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The Educational Quality and Reliability of Parotidectomy Videos on YouTube: A Cross-sectional Study

Çağrı Becerik[1], Selim Kul[2]

[1]Department of Otorhinolaryngology, Kemalpaşa State Hospital, İzmir, Turkey
[2]Department of Otorhinolaryngology, Çerkezköy State Hospital, Tekirdağ, Turkey

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ABSTRACT

Background: Parotidectomy is a frequently performed operation in head and neck surgery, and surgeons in the learning stage can often benefit from YouTube videos. In this study, we aimed to verify the reliability and educational quality (EQ) of YouTube videos about parotidectomy.

Methods: On YouTube, a search was conducted with the terms "parotid gland," "parotid gland surgery," "parotidectomy," and "parotidectomy procedure." We examined the first 50 videos for every keyword. The videos were evaluated for quality and reliability with respect to the modified DISCERN benchmark criteria and the modified *Journal of the American Medical Association* benchmark criteria. The popularity of the videos was evaluated using the Video Power Index (VPI). The evaluation method for EQ was LAParoscopic Surgery Video Educational Guidelines (LAP-VEGaS).

Results: Fifty-five videos were included in the study. According to LAP-VEGaS scoring, 34 videos were rated medium, and 11 videos were rated high quality. There was a strong positive correlation between the DISCERN score and LAP-VEGaS score ($rs = 0.747$, $P < .001$). There was a moderate positive correlation between LAP-VEGaS score and the VPI value ($rs = 0.536$, $P < .001$). The VPI scores of the lower LAP-VEGaS groups were statistically significant and lower than the middle and higher groups (respectively; $P = .044$, $P = .001$).

Conclusion: Parotidectomy videos have an average EQ, according to LAP-VEGaS scoring, and more high-quality instructional videos are required for this widely used platform. Especially videos with high VPI ratios and videos published by universities were found to be better in terms of EQ and reliability in our study.

Keywords: Educational quality, information, parotidectomy, reliability, Youtube

Introduction

In recent years, there has been a rapid advancement in otolaryngology surgical education. Trainees traditionally relied on written sources and master-apprentice medical data to learn technical skills. The proliferation of digital platforms and the internet has allowed surgeons to benefit from videos of other surgeons.[1,2] Videos are increasingly used to enhance the surgical learning experience due to technological advances and ease of access to online information.[3] High-quality videos specific to otolaryngology frequently require a paid subscription, despite the rapid technological developments and accessibility.[4] Because of this, trainees frequently use freely available online educational materials. It is stated that 90% of residents and medical students use videos to prepare for surgery, with YouTube being the preferred platform for 95% of these students.[5]

Researchers have previously investigated the educational quality (EQ) of operations such as thyroidectomy, neck dissection, cholesteatoma surgery, otoplasty, and tonsillectomy for otorhinolaryngology in YouTube videos.[6-10] To our knowledge, there was no review of parotidectomy operations in the literature. The purpose of this study is to assess the EQ of YouTube videos about parotidectomy using objective and unbiased measurement techniques.

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Methods

This study used a retrospective and cross-sectional research design to assess the high caliber, dependability, and popularity of YouTube videos regarding parotidectomy procedures. Ethics committee approval is not required for our study because the videos included in our study are publicly accessible and the evaluation is provided under standard conditions. Since our study was not conducted on any human being and only video evaluations were made, informed consent was not required for this study.

Search Strategy

"Parotid gland," "parotid gland surgery," "parotidectomy," and "parotidectomy procedure" were searched for once on www.youtube.com on January 15, 2023, using a cached Internet browser. These keywords were selected based on the YouTube search bar's relevancy of the term "parotidectomy." The only filter that was used was "sort by relevance," which is YouTube's default search filter. Although most users never go past the first few pages of any search results, we still analyzed the top 50 results for each keyword search. The following criteria for inclusion were developed: 1) Videos in the English language; 2) videos showing surgical procedures; and 3) the most recent revision to remove duplicate videos.

Video Analysis

Two authors examined the videos independently. Video attributes were tracked, including the number of views, likes, dislikes, and comments, along with the upload source, URL address, title, length, and upload date.

Outcome Measures

The videos' dependability and quality served as the main outcome metrics. The modified *Journal of the American Medical Association* (*JAMA*) benchmark criteria, the modified DISCERN criteria, and the LAParoscopic Surgery Video Educational Guidelines (LAP-VEGaS) were 3 objective checklists that were utilized to reach this conclusion (Table 1).

The modified DISCERN criteria score was used to evaluate the videos' content uncertainty, reference attachment, bias, clarity, and reliability.[11] There are 5 total points given, one for each criterion; higher scores correspond to higher reliability.

Main Points

- YouTube videos are a frequently used platform by people receiving surgical training in recent years.
- While some of the videos contain high-quality images and educational visuals, some videos are missing and the image quality is quite low.
- Parotidectomy is a frequently performed surgery in otolaryngology practice and there are many key points of the operation.
- It has been determined that the majority of quality videos on YouTube are published by a university or hospital.
- High-image quality operation videos produced by certain centers for such surgeries are actually a necessity in today's technology.

The modified *JAMA* benchmark criteria bestowed a maximum of 4 points to each of the following: authorship, reference, description, and currency of the videos.[12] A validated surgical video assessment tool for publication and presentation,[13] LAP-VEGaS, was previously used to rate cholesteatoma surgeries[8] neck dissections,[7] and appendectomies.[14] Videos are sorted into 3 groups based on their EQ scores: low (EQ scores 0-6), medium (7-12), and high (EQ scores 13-18). Nine items are evaluated and scored ranging from 0 (not present) to 2.

YouTube video metrics, such as the video's duration, the amount of time it has been up since it was uploaded, the number of people who have viewed it, the number who have liked or disliked it, and the number of comments, were used as secondary outcome measurements. The following metrics were used to calculate the video power index (VPI), which evaluated the video's popularity:[15] (Like ratio View ratio)/100 is the VPI. The ratio of views to days since the video was uploaded is known as the view ratio. The like ratio is calculated as follows: (likes × 100)/(likes + dislikes).

Statistical Analyses

The statistical package IBM SPSS Statistics Standard Concurrent User V 25 (IBM SPSS Corp.; Armonk, NY, USA) was used to evaluate the data. Numbers (n), percentages (%), mean ± standard deviation, median (*M*), minimum value, and maximum value were used to represent descriptive statistics. Using the Shapiro–Wilk test for normality, the numerical variable data's normal distribution was assessed. Kruskal–Wallis analysis was used to compare numerical variables that did not meet the normal distribution condition among the low, medium, and high groups in LAP-VEGaS. A multiple comparison test called the Dunn–Bonferroni was employed. Spearman correlation analysis was used to assess the degree of correlation between numerical variables. An application of Cohen's Kappa analysis was used to assess interrater reliability. A value of $P < .05$ was considered statistically significant.

Results

Out of the 200 videos that were first examined, 69 did not fit the inclusion requirements, and 76 were duplicates. Figure 1 displays the remaining 55 videos.

Only LAP-VEGaS was accepted as having a normal distribution by Shapiro–Wilk ($P = .458$); other variables lacked a normal distribution ($P < .05$).

The descriptive features of the videos are given in Table 2. The median VPI score of the videos was 3.2 (0.1-81.7), the median DISCERN score was 3.0 (1.5-4.0), the median *JAMA* score was 2.5 (1.0-3.0), and the mean LAP-VEGaS score was 9.8 ± 3.3. Interrater reliability was found to be low when examined for the LAP-VEGaS groups ($\kappa = 0.36$; $P < .001$). Interrater reliability was evaluated for *JAMA* and DISCERN scores, and low agreement was found for both ($\kappa = 0.29$, $P < .001$; $\kappa = 0.24$, $P = .002$, respectively).

There was a weak positive correlation between DISCERN score and *JAMA* score and VPI value ($r_s = 0.299$, $P = .027$; $r_s = 0.419$, $P = .001$, respectively). There was a strong positive correlation between the DISCERN score and LAP-VEGaS

Table 1. Modified DISCERN Criteria, Modified *Journal of the American Medical Association* Benchmark Criteria, LAParoscopic surgery Video Educational Guidelines

Modified DISCERN Criteria		Modified *JAMA* Benchmark Criteria		LAParoscopic Surgery Video Educational Guidelines
1	Are the aims clear and achieved?	Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided	Author and Institution Case Presentation Positioning Surgical Procedure Intraoperative Findings Procedure Outcomes Additional Graphic Content English Audio/ Commentary Image Quality
2	Are reliable sources of information used? (i.e., publication cited, speaker is otolaryngologist)	Attribution	References and sources for all content should be listed clearly, and all relevant copyright information should be noted	
3	Is the information presented balanced and unbiased?	Disclosure	"Ownership" should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest	
4	Are additional sources of information listed for patient reference?			
5	Are areas of uncertainty mentioned?	Currency	Dates when content was posted and updated should be indicated	

score (r_s = 0.675, P < .001). There was a weak positive correlation between the *JAMA* score and the LAP-VEGaS score (r_s = 0.438, P = .001). There was a moderate positive correlation between LAP-VEGaS score and the VPI value (r_s = 0.536, P < .001). No statistically significant correlation was found between the *JAMA* score and VPI value (P = .580) (Table 3).

The videos were divided into low, medium, and high groups according to LAP-VEGaS score, and the relationship between other variables was examined according to the groups. There was no significant difference between the upload time and length values of LAP-VEGaS groups (P > .05). According to LAP-VEGaS groups, there was a significant difference between the groups' *JAMA*, DISCERN, and VPI scores, respectively (P = .019, P < .001, and P = .002) (Table 4).

A statistically significant difference was found in JAMA scores according to LAP-VEGaS groups (P = .019). In paired group comparisons, a significant difference was found between the low and high groups (P = .015), and no statistically significant difference was found between the middle group and the low and high groups (P > .05).

DISCERN scores of LAP-VEGaS groups were statistically significantly different in all groups. DISCERN scores of the low group were significantly lower than those of the middle and high groups (respectively; P = .017, P < .001). DISCERN scores of the middle group were significantly lower than those of the high group (P = .004).

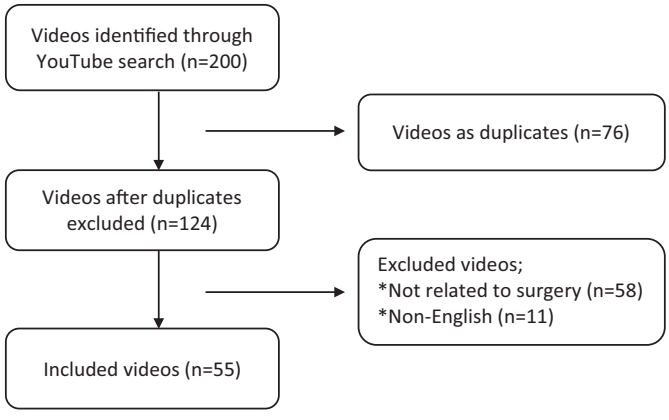

Figure 1. Selection of eligible YouTube videos for the study.

The VPI scores of the lower LAP-VEGaS groups were statistically significant and lower than the middle and higher groups (respectively; P = .044, P = .001). There was no statistically significant difference in VPI scores between the middle and high groups (P > .05).

Videos were divided into 3 groups according to the upload source: group 1: university, group 2: independent user, group 3: hospital. A statistically significant difference was found between VPI scores and length (sec) between the groups (P < .05) (Table 5).

The VPI scores of group 2 were significantly lower than those of group 1 (P = .019), while the VPI scores of group 3 and the other groups were similar. When the length was compared between groups, group 2 was found to be significantly shorter than group 1 (P = .027). No significant difference was detected between group 3 and the other groups in terms of length (P > .05).

Discussion

Assessing the EQ of YouTube videos featuring parotid gland surgery is a novel approach, which is being followed in this study. The majority of the parotidectomy videos in our otola ryngologist-simulated research had average EQ. The videos showed all of the surgical steps in detail and had generally excellent image quality.

Previous research evaluating YouTube videos for informing patients on health-related issues reported that the videos were of poor quality and provided insufficient information.[8,16] They claimed that relying on experts and video sources made these videos inconsistent and unreliable. However, academic websites had the best information quality among these videos, while patient-mediated websites had the worst.[17] Radonjic et al[18] found that the modified *JAMA* benchmark score and the modified DISCERN criteria score, which measure the educational value and usefulness of YouTube videos for patients

Table 2. Distribution of the Study Groups and Variables

Video Metrics	Statistics
Time (sec), *M* (minimum–maximum)	528 (86-6330)
Times since uploaded (days), *M* (minimum–maximum)	1293 (41-5875)
Views, *M* (minimum–maximum)	2669 (83-266677)
Likes, *M* (minimum–maximum)	40 (1-2300)
Dislikes, *M* (minimum–maximum)	0 (0-61)
Number of comments, *M* (minimum–maximum)	2 (0-93)
View ratio, *M* (minimum–maximum)	3.3 (0.1-81.7)
Like ratio, *M* (minimum–maximum)	100.0 (80.3-100.0)
VPI, *M* (minimum–maximum)	3.2 (0.1-78.3)
Modified DISCERN score, *M* (minimum–maximum)	3.0 (1.5-4.0)
Modified *JAMA* benchmark score, *M* (minimum–maximum)	2.5 (1.0-3.0)
LAP-VEGaS, ±*SD*	9.8 ± 3.3
Surgery type, n (%)	
Deep lobe	2 (3.6)
Partial	4 (7.3)
Superficial	41 (74.5)
Total	8 (14.5)
Upload source, n (%)	
University	16 (29.1)
Hospital	15 (27.3)
Independent user	24 (43.6)
Auditory commentary or subtitles, n (%)	
Present	44 (80.0)
Not present	11 (20.0)
LAP-VEGaS grouping, n (%)	
Low	10 (18.2)
Medium	34 (61.8)
High	11 (20,0)

JAMA, *Journal of the American Medical Association*; LAP-VEGaS, LAParoscopic Surgery Video Educational Guidelines; *M*, median.

Table 3. Spearman Correlation Values of the modified DISCERN score, the modified *Journal of the American Medical Association* Benchmark Score, LAParoscopic Surgery Video Educational Guidelines, and Video Power Index Scores

	DISCERN	*JAMA*	LAP-VEGaS	VPI
DISCERN	–	r_s = 0.299 *P* = .027*	r_s = 0.675 *P* < .001*	r_s = 0.419 *P* = .001*
JAMA		–	r_s = 0.438 *P* = .001*	r_s = 0,076 *P* = .580
LAP-VEGaS			–	r_s = 0.536 *P* < .001*
VPI				–

JAMA, *Journal of the American Medical Association*; LAP-VEGaS, LAParoscopic Surgery Video Educational Guidelines; VPI, video power index; r_s = spearman correlation coefficient.
**P* < .05 statistically significant.

with abdominal aortic aneurysms, were both below average, at 1.74 and 0.84, respectively. Comparing the modified DISCERN criteria scores and modified *JAMA* benchmark criteria scores of the videos in our study to the results of previous studies, they should be regarded as low. This demonstrated how untrustworthy and low-quality YouTube is when it comes to providing information about parotid gland surgery.

For educators and medical students, YouTube has become an increasingly valuable educational resource. Curran et al[19] states that 31 of the 113 publications that were found for a scoping review on the applicability, efficacy, and validity of YouTube video resources in medical education fulfilled the inclusion criteria, which concentrated on the platform's use in the field. It is suggested to improve the quality and usefulness of YouTube videos to make them more suitable for use as educational resources in medical education, as only 19.4% (n = 6) of the articles reported the evaluation results on the educational use of YouTube.

Video surveillance is a useful factor for surgical trainees to improve their surgical proficiencies.[5,20] Although YouTube is not a platform for education, we still decided to review its content because it is the most widely used educational tool among surgical residents worldwide. The fact that it is user-friendly, open to all, and well-known is an advantage, but the fact that anyone can upload videos and there is no peer review process in place also makes it a drawback. After conducting this study, we concluded that the LAP-VEGaS-based educational value of the videos on this platform is not high enough.

The videos that were chosen based on the LAP-VEGaS scoring criteria had a very diverse range of quality, to put it objectively. Ten (18.2%) of the videos were rated as low quality, and 34 (61.8%) as medium quality. Eleven (20%) of the videos were rated as high quality. YouTube's popularity and relevance have historically been determined by video attributes, likes, dislikes, total views, and upload date, but these attributes have not been linked to or indicative of the caliber of the videos.

The recently published Instructional Videos in Otorhinolaryngology by YO-IFOS (IVORY)-grading-system (GS) is a new consensus for the evaluation of educational surgical videos. In the article where they evaluated parotidectomy videos, they found the average IVORY-GS score to be 24.9 (maximum 44). The EQ level of the videos was found to be mostly low and medium, similar to our study. The predictive factors in videos with high scores were determined as more likes and a higher likes/dislikes ratio.[21]

The popularity of YouTube videos can be seen in the study's moderate correlation between VPI and LAP-VEGaS scores. We showed that videos uploaded by universities and hospitals produce more reliable and educational content than videos uploaded by independent users. This situation can inform us that the videos with high EQ, prepared by expert surgeons, and published by valuable universities or similar institutions, are watched and liked more in surgical training videos.

It is essential to be informed of this study's limitations. Initially, considering that the variability depends on the date/time of the search and the use of various search words is one of this study's main limitations. Since a lot of material is created every

Table 4. Comparison of Variables Among LAParoscopic Surgery Video Educational Guidelines Groups

	LAP-VEGaS			
	Low *M* (Minimum–Maximum)	Medium *M* (Minimum–Maximum)	High *M* (Minimum–Maximum)	Statistics
JAMA	1.5 (1.0-2.5)[a]	2.0 (0.5-2.5)[ab]	2.0 (1.5-2.5)[b]	*H* = 7.957 *P* = .019*
DISCERN	1.3 (0.5-2.0)[a]	2.5 (1.5-3.5)[b]	3.0 (2.0-3.5)[c]	*H* = 23.336 *P* < .001*
VPI	0.6 (0.4-7.8)[a]	3.3 (0.1-61.2)[b]	20.5 (0.7-78.3)[b]	*H* = 12.863 *P* = .002*
Upload time (days)	1255.5 (276.0-4571.0)	1227.0 (41.0-5875.0)	1430.0 (377.0-5529.0)	*H* = 0.740 *P* = .691
Time (seconds)	412.0 (89.0-6330.0)	537.5 (86.0-5550.0)	601.0 (362.0-3317.0)	*H* = 0.695 *P* = .706

H, Kruskal–Wallis test; *JAMA*, *Journal of the American Medical Association*; LAP-VEGaS, LAParoscopic Surgery Video Educational Guidelines; *M*, median; VPI, video power index.
*Superscripts a, b, c show the difference between groups.

Table 5. Comparison of Variables Between Video Uploader Groups

	Group 1 University *M* (Minimum–Maximum)	Group 2 Independent User *M* (Minimum–Maximum)	Group 3 Hospital *M* (Minimum–Maximum)	Statistics
JAMA	2.5 (1.0-3.0)	2.5 (1.0-3.0)	3.0 (1.5-3.0)	*H* = 1.303 *P* = .521
DISCERN	2.8 (1.5-4.0)	2.5 (1.5-4.0)	3.0 (1.5-4.0)	*H* = 5.972 *P* = .050
VPI	10.2 (0.4-78.2)[a]	1.7 (0.2-43.0)[b]	2.8 (0.1-61.2)[ab]	*H* = 6.061 *P* = .048*
LAP-VEGaS, ± SD	10.4 ± 4.0	8.9 ± 3.0	11.0 ± 2.7	*F* = 2.163 *P* = .125
Upload time (days)	1241.5 (125.0-5875.0)	884.5 (41.0-4527.0)	1812.0 (497.0-5529.0)	*H* = 5.027 *P* = .081
Length (seconds)	1013.5 (187.0-6330.0)[a]	477.0 (89.0-4461.0)[b]	723.0 (86.0-3317.0)[ab]	*H* = 6.846 *P* = .033*

F, one-way analysis of variance; *H*, Kruskal–Wallis test, *JAMA*, *Journal of the American Medical Association*; LAP-VEGaS, LAParoscopic Surgery Video Educational Guidelines; *M*, median.
*Superscripts a, b indicate the difference between groups.

day, more unique and practical videos can sooner or later be shared. Second, limiting a training tool to the first 50 videos returned by a search can still be effective. The upload date, views, and ratings of the videos can also be used to sort or filter them for surgeons who are watching for educational purposes.

The EQ of the parotidectomy tutorials on YouTube is average, if not bad. It can be used by a surgeon to see different methods, but there is a need for more reliable and high-image quality sources. Among parotidectomy videos, especially videos with high VPI ratios and videos published by universities were found to be better in terms of EQ and reliability in our study. More videos on this subject may be added in the future.

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