Dear Editor,

We wish to highlight the relationship between the site of tympanic membrane (TM) perforation and the degree of hearing loss. We feel that this issue is worthy of consideration as there is a need to revise the related popular belief, as well as enhance the clinical knowledge among otorhinolaryngologists and relevant medical candidates.

When the TM is perforated, due to the long wavelength, low-frequency sounds can bend and escape via the hole, resulting in less force on the intact part of the TM. This leads to less effective movements of the TM and ossicles, and low-frequency conductive hearing loss. When the size of the TM perforation increases, more hearing loss at low frequencies is expected as more low-frequency sounds can escape through the bigger perforation. Additionally, high-frequency hearing loss could also occur as the bigger hole would now permit high-frequency sounds to escape.

Early studies in the 1970’s revealed that perforation in the posterior quadrant of the TM caused more hearing loss than the anterior part.1,2 This notion has been widely accepted by many otorhinolaryngologists ever since. However, more recent studies have found that the site of TM perforation has no effect on the degree of hearing loss.3–6

One of the possible reasons why the outcomes of earlier studies are different from the later ones is that the middle ear volume was not taken into consideration in the study procedures. When the middle ear volume was controlled, no significant differences in air-bone gaps were found between the anterior and posterior parts of the TM.4

In the presence of an intact middle ear system, we support the notion that the degree of hearing loss is affected only by the size of the TM perforation (more hearing loss with bigger perforation size) and middle ear volume (more hearing loss with smaller middle ear volume). By considering the
existing literature, the site of TM perforation has no influence on the degree of hearing loss. This information should be widely disseminated among practicing otorhinolaryngologists and regarded as a “revision” to the popular belief that more hearing loss would occur when the posterior part of the TM is perforated. This revised issue has at least two clinical implications. Firstly, it is possible to have a milder degree of hearing loss in cases of TM perforation involving the posterior part. In this regard, the outcomes are possibly genuine, and the validity of a pure tone audiometric result may not be an issue. Secondly, in line with the statement by Park et al., it is also possible for patients with small TM perforation size to have bigger hearing losses or vice versa as the middle ear volume also plays an important role in this matter.

Disclosure

No conflicts of interest, financial or otherwise, were declared by the author.

REFERENCES