



ORIGINAL RESEARCH PAPER

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SINGLE FLAP OTOENDOSCOPIC MYRINGOPLASTY FOR LARGE CENTRAL PERFORATION

KEY WORDS: Endoscope, tympanic membrane, perforation, otitis media

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ABSTRACT

BACKGROUND: Otoendoscopic myringoplasty has been successfully used for repair of small to medium sized perforation using various materials. Very few studies have used this method for repair of large central perforation.
OBJECTIVE: To evaluate the transcanal otoendoscopic approach to reconstruct large central perforation by raising single flap.
MATERIAL & METHODS: Study on forty patients with chronic suppurative otitis media dry stage with large central perforation in medical college hospital and research centre was conducted. A zero degree 4mm otoendoscope and custom made suction elevator was used for myringoplasty.
RESULTS: The perforation of thirty eight patients had healed by the end of two months.
CONCLUSION: Otoendoscopic myringoplasty is effective in managing large central perforation and patients need to be observed for longer period to calculate the successful rate.

INTRODUCTION:

Myringoplasty is one of the frequently undertaken procedures for the treatment of chronic suppurative otitis media. The procedure can be performed in 3 different ways, viz., post aural approach, endaural approach, and endomeatal approach with use of operating microscope. Endoscopic approach to the middle ear is a recent concept and it is minimally invasive. Otoendoscope has advantages of better visualization of the middle ear structures and greater degree of freedom in negotiating the external auditory canal bulges^{1,2}. It has been successfully used in reconstruction of small to medium sized perforation^{3,4} and very few numbers of large central perforation are taken up for otoendoscopic myringoplasty with tympanomeatal flap elevation. Here we performed the otoendoscopic myringoplasty technique for the patients with chronic suppurative otitis media with large central perforation with good graft take up rate.

MATERIAL & METHODS:

A total number of 40 patients who came with chronic suppurative otitis media with large central perforation were selected for the study. All these patients underwent otoendoscopic myringoplasty during the period from June 2012 to December 2012. The criterion for inclusion included dry stage of chronic suppurative otitis media, central perforation with more than 50 percent involvement of the pars tensa, hearing loss of not more than 50dB. All the subjects underwent detailed endoscopic examination and the findings were carefully documented. The preoperative endoscopic examination revealed that none of the patients had active mucosal disease at the time of surgery.

Surgical technique:

All selected patients underwent the procedure under general anaesthesia. Using a zero degree otoendoscope, an endomeatal circumferential incision was made 6mm from the tympanic annulus, single tympanomeatal was elevated from the underlying bone and annulus was lifted from the sulcus. The entire flap was elevated from inferior to superior till the flap is having a pedicle attached to the superior canal skin. Care is taken to separate the skin from the underlying mucosa so that the graft replaces the fibrous middle layer of the tympanic membrane. The middle ear was inspected for any epithelial residue and ossicular mobility was confirmed by eliciting round window reflex. Temporal fascia graft or perichondrium was used as graft material. The Middle ear was filled with gel foam and the flap was repositioned appropriately all over the circumference to overlap the graft material (figure 1). External auditory canal was packed with medicated gel foam and a small cotton pack was placed over the gel foam for 5 days. After 5 days, external cotton pack was

removed and instructed the patient to avoid entry of water in the ear for another 10 days. After about another 15 days patient was followed and external auditory canal was cleaned of remaining gel foam and the neodrum was examined using endoscope (figure 2). All the patients underwent audiometry evaluation at the end of 2nd month.

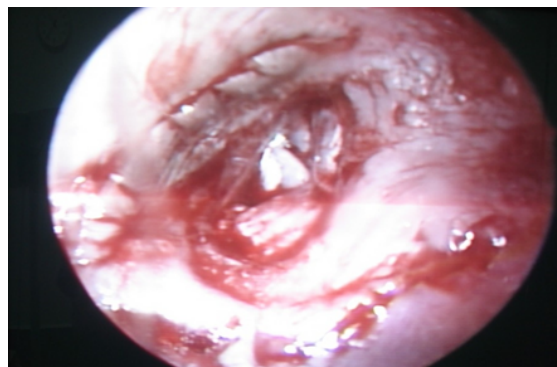
RESULTS:

Forty patients were categorized into 20 male patients and 15 female patients. Age of the patients ranged from 15years to 55 years. All the patients had history of chronic ear discharge for more than 3 months. Age of the patients ranged from 15years to 55 years. All patients had history of chronic ear discharge for more than 3 months duration with mean being 2 years. One patient had unhealed traumatic perforation.

A detailed ENT and head and neck examination confirmed the tympanic membrane perforation using zero degree 4mm otoendoscope and hearing assessment was done with pure tone audiometry. Mean conductive hearing loss was 35dB. None of the patients had sensorineural hearing loss. Active ear discharges of the patients were treated medically and allowed to remain dry for at least one month before taking up for operation.

Mean duration of the surgery was one hour. Thirty eight patients had their perforation closed at the end of one month. Two patients developed acute upper respiratory tract infection following which developed small central perforation and treated medically and had their perforation closed at the end of third month. At the end of three months all 38 patients were examined and pure tone audiometric investigation was done and mean air bone gap closure was within 25dB.

Image 1: Perforated Tympanic membrane



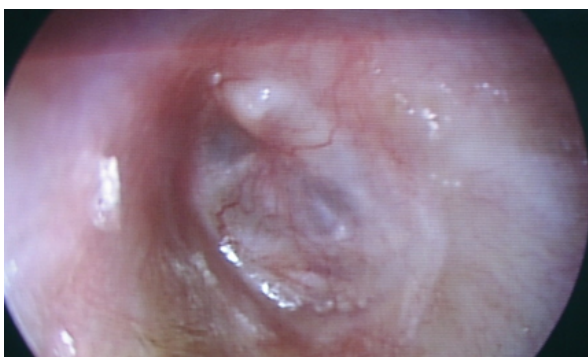
DISCUSSION:

Otoendoscopic myringoplasty is a procedure which involves reconstruction of tympanic membrane. Initially otoendoscope was used as a diagnostic tool to closely inspect the tympanic membrane and the middle ear structures⁵. First use of the endoscope was done in the year 1967 by Mer et al to examine the middle ear⁶. Later on with the advent of rigid Hopkins rod telescopes, otoendoscopes are now routinely used for the examination of the intact tympanic membrane and its abnormalities and middle ear surgeries⁷. However, in due course it was used as an alternative to the microscope in reconstruction of the tympanic membrane. There are basically 3 approaches to visualize the tympanic membrane, postaural, endaural, and transcanal. Of all these approaches used by the microscope, postaural and endaural approaches usually make an external incision and leave a scar and post operative morbidity⁸. Further, in selected cases with wide and straight external auditory canal the transcanal approach rendered no external scar and minimal morbidity post operatively.

Otoendoscope made this approach more popular in treatment of small central perforations with close inspection of the middle ear structures. In the literature, there are various graft materials that have been used for this method of transcanal endoscopic reconstruction of the tympanic membrane with small central perforation^{4,9,10,11}. There are very few reported cases in which the large central perforations are explored and reconstructed using the endoscope. Most suitable graft material for the reconstruction is either temporalis fascia or perichondrium for large perforations. In majority of the endoscopic transcanal myringoplasty, endomeatal skin flap are not raised because of the technical difficulty with one had only free¹². In our study we have also used a single flap technique to prepare the bed for the graft material. However, this can be overcome with suitable designed suction elevator¹³.

Endoscope allows for better visualization and elevation of the skin and fibrous layer from the underlying mucosa. Because, remnant of the mucosa hinders the growth of the epithelium it should be meticulously separated from the overlying fibrous layer. The basic principle using superiorly based skin flap is its thickness which makes it stronger to reposition back over the graft¹⁴. Endoscope allows the graft to be secured firmly below the annulus entirely in the pars tensa area and placing the overlying gel foam.

Image 2: Reconstructed Tympanic membrane



CONCLUSION:

Otoendoscope in recent days has been successfully used for reconstruction of tympanic membrane without elevation of the tympanic membrane without elevation of the tympanomeatal flap for small to medium sized perforation. Here used the otoendoscopic procedure for closure or the large central perforation with endomeatal elevation of the tympanomeatal flap. This procedure is least morbid with early recovery. Further, the otoendoscopic procedure can be done by the properly designed custom made suction elevator

which can overcome the restriction of one hand surgery.

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