Cartilage Tympanoplasty for Flight Induced Otalgia

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INTRODUCTION

Otic barotrauma induced otalgia can be caused by a variety of activities including flying, scuba diving and hyperbaric oxygen therapy. Patients are referred to otolaryngologists for management of their symptoms and the mainstay of treatment includes decongestants, pressure equalizing earplugs and tympanostomy tube placement. Nonetheless, these options may not adequately and optimally treat all patients.

Cartilage tympanoplasty is a commonly used surgical technique but its use is not well described in the treatment of otic barotrauma induced otalgia. This case series presents four ears (three patients) that successfully underwent cartilage tympanoplasty for the treatment of flight induced otalgia.

METHODS AND MATERIALS

A retrospective chart review was performed of cartilage tympanoplasty performed by a single surgeon over the past 10 years for the treatment of otic barotrauma induced otalgia. Progress notes, operative notes and audiograms were reviewed to assess indications for operative repair, operative technique, and patient outcomes, including subjective improvement and audiometric results.

RESULTS

A total of four ears (three patients) underwent cartilage tympanoplasty for the treatment of otic barotrauma induced otalgia. All three patients complained of otalgia with flying. All patients noted subjective improvement in their symptoms when flying post-operatively. No patient complained of hearing loss or had significant worsening in hearing on post-operative audiogram. No other complications were noted. Patients had tried and failed a combination of decongestants and allergy medications. Three out of four ears previously underwent tympanostomy tube placement but no tympanostomy tubes were in place at the time of surgery.

In regards to surgical technique, a tympanomeatal flap was elevated and either tragal or conchal cartilage was used as support medial to the tympanic membrane. The cartilage was shaped to span posteriorly between the annulus and the manubrium of the malleus. The procedure was performed endoscopically in two cases and under the operating microscope in two cases.

The patient who underwent bilateral cartilage tympanoplasty had a history of right sided chronic otitis media and previously underwent right tympanomastoidectomy with ossicular chain reconstruction. In addition to complaints of otalgia with flying she was also found to have recurrent mld to moderate conductive hearing loss on pre-operative audiogram. During her cartilage tympanoplasty she underwent revision ossicular chain reconstruction with resultant closure of her air bone gap on post-operative audiogram.

DISCUSSION

Currently, decongestants, pressure equalizing earplugs and tympanostomy tube placement remain the mainstay of treatment for flight and other otic barotrauma induced otalgia. Cartilage tympanoplasty can be considered as an alternative treatment option, especially for those who failed or wish to avoid tympanostomy tube placement. All three patients in this series had resolution of their symptoms without any resultant hearing loss after cartilage tympanoplasty.

Symptoms related to otic barotrauma are very common and usually include pain and blockage but in a small number of cases can lead to rupture of the tympanic membrane or oval or round window. The exact mechanism by which cartilage tympanoplasty improves patients’ symptoms is unknown but is likely related to a stiffening effect on the tympanic membrane. Barotrauma induced otalgia secondary to a stretch in the tympanic membrane from variations in atmospheric and middle ear pressure could theoretically be alleviated by placement of a cartilage graft against the tympanic membrane. In this series the cartilage graft was placed along the medial aspect of the posterior tympanic membrane.

CONCLUSIONS

This study demonstrates that cartilage tympanoplasty can be a helpful procedure for patients who complain of otalgia associated with flying but who are not ideal candidates for other treatment options. More research is needed to further demonstrate the effectiveness of cartilage tympanoplasty for treating flight induced otalgia and whether it may be applicable in the treatment of other causes of otic barotrauma induced otalgia.

REFERENCES