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YouTube as an information source for pediatric adenotonsillectomy and ear tube surgery

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ABSTRACT

Objectives: Assess the overall quality of information on adenotonsillectomy and ear tube surgery presented on YouTube (www.youtube.com) from the perspective of a parent or patient searching for information on surgery.
Methods: The YouTube website was systematically searched on select dates with a formal search strategy to identify videos pertaining to pediatric adenotonsillectomy and ear tube surgery. Only videos with at least 5 (ear tube surgery) or 10 (adenotonsillectomy) views per day were included. Each video was viewed and scored by two independent scorers. Videos were categorized by goal and scored for video/audio quality, accuracy, comprehensiveness, and procedure-specific content. Study design: Cross-sectional study. Setting: Public domain website.
Results: Fifty-five videos were scored for adenotonsillectomy and forty-seven for ear tube surgery. The most common category was educational (65.3%) followed by testimonial (28.4%), and news program (9.8%). Testimonials were more common for adenotonsillectomy than ear tube surgery (41.8% vs. 12.8%, $p = 0.001$). Testimonials had a significantly lower mean accuracy (2.23 vs. 2.62, $p = 0.02$), comprehensiveness (1.71 vs. 2.22, $p = 0.007$), and TA specific content (0.64 vs. 1.69, $p = 0.001$) score than educational type videos. Only six videos (5.9%) received high scores in both video/audio quality and accuracy/comprehensiveness of content. There was no significant association between the accuracy and comprehensive score and views, posted "likes", posted "dislikes", and likes/dislikes ratio. There was an association between "likes" and mean video quality (Spearman's rho = 0.262, $p = 0.008$).
Conclusion: Parents/patients searching YouTube for information on pediatric adenotonsillectomy and ear tube surgery will generally encounter low quality information with testimonials being common but of significantly lower quality. Viewer perceived quality ("likes") did not correlate to formally scored content quality.

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1. Introduction

The internet is a valuable source of medical information, but the quality of the information is difficult to determine. The quality of otolaryngology information was recently assessed and found to vary considerably [1,2]. Parents with children that have common otolaryngologic health problems regularly search for and utilize the internet to enhance their understanding of child's condition [3]. While physicians remain the most important source of information in guiding a parent's decisions, the influence of information found on the internet clearly exists. In one study, 78% of parents reported that the information they found on the internet had an impact upon the decision to have an ENT surgical procedure performed on their children [4]. The third most popular website in the world, YouTube, is a source of user-uploaded video content [5]. Several studies have assessed the quality or usefulness of videos on YouTube for various specialties [6–10]. However, only two have addressed how the use of YouTube may affect patient care in otolaryngology to teach the Epley maneuver [7] as well as its usefulness as a source of information in pediatric tonsillectomy [11]. While previous studies have focused on evaluating sites that are either encyclopedic or medical in focus, the current study has sought to determine whether YouTube is a good information source for parents (or patients) seeking to learn about their child's otolaryngologic surgery.

Adenotonsillectomy (TA) and ear tube surgery (BMTT) are common procedures performed on children, accounting for an

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Table 1
Boolean search terms used to identify videos.

Topic	Search term
Adenotonsillectomy	~"Tonsillectomy" OR ~"adenoidectomy" OR ~"tonsil removal" OR ~"adenoid removal" OR ~"tonsil surgery" OR ~"adenoid surgery" OR ~"tonsillitis surgery"
Bilateral tympanostomy with tubes	~"Ear tubes" OR ~"ear tube surgery" OR ~"ear infection surgery" OR ~"myringotomy" OR ~"tympanostomy tubes"

estimated 530,000 (TA) and 667,000 (BMTT) of the 3,266,000 ambulatory surgeries performed in the United States in 2006 in those under the age of 15 [12]. This likely equates to at least 1 million parents each year who are learning about TA and BMTT and need quality sources of information from which to learn. The objective of the current study is to systematically identify YouTube videos that are likely to be encountered by parents (or patients) seeking information on BMTT and TA and assess the overall quality of this video library to help otolaryngologists guide potential patients and parents of pediatric patients on how best to find quality information on YouTube.

2. Methods

This study was exempt from Institutional Review Board approval at our institution as it involved the use of public access data only. On February 4th and 7th 2013, a YouTube search was performed on https://www.youtube.com/ for videos pertaining to TA and BMTT respectfully. Utilizing Google search term operators, comprehensive search terms were developed to account for the search terms most likely entered by parents seeking more information about these procedures [13]. This enabled for one comprehensive search versus several searches of each individual term (See Table 1). The only search filter used was the "sort by" filter of "relevance," which is the default filter for a typical YouTube search. Advertisements presented by YouTube at the beginning and end of the search results were not counted and were ignored. The duration of the video, the number of views, the upload date, and the likes and dislikes (crude viewer feedback) of these videos was recorded. Using this information, the days since upload, views per day, and likes/dislikes ratio was calculated. Some videos were posted by multiple users, creating duplicates. These duplicates were considered individually, as they were considered unique by the YouTube search algorithm.

To identify the videos that were most likely to be watched by parents/patients, views per day since posting were calculated for all videos. Practical cutoffs of 10 views/day (TA) and 5 views/day (BMTT) were established with the difference being due to tonsillectomy videos being viewed twice as often as ear tube videos (31.3 views/day vs. 16.0 views/day). The videos that met the criteria were found in the first six and five pages of YouTube video results for TA and BMTT respectfully. Any further pages of results would likely be viewed infrequently by parents and patients and were thus ignored. YouTube uses a proprietary algorithm to rank their search results, but it is known [14] that viewing frequency and how much of the video a viewer watches contribute to the ranking. Thus, surveying the most frequently viewed videos in the first several pages of search results will likely include videos watched by a majority of parents and patients.

A customized scoring scheme was developed where scores were given for category, goal, video/audio quality, accuracy, comprehensiveness, and procedure-specific content. (See Table 2) The procedure specific questions were develop a priori after considering the basic questions a reasonable viewer would want to know if researching that procedure. Description of the video under the "about" tab was considered in the scoring of the videos. Each video was scored by two independent viewers (M.D.P and S.E.B) who were knowledgeable in the indications, technique, and complications of ear tube insertion and tonsillectomy/adenoidectomy as either a senior Otolaryngology Resident (M.D.P) or a Board-Certified Otolaryngology Attending (S.E.B). Both scorers participated in the development of the customized scoring scheme and were familiar with the criteria for each score category. Numerical scores from the two scorers were averaged and final categories were chosen based on simple majority. The customized scoring scheme was assessed for inter-rater reliability but was not assessed for validity as normal standard for YouTube video quality has not been established. Additionally, this study was designed to assess YouTube content using a practical "what would

Table 2
Customized scoring scheme.

Category	**Goal**
(T)estimonial, personal experience	(D)escription of procedure
(A)dvertisement (industry)	(I)ndications
(E)ducational, either from provider or institution	(P)ost-op care
(N)ews program, report	(C)omplications
(O)ther	(O)ther
Video quality	**Audio quality**
3 – Good – Clear visuals and text, with some professional graphics or effects. HD	3 – Good – No difficulty understanding spoken words, music.
2 – Fair – Regular video quality, average text clarity. Home video.	2 – Fair – Speech difficult to understand, distracting audio or background sounds.
1 – Poor – Visuals are blurry, grainy, or difficult to understand.	1 – Poor – No audio.
Accuracy score (standard = common knowledge of a competent otolaryngologist)	**Comprehensiveness score** (according to the goal above)
4 – No erroneous factual statements, excellent pt/parent usefulness	4 – Complete presentation of topic, no obvious omissions
3 – Minor errors, strong opinions, good usefulness	3 – Mostly complete presentation, no important omissions
2 – Multiple errors, limited usefulness	2 – Fairly complete presentation, important omissions but still useful
1 – Misleading statements, no usefulness	1 – Misleading, incomplete presentation of topic
TA specific questions	**BMTT specific questions**
1 – What are tonsils/adenoids? (Addressed-1 Not Addressed-0)	1 – When are ear tubes needed? (Addressed-1 Not Addressed-0)
2 – Why do tonsils/adenoids need to be removed?	2 – What are the risks to putting in ear tubes?
3 – What risks are involved with tonsillectomy and adenoidectomy?	3 – Does it correctly describe the procedure?
4 – Does it correctly describe the procedure?	