loss and more than 30 dB loss. In all the cases conductive hearing loss (AB gap) was calculated by pure tone audiometry. Bone conduction up to 5 dB was considered as test error and was not taken into consideration. In the results, authors had noted granulations and non-healing in canal wall, graft uptake and hearing improvement.

There were no granulations, edema in EAC in any of the patients at 3 months. Complete healing of canal wall was present in all the 40 cases. Graft uptake was successful in 39/40 patients with success rate of 97.5% at 3 month post op period. The average hearing loss in pre-op patient was 38.55 dB, which improved to 17.33 in post-op patient with improvement by 21.22 dB. In this study, the hearing improvement with a-b gap closure of less than 20 db was seen in almost 90% patients. Hearing gain was statistically significant in all types of tympanic membrane perforations

including smaller, larger and subtotal perforations with 'p' value less than 0.05.

There were three modifications which author mentioned in his technique viz. Modified Rosen's Incision, circumferential 360° elevation of fibrous annular from its sulcus and no gel foam in middle ear for medial support of fascia graft. The main point of discussion about myringoplasty in this study was the canal wall incision which author labelled as **Modified Rosen's Incision**. All the cases were done by post aural route. After meatotomy to enter EAC, two incisions were given to merge with two ends of meatotomy incision. Start point of upper incision was 3 to 4 mm lateral to annulus at 2 O'clock for right ear and spirally goes upward backward and posteriorly to meet superior end of meatotomy incision and inferior incision starts at same level from 4 O'clock for right ear goes spirally downward laterally and posteriorly to meet inferior end of meatotomy incision, leaving anterior skin between 2 O'clock to 4 O'clock as vascular strip.

Advantages of this modified Rosen's incision were preservation of healthy blood supply to the tympano-meatal flap. This incision was easy to learn and perform. It can be tailor made according to canal size, the incision could be placed medially or laterally in case of small canal and wide canal respectively to provide adequate balance between bulk of tympano-meatal flap and working space for graft placement. It provide good view of bony canal wall to address any overhang, give 3 to 4 mm of margins all around perforation to prevent rolling of margins and should be easy

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to handle during tympano-meatal flap repositioning over graft, as graft was sandwiched between canal wall and tympano-meatal flap.

Second modification was circumferential elevation of annulus from its tympano-meatal flap elevated all around along with 360° elevation of annulus after denuding handle of malleus. The anterior canal wall skin elevated using a circular knife from medial to lateral direction and tympano-meatal skin reflected anteriorly by laterally based anterior skin flap between 2 to 4 O'clock for right ear. Mokhtarinejad et al. [1] used the same technique and reported high success rate in graft uptake, i.e., 95%. Anteriorly annulus was lifted up from its sulcus. Here in this study the success rate is 97.5%.

Advantage of this step was that it allows any bony canal overhang, which can be easily corrected. Graft could be place over canal wall all around 360°. No difference with size of perforation and can be done for moderate to subtotal perforation. Eustachian tube opening can be easily examined, graft will not obstruct Eustachian tube opening even in early post op period when there is edema of graft and graft will not fall from anterior margin. Graft was placed all around over bony meatal wall medial or lateral to handle of malleus. Tympano-meatal flap was repositing back over graft maintaining anterior angle.

Third modification was not to put any Gelfoam in middle ear as graft was well supported all around. Samad and Tootonochi [2] also advocated no gel foam to be used in middle ear. Advantage to this step was that no foreign body material is placed in middle ear hence prevent any scarring and fibrosis secondary to foreign body reaction. Secondly, good aeration of middle ear and mastoid air cell was restored early leading to early hearing improvement and less heaviness feeling in middle ear.

Various advantages of this technique were maintaining of healthy blood supply to the tympano-meatal flap, easy to learn and perform, can be tailor made according to canal size, provide good view of bony canal wall to address any overhang, give 3 to 4 mm of margins all around perforation to prevent rolling of margins and should be easy to handle during tympanomeatal flap repositioning over graft, as graft was sandwiched between canal wall and tympanomeatal flap it does not require any gel foam support from medial side and hence no gel foam was placed in middle ear. Canal healing was complete with no granulation or non-healing area in EAC. This gives additional advantage of early hearing gain, avoids any feeling of heaviness in ear and prevents any fibrosis in middle ear. There were no cases of anterior blunting and graft lateralization in any patients.

The proposed technique can be used for all type of perforation, gives good results of graft uptake and hearing improvement, does not require special skills, easy to learn and perform even for novice ear surgeon. No specific

complications were encountered while using this modification of the traditional approach.

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