

## Letter to the Editors

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Dear Editors,

I read with great interest the article entitled ‘Comparison of endoscopic butterfly-inlay versus endoscopic push-through myringoplasty in repairing anterior perforations of the tympanic membrane’, by Gülşen and Erden<sup>1</sup>. The authors compared the surgical and functional results of endoscopic butterfly-inlay cartilage myringoplasty and endoscopic push-through myringoplasty for the treatment of anterior perforation of the tympanic membrane. The authors concluded that the endoscopic butterfly-inlay cartilage myringoplasty is technically easier to perform compared to the push-through myringoplasty, does not require packing and has a shorter operating time. It is a reasonable approach for repair of anterior perforations of the tympanic membrane. This is the first study to compare the outcomes of these two minimally invasive techniques for such repair.<sup>1</sup> Although this study is interesting, I just want to declare some points that limit the power of this study.

In this study, only a 1 mm deep groove was created around the entire margin of the chondroperichondrial composite graft for the butterfly-inlay technique.<sup>1</sup> However, the reported groove depth is 2 mm in most studies.<sup>2–5</sup> The limited depth and asymmetry of the groove increase the risk of graft failure. Another consideration is cholesteatoma or epithelial pearl formation. The lateral wing of a butterfly inlay is placed directly over the outer squamous epithelium layer of the eardrum, which could increase the risk of cholesteatoma or epithelial pearl formation.<sup>6</sup> In addition, the physical examination of the cholesteatoma behind the cartilage graft is difficult to understand. Furthermore, the follow-up time was short in this study: only six months were evaluated. A long-term follow up of at least 12 months should be considered in the future, to monitor for cholesteatoma.

I do not believe that the butterfly-inlay cartilage myringoplasty is technically easier to perform compared to the push-through technique. On the contrary, the butterfly technique requires precise measurement of the perforation size and shape, and meticulous sizing of the cartilage graft, which increases the technical difficulty of the procedure for the beginner.<sup>7</sup> We recently developed the modified push-through myringoplasty technique, which is similar to the butterfly technique. However, rather than splitting the cartilage, the perichondrium is used to support the cartilage graft. A cartilage graft with one-side of perichondrium was harvested. The lateral perichondrium was dissected circularly and rolled up, keeping the pedicle at the centre of the cartilage intact. The cartilage graft was pushed through the perforation and placed medial to the remnant tympanic membrane, while the free edge of the perichondrium was elevated and placed lateral to the malleus and remnant tympanic membrane.

## References

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## Author's reply

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Dear Editors,

We read with great interest the letter to the editor entitled 'The comparison of endoscopic butterfly-inlay and push-through myringoplasty', by Z Lou. In the letter, the author stated some concerns that may limit the power of our study, as follows: (1) the depth of the circumferential groove on the butterfly-shaped graft; (2) cholesteatoma or epithelial pearl formation following butterfly-inlay tympanoplasty; and (3) the technical difficulty of the butterfly-inlay technique.

According to our clinical experience, approximately 1 mm groove depth is sufficient for the butterfly-inlay technique. In the vast majority of our cases, we had no problems with graft stabilisation in the butterfly-inlay technique with 1 mm circumferential groove depth on the cartilage graft. Furthermore, Kim *et al.*<sup>1</sup> and Akyigit *et al.*<sup>2</sup> performed butterfly-inlay cartilage tympanoplasty by creating circumferential grooves on the cartilage graft of 1 mm and 0.5–1 mm depth, respectively, and both authors reported comparable functional and anatomical outcomes in their articles.

In the discussion section of our article, we stated that cholesteatoma formation is theoretically possible.<sup>3</sup> However, in the current English-language literature, neither cholesteatoma or epithelial pearl formation have yet been reported following butterfly-inlay cartilage tympanoplasty. This may be explained by the theory that the healing process of the tympanic membrane perforation starts from the fusion of the graft with the lamina propria layer of the tympanic membrane remnant.<sup>4,5</sup> In addition, we observed that excess perichondrium and the cartilage part of the chondroperichondrial graft lateral to the tympanic membrane remnant became necrotic in a short period of time (between the second week and one month) post-operatively. In addition, at the post-operative three-month control examination, we observed that epithelialisation over the cartilage graft was complete in all of the cases except graft failures. Cholesteatoma or epithelial pearl formation is

not an expected issue after the completion of epithelialisation over the cartilage graft. In this context, a period of six months' follow up post-operatively is adequate following butterfly-inlay cartilage tympanoplasty regarding cholesteatoma or epithelial pearl formation. Moreover, our average follow-up period following butterfly-inlay cartilage tympanoplasty was 8.2 months.<sup>3</sup>

According to our personal experience, preparing the butterfly-shaped chondroperichondrial graft is not a challenging issue, even for beginners. As shown in our study (Figure 1), precise measurement of the perforation diameter using a disposable paper ruler is a very practical and cost-effective method, and based on this measurement adjusting the size of the butterfly-shaped graft is an easy procedure.<sup>3</sup> On the contrary, packing the middle ear, particularly the orifice of the Eustachian tube, with an absorbable sponge can sometimes be a difficult procedure in the push-through myringoplasty technique. In the beginning, in some cases, after pushing the graft through the perforation, we observed that middle-ear support was not adequate, and we then removed the graft and added additional absorbable sponges. Vice versa, in cases where we packed the middle ear more than required, we had difficulties pushing the graft through, and then had to remove some sponge pieces. Hence, determining the amount of middle-ear packing requires experience in the beginning.

As a result, we disagree with the opinion that the points mentioned by the author of the letter limit the power of our study.

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