

Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study

First letter

Dear Editors,

We would like to address the manuscript titled ‘Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study’ by Shankar *et al.*¹

Their work is excellent and expands the indications for myringoplasty for chronic tympanic membrane perforation, and should shorten the waiting time for surgery in patients with a chronic tympanic membrane perforation. However, we believe that two points need to be clarified.

First, the inclusion criteria included patients with history of discharge for at least six weeks, but the authors did not describe the degree or properties of the discharge in detail. Some studies have shown that a moist middle-ear condition without purulent discharge does not affect eardrum healing; in fact, it can accelerate eardrum healing.^{2–6} In comparison, an excessively wet environment adversely affects eardrum healing, especially in patients with purulent discharge.⁷ Studies have suggested that excess moisture in the wound bed impairs the healing process, leading to peri-wound maceration.^{8,9} If the excess moisture is left unchecked, healing can be impeded, and there may be subsequent breakdown and further deterioration of the wound bed. Therefore, we believe that the authors should clearly describe the degree and properties of the discharge to help the reader select patients.

Second, the authors did not describe in the Methods section of the article whether the sclerotic plaques on the residual eardrum need to be removed. The sclerotic plaques associated with chronic tympanic membrane perforation are an important factor affecting eardrum healing. Some studies of tympanoplasty for chronic tympanic membrane perforation found that excision of the sclerotic plaques improved the success rate.^{10,11} In addition, two studies of fibroblast growth factor-2 for traumatic and chronic tympanic membrane perforation proved that residual tympanic membrane calcification was a significant risk factor for non-healing of tympanic membrane perforation.^{12,13} The authors of a study of spontaneous healing in a large sample of traumatic tympanic membrane perforation cases suggested that pre-existing sclerotic plaques were the main cause of healing failure.⁴ Therefore, the paper would have been better if it had compared the success rates among tympanic membrane perforation patients with and without sclerotic plaque.

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References

- 1 Shankar R, Virk RS, Gupta K, Gupta AK, Bal A, Bansal S. Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study. *J Laryngol Otol* 2015; **129**:945–9

- 2 Lou Z, Tang Y, Xiao J. The effect of ofloxacin otic drops on the regeneration of human traumatic tympanic membrane perforations. *Clin Otolaryngol* 2015. Epub 2015 Oct 14
- 3 Lou Z, Wang Y, Su K. Comparison of the healing mechanisms of human dry and endogenous wet traumatic eardrum perforations. *Eur Arch Otorhinolaryngol* 2014; **271**:2153–7
- 4 Lou ZC, Tang YM, Yang J. A prospective study evaluating spontaneous healing of aetiology, size and type-different groups of traumatic tympanic membrane perforation. *Clin Otolaryngol* 2011; **36**:450–60
- 5 Ozturk K, Yaman H, Cihat Avunduk M, Arbag H, Keles B, Uyar Y. Effectiveness of MeroGel hyaluronic acid on tympanic membrane perforations. *Acta Otolaryngol* 2006; **126**:1158–63
- 6 Caylan R, Titiz A, Falcioni M, De Donato G, Russo A, Taibah A *et al.* Myringoplasty in children: factors influencing surgical outcome. *Otolaryngol Head Neck Surg* 1998; **118**:709–13
- 7 Griffin WL Jr. A retrospective study of traumatic tympanic membrane perforations in a clinical practice. *Laryngoscope* 1979; **89**(2 Pt 1):261–82
- 8 Schultz GS, Sibbald RG, Falanga V, Ayello EA, Dowsett C, Harding K *et al.* Wound bed preparation: a systematic approach to wound management. *Wound Repair Regen* 2003; **11**(suppl 1): S1–28
- 9 Dowsett C, Ayello E. TIME principles of chronic wound bed preparation and treatment. *Br J Nurs* 2004; **13**:S16–23
- 10 Migirov L, Volkov A. Influence of coexisting myringosclerosis on myringoplasty outcomes in children. *J Laryngol Otol* 2009; **123**:969–72
- 11 Aslan H, Katilmiş H, Oztürkcan S, Ilknur AE, Başoğlu S. Tympanosclerosis and our surgical results. *Eur Arch Otorhinolaryngol* 2010; **267**:673–7
- 12 Hakuba N, Hato N, Okada M, Mise K, Gyo K. Preoperative factors affecting tympanic membrane regeneration therapy using an atelocollagen and basic fibroblast growth factor. *JAMA Otolaryngol Head Neck Surg* 2015; **141**:60–6
- 13 Lou Z, Yang J, Tang Y, Xiao J. Risk factors affecting human traumatic tympanic membrane perforation regeneration therapy using fibroblast growth factor-2. *Growth Factors* 2015; **33**: 410–18

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Authors' reply

Dear Editors,

We are glad to hear about the interest in our work titled ‘Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study’. We would like to thank Dr Zhengcai Lou for reading our paper in depth. We have gone through the author’s queries in detail.

Firstly, Dr Lou raised the question of whether the degree and nature of the ear discharge had any bearing on the healing results following tympanoplasty. In our study (as mentioned in the article), of the 35 patients with wet ear, 28 patients had mucoid discharge and 7 patients had mucopurulent discharge at the time of surgery.¹ On subsequent evaluation of the success of graft uptake between the two types of discharge, no statistically significant difference in success rate was found ($p = 0.526$) (Table I). Similarly, no difference in the graft uptake rate was found when the degree of the discharge was compared.

Similar results have been shown by other authors. For example, a prospective audit study by Kotecha *et al.*, which reviewed 1070 individuals, showed that patients

TABLE I
SUCCESS OR FAILURE OF GRAFT UPTAKE BY EAR
DISCHARGE TYPE

Ear discharge type	Successful graft uptake	Failure of graft uptake	Total
Mucoid	23	5	28
Mucopurulent	5	2	7

Pearson chi-square ($p = 0.526$). Data represent numbers of ears.

with dry ear, or mucoid, serous or purulent discharge, had failure rates of 17.7 per cent, 17.1 per cent, 11.8 per cent and 17.2 per cent, respectively; these rates are comparable, irrespective of the nature of the discharge.²

We agree with the author that the moist environment of a wet ear might accelerate the healing process of the ear drum.^{3–7} In our study too, tympanic membrane vascularity was found to be higher in cases of wet ear (16 out of 25, 64 per cent) than in cases of dry ear (3 out of 21, 14.3 per cent) ($p < 0.001$). However, on subsequent comparison, no statistical difference was observed in the final graft uptake rates between the wet and dry ear based on the vascularity ($p = 0.115$).

The second comment queried whether the tympanosclerotic patches on the tympanic membrane were removed or not during the surgery. Nineteen (27.1 per cent) of our patients had tympanosclerosis at the time of surgery. Of these 19 patients, 13 were in the dry ear group and the remaining 6 were in the wet ear group. Five patients also had some middle-ear sclerosis along with the tympanosclerosis (four in the dry ear group and one in the wet ear group). During the over-underlay technique of tympanoplasty, all efforts were made to clear the tympanosclerotic patch before the grafting was done. In addition, the middle-ear sclerosis was cleared if present before grafting. Thus, no comparison between the presence and absence of tympanosclerosis on graft uptake rates was possible.

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References

- Shankar R, Virk RS, Gupta K, Gupta AK, Bal A, Bansal S. Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study. *J Laryngol Otol* 2015;**129**: 945–9
- Kotecha B, Fowler S, Topham J. Myringoplasty: a prospective audit study. *Clin Otolaryngol Allied Sci* 1999;**24**:126–9
- Lou Z, Tang Y, Xiao J. The effect of ofloxacin otic drops on the regeneration of human traumatic tympanic membrane perforations. *Clin Otolaryngol* 2015. Epub 2015 Oct 14
- Lou Z, Wang Y, Su K. Comparison of the healing mechanisms of human dry and endogenous wet traumatic eardrum perforations. *Eur Arch Otorhinolaryngol* 2014;**271**:2153–7
- Lou ZC, Tang YM, Yang J. A prospective study evaluating spontaneous healing of aetiology, size and type-different groups of traumatic tympanic membrane perforation. *Clin Otolaryngol* 2011;**36**:450–60

- Ozturk K, Yaman H, Cihat Avunduk M, Arbag H, Keles B, Uyar Y. Effectiveness of MeroGel hyaluronic acid on tympanic membrane perforations. *Acta Otolaryngol* 2006;**126**:1158–63
- Caylan R, Titiz A, Falcioni M, De Donato G, Russo A, Taibah A *et al.* Myringoplasty in children: factors influencing surgical outcome. *Otolaryngol Head Neck Surg* 1998;**118**:709–13

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Second letter

Dear Editors,

The authors of the paper titled ‘Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study’ rightly point out that previous studies seeking to determine whether discharge at the time of surgery has an adverse effect on the outcome of myringoplasty operations have produced conflicting results. This is because they were inadequately powered to answer this question. The same is true of Shankar and colleagues’ study.

Fortunately, a study has already been published which provides a definitive answer.¹ When devising the study, the authors decided that, as patients with active ears benefit more from surgery than those with dry ears, the important question was whether discharge at the time of surgery was associated with an increase in the rate of persistent perforations of less than 10 per cent. A power calculation based on this premise indicated a need for a sample size of 182, with equal numbers in each group. In fact, 268 patients were enrolled, of whom 246 attended a follow-up appointment 6 months after surgery. The success rate for inactive ears was 83 per cent and that for active ears was 82 per cent. The authors concluded that: ‘There is no clinically significant difference in the success rate for myringoplasty in patients whose ears were active or inactive at the time of surgery’.¹

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Reference

- Mills RP, Thiel G, Mills N. Results of myringoplasty operations in active and inactive ears in adults. *Laryngoscope* 2013;**123**: 2245–9

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Authors’ reply

Dear Editors,

We are glad to hear about the interest in our work titled ‘Evaluation and comparison of type I tympanoplasty efficacy and histopathological changes to the tympanic membrane in dry and wet ear: a prospective study’. We would like to thank Prof Mills for going through our paper in depth. We agree with the observation made by Prof Mills regarding the sample size and the power of the study. Our study is not