

ARTICLE

## 'Viewer discretion advised when preparing for surgery' – why YouTube cannot teach you how to do an upper blepharoplasty. An evaluation of the educational potential of surgical videos on blepharoplasty on YouTube

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### ABSTRACT

Over the last years, the layout of surgical training has significantly changed. Surgical residents rely on YouTube videos to prepare for upcoming cases. Eyelid surgery including blepharoplasty ranks among the 5 most often performed cosmetic surgeries. It will be one of those surgeries regularly researched by plastic surgery residents. Therefore, the aim of this study was to evaluate the educational value of the most viewed upper lid blepharoplasty videos on the most popular video broadcasting website, YouTube. A video scoring system consisting of 8 items was developed in accordance with the technical details described in the literature. Video scores were categorized into 3 groups, namely as 'poor', 'moderate'; or 'good' in terms of their contribution to surgical education. The first 300 videos were evaluated for the search results for 'blepharoplasty'. After exclusion and summarization of video fragments, a total number of 36 videos were included in the study. Multivariable logistic regression models found no correlation between likes, views, comments and the attributed educational score. The quality of available educational surgical video content varies widely, and surgical trainees need to be critically aware of this as view counts as well as the number of likes and comments will not necessarily relate to videos' educational quality. There is a need for high-quality educational videos.

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### KEYWORDS

YouTube; blepharoplasty; education

### Introduction

The layout of surgical training is constantly changing. Over the last couple of years, visual media have gained importance in surgical training [1]. YouTube is the most well-known online video sharing site with over 2 billion views per day [2] and an average user spending at least 15 min a day on the site [3]. A recent study by Rapp et al. showed that YouTube is also the most frequently used educational video source for residents preparing for a surgical procedure [4]. Survey participants in this study included fourth-year medical students, general surgery residents, and faculty surgeons.

Moreover, this use of instructional videos for clinical skills teaching has proven to result in improved learning outcomes compared with the traditional face-to-face didactic teaching method [5]. However, the lack of guidelines and upload criteria means that the instructional quality of available videos will vary widely [6]. Overall, there is still concern regarding the quality of the available surgical educational video resources on YouTube and unregulated open main-stream media remains a controversial tool among teaching staff.

Eyelid surgery including blepharoplasty ranks among the 5 most often performed cosmetic surgeries according to the American Society of Plastic Surgeons [7]. This procedure will thus be among those regularly researched by plastic surgery residents. There are many blepharoplasty-related videos available on YouTube that could be an important educational resource for surgeons preparing to perform this procedure. But the educational

quality of these videos has so far not been evaluated. The aim of this study is thus to evaluate the educational potential of the most viewed upper lid blepharoplasty videos on the most popular video broadcasting website, YouTube.

### Methods

#### Study design

A search for the keyword 'blepharoplasty' was performed on YouTube on the 1st of June 2020. Search results on YouTube were listed in a descending fashion from most viewed to least. Five video results are shown per screen. Although 90% of the internet users pay attention to only the first 3 pages [8] the first 60 'pages' were included as several videos would potentially need to be excluded. As each page contains 5 videos, 300 videos were included in total. As search results are updated continuously, these 300 videos were saved.

#### Inclusion/exclusion criteria

The language of the videos included was English. Video exclusion criteria were defined by the consensus of three authors. Exclusion criteria were lack of narration or descriptive subtitles, videos about lower lid blepharoplasty, videos that were uploaded primarily for commercial purposes, videos with irrelevant content (e.g. non-surgical upper eyelid treatment), patient experiences, animations, and duplicate videos. Videos uploaded as separate parts

**Table 1.** The developed video rating scheme awards a point per criterion addressed. A maximum score of 8 can be achieved.

1	Are preoperative markings discussed	1
2	Is surgical anatomy discussed	1
3	Is preparation of the surgical field and anaesthetics	1
4	Is fat resection discussed	1
5	Is muscle resection discussed	1
6	Are closure and suture technique discussed	1
7	Are potential complications discussed?	1
8	Is postoperative care discussed?	1
	Total	8

were included as a single video and for evaluation of viewer-related variables, the mean of the separate parts are calculated. This method of evaluation is usually employed in studies related to YouTube videos [9,10].

### Primary outcome

Videos were evaluated for days since upload, views per day and number of total views, length of the video, number of likes, dislikes and comments, presence of narration, presence of descriptive subtitles, upload source. Upload source was defined as hospital, physician (uploaded by an individual physician without any affiliation) or other.

### Video scoring system

A video scoring system consisting of 8 items was developed in accordance with the technical details described in the literature [11] (Table 1). Blepharoplasty can be considered a short surgical procedure that requires certain steps like preoperative markings or tissue types resected (skin, muscle, fat). Each video received 1 or 0 if the specific item was addressed in the video. As the presence of 8 items relevant to the surgical process were evaluated the total score for each video was between 0 and 8. Video scores were categorized into 3 groups, as poor (0–3), moderate (4–5) or good (6–8) in terms of their contribution to the surgical education. While the score thus evaluates if topics relevant to education are addressed, it does not aim to evaluate the quality of the surgery performed. It also does not aim to assess whether certain steps of a blepharoplasty surgery i.e. muscle resection are deemed necessary but rather evaluates if a potential surgical step is mentioned. This type of scoring was chosen as preferred surgical techniques vary and will be surgeon and patient dependent. Videos were scored independently by 2 authors (resident and attending surgeon) and agreement of both authors was sought. In the case of controversy, a third author could be consulted and his decision regarded would be the final score.

Ethical approval was not necessary for this study as only data open to public access was used.

### Statistical analysis

Descriptive statistics included frequencies and proportions for categorical variables. Means, medians, and ranges were reported for continuously coded variables. The Chi-square tested the statistical significance in proportions differences. The t-test and Kruskal-Wallis test examined the statistical significance of means and median differences. Univariable and multivariable logistic regression models tested the relationship between video score and several variables, namely number of views, likes and comments as well as the presence of narration, presence of subtitles and upload source. R software environment for statistical computing

**Table 2.** Summary of video exclusion criteria.

Video exclusion for reasons of	
Language	1
Lack of narration/descriptive subtitles	12
Videos about lower blepharoplasty	32
Primarily commercial content	41
Irrelevant content	64
Patient reports	95
Animations	16
Duplications	2

**Table 3.** Descriptive video data.

Variable	
Number of total views	
Median	31507.5
IQR	15950.5–80438.8
Number of days online	
Median	2633
IQR	1589.5–3512.5
Video length, min	
Median	5.3
IQR	3.9–9.2
Number of likes	
Median	55
IQR	36.2–150.8
Number of dislikes,	
Median	7
IQR	3–18
Number of comments	
Median	10.5
IQR	1.2–34
Educational score,	
Median	4
IQR	3–5
Audio commentary, <i>n</i> (%)	
Not available	8 (22.2)
Available	28 (77.8)
Subtitles, <i>n</i> (%)	
Not available	18 (50)
Available	14 (38.9)
Uploaded by	
Hospital, <i>n</i> (%)	7 (19.4)
physician, <i>n</i> (%)	28 (77.8)
other <i>n</i> (%)	1 (2.8)

and graphics (version 3.4.3) was used for all statistical analyses. All tests were two-sided with a level of significance set at  $p < 0.05$ .

## Results

The first 300 videos were evaluated for the search results for 'blepharoplasty'. A total of 263 videos was excluded for reasons illustrated in Table 2. Two fragments of videos were regarded as one separate video. After exclusion and summarization of video fragments, a total number of 36 videos were included in the study. An audio commentary was present in 78%, while descriptive subtitles were present in 39% of the included videos. Upload source was a surgeon in 78% and a hospital or private practice group in 19%. Videos had an average length of 8.37 min. Descriptive statistics are summarized in Table 3. When the video features were evaluated, we saw that preoperative markings and suture technique were addressed in most videos (markings 72% and suture 81%) but potential complications and surgical anatomy were topics not regularly included in the videos (complications 11%, anatomy 38%). Details of the scoring process are summarized in Table 4. Univariable models suggested a correlation between likes, views, comments and the attributed educational score. This correlation could not be confirmed in

**Table 4.** Availability of video details.

Video detail	Absent (n, %)	Present (n, %)
Preoperative markings	10, 30%	26, 70%
Surgical anatomy	24, 68%	12, 32%
Patient preparation and anaesthesia	14, 41%	22, 59%
Issue of fat removal addressed	8, 24%	28, 76%
Issue of muscle resection addressed	19, 54%	17, 46%
Suture technique	7, 22%	29; 78%
Complications mentioned	32, 89%	4; 11%
Postoperative considerations	22, 62%	14; 38%

**Table 5.** Multivariable logistic regression models.

Variable	Odds ratio	95%-Confidence Interval		p-value
		2.5 %	97.5 %	
Number of views	1.00	1.00	1.00	0.66
Number of likes	0.99	0.98	0.99	0.08
Number of comments	0.98	0.90	1.09	0.78

multivariable logistic regression models (see Table 5). No significant correlation between these factors and the attributed score could be found.

## Discussion

Upper Blepharoplasty is a surgical procedure in which eyelid skin with or without orbicularis oculi muscle and orbital fat is excised to rejuvenate the esthetic look of the patient along with correction of potential functional abnormalities [12]. It is among the top five commonly performed surgical procedures in plastic surgery. We would thus argue it is one of the procedures every plastic surgeon needs to know how to perform. Celentano et al. found that 86.7% of surgical residents routinely watch online surgical videos to prepare for surgeries and the most common sources are YouTube and websurg.com [13]. The benefit of video to demonstrate critical anatomy to surgical trainees has been demonstrated [14]. At the same time, YouTube videos are available 24 h a day thus making them accessible even for busy surgical trainees. Moreover, video learning has been shown to be both educational and enjoyable for residents [15]. However, the fact that anyone can upload videos on YouTube and refer to them as educational holds a problem as actual educational video quality is not guaranteed. Other studies have already evaluated the potential benefits of YouTube for certain surgical procedures [16]. Frongia et al. looked at YouTube as a potential training resource for laparoscopic fundoplication. The group found varying degrees of quality of the videos available and concluded that alternative video platforms aimed at professionals should also be considered for educational purposes [17]. Chen et al. looked at pulmonary lobectomies on YouTube and advised that trainees should critically examine the quality of video content and that surgical videos should be improved in quality before they can be used in medical teaching [18]. When screening YouTube videos it is important to be aware that YouTube lists the search results according to an algorithm depending on parameters like total view and comments rather than quality [9]. In our evaluation, we did not see a significant correlation between these parameters with our quality score. When looking for videos about blepharoplasties on YouTube one will be confronted with a significant number of non-relevant or low-quality videos. Distinguishing between lower and higher quality can be difficult for less experienced surgical trainees. As

Rodriguez et al. stated: Critical analysis skills should therefore be an integral part of today's medical curriculum [19] and also teachers need to be aware of the potential bias students will be faced with. Thus, evaluating the quality of procedural videos on YouTube, in our case blepharoplasties, for surgical educational purposes is of value. Our evaluation found 78% of evaluated videos to be of low to moderate educational quality. With a similar concern in mind, other studies have been published evaluating, for example, laparoscopic fundoplication videos on YouTube [17]. Frongia et al. also saw varying degrees of quality of available video material, a result we can relate to. To the best of our knowledge, our study is the first to evaluate the educational quality of blepharoplasty videos on YouTube. A good educational video should in our opinion include the criteria we proposed but as our results demonstrate the information provided by most blepharoplasty videos available is incomplete. However, as surgical residents' training curves may be accelerated by watching high-quality educational videos the rate of good-quality surgical videos should be increased and the video scoring system as we described for blepharoplasties can be used for this purpose. Other surgical disciplines are starting to address this need as well and consensus reports on ways of surgical procedure video presentations have already been published [20]. Additionally, video platforms addressed specifically to the medical community are gaining in popularity. Among these are 'MedTube' (<https://medtube.net>) or VuMedi (<https://www.vumedi.com>). Surgical societies have also recognized the need for high-quality videos among them ISAPS (the International Society for Aesthetic Plastic Surgery). Platforms like these might provide more high-quality videos as they provide videos by certified specialists for specialists. Establishing peer review processes for this surgical video platform content might be the appropriate next step towards transparently guaranteeing high-quality content. For most of these professional platforms registrations or memberships will be required. This might make information not as readily available to residents. As the information provided will be of generally good quality these registration processes should be encouraged in our opinion. Also, plastic surgery departments might want to consider recording surgeries and standard operating procedures to assure that their own residents are aware of what is expected of them. Of course, especially in the beginning, the creation of video material will be time and resource consuming but we strongly believe in its benefit especially as the on-sight education time for our residents is limited by the laws on working hours.

Some limitations of our study need to be mentioned. We are aware that a major limitation of our study is the lack of a validated evaluation scale for measuring the quality of the assessed videos. However, scores including the relevant steps of a particular procedure have been employed previously [9]. As the validation of the score is tested for the first time and subjective components related to the reviewers might exist, scores were evaluated by two surgeons to provide consistency of the system. Nevertheless, two reviewers (even with the availability of a third reviewer to resolve potential controversies) may be insufficient for validation. Another apparent limitation is that our study only demonstrates the situation of available videos at a certain time. Social media like YouTube have a dynamic character by definition which means that these results might be different in the future. Despite this quick turnover of the uploaded content, however, the most popular videos list may not change that fast. A third limitation is the low number of included videos ( $n=36$ ), we did however include the first 300 videos in our initial evaluation and

the total view count of 2,752,583 indicates the impact of the videos and thus the value of this study.

## Conclusion

The quality of available educational surgical video content varies widely. Surgical trainees need to be critically aware of this as view counts as well as the number of likes and comments will not necessarily relate to videos' educational quality. There is a need for high-quality educational videos. It should thus be in the interest of educational institutions to participate in sharing videos on this platform to improve the quality of the delivered information as well as the educational experience of trainees.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Patient consent

For this type of study informed consent is not required.

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