ORIGINAL ARTICLE

YouTube as an Information Resource for Persons Interested in Septoplasty and/or Turbinoplasty

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Background and Objectives: YouTube is a widely used web site. In general, many people search for medical information on YouTube. We evaluated the septoplasty and turbinoplasty videos on YouTube from an expert's point of view.

Methods: We used "septoplasty," "turbinoplasty," and "septoplasty turbinoplasty" to search YouTube. Of the 150 videos, we eventually viewed 83. Two researchers assessed the sources, lengths, and numbers of likes, dislikes, and views. The videos were classified as "excellent," "moderate," or "poor" in terms of utility; we also evaluated the uploaded material and content.

Results: Of the 83 videos, 18 (21.7%) were excellent, 27 (32.5%) were moderate, and 38 (45.8%) were poor. We found no significant differences in length and mean likes, dislikes, and views between the groups classified as useful. Fifteen (39.5%) of 38 poor videos were by patients, and 13 (34.2%) of 38 poor videos were by physicians. When organized by content type, videos on personal experiences were significantly longer than the others. Of 20 videos on personal experiences, 15 (75%) were poor and all 5 advertisement videos (100%) were poor.

Conclusion: Information from YouTube on septoplasty and turbinoplasty is not yet adequate. However, since YouTube content cannot be controlled, it is necessary to upload objective and accurate videos for patients and experts in professional groups such as the medical society. Such videos should be promoted and used actively.

Keywords: Septoplasty; Turbinoplasty; YouTube; Quality of information.

INTRODUCTION

The Internet allows patients to access medical information easily [1]. According to a recent survey, 8 of 10 people access health information in this way [2,3]. In the pandemic era of COVID-19, internet usage has increased more than ever before. YouTube (http://www.youtube.com) is a popular source of entertainment and education. More than 300 hours of video are updated every minute; over a billion people watch videos for more than 1 h/day [4]. The ubiquity of YouTube renders it potentially valuable to educate patients, students, and medical professionals [5]. However, users registered on You-Tube can upload the content they want without any restrictions, and all users can watch the video regardless of whether they are registered or not. Recognizing these problems, many authors have analyzed the utility of YouTube in terms of education on prostate cancer, burns, hysterectomy, and the surgical methods used [4,6,7].

Septoplasty and turbinoplasty are surgeries that are frequently performed in the otolaryngology area to relieve symptoms such as nasal congestion due to structural problems or rhinitis. In the early 20th century, Killian and Freer first proposed the septoplasty technique [8]. Classically, septoplasty was done using a headlight and nasal speculum under direct visualization. However, endoscopic septoplasty was introduced in 1991 [9]. The surgeries via endoscopic approach allow the audience to watch the process on a monitor; this is valuable when teaching. Turbinoplasty is also widely performed endoscopically. When preparing for surgery, surgeons often refer to videos on YouTube. However, no study has yet analyzed the quality of the information available; if this is poor, serious complications may occur. Here, we evaluated the quality of

YouTube videos about septoplasty and turbinoplasty from an expert's point of view, and investigated how it affects users who watched the video by analyzing the content of viewer comments.

METHODS

Search strategy

We searched YouTube on March 10, 2021 using the terms "septoplasty," "turbinoplasty," and "septoplasty turbinoplasty." The inclusion criteria were: 1) use of the English language, 2) a primary focus on septoplasty and/or turbinoplasty, and 3) no problem with audio and visuals. The exclusion criteria were: 1) non-English language, 2) damage to audio or visuals, 3) a satirical, dramatic theme, and 4) a duplicate. We created a new account; the search was not affected by a past viewing history. For each keyword/key phrase, fifty of the videos sorted in the order of relevance, which is the default of YouTube, were analyzed. A total of 67 videos were excluded (duplicates= 35, absence of audio=20, endoscopic sinus surgery=6, non-English language=4, rhinoplasty=1, tonsillectomy=1) (Fig. 1).

Video assessment

We extracted the number of views, length of the video, number of "likes," "dislikes," and type of content. Videos were also categorized according to their creators into six categories: academic (university affiliation), physician (not affiliated with university), patient, commercial, non-physician (allied health professional, therapist, etc.), and unclassified. According to the intention of the video, it was classified into four categories. The first is an explanation of surgical technique, the second is information about the disease or surgery, the third is related to personal experience, and the last is an advertisement. All videos were analyzed in terms of the reliability and completeness of the information and were rated as "useful." Two researchers (Jeong CY, Kim SW) evaluated all the videos independently. All researchers have completed residency training at the same tertiary institution and have extensive experience in diagnosis and management of septoplasty and turbinoplasty. As no standard validated means of analysis exist, it was used to grade video quality by modifying predetermined criteria from previous studies (Table 1) [10]. "Excellent" reflected first-rate information and flow—such a video was very useful for patients. "Moderate" referred to second-rate information quality and suboptimal flow, with some important information adequately discussed but other aspects poorly discussed—such a video was somewhat useful for patients. A "poor" video contained poor-quality information, flowed badly, lacked most information, and was not at all useful for patients. The overall bias/general tone of each video in terms of septoplasty and turbinoplasty was subjectively graded as for, against, or neutral.

Statistical analysis

Differences between groups were compared with the aid of the Kruskal–Wallis test; the Tukey's test was used for post-hoc comparisons. We used Cohen's Kappa coefficient to evaluate the extent of agreement among reviewers; values above 0.8 represent "excellent" agreement, between 0.6 and 0.8 "substantial" agreement, between 0.4 and 0.6 "moderate" agreement, and below 0.4 "poor" agreement [11]. All statistical analyses were performed using the SAS software (ver.9.4; SAS Institute, Cary, NC, USA).

Ethics statement

The Seoul St Mary's Hospital Institutional Review Board (KC20ZISI0819) approved this study, and all individuals have signed the consent forms.

RESULTS

The top 83 videos on septoplasty and/or turbinoplasty had a mean duration of 6 min 42 s (0:06:42 standard deviation

Fig. 1. Methodology of selection of YouTube videos for analysis.

Table 1. Classification of content

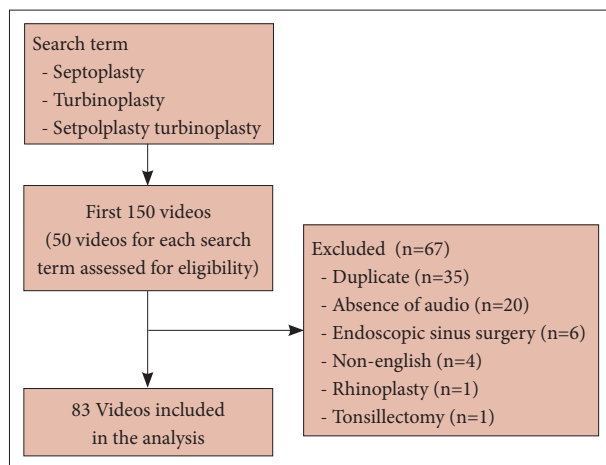| Classification	Content
Excellent	Best quality and flow, most relevant information included; useful for patients.
Moderate	Average quality, suboptimal flow, some important information adequately discussed but other aspects poorly discussed; somewhat useful for patients.
Poor	Low quality, poor flow, most information missing; not at all useful for patients.

Table 2. Video demographics by utility

Video demographic	Utility of information			Total	p-value
	Excellent	Moderate	Poor		
Video	18 (21.7)	27 (32.5)	38 (45.8)	83 (100)	-
Total length (h:min:s)	1:26:13	3:34:39	4:16:31	9:17:23	-
Mean length (h:min:s)	0:04:47±0:02:32	0:07:47±0:11:46	0:06:45±0:05:53	0:06:42±0:07:53	-
Mean "likes"	2,781.9±11,285.5	660.1±2,676.7	523.1±2,424.1	1,057.7±5,671.4	-
Mean "dislikes"	27.8±65.0	15.6±22.8	16.0±33.9	18.4±39.8	-
Total views (n)	1,516,523	1,189,542	2,549,030	5,255,095	-
Mean views	84,251.3±244,707.4	44,057.1±62,803.9	67,079.7±224,486.1	63,314.4±191,386.5	-
Upload source					
Academic	12 (66.7)	12 (44.4)	4 (10.5)	28 (33.7)	-
Physician	4 (22.1)	6 (22.2)	13 (34.2)	23 (27.7)	-
Patient	1 (5.6)	4 (14.8)	15 (39.5)	20 (24.2)	-
Commercial	0	1 (3.7)	5 (13.2)	6 (7.2)	-
Non-physician	0	1 (3.7)	0	1 (1.2)	-
Unclassified	1 (5.6)	3 (11.1)	1 (2.6)	5 (6.0)	-

Values are presented as number (%) or mean±standard deviation. Percentages may not sum to 100 due to rounding. -, not applicable

[SD] 0:07:53; range 0:00:36 to 0:58:46). The mean number of likes was 1,057.7 (SD 5,671.4) and the mean number of dislikes 18.4 (SD 39.8). The videos were viewed 5,255,095 times (mean 63,314.4, SD 191,386.5; range 30 to 1,285,694). The most watched video recorded 1,285,694 views and was produced by a patient who removed the splint after septoplasty. The video receiving the most likes (48,000) was an animation of the surgical procedure. This video also had the maximum dislikes (283). Video demographics by utility are listed in Table 2. About half of all videos were 38 (45.8%) poor, 27 (32.5%) moderate, and 18 (21.7%) excellent. There was no significant difference between these groups in terms of either length, the numbers of likes/dislikes, or the number of views. Excellent videos were usually uploaded by academics (12, 66.6%). Of the 38 poor videos, 15 (39.5%) were uploaded by patients and 13 (34.2%) by physicians. The video demographics by content are listed in Table 3. Most videos concerned the surgical technique (31, 37.3%). In total, 27 videos (32.6%) provided information about the disease or surgery, 20 (24.1%) personal experiences, and 5 (6.0%) were advertisements. The mean length of the videos on personal experiences (0:10:45±0:06:32, h:min:s) was significantly longer than that of videos on surgical technique (0:05:04±0:03:06, h:min:s; p=0.001), those providing information about the disease or surgery (0:06:30±0:11:33, p=0.004), and advertisements (0:01:58±0:01:36, p=0.004). The mean view number of advertisement videos (2,543.4± 3,644.1) was significantly lower than those of videos on surgical techniques (46,560.2±107,488.6, p=0.006) and personal experiences (97,891.3±282,594.6, p=0.012). Of the 31 videos on surgical technique, 12 (38.7%) were moderate and 10 (32.3%) poor. Of 27 videos providing information, 11 (40.7%) were

moderate and 8 (29.7%) poor. The videos on patient experiences were poor in 75% of cases; all advertising videos were poor. No video was biased against septoplasty and/or turbinoplasty except for some videos on patient experiences. The interobserver variabilities (weighted kappa scores) were 0.90 between Jeong CY and Kim SW (thus, excellent).

DISCUSSION

Patients who want to participate in medical decision-making are increasingly learning more about diseases and possible treatments using the Web. YouTube is a popular public access video sharing website that hosts an increasing number of clips on disease diagnosis, treatment and prevention. In 2007, Keelan et al. [12] analyzed immunization videos on YouTube. Since that time, videos on pediatrics, orthopedics, and internal medicine have been evaluated. We explored the content quality of videos on septoplasty and/or turbinoplasty. These are not emergency surgeries (unlike nose bone fracture); patients have the time to seek medical information. However, YouTube has no strict rules; anyone can upload videos that anyone can view. Almost half of the videos were poor; this rate is high compared to those of previous studies evaluating the video contents in other disciplines [7,13]. Of the poor videos, most were uploaded by patients. Most videos on patient experience were poor; the most-viewed video showed a patient removing packing in the outpatient clinic. However, recent studies found that packing may not be performed unless the risk of bleeding is high [14]. Videos uploaded by patients tended to be poor, imparting misinformation. However, unlike in other reports, patients who underwent surgery

Table 3. Video demographics by content

Video demographic	Type of content					p-value
	Surgical technique	Information about the disease or surgery	Personal experience	Advertisement	Total	
Videos	31 (37.3)	27 (32.6)	20 (24.1)	5 (6.0)	83 (100)	-
Total length (h:min:s)	2:36:52	2:55:43	3:34:57	0:09:51	9:17:23	-
Mean length (h:min:s)	0:05:04±0:03:06	0:06:30±0:11:33	0:10:45±0:06:32	0:01:58±0:01:36	0:06:42±0:07:53	0.001*, 0.004†, 0.004‡
Mean "likes" (n)	565.5±2,681.0	1,884.3±9,218.5	965.6±3084.8	12.2±16.8	1,057.7±5,671.4	0.007‡
Mean "dislikes" (n)	12.32±21.9	20.7±54.6	29.2±41.5	1.0±1.4	18.4±39.8	-
Total views (n)	1,443,368	1,841,183	1,957,827	12,717	5,255,095	-
Mean views (n)	46,560.2±107,488.6	68,191.9±204,548.1	97,891.3±282,594.6	2,543.4±3,644.1	63,314.4±191,386.5	0.012‡, 0.006§
Utility rating						
Excellent	9 (29.0)	8 (29.6)	1 (5.0)	0	18 (21.7)	-
Moderate	12 (38.7)	11 (40.7)	4 (20.0)	0	27 (32.5)	-
Poor	10 (32.3)	8 (29.6)	15 (75.0)	5 (100)	38 (45.8)	-
Bias						
For	7 (22.6)	13 (48.1)	6 (30.0)	2 (40.0)	28 (33.8)	-
Neutral	24 (77.4)	14 (51.9)	8 (40.0)	3 (60.0)	49 (59.0)	-
Against	0	0	6 (30.0)	0	6 (7.2)	-

Values are presented as number (%) or mean±standard deviation. Percentages may not sum to 100 due to rounding. *surgical technique vs. personal experience; †information about the disease vs. personal experience; ‡personal experience vs. advertisement; §surgical technique vs. advertisement. -, not applicable

were not negative (i.e., anti-surgery) [4]. Many reported good surgical effects; all problems were attributable to short-term follow-up (less than 3 months). After septoplasty or turbinoplasty, recurrence is possible; follow-up must be long-term [15].

Given the rise in endoscopic surgery, many excellent videos were uploaded by academics. However, of the 31 videos related to the surgical technique, 12 (38.7%) were moderate and 10 (32.3%) poor. Many videos described endoscopic surgery, probably because it was easy to film. Most videos describing surgical techniques did not provide subtle details. It is essential that training videos follow standard guidelines. This should show the procedures performed by experienced professionals and include the entire process, thus commencing when the patient is prepared for surgery. In addition, as septoplasty is still often performed via gross surgery, relevant videos are required. Of the turbinoplasty videos, several seemed to cause empty nose syndrome (because of excessive removal) and many had no audio. Unlike videos uploaded by academics, those uploaded by physicians accounted for 13 (34.2%) of all 38 poor videos, thus ranking just before patients. No video was biased against the surgical techniques, provide information or advertisement. Interestingly, the complications of septoplasty and turbinoplasty were rarely mentioned. Videos uploaded by doctors were not objective and not very useful.

Other works found that the longer the video, the higher the information quality [13]. However, most people want to watch short videos only, which is why they are misled. We found no significant effect of video length, or like or dislike ratings, between excellent, moderate, and poor videos. Those describing patient experiences were significantly longer than others, but were mostly moderate or poor.

Much Web information is of poor quality; doctors must tell patients to be selective. As mentioned above, several reports on medical YouTube videos have appeared. According to recent systematic review, YouTube contains a vast amount of medical data, some of which are inaccurate or misleading [16]. However, there is no standard analysis method yet. Sampson et al. [17] tried to create guidelines for the analysis of YouTube videos, but with limited success. Considering the characteristics of YouTube, it is not easy to set standards for evaluating YouTube videos. Rather, since YouTube has lots of influence on people, it is necessary to prepare a plan to provide accurate information to patients and experts using YouTube. A professional group such as a Society of Otorhinolaryngology-Head and Neck Surgery should produce and actively promote content in order to deliver accurate information to patients. In order for people to trust the information provided by the medical society, it is necessary to continuously check the comments and reactions on the content and take action immediately. In addition, doctors should inform patients us-

ing QR code or link so that they can access objective information created by the medical society.

As found by Lee et al. [18] (exploring whether YouTube might be a useful source of information on laparoscopic cholecystectomy), videos uploaded by tertiary centers scored significantly higher (in terms of the mean) than did those from secondary centers, but were viewed significantly less often. Many surgical videos were excellent, but some described a technique not used today and not contained the overall process; this is inappropriate. Tertiary centers should continuously upload and manage videos, explaining the latest surgical techniques and the entire process in detail. Each video produced by a professional group needs to state the authors' affiliations and describe the content.

Our work has several limitations. First, we analyzed only 83 YouTube videos retrieved using "septoplasty," "turbinoplasty," and "septoplasty turbinoplasty." However, many people do not use more than 1 or 2 pages of search results. Second, we scored the videos subjectively; no validated assessment tool is yet available. Although the kappa scores indicated excellent interobserver agreement, this may be affected by the training history or other factors. Also, the video was evaluated only from an expert's point of view, and the patient's point of view may be different even for the same video. It seems that further investigation into this is necessary. Third, the results depend on the search terms used. We employed "septoplasty" and "turbinoplasty." We assumed that these would be popular, but "deviated nasal septum" and/or "turbinate hypertrophy" may have been (appropriately) used; the retrieved videos would differ. Lastly, we conducted a cross sectional study to evaluate the quality of information. The result may change according to conditions such as videos added or deleted later, or total views of existing videos.

Our study contributes to a better understanding of the YouTube information available on septoplasty and turbinoplasty. YouTube is not the right source of this information at the moment. However, as the number of users of YouTube is increasing, reliable YouTube videos with accurate information should be uploaded by a professional group such as a Society of Otorhinolaryngology-Head and Neck Surgery. After producing the necessary video for patients and professional groups, it should be continuously promoted and used actively.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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