



Does Tube Type Matter in Post-Tympanostomy Tube Otorrhea?

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ABSTRACT

Objectives: The objective of this study was to review consecutive tympanostomy tube surgeries for last 8 years paying particular attention to the type of tube inserted at the time of surgery.

Methods: Retrospective chart analysis of the last 3046 consecutive ears for tympanostomy tube surgery from 2005 to 2013.

Results: Out of 3046 total ears reviewed, the total rate of otorrhea was 3.78% with 0.0% otorrhea in titanium tubes, 0.0% otorrhea in Sheehy activent tubes, 2.19% otorrhea in Donaldson tubes, 2.72% otorrhea in Sheehy collar button tubes, 3.28% otorrhea in Shepard tubes, 3.88% otorrhea in fluoroplastic tubes, 6.9% otorrhea in stainless steel tubes, 18.52% otorrhea in Goode tubes, and 25.0% otorrhea in triune tubes.

Conclusion: Early post-tympanostomy tube otorrhea is a frequent complication of tympanostomy tube insertion with a complication rate of 3.8%, and the type of tubes placed at time of surgery seems to make a difference in the incidence of post-tympanostomy otorrhea.

INTRODUCTION

Today the use of tympanostomy tubes are the most common procedure used by otolaryngologists to treat otitis media, a middle year infection commonly found in children. The introduction of transtympanic plastic tubes in 1954 completely revolutionized middle ear treatments although primary sources show that the first use of tympanostomy tubes can be dated as far back as 1760. In the mid 1800s, sources also reveal that seven different types of tympanostomy tubes were designed and manufactured¹. Tympanostomy tubes, followed by adenoidectomy, have been observed to be the most effective way in preventing otitis media as well as produce large changes in quality of life².

Otorrhea is a type of ear discharge, often the most common complication in tympanostomy tube procedures occurring at a rate of 2% to 17%. There are two postoperative periods in which otorrhea can occur in. The first, early otorrhea, happens in the first two weeks following the procedure³. The late period occurs between two weeks and the time of the tube extrusion. Higher rates of otorrhea have also been seen in ears with mucoid or purulent fluid at the time of the surgery⁴. Postoperative otorrhea could develop into chronic suppurative otitis media and a diseased middle ear⁵. It also affects the quality of life, especially for the children that it commonly occurs to. Therefore it is important to develop a method to prevent otorrhea.

Otorrhea is caused by many different factors, including the type of material of the tube, the type of postoperative treatment, as well as the background of patient, such as age or living environment. Studies have been done to prevent otorrhea, such as using phosphorylcholine-coated fluoroplastic Armstrong beveled tympanostomy tubes⁶. However, there was no statistically significant difference that indicated prevention. Surgeons have also tried unsuccessfully to lower contamination by using the non-touch technique while performing the surgery⁷. The non-touch technique is costly, time consuming, and ineffective. This indicates that early otorrhea is more likely caused by preexisting middle ear condition than by external contamination.

Other studies have succeeded in finding a treatment that will help prevent postoperative otorrhea. Studies have shown that the use of systemic antibiotic is most effective. Prophylactic antibiotic drops after tympanostomy tube placement have shown a significant decrease in the incidence of otorrhea. For ears with mucoid or purulent fluid, the drop treatment lasts five days after surgery⁸.

Erythromycin is an ophthalmic ointment that is resistant against strains of bacteria that are often found in middle ear fluid, such as *H. influenzae*, *M. catarrhalis*, and *S. pneumoniae*⁹. Ofloxacin is another otic treatment used to treat against those bacteria. In addition, a study by Poetker et al¹⁰ concludes that the use of prophylactic otic drops such as ofloxacin eases the pain of the patients.

METHODS AND MATERIALS

A retrospective chart analysis from July 2005 to Sept. 2013 of the last 8 years of consecutive tympanostomy tube surgery was done, with examination of the patients' age, ethnicity, previous tube insertion, adenoidectomy, and type of tube. At 1 week post operative visit, the documentation of otorrhea or no otorrhea was examined.

RESULTS

A total of 3046 consecutive ears were studied and are presented in Table 1.

Table 1

Tube Inserted	Ears	Otorrhea	Percent
Titanium	1	0	0.00%
Fluoroplastic	1625	63	3.88%
Shepard	977	32	3.28%
Sheehy collar button	184	5	2.72%
stainless steel	87	6	6.90%
Triune	4	1	25.00%
Donaldson	137	3	2.19%
Goode t-tube	27	5	18.52%
Sheehy activent	4	0	0.00%
TOTAL	3046	115	3.78%

DISCUSSION

This was a retrospective chart analysis that showed when doing a tympanostomy surgery, the type of tube placed made a difference in the rate of immediate post-tympanostomy tube otorrhea.. The overall rate of post-tympanostomy tube otorrhea was 3.78% with silver-oxide coated tubes like Donaldson tubes having the least amount of complication and the long dwelling tubes like triune or Goode T-tube having the most amount of complication as can be expected. This study has been approved by Kaiser Permanente IRB Board #4996

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