

Regenerative Myringoplasty – A Case Report

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Abstract

Dry perforation of the tympanic membrane cause hearing impairment and predispose the middle ear to infections. Small dry perforations can be closed by chemical cauterization using silver nitrate in an office setting. In a chemically induced myringoplasty all the five layers of tympanic membrane would be present akin to the normal tympanic membrane. It's an effective means of tympanic membrane closure. In selected patients it restores hearing back to normal and allaying the patient of a irritable symptoms like tinnitus. It reduces the surgical waiting list. It also saves time and money for the patient, surgeon and hospital. We present a case report of 35 year old male diagnosed to have permanent perforation syndrome he was managed successfully in an office setting with complete closure of the perforation restoring his hearing to normal.

Key words: *Regenerative myringoplasty, Induction myringoplasty, Silver nitrate induced myringoplasty.*

Perforations of tympanic membrane secondary to trauma or otitis media is an indication for surgical repair of the tympanic membrane. Surgical repair is a rule than exception. Dry perforations can be successfully closed by chemical means in an office setting in appropriately selected cases. Such a conservative managements saves the patient the risks of surgery

anesthesia and hospitalization.

Method and Results

A 35 year old male presented with history of othorrea, decreased perception of hearing and tinnitus of left ear of six month duration. The othorrea responded to oral antibiotics and aural drops. The decreased perception of hearing and tinnitus persisted. Microscopic examination of his

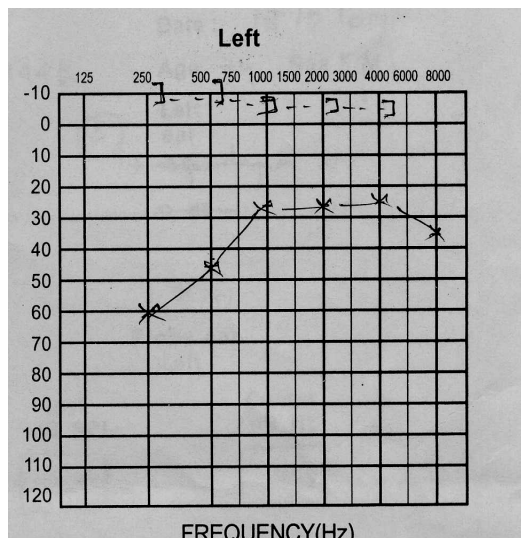
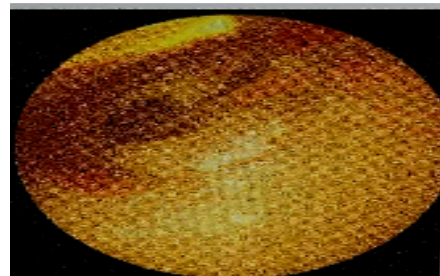
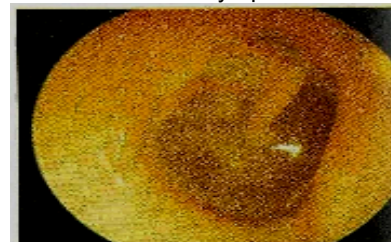


Table: 1



Perforation of the tympanic membrane



Normal tympanic membrane

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left ear revealed a large central perforation measuring about six millimeters in diameter that's about $3/5^{\text{th}}$ of the surface area of the pars tensa. No focus of infection was present in nasal cavity, throat or paranasal sinuses. Tuning fork test revealed conductive pathology on the left side. The facial nerve, mastoid and vestibular system was normal. Rest of otorhinolaryngological examination, systemic examination and general examination of the patient was normal. Patient underwent an audiological evaluation, pure tone thresholds showed.

Moderate hearing losses of conductive type (Table 1) tympanogram shows B wave on the left side, absent a acoustic reflexes on the left side, the middle ear pressure and static compliance-no peak attainable. However, the speech discrimination scores was 95% on the left side. Routine Haematological investigations were within normal limits and radiological examination of the mastoids showed well pneumatized mastoids. A diagnosis of chronic otitis media safe variety was made. In the second visit in a office setting 4% topical xylocaine solution about 2 ml was used as local anesthetic for the tympanic membrane. Injection atropine was the only pre anesthetic medication given. Ensuring ear was dry the rim of the perforation was cauterized with a bead of silver nitrate solution (2%). A paper patch soaked in anti biotic solution was used to cover the tympanic membrane perforation. The ear canal was packed with anti biotic soaked merocel. The patient was kept on a follow up at fortnightly intervals to observe the regeneration of the tympanic membrane. By 4 weeks microscopic examination showed closure of tympanic membrane perforation. After six weeks patient was sent for a repeat audiological evaluation. Pure tone thresholds had returned to normal with closure of air bone gap, the tympanogram showed A type of curves, acoustic reflexes had returned to normal, patient confirmed subjective improvement in hearing to almost normal and tinnitus had disappeared.

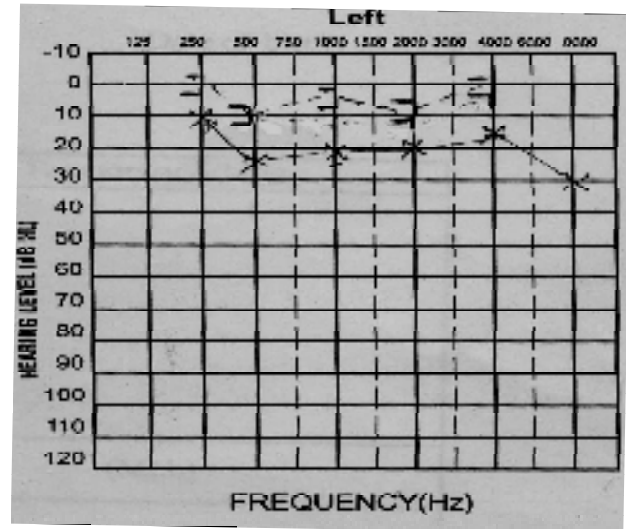


Table 3

Discussion

Tympanic membrane perforations are of special interest. Since its persistence can lead to variety of problems like permanent perforation syndrome, cholesteatoma tubo tympanic disease, extra cranial complications of otitis media, intra cranial complication of otitis media. The pars tensa has five distinct layers, an outer most epidermal layer, a thin dermis of fibrous tissue, an outer radiate fibrous layer, an inner circular fibrous layer and a mucousal layer. A perforation closure induced by a repeated acid cautery of its rim often results in a perfectly normal appearing, tympanic membrane possessing all the five layers. Whereas, spontaneous closure is only 2 layered devoid of fibrous layer giving rise of thin tympanic membrane. 3 guiding principles promote healing of tympanic membrane perforation by chemical cauterization.

- i. The edges of tympanic membrane perforation lined by stratified squamous epithelium which prevent spontaneous closure of perforation must be destroyed to permit fibro blastic proliferation of the fibrous layer.
- ii. The rim of the perforation must be kept moist because drying would caused death of the young fibro blast.
- iii. The edges of the perforation must be bleeding since hyperemia induces fibro blastic proliferation.

Regenerative myringoplasty must be attempted in a perforation not involving more than 65% of the surface area of the pars tensa. Derlacki, who has reported the largest series of chemical cauterization of tympanic membrane perforation about 75% of 131 perforations recovered. Repeated cauterization may be required in few cases. Induction myringoplasty may not be recommended in the following conditions.

1. Large perforation involving more than 65% of the surface area of the pars tensa.
2. Narrow external auditory canal preventing view of the anterior edge of the perforation.
3. Patient who refused series of weekly treatment.
4. When ingrowth of epidermis is suspected of forming an incipient or active cholesteatoma.

Conclusions

For the central perforation of the tympanic membrane measuring about 2 - 6 mm in diameter without a middle ear/mastoid disease, inductive myringoplasty can be attempted. The healing which is promoted by such induction would result in formation of all the layers of tympanic

membrane and this would result in normal hearing post procedure. Since it's an office procedure done under local anesthesia, the patient is saved from the risk of general anesthesia hospital stay, hospital cross infections and cost of the hospitalization. For the surgeon it reduces the surgical waiting list.

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