ABSTRACT

Purpose: Few cases of medial migration of tympanostomy tubes have been reported. The aim of this systematic review is to present all cases of medial migration of tympanostomy tubes reported in the literature in order to provide the most beneficial management option.

Methods: A systematic review was conducted in order to elucidate the occurrence of middle ear migration of tympanostomy tubes and present its outcomes. Eligible articles were identified through a comprehensive search in Cochrane, Embase and Medline electronic databases. Two reviewers independently screened the data sources, using predefined inclusion criteria to generate a list of eligible articles.

Summary of results: 10 articles were chosen for data extraction from which 29 patients presenting with middle migration of tympanostomy tube were identified.

Conclusion: The low complications associated with removing a medialized tube and the risk of leaving foreign objects in the middle ear cleft make myringotomy for removal of the tube a practical and safe management option for medialized tubes even in patients with no presenting symptoms.

INTRODUCTION

Tympanostomy tube placement is the most common surgical procedure performed in children. 1 It is estimated that up to 17% of patients who have tympanostomy tubes placed will develop some sort of complications. 2,3 These include otitis media, percutal drum atrophy, scarification, granulation tissue, tympanosclerosis, persistent perforation (lasting more than 3 months), blockage of the tube lumen, premature extrusion, cholesteatoma formation and tympanostomy tube displacement into the middle ear. 4,5,6

Medial migration of a tympanostomy tube is a rare occurrence where the tube migrates into the middle ear space as opposed to normal extrusion laterally into the external auditory canal. A meta-analysis conducted by Kay et al. indicated a 0.5% rate of medial displacement of tympanostomy tubes, concordant with Groblewski et al.’s occurrence rate of 0.11%. 7,8 The underlying mechanisms behind this complication are believed to be technical errors in insertion, eustachian tube dysfunction and biofilm formation on the medial surface of the tubes 2,7. Given the infrequency of medialized tympanostomy tube in otolaryngology practice, it is understandable why there is a lack of consensus in the literature dedicated to the specific management of this condition. Only a few cases of medial migration of tympanostomy tubes have been reported. The medial displaced tube is either removed surgically to avoid the risk of middle ear inflammation and its sequelae, or is left in place if the patient is asymptomatic.

The aim of this systematic review is to present all cases of medial migration of tympanostomy tubes reported in the literature in order to delineate the most beneficial management option.

METHODS AND MATERIALS

Search Strategy: A systematic review was completed in order to elucidate the occurrence of middle ear migration of tympanostomy tubes and present its outcomes. Eligible articles were identified through a comprehensive search in Cochrane, Embase and Medline electronic databases. Articles written in English and French, published between January 1978 to February 2014 were considered. The search strategy included medical subject headings, subheadings, and text words such as “migration”, “tympanostomy tubes”, “PE tubes”, “middle ear”, “migration”, “medialized”, “grommet” and “foreign body”. Complete search strategies can be obtained from the authors.

Criteria for Inclusion: The inclusion criteria for this review were articles describing a single or many cases of medial migration of tympanostomy tubes. Articles mentioning middle ear migration as a complication of tubes but did not report cases were excluded. All included articles discussed whether intervention or observation was conducted post medial migration of tubes.

Study Selection: Two authors independently reviewed the titles and abstracts retrieved by the electronic search and full texts were examined to revalidate inclusion.

RESULTS

Table 1. Outcomes of patients with medialized tubes from selected studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients</th>
<th>Follow-up</th>
<th>Type of Tube</th>
<th>Removal</th>
<th>Complications</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Kay MA et al. Medial migration of tympanostomy tubes in the middle ear cleft: an unusual complication of tube placement. Recent advances in otitis media with effusion. Proceedings of the seventh international symposium. 1999 June; 661-663.</td>
<td>30</td>
<td>1 year</td>
<td>PE tubes</td>
<td>Yes</td>
<td>Asymptomatic</td>
<td>Observation</td>
</tr>
</tbody>
</table>

DISCUSSION

Should medialized tubes be surgically removed in asymptomatic patients?

Most authors believe that when a tube migrates to the middle ear without causing any symptoms, tubes should be left alone but the patient followed closely. 4,5,6,11 Thus, the medialized tube would be removed once a symptom occurs. Others present an apprehension about the presence of a foreign body in the middle ear cleft and its potential risks to cause a reaction. Therefore, they suggest that medialized tubes should be surgically removed even if the patient is asymptomatic. 7,8 Documented delayed complications reported from a mediadly migrated tube are conductive hearing loss, vertigo, retraction or thickening eardrum or middle ear effusion.

In one case, a patient developed perilymphatic fistula 25 months after tube insertion. 2 In another patient where observation was decided as management, the patient started experiencing drainage from the ear that responded well to medical therapy. However, 22 years after the initial tube insertion, the patient experienced granulation tissue and drainage that were no longer responsive to medication. Otoscopic examination showed a large granulation polyp in the canal, which failed to regress. A medialized tympanostomy tube was found behind a thickened TM and granulation tissue.

CONCLUSIONS

Based on this review asymptomatic patients with medialized tubes could still develop complication several years later such as hearing loss, vertigo, retraction or thickening eardrum or middle ear effusion. In light of these potential sequelae and complications, as well as the low morbidity associated with surgical removal, the authors would recommend removing medialized tubes or closely monitoring these patients, warning families about future potential complication.

REFERENCES