Reviewer's report

Title: Correlating the site of tympanic membrane perforation with Hearing loss.

Version: 1 Date: 30 September 2008

Reviewer: Tien-Chen Liu

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I general, I think the outcome of this study added very little new information on the existing knowledge. Besides it has some flaws in data analysis, presentation and confusing terminology as well. There is room to improve by a large margin. Therefore, I cannot recommend publication of this article in its present form. Specifically, the followings are my concerns:

Major concerns:

1. The hearing loss of the chronic otitis with ear drum perforation can not be attributed to the perforated tympanic membrane only. Even in the pure conductive cases, the status of the ossicular chain (especially the stapes) plays an important role, which is not easily quantified. The ossicles may be decayed of fixed by tympanosclerosis. The past studies demonstrating the role of tympanic membrane is primarily based on a modeling condition which the ossicles are either assumed to be normal or can be controlled (for instance in Susan Voss’s paper). Therefore, I think the paper is oversimplified by assuming the ear drum is the simple and solely essential determinant in conductive hearing loss.

2. I am in doubt of the term “complicated” and “non-complicated” perforations of tympanic membrane perforations, which were very rarely used in otological textbook and papers. If the authors wish to divide the patients by their hearing types, pure conductive and mixed type hearing loss will serve the purpose. If they would categorized based on the time course, then acute and chronic are appropriate. Further more, why do I get the impression that in this article, acute equals to uncomplicated while chronic means complicated? What is the definition of acute ear drum perforation? Are they acute traumatic ear drum perforations? I don’t believe that there are some many cases of traumatic central ear drum perforations. Therefore, the term acute/uncomplicated/pure conductive hearing loss seems to be inappropriate.

3. In analyzing the data for mixed hearing loss, there is no point to incorporate the sensorineural component, whatever its causes, into the statistical analysis in this case. I think the proper way to do it is to use the air-bone gap, instead of the absolute hearing thresholds to do the correlation analysis. It may end up a completely different result.

Minor concerns:

1. Figure 1 seems to be ambiguous and unnecessary. Which ear does this
sketch refer to? I think most of the readers will literally understand the meaning of central, anterosuperior, posterosuperior, anteroinferior and posterosuperior perforations. The figure might as well be replaced by real tympanic membrane pictures representing typical cases of these ear drum perforations. Also these pictures can illustrate the boundary of the author’s definition of perforations other than central.

2. There all totally 62 subjects with 77 perforated ear drum participated in this study. However, in some place, the authors stated that 62 patients with 132 ears..... This is wrong because the normal ears were obviously not included in data analysis.

3. The authors purposely excluded cases with discharging ears and patients with history of ototoxicity. In my opinion, in order for the result not to be contaminated by cholesteatoma case, all patients with marginal posterior-superior perforation with a proved (either by operation or CAT scan) should be ruled out. That is the correct way to remove confounding effects of ossicular destruction by cholesteatoma.

4. Despite the proper way of statistical analysis and the significance has not been reached at Table two ( uncomplicated cases). It also appears that the central perforation outnumbers the others greatly. I would suggest the author to collect more cases that belongs to perforation other than central perforation so that a fair-looking comparison can be derived and the results become more convincing.

5. The authors listed a detailed questionnaire in the appendix of the paper, but did not mention a word about it in the “Results” section. Does it only sever the purpose of providing information for patient’s ototoxic history? Or there may be other useful information that can be extracted and analyzed by the questionnaire?

6. The English writing is no so fluent and there are many grammatical errors through out the context, I think the authors should seek help from a native English speaker/writer.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests