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Assessing the educational quality of 'YouTube' videos for facelifts

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ABSTRACT

Objectives: Facelifts are among the most common facial plastic procedures performed. Given the existence of a variety of surgical approaches and the proximity of key anatomical structures, the development of proper surgical skills and knowledge is necessary to ensure positive outcomes. Many surgical learners utilize YouTube videos as supplemental tools in their education. Our aim was to gauge the quality and quantity of available YouTube videos describing the surgical approach to rhytidectomy.

Methods: The YouTube video platform was searched using predefined keywords. Videos meeting inclusion criteria were reviewed and scored by 3 practicing facial plastic and reconstructive surgeons. Thirteen different intraoperative, pre/postoperative, and video quality characteristics were scored on a binary scale by each grader. Descriptive statistics were obtained and interrater reliability was assessed using Kappa's coefficient.

Results: Thirteen videos met criteria for analysis. A high degree of interrater reliability was confirmed using Kappa's coefficient, with κ values = 0.73, 0.75, and 0.59 for each combination of scorers. In general, YouTube videos were found to be deficient in discussing key criteria of rhytidectomy, particularly with regards to pre/postoperative points such as indications, patient selection, and possible complications. Intraoperative benchmarks were also lacking, with 8/13 videos not discussing the facial nerve and 8/13 failing to demonstrate an appropriate facelift incision.

Conclusions: YouTube instructional videos depicting rhytidectomy lack discussion of key tenets of successful facelift surgery. Until improvement in the educational quality of such material occurs, surgical trainees should implement discretion when choosing YouTube videos to complement their learning.

Level of Evidence: Not Applicable.

1. Introduction

In 2017, facelifts were performed over 125,000 times in the United States [1], making them the third most common facial plastic surgery procedure. Numerous surgical techniques have been developed, each with its own indications, strengths, and risks [2–4]. The evolution from skin only facelifts [5] to multi-plane and deep-plane dissections [3] underscores the importance of the dissection plane and anatomic relationships to surgical outcomes. For the trainee, a knowledge of anatomy, surgical technique, perioperative care, and potential complications are critical to safely perform rhytidectomy and achieve desirable results.

Widespread use of the internet has resulted in the extension of surgical education beyond textbooks and the operating room [6]. Publicly accessed surgical videos are increasingly being used by trainees when preparing for cases [7]. As reported, YouTube (San Bruno, CA) is the most commonly used video platform for surgical trainees [8]. For the surgical educator, YouTube offers a variety of advantages over a self-hosting platform including established reputation, built-in analytics, and the capacity to be shared on social media [9]. While trainees rely on online surgical videos as an educational resource, their intent may be geared towards marketing or directly to the patient. As a result, the educational quality of these videos varies, given the lack of a peer-review process and the inability to scrutinize the content produced by authors [10]. Rather, the results of a YouTube search are based on an algorithm accounting for likes, views, and popularity [11]. Therefore, the need to evaluate and identify the educational quality of these resources is paramount.

A number of disciplines have studied the educational quality of YouTube videos demonstrating surgical procedures [12–14].

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Table 1
Summary of phrases used in the 'YouTube' search. Corresponding number of videos that were used in the analysis also depicted. For each video included in the study, the length, number of views, likes, dislikes, upload date, and upload source was noted (data not shown).

Search phrase	Total results	Number included
Facelift surgery	83,500	8
Facelift procedure	49,200	2
Facelift technique	39,400	1
Facelift operation	53,700	0
Rhytidectomy	34,500	2

Equivalent studies have yet to be performed for rhytidectomy. The primary objective of this investigation was to critically evaluate the quality of rhytidectomy instructional videos available on YouTube.

2. Materials and methods

Using Google Chrome (version 65.0.3325.181) with cleared cache and deleted cookies, the YouTube database was queried using the following search terms: "facelift surgery", "facelift procedure", "facelift technique", "facelift operation", and "rhytidectomy". The top 100 videos for each search term were included for review, as determined by 'relevance' according to YouTube's algorithm. An additional 10 videos outside of the top 100 were also reviewed for each search term to better ensure qualifying videos were not missed. Inclusion criteria consisted of surgical videos with the primary focus of educating the viewer, English language narration, and intervention performed at a health care institution. Excluded were videos with lecture format, animations, and those that lacked audio. A summary of the search terms and corresponding results is depicted in Table 1. For each video in the study cohort, video length, number of views, likes, dislikes, upload date, and upload source (private vs. academic vs. society) was recorded.

Prior to search query, three staff facial plastic surgeons (PB, LL, and DS) who routinely perform rhytidectomy identified key preoperative, intraoperative, and postoperative surgical criteria for rhytidectomy using a modified Delphi approach. The focus was not on the technique, but rather concepts common to all approaches, and the video's ability to communicate that information. A total of 13 characteristics for evaluation fell under three broad descriptive criteria – intraoperative quality, pre/postoperative quality, and audiovisual metrics (Table 2).

Search results were evaluated. The presence of each concept was graded on a binary scale by each surgeon. A video was given a score of "1" when a particular concept was adequately discussed, and a score of "0" if that concept was not sufficiently addressed. Audiovisual metrics were assessed on a binary scale, with a score of "1" representing a positive overall assessment, and a "0" representing a negative assessment. Rankings were then compiled to create a composite rating sheet describing each video's performance in all fields.

Descriptive statistics were performed using SAS Software (Cary, North Carolina, USA). Interrater reliability was assessed using Cohen's kappa coefficient (κ) [15] to determine the degree of consistency in scoring among the three graders.

3. Results

The search parameters yielded a total of 260,300 nonunique results. 500 of these hits were reviewed and 13 videos were found which satisfied all inclusion and exclusion criteria. Table 3 contains the composite results of the analysis for each of these 13 videos. Each video was uploaded by a unique account. Agreement among all three of the surgeons is shown in dark green (all favorable) and dark red (all unfavorable) boxes. Light green and light red boxes represent the corresponding 2-1 majority vote. Kappa coefficients were obtained to compare each grader in consistency (Table 4); DS had a κ of 0.73 and 0.75 when compared to LL and PB, respectively. The κ coefficient between LL and PB was 0.59.

Also noted in Table 3 is the type of flap elevation shown in each video, with 6/13 demonstrating sub-SMAS elevations and 5/13 exhibiting SMAS plication/imbrication. In one of the videos, a skin only facelift was done, while another video demonstrated a sub-periosteal midface lift.

Intraoperatively, 8/13 (62%) of videos did not discuss the facial nerve. Eight (62%) of the videos failed to demonstrate an appropriate rhytidectomy incision. Only 6 (42%) videos showed safe flap elevation techniques, while 2 (15%) videos discussed indications for surgery. One (8%) video discussed patient selection criteria, one (8%) discussed anesthesia, and one (8%) discussed complications. No videos discussed postoperative management. Video, audio, and language intelligibility was adequate in the majority of videos.

The mean length of videos was 10 min (range: 2–40), with each video having an average of 84,000 views (range: 600–289,000). The mean number of likes for a video was 235 (range: 6–1000), and the mean number of dislikes was 37 (range: 0–157). Videos were posted to the platform a mean of 55 months prior to date of query (range: 1–102, standard deviation: 28). All videos were uploaded by physicians in a private practice setting with the exception of one created by a medical society.

4. Discussion

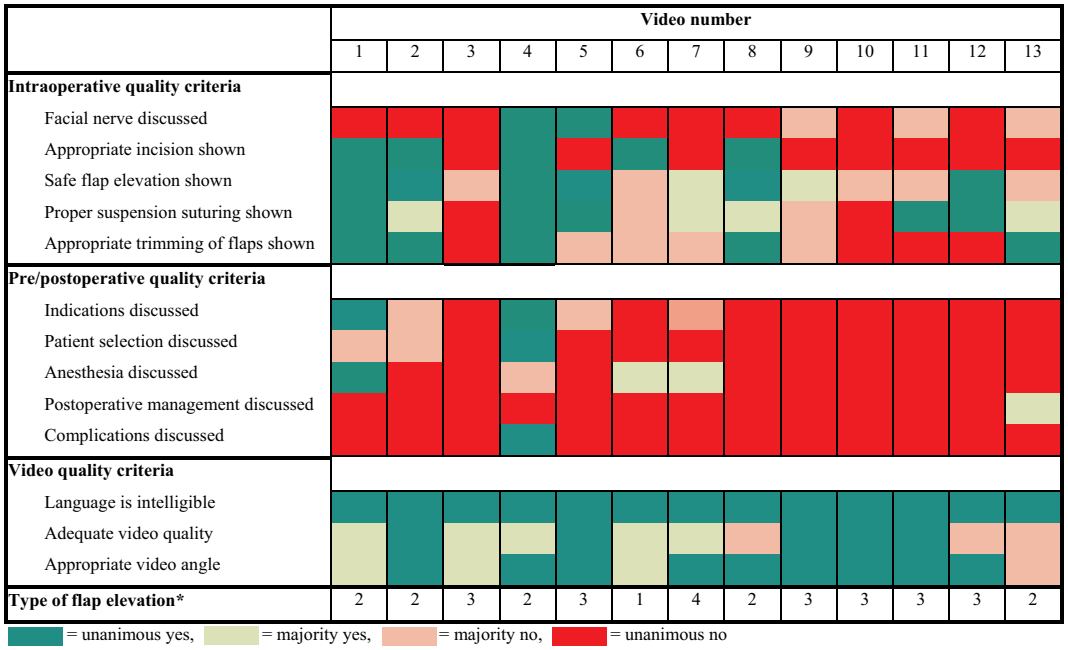
With the expansion of the internet and mobile technology, the number of educational options available to the surgical resident has increased dramatically [6,7,16]. Among newer training tools, freely accessible online videos depict procedural steps of a relevant surgery. Given that YouTube is the preferred source for surgical videos, the unknown quality of this information and lack of a peer review process is reason for concern. As surgical trainees continue to rely upon online surgical videos, it is critical these resources are appropriately scrutinized and their educational value determined within a medical context.

While a significant proportion of surgical trainees use online educational resources, such methods continue to lag behind traditional learning modalities such as textbooks, lectures, and journal articles. Glass et al. surveyed 773 surgical residents enrolled in various programs across the country and found that, when looking for information related to patient care, 57% used textbooks while 36% utilized online videos/resources [7]. With regards to preference of learning tools employed, Rapp et al. found 90% of surveyed residents viewed traditional works as favorable as compared to only 64% in favor of educational videos [8].

Table 2
Summary of the criteria used for scoring videos. Criteria were classified in three broad categories as depicted below.

Intraoperative quality criteria	Pre/postoperative quality criteria	Audiovisual metrics
1. Facial nerve discussed	1. Indications discussed	1. Language is intelligible
2. Appropriate incision shown	2. Patient selection discussed	2. Adequate video resolution
3. Safe flap elevation shown	3. Anesthesia discussed	3. Appropriate video angle
4. Proper suspension suturing shown	4. Postoperative management discussed	
5. Appropriate trimming of flaps shown	5. Complications discussed	

Table 3
Tabular summary of the scoring done by the three reviewers for each video with regards to each criteria. Color coding as per the legend below.



*Type of flap elevation: 1 = skin only, 2 = SMAS plication/imbrication, 3 = sub-SMAS dissection, 4 = midface lift.

Table 4
Assessment of interrater reliability between the three reviewers.

Rater 1	Rater 2	Kappa coefficient (κ)	Standard error
DS	LL	0.73	0.05
DS	PB	0.75	0.05
LL	PB	0.59	0.06

The use of YouTube videos as a source for surgical education has been investigated in a number of medical specialties outside of otolaryngology. Addar et al. examined the quality of videos describing splinting of the fractured distal radius and deemed 10/16 videos as being “inadequate as educational videos.” [13] Fischer et al. reviewed 13 videos describing the approach to knee arthrocentesis and stated 8 were considered useful for teaching purposes [17]. The importance of the source of information for the video was delineated by Bezner et al., who noted differences in accuracy if videos were posted by medical professionals as opposed to lay persons [18].

In our study there was clear agreement that, overall, videos failed to discuss key criteria of rhytidectomy (e.g. indications, complications, perioperative management). Specifically, videos scored very poorly in pre/postoperative criteria metrics. While surgical technique is important, an educational source on rhytidectomy must be complemented with patient selection criteria, perioperative care, and management of potential complications. Videos failed to mention these on all accounts. Conversely, high scores were achieved for the vast majority of videos with regards to audiovisual features.

While videos focused on operative techniques and scored slightly better in this category, marks for intraoperative key quality criteria also demonstrated a majority of low scores. For example, the majority of the videos screened made no reference to the facial nerve, arguably the most critical anatomic structure to avoid injury to during rhytidectomy. Given the intricate relationship between this nerve and the surrounding fascial planes, (e.g. SMAS) [19], the importance of knowing its anatomical location at all levels of the face cannot be overstated. Facial nerve injury occurs in up to 2.5% of facelifts [20]. Teaching tools should emphasize the relevant anatomy of the facial nerve during a facelift to help trainees avoid the occurrence of this morbidity.

The calculation of kappa coefficients was used to validate the interrater reliability among the three graders. While the benchmarks used to describe the magnitude of agreement for κ values are arbitrary [21], the most commonly cited scale is 0.01–0.20 = slight, 0.21–0.40 = fair, 0.41–0.60 = moderate, 0.61–0.80 = substantial, and 0.81–0.99 = almost perfect [22–24]. Using this scale, statistical agreement among graders would be considered ‘substantial’ in 2/3 comparisons (Table 4), with the third pair just below this threshold. This high degree of consistency among the raters strengthens the trends in scoring described above.

There were some notable concerns in the search results. One video labeled as a facelift instead showed a sub-periosteal midface lift. Another demonstrated the skin incision being created using electrocautery. A third showed the surgeon operating on his mother, which is in conflict with the American Medical Association guidelines from the Council on Ethical and Judicial Affairs [25].

The intent of an online video creator on a platform such as YouTube is unclear. Some purport to teach surgical technique, while others educate patients about the procedure, while others may be for marketing purposes. Twelve of the 13 videos were uploaded from an individual surgeon's private practice with mention of their practice. This study was unable to elicit the purpose of video content creation.

The internet has resulted in a proliferation of online resources that has profoundly altered surgical education [6]. That videos are portable, reusable, fungible, often free, accessible by mobile devices, and accessible on a global scale are but a few examples of how the internet has altered information transfer. The pervasiveness of the internet has benefitted surgical education by changes in learning anatomy [26], simulation labs [27], and procedural skills [28], but may cause concern in other areas. For instance, recent changes in Net Neutrality legislation may affect medical reference access in unknown ways [29]. Likewise,

the lack of a peer review process and quality ratings for online surgical video resources raises concerns. Ideally, the freely accessible nature of these resources can be embraced while a continuous system of quality improvement evolves in parallel.

Limitations of this study included a degree of subjectivity in the scoring system, as what one grading surgeon may have deemed adequate presentation or explanation for a specific topic may have been viewed differently by another grader. Additionally, our search was confined to videos uploaded to the YouTube platform. Videos hosted on physician-centric sites such as surgical society webpages were not analyzed. Investigating the quality of such privately-hosted videos generated by academic societies could provide further data on the overall quality of available educational surgical tools. While such websites may contain more thorough videos describing the surgical steps and considerations for a facelift, access to educational content may be hidden behind a membership paywall. To our knowledge, no review of the quality of such materials has been conducted to date.

5. Conclusions

With the expansion of the internet, surgical education resources have migrated online, with the preferred source for trainees being YouTube. This is the first study to evaluate the educational quality of online rhytidectomy videos being used as a surgical reference on that platform. While some videos demonstrated isolated key concepts, not one satisfied all the key criteria to safe facelift surgery; in fact, the majority of videos showed significant shortcomings in their pre-operative, intraoperative, and post-operative content. Given the increasing use of online surgical videos by surgical trainees, baseline knowledge of the educational quality of these videos is critical. Until such development occurs, surgical trainees should use caution when choosing YouTube videos to supplement their preparation and learning.

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None.

Conflicts of interest

None.

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