Rates of tube complications and replacements in syndromic vs. non-syndromic pediatric patients

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ABSTRACT

Objectives: Previous studies have estimated the rates of complications related to tympanostomy tube placement range anywhere from 10-30%. To our knowledge there are no studies that have examined rates of complications and replacement of tubes in syndromic(S) versus non-syndromic(NS) patients. The objectives of this study were to determine the rates of complications and need for replacement of tubes in syndromic children in comparison to nonsyndromic pediatric patients.

Study Design: Retrospective chart review.

Methods: Charts of all pediatric patients who underwent tympanostomy tube insertion from 2012-2014 by a board-certified pediatric otolaryngologist at a tertiary care pediatric hospital were reviewed. We examined demographic data, surgical data, post-operative complications and follow up.

Results: 281 patients who underwent tympanostomy tube placement during the study period met inclusion criteria—66 syndromic and 215 non-syndromic. The three most common complications – otorrhea (S-28; NS-56), granulation tissue (S-6; NS-16), and tube blockage (S-7; NS-12)—were examined individually. There was no statistically significant difference between the two groups in incidence of these complications. In total, 17 syndromic patients experienced 35 complications related to the tympanostomy tubes versus 70 complications in 68 non-syndromic patients. This was not a statistically significant difference(p = 0.148). Likewise, the rate of repeat tympanostomy tube placement between the two groups was non statistically significant (S-22 versus NS - 51, p=0.1193).

Conclusions: Although higher incidence of complications and need for tube replacements were expected in syndromic patients, this study reveals no significant difference in comparison to non-syndromic patients.

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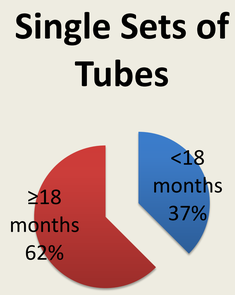
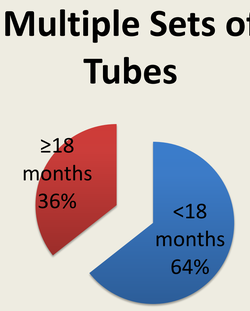
INTRODUCTION

Myringotomy with insertion of tympanostomy tubes (TT) is the most commonly performed pediatric surgery, and as such, comprises a large percentage of the pediatric and general otolaryngologist's practice.[1] By 3 years of age, up to 1/15 children will have had TT placed.[2] The literature suggests that up to 20% of these children will eventually require additional sets of tubes.[3] Additionally, there is data supporting that post TT otorrhea may occur in as many as 10-30% of cases, tube blockage 10%, and granulation 5%.[4,5] Many congenital syndromies, especially craniofacial abnormalities are known risk factors for acute otitis media, and chronic otitis media with effusion.[6] One would expect these patients to experience both increased rates of otorrhea and perhaps necessity for repeat TT placement. We set out to compare the rates of post operative complications and need for repeat TT placement between syndromic patients and non-syndromic patients.



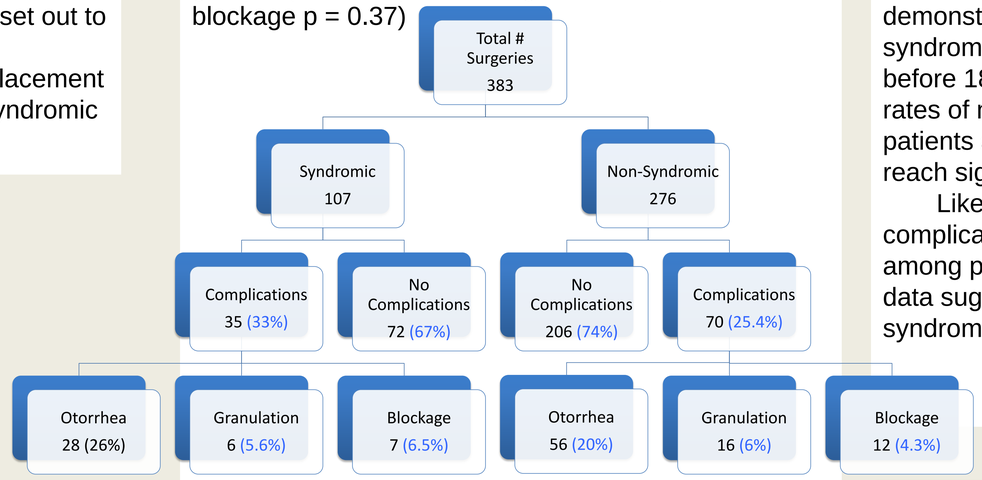


METHODS AND MATERIALS

This was a retrospective chart review of all patients who underwent TT placement at a large tertiary care pediatric hospital between 2012-2014. We examined demographic data, post-operative complications, number of sets of tubes placed, and follow up. We gathered data retrospectively on patients who had repeat TT placement during this period. Complications related to TT placement were also recorded including otorrhea, blockage, and granulation. The data was analyzed in two groups—patients with known syndromes and those without. Patients who were treated prior to referral to our practice were excluded as were patients for whom we had no follow up data.

RESULTS

281 patients met inclusion criteria and underwent a total of 383 surgeries for TT placement. This included 66 syndromic (S) and 215 non-syndromic (NS) patients. The 66 patients with known syndromes underwent a total of 107 surgeries for TT placement and experienced 35 complications (33%). This was greater than the rate of complications experienced in the non-syndromic patients (25%), however the difference did not meet statistical significance (p = 0.148). The three most common complications experienced in each group were otorrhea (S-28; NS-56), granulation tissue (S-6; NS-16), and tube blockage (S-7; NS-12). Each was individually analyzed comparing rates in syndromic vs non-syndromic patients using chi^2 analysis, and again, there was no statistically significant difference between the two groups. (otorrhea p = 0.212; granulation p = 0.9495; blockage p = 0.37)



The incidence of requiring multiple sets of TT was then examined for each group of patients. 22 patients (33%) with known syndromes required multiple sets of tubes during the study period, which was higher than the percentage of non-syndromic patients who required multiple sets of tubes (51; 24%). However, this did not reach statistical significance (p = 0.11). The two most common groups of patients within the syndromic population were those with cleft palate and trisomy 21. It is well established that these patients often develop AOM, COM, and ETD and very frequently require TT placement. As such, each group was separated out and analyzed individually to determine whether these syndromes conferred higher risk of requiring multiple sets of tubes. While there was no statistically significant increase in likelihood of cleft palate patients requiring multiple sets of tubes when compared to the entire study population, there was increased likelihood for trisomy 21 patients (p = 0.0268).

Finally, we examined the impact that age at time of first set of TT plays in determining whether or not multiple sets are required. Patients who were under 18 months of age at the time of TT placement were significantly more likely to require multiple sets of tubes than those who had tubes placed at 18 months or later (p = 0.00007). Similarly, children in the syndromic population were more likely to have TT placed at an age earlier than 18 months their their counterparts in the non-syndromic group.

DISCUSSION

This study supports existing literature that patients who have their first set of TT placed before the age of 18 months have greater likelihood of requiring repeat placement of tubes at a later date.[3] One might expect this to be true since on average, tubes remain for 12 months, yet peak incidence of otitis media lasts until 36 months.[7] Multiple congenital syndromes confer increased risk factors for developing RAOM, COME, ETD, and in turn increased risk for requiring TT placement. Two such conditions which have been extensively studied are cleft palate and Trisomy 21. Since placement of TT in patients with cleft palates is routinely performed at approximately 3 months of age, one would expect more of these patients to require multiple sets of tubes. Interestingly, our data demonstrates that patients with known syndromes are more likely to have TT placed before 18 months of age, but the difference in rates of multiple tubes between syndromic patients and non-syndromic patients does not reach significance.

Likewise, one might expect incidence of complications from TT placement to be higher among patients with known syndromes. Yet our data suggests that the rates of complications in syndromic patients and non-syndromic patients are similar.

	Syndromic	Non-Syndromic
Total # patients	66	215
Total # surgeries	107	276
Complications (rate)	35 (33%)	70 (25%)
# needing multiple sets of tubes	22	51
Ave # tubes for multiples	2.86	2.15
< 18 months at 1st set of tubes	39 (59%)	86 (40%)
Ave age at time of 1st surgery	23.4 months	29.5 months

CONCLUSIONS

There is not a statistically significant difference in either rate of complications or incidence of requiring multiple sets of TT between syndromic and non-syndromice pediatric patients. However, patients with trisomy 21, and patients who have their first sets of TT placed before 18 months of age are more likely to require repeat placement at a later date.

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