A New Treatment for Post-tympanostomy Tube Otorrhea

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Abstract:
Objective: Our objective was to study the effect of antibiotic ointment on preventing post-tympanostomy tube otorrhea. Study Design: The study design was a retrospective chart analysis of the last 344 consecutive ears for tube surgery without ointment and tube surgery with ointment. Subjects and Methods: The subjects were patients undergoing tube surgery using chart review. Results: Of the 128 ears with no ointment, 12 ears developed otorrhea within 1 week or an incidence of 9.4%. Of the 216 ears with tubes coated with antibiotic ointment, 7 ears developed post-tympanostomy tube otorrhea within 1 week or an incidence of 3.2%. Our analysis using the chi-square test was statistically significant, with a p value of 0.02. Conclusion: Post-tympanostomy tube otorrhea is a frequent complication of tympanostomy tube insertion, but by coating the tube with an antibiotic ointment at the time of surgery, we can decrease that incidence from 9.3% to 3.2%.

Introduction:
The most common surgical procedure is the tympanostomy tube. The introduction of the use of ventilation tube was by Politzer in the 19th century. He used it for middle ear space ventilation and drainage. However, it was abandoned when high otorrhea and obstruction rates resulted. In 1954, Armstrong re-introduced the pressure-equalizing tubes and named it a tympanostomy tube. Now, insertion of tympanostomy tubes has become the most common surgical procedure. The development of otorrhea is the most common complication of the tympanostomy tube procedure. The incidence of Otorrhea is usually about 17%, however can vary from 3.4% to 74%. There are two classifications of Otorrhea: simple and complicated. Simple post-tympanostomy tube otorrhea (PTTO) is a painless discharge, while complicated PTTO can lead to other problems such as peri-auricular cellulitis or occlusion of the external ear canal. Many researchers in the past have tried multiple techniques at prevention including sterilizing the ear canal, no touch technique, and antibiotic drops. Recently the fluoroquinolone ear drops have been used for prevention due to the lack of ototoxicity and have met with some success. We present a new treatment for post tympanostomy tube otorrhea which involves erythromycin ophthalmic ointment.

Methods:
Retrospective chart analysis of the last 344 consecutive ears for tube surgery without ointment and tube surgery with ointment from Dec. 2006 to Oct. 2007 was done. Only surgery using 7mm fluoroplastic tubes were reviewed. The fluid from the middle ear was classified as no fluid, serous fluid, mucoid fluid, or purulent fluid. During the surgery, some ears received erythromycin ophthalmic ointment coated onto the flange end of the tube while other ears did not receive any ointment. At post-operative visit 1 week later, the ear was then examined for post tympanostomy tube otorrhea and was classified as to otorrhea or no otorrhea.

Results:
A total of 128 ears had no ointment during the operation. Of the 128 ears, 12 ears (9.4%) developed otorrhea within 1 week. A total of 216 ears had erythromycin ointment coated onto the fluoroplastic tube during the operation and at time of tube insertion. Of the 216 ears, 7 ears (3.2%) developed post tympanostomy tube otorrhea within 1 week. Our analysis using the chi-square test was statistically significant, with a p value of 0.016. The middle ear findings were 5% with no fluid had otorrhea, 7% with mucoid fluid had otorrhea, 5% with serous fluid had otorrhea, and 16% with purulent fluid had otorrhea.

Discussion:
This retrospective study showed that when doing the tympanostomy tube procedure, there will be a reduced risk of post-tympanostomy tube otorrhea if the antibiotic, erythromycin ophthalmic ointment is applied onto the fluoroplastic tube. Certain types of tubes will result in more frequent occurrences of otorrhea; however in this study, it was not a factor because all the tubes were the same, standard 7mm fluoroplastic tubes. Likewise, other factors that could affect the incidence of otorrhea such as the issue of topical antibiotic drops on otorrhea was not focused in this study. Our middle ear findings were consistent with other studies showing that most otorrhea occurred in middle ears with purulent fluid. Our main objective was to study the effect of erythromycin ophthalmic ointment on otorrhea if applied to the fluoroplastic tube during the procedure. The antibiotic erythromycin ophthalmic ointment was chosen because fewer people are allergic to it. The ointment also made the tube easier to insert by lubricating the flange end of the tube and helped in prevention of clogged tubes postoperatively by temporarily covering the opening of the tubes until the ointment melted away, preventing another complication of tympanostomy tube surgery which was described by Cunningham5 who found it helped prevent plugging of the tube from an incidence of 4.7% without ointment to 2.3% with ointment. Although this study did not examine the complication of plugged tympanostomy tubes, we did not notice this complication in our series of patients. The ophthalmic ointment was milder for the middle ear mucosa compared to other antibiotic ointments for the skin. While other studies without antibiotics show a higher incidence of otorrhea (17%), our study showed only a 9.4% incidence of post-tympanostomy tube otorrhea without antibiotic ointment which was reduced to 3.2% with erythromycin ophthalmic ointment.

Conclusion:
Although the total number of ears studied was only 344, we were able to obtain statistically significant results indicating that erythromycin ophthalmic ointment may help in preventing post-tympanostomy tube otorrhea. Further research with more patient data would help in delineating the effect of ointment on post-tympanostomy tube otorrhea.

References:

This study has been approved by Kaiser Permanente IRB #4996