Evaluating YouTube as a Source of Patient Information for Blefaroplasty

Fatih Savran, MD[1]🔘   Emine S. Elibol, MD[2]🔘

[1] Department of Otolaryngology, University of Health Sciences, Umraniye Research and Education Hospital, Istanbul, Turkey
[2] Department of Ophthalmologist, University of Health Sciences, Goztepe Research and Education Hospital, Istanbul, Turkey

Address for correspondence Fatih Savran, MD, Department of Otolaryngology, University of Health Sciences, Umraniye Research and Education Hospital, Istanbul, 34764, Turkey (e-mail: fatih.savran@hotmail.com).

Abstract

This study aims to evaluate the content and quality of popular videos about blepharoplasty treatment in YouTube. Four keywords "blepharoplasty," "upper blepharoplasty," "lower blepharoplasty," and "blepharoplasty information" were searched in YouTube. After the videos were sorted by the number of views, the last 50 videos were based on general characteristics, primary purpose, information content, relevance, audiovisual quality, as well as viewer interaction index DISCERN score (minimum–maximum: 16–75), *Journal of the American Medical Association* (JAMA) score (minimum–maximum: 0–4), and Global Quality score (minimum–maximum: 0–5), and view rate formulas were calculated for each video. A total of the best 49 videos were evaluated in our study. The total number of views of these videos was 10,938,976. The total duration of these videos was 409 minutes. The average duration of the videos was 8.35 ± 8.38 (standard deviation [SD]). There was no significant ($p > 0.05$) correlation between the measurement of DISCERN scores of the two observers. A significant ($p < 0.05$) difference was observed between the JAMA score measurements of the two observers. There was no significant difference ($p > 0.05$) between the GQS score measurements of the two observers. Currently, YouTube is not a viable resource for patients to learn about blepharoplasty. Physicians should be aware of the limitations and provide up-to-date and peer-reviewed content on the web site, and patients should also be warned about obtaining information.

Keywords
► blepharoplasty
► YouTube
► video analysis
► patient information

Dark circles, "crow's feet" wrinkles, eyelid bags, dermatochalasis, and thinning and drying of the skin are the main features of the aging of the upper part of the face. Falling and emptying of the upper eyelid, loss of volume, and a sunken appearance of the eye with a deep furrow are other signs of aging.[1] The cumulative effect of aging-related changes in the eyelid area results in "eyelid sagging," suborbicular ocular fat (SOOF) descent, eyelid/eyebrow drooping, loss of skin elasticity, and subcutaneous fat loss.[2] Once upon a time, the only possible treatment for aging the periorbital area is surgery (blepharoplasty) or laser-assisted procedure or injection of fillers.[1]

The reasons for patients undergoing upper blepharoplasty may be purely cosmetic, functional, or both. Patients may apply for cosmetic upper blepharoplasty with esthetic concerns about sagging skin which may result in a more youthful appearance. Clinical evaluation and management of both functional and cosmetic concerns are important.[3] Also, dermatochalasis is a senile pathology characterized by drooping upper eyelids which can cause visual field loss, decreased contrast sensitivity, and increased astigmatism.[4] In addition, it should be noted that any drooping of the upper eyelid also requires ptosis repair due to poor muscle function. Live surgery performed by videotapes and skilled

surgeons should be observed before attempting the first case.[5]

The effect of transmitting health information through social media platforms has been analyzed by various studies. Many researchers reviewed YouTube content for specific health issues. However, no one has previously analyzed the video content about blepharoplasty on YouTube in terms of patient and content.

Our aim in this study was to evaluate the content of the most-watched YouTube videos about blepharoplasty.[6–14]

Methods

Search Strategy

Online video hosting resource YouTube (*http://www.youtube. com*) was searched for videos containing information on blepharoplasty on January 21, 2021. Four keywords were searched on YouTube: "blepharoplasty," "upper blepharoplasty," "lower blepharoplasty," and "blepharoplasty information." There are many different eyelid problems and their different surgical approaches. Canthopexy, canthoplasty, and ptosis surgery are some of them. It is known that the most common eyelid esthetic is blepharoplasty. We also evaluated only operations involving blepharoplasty to be specific in our study. English-language videos of the top 50 results that attract attention according to the number of views on YouTube were displayed. The following exclusion criteria were applied: non-English, unrelated to blepharoplasty knowledge, low audiovisual quality, and replicas. The top 50 videos ranked according to the number of views that met the inclusion criteria were then evaluated. This study did not require ethics committee approval, as it contained only publicly available data. The first 50 videos that appeared on the first three pages were included in the study, since the search results on the site include the first three pages and 95% of the people doing an online search will not look beyond the first three pages of the printout.[14]

Video Assessment

1. All videos were viewed as a whole and the following general parameters were recorded for each: (1) number of views, (2) time (minutes), (3) the number of comments, and (4) the total number of "likes" and "dislikes." Videos were divided into the following seven main groups according to their sources: (1) surgeon, (2) patient/personal, (3) education, (4) doctor (eye diseases, ear nose throat diseases, plastic surgery, or doctor), (5) TV show/YouTube channel, (6) clinic, and (7) charity.

2. Interaction index and view rate formulas were calculated for each video to evaluate the level of engagement using likes, dislikes, total view, and load times relative to Hassona et al.[12] Interaction index defined as; ([number of likes – number of dislikes] / total number of views) $\times$ 100%. Viewing rate defined as; (number of views / number of days since upload) $\times$ 100%.

3. The main purpose of the videos: the videos were categorized under five headings: (1) patient experience, (2) parental experience, (3) surgical treatment procedure, (4) education, and (5) blepharoplasty patient information. The purpose classification was based heavily on the subject in focus. The videos were independently reviewed by an experienced ophthalmologist and otolaryngologist.[15]

All videos were additionally evaluated regarding their DISCERN, the *Journal of the American Medical Association* (JAMA), and Global Quality scores (GQS).

4. Corresponds to an assessment consisting of three parts in the DISCERN scoring system with a total of 16 questions, each scored from 1 to 5. This scoring system evaluates the objectivity and exhaustibility of medical information specifically related to treatment. The first part evaluates the reliability of a publication (an online video in our case) with 8 questions, followed by the second part that evaluates the information about the treatment with 7 questions, and the third part that evaluates the general quality of the video content, and the last question in the third part is removed from the scoring and evaluated on 15 questions. The DISCERN scoring system ranges from 16 to 75 points and is excellent (i.e., 63–75 points), good (i.e., 51–62 points), moderate (i.e., 39–50 points), poor (i.e., 27–38 points), or very poor (i.e., 16–26 points).

5. The JAMA scoring system is a well-known quality assessment tool that allows users to evaluate the reliability of online health-related resources. It consists of four criteria, that is (1) authorship, (2) citation, (3) description, and (4) currency, and each of them is scored between 0 and 1. Four points indicate the highest quality.[16]

6. Finally, we also used the GQS system which allows users to rate the overall quality of video content on a 5-point Likert's scale. GQS also reflect the flow of information presented in online videos and ease of use. The video was given 0 points, 1 point, and 2 points according to the video details of each element.[16,17]

Statistical Analysis

The data were collected independently by one ophthalmologist and one otolaryngologist, who specialize in blepharoplasty, using a Microsoft Excel spreadsheet. Mean, standard deviation (SD), median, minimum, maximum value frequency, and percentage were used for descriptive statistics. Intraclass correlation was used for the repeated quantitative analysis. The McNemar test was used for the comparison of repeated qualitative data. Kaplan–Meier was used in the survival analysis. SPSS 27.0 was used for statistical analyses. Statistical significance was set at $p < 0.05$.

Ethics Statement

Institutional Review Board approval was unnecessary for this study, because only public access data were used.

Results

A total of the best 49 videos were evaluated in our study. Ninety-nine videos were evaluated. Five videos were
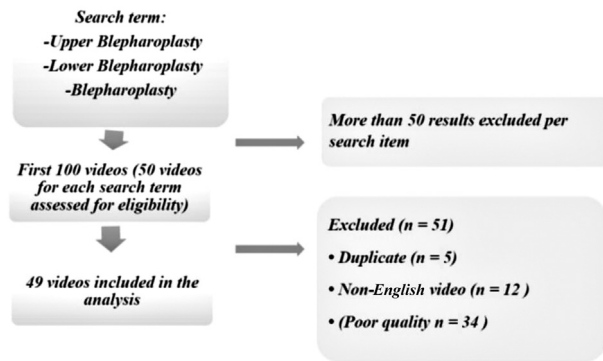
Fig. 1 Analysis of video.

Fig. 2 Sources.

repeated because 12 videos were not in English, and 34 videos were excluded because they were of poor quality (►**Fig. 1**). The total number of views of these videos was 10,938,976. The total duration of these videos was 409 minutes. The average duration of the videos was 8.35 ± 8.38 (SD). Two doctors watched and evaluated the videos separately.

The descriptive analysis is shown in ►**Table 1**.

It was seen that 32 (65.3%) of the videos were uploaded to YouTube by doctors, 13 (26.5%) by the patients, and 4 (8.2%) by a clinic (►**Fig. 2**).

When the videos were evaluated according to their purposes, there were 27 (55.1%) videos with surgical treatment experience. There were 13 (26.5%) videos of patient experience, 6 (12.2%) of video training, and 3 (6.1%) videos of blepharoplasty patient information (►**Fig. 3**).

There was no significant ($p > 0.05$) correlation between the measurement of DISCERN scores of the two observers. A significant ($p < 0.05$) difference was observed between the JAMA score measurements of the two observers. There was no significant difference ($p > 0.05$) between the GQS score measurements of the two observers (►**Table 2**).

JAMA score did not differ significantly ($p > 0.05$) in physician, patient, and clinical groups. The GQS score in the physician group was significantly higher ($p < 0.05$) than the patient group. The GQS in the clinical group was not significantly different ($p > 0.05$) from the patient and doctor groups. DISCERN scores did not differ significantly ($p > 0.05$) in physician, patient, and clinical groups (►**Table 3**).
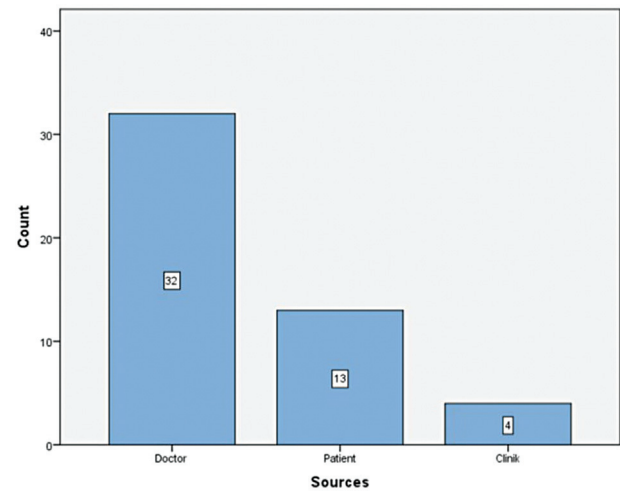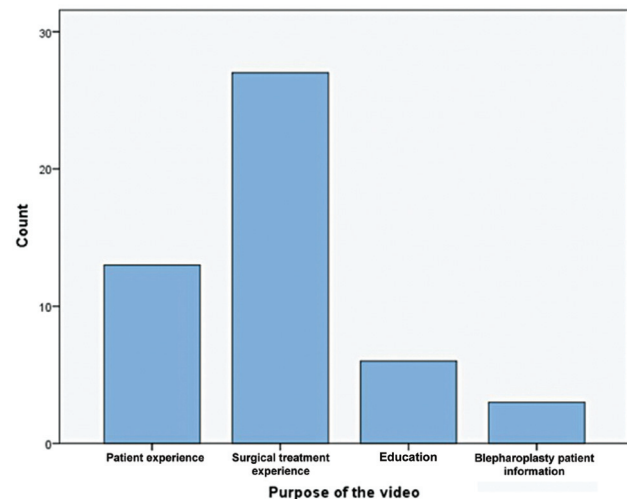
Fig. 3 Purpose of the video.

Discussion

In previous studies, diseases such as rhinosinusitis, oral cancers, cleft lip and palate, refractive surgery, and strabismus were analyzed with YouTube. Our study is the first study

Table 1 The descriptive analysis

Description	Minimum–maximum	Median	Mean $\pm$ SD
Like	0.00–5,800	626.0	1,050.9 $\pm$ 1,160.1
Dislikes	0.00–1,100	60.0	102.7 $\pm$ 169.8
Publication period	541.0–4,581	2,252.0	2,428.2 $\pm$ 1,060.8
Duration (min)	1.00–51	6.00	8.35 $\pm$ 8.38
Views ($\times 10^4$)	7.44–92	13.71	22.32 $\pm$ 18.69
Interaction index	0.00–1.84	0.36	0.43 $\pm$ 0.38
View rate	0.17–5.22	0.76	1.15 $\pm$ 1.15

Abbreviation: SD, standard deviation.

Table 2 Observes rating

		Minimum–maximum	Median	Mean ± SD/n (%)	r	p
DISCERN score						
Observer A		16.0–52.0	28.0	29.69 ± 7.98	0.012 (−0.267 to 0.90)	0.466[a]
Observer B		17.0–45.0	31.0	31.24 ± 5.43		
JAMA score						
Observer A	0			12 (24.5)		0.000[b]
	I			13 (26.5)		
	II			15 (30.6)		
	III			9 (18.4)		
Observer B	I			2 (4.1)		
	II			44 (89.8)		
	III			3 (6.1)		
GQS						
Observer A	I			5 (10.2)		0.110[b]
	II			21 (42.9)		
	III			16 (32.7)		
	IV			7 (14.3)		
Observer B	I			2 (4.1)		
	II			13 (26.5)		
	III			21 (42.9)		
	IV			13 (26.5)		

Abbreviations: GQS, Global Quality score; JAMA, Journal of the American Medical Association; SD, standard deviation.
[a]Intraclass correlation.
[b]McNemar's test.

Table 3 Evaluation of video resources

		Doctor	Patient	Clinic	p
JAMA score	Mean ± SD	1.56 ± 1.05	0.92 ± 0.86	2.00 ± 1.41	0.104[a]
	Median	2.00	1.00	2.50	
GQS score	Mean ± SD	2.72 ± 0.85	2.00 ± 0.58	2.50 ± 1.29	0.034[a]
	Median	3.00	2.00	2.50	
DISCERN score	Mean ± SD	31.3 ± 6.0	29.9 ± 3.3	35.5 ± 5.4	0.142[a]
	Median	32.0	30.0	37.0	

Abbreviations: GQS, Global Quality score; JAMA, Journal of the American Medical Association; SD, standard deviation.
[a]Kruskal–Wallis (Mann–Whitney U-test).

showing the level of information acquisition of patients from YouTube with blepharoplasty and comparing two surgeons.

Blepharoplasty is one of the most common esthetic procedures applied today. Its popularity is partly due to its ability to consistently make significant improvements in facial esthetics with a relatively short operation with an acceptable risk profile.[18] Popular social media web sites, including YouTube, are increasingly used by patients as a source of health information.[14] Patients can search YouTube for information because patient education resources provided by health care providers can be written at a level of comprehension that they cannot understand which cannot evaluate the quality, reliability, and accuracy of this infor-

mation. In our study, it was showed how much of the YouTube videos came from patients and other videos such as education and doctor training.[19]

YouTube has helpful videos that can aid patient or parent decision-making and education. However, most of these have poor production or education quality. Without a clinical background to evaluate videos, most parents or patients will not be able to determine whether a video is valuable in understanding blepharoplasty correctly. Physicians who have these data can inform their patients about what types of videos to look for and which to avoid. Higher quality videos tend to be news programs followed by educational-themed programs.[20] In our study, it was observed that the videos of

upper eyelid blepharoplasty were mostly uploaded by doctors. However, in the video evaluation, only the GQS in the physician group was significantly different from the patient group. We found no significant difference in other DISCERN and JAMA scoring.

The fact that blepharoplasty surgery is relatively safe and easy, that it can be performed mostly in local operating room conditions, the quality of life is not impaired in the postoperative period, the postoperative period is mostly painless and comfortable, the development of gravity-induced dermatochalasis in most middle-aged patients, and the increase in people's interest in esthetics in recent years have led to the widespread application of blepharoplasty. The positive effects of upper lid blepharoplasty on visual functions have been shown in many studies. Hacker and Hollsten found an average increase in visual fields of 26.2% in their patients who underwent upper lid blepharoplasty.[4] Rogers et al found a significant increase in contrast sensitivity values in 14 patients who underwent upper lid blepharoplasty.[21] Likewise, Hollander et al in a meta-analysis evaluating 3,525 studies, argued that upper lid blepharoplasty significantly improved the quality of life of patients.[22] It is known that patients with dermatochalasis or ptosis have a significant increase in their quality of life after surgical reconstruction.[23–26] In our study, it was aimed to observe the effects of blepharoplasty with videos shared on social media.

In the age of technology, people seek answers to all their demands, including health services, by searching through social media, listening to or reading comments before they go to professionals. Social media or the internet seems to have become information garbage. As seen in our study, it is very difficult for patients to reach accurate and complete information. Social media is mostly used by doctors and YouTubers for advertising purposes, it is important to be interesting and popular when creating content. As quality information sources do not have a striking aspect in terms of both title and content, the viewing rate decreases and it becomes more difficult to notice as it falls behind on the YouTubeplatform. Health professionals should make and recommend quality YouTubebroadcasts that provide striking but accurate information that will satisfy the curiosity of patients. The increasing prevalence of reference videos for blepharoplasty is likely due to the good management of the postoperative healing process accompanying this procedure, the rapid recovery, and the increased performance of the surgery with local anesthesia. In our study, it was thought that the majority of the videos made by the doctor were due to the fact that the surgery was performed with local anesthesia in a short time. The number of upper blepharoplasty videos in the YouTube library was higher than for lower blepharoplasty. This is probably due to the increasing prevalence of reference videos for upper blepharoplasty. Upper blepharoplasty is a more common procedure, and it also reveals a possible need for higher quality production.

There was a general shortage of YouTube videos addressing the indications and risks of each of these procedures. Unfortunately, this is perhaps the most important issue when physicians create videos in their videos in a way that parents and patients would like to understand. As parents and patients become an increasingly proactive part of the health care decision-making team, it is imperative that they understand the risks and indications of a proposed procedure.[20] In our study, there was a shortage of videos that addressed the indications and risks. Increase in the number of these videos may be required to proactively participate in the treatment process for parents and patients. The lack of information on the indications and risks of blepharoplasty suggests that YouTube may not be able to fully answer a patient's important questions about procedures and the physician should refer the patient to useful sources of information.

Although the vast majority of videos on YouTube are created by physicians, the insufficiency of videos may be long enough and not contain all the information. This inevitably leads to prejudices and neglect of important information.[20] In our study, although most of the videos posted on YouTube on blepharoplasty were uploaded by doctors, the poor quality of the videos and the lack of important information can help the videos to be completed and uploaded after being evaluated by professionals. Perhaps medical professionals might want to think strongly of creating comprehensive, high-quality videos on YouTube that cover the basics of blepharoplasty and other common procedures and then refer patients to these videos. Considering the quality of information observed on YouTube documented in this study, this seems like a highly worthwhile effort.

The likes and dislikes functionality of a video on YouTube is a way for a viewer to quickly share their positive or negative rating after watching a video, thus giving a potential viewer an idea of whether a particular video will be useful or entertaining.[20] It can be concluded that a video with a large number of "likes" on blepharoplasty will have a better overall quality than a less "liked" or "disliked" video. Unfortunately, in our study, "likes" and "dislikes" were not related to accuracy, sophistication, or procedure.

In a study conducted by Nicholl et al, it was observed that parents and patients paid attention to information about correct information, reliability, and up-to-dateness when searching for information. They have demonstrated this using modified JAMA and DISCERN scores.[27] In our study, it was thought that we addressed the concerns of the patients by using the DISCERN, JAMA, and GQS scoring systems. In addition, 42.9% of the GQS evaluation of observer A was of poor quality, but some information was available, videos were evaluated as very limited use for patients, while observer B had insufficient flow in 42.9%, some information was included but important issues were missing, it has been found to be somewhat useful for patients.

The work of Bruce-Brand et al was evaluated and the average DISCERN scores were found to be 41.1. It was evaluated as medium quality in this study. In the same study, the highest scores were reported as 55 for nonphysician sites, 49 for physician sites, and 52.5 for academic sites. In our study, the statistical scores were 31.3 ± 6 in physicians, 29.9 ± 3.3 in patients, and 35.5 ± 5.4 in clinical videos. Although the clinical videos seemed more useful, all videos were evaluated as poor in general.[26]

Limitations and Strengths

The weaknesses of this study included the variable nature of the YouTube video library, the unknown method for ranking video results, and the subjective nature of our rating criteria. In our study, the evaluation was made by two different doctors. In our evaluation, while there was no difference between the DISCERN and GQS scores, it was found that there was a difference between the doctors in the other JAMA score. The results of our study will undoubtedly change over time as new videos are uploaded to YouTube. The results of a typical search will also be sorted according to a proprietary algorithm that is not available to the public, thus placing a filter on any comprehensive YouTube library analysis.[20] Another weakness of this study was that only the top 50 videos were included for each keyword, as the sample size was limited after the exclusion criteria were applied.

Authors acknowledge that the way video content that analyzed by a doctor may differ from an ordinary person. Patients, parents, and doctors may have different expectations regarding video content, but currently there is not enough information about what information parents and patients prefer to see on a web site or YouTube when searching for information about medical illnesses. In our study, it was observed that the DISCERN scores of YouTube blepharoplasty videos were less useful in the evaluation.[19]

Despite these limitations, this study is the first to investigate the quality of blepharoplasty videos on a popular video sharing site. According to other studies, this study gains importance as it is the first study comparing DISCERN, JAMA, and GQS scores between two doctors.

Conclusion

YouTube is a variable quality source of information on blepharoplasty, with a wide audience and the potential to influence patients' knowledge and behavior. Physicians and professional organizations must be aware of and adopt this emerging technology to raise awareness about blepharoplasty and empower patients to distinguish useful information from misleading information. There is no difference in the popularity and viewing of useful and misleading videos. YouTube is not currently a viable resource for patients to learn about blepharoplasty. Physicians should be aware of the limitations and provide up-to-date and peer-reviewed content on the web site, and patients should also be warned about obtaining information.

Note

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' Contributions

All authors were involved in the conception and design of this study. F.S. and E.S.E. wrote the analysis plan. F.S. and E.S.E. conducted the search, screened all videos for eligibility and performed quality assessment, and data extraction. F.S. analyzed and interpreted the data. E.S.E. wrote the drafts of the manuscript and all other authors critically revised the different versions of the manuscript. Moreover, all authors were involved in discussing the results and interpreting the findings. All authors read and approved the final manuscript.

References

1 Cantisani C, Amori P, Vitiello G, et al. Nonsurgical blepharoplasty. Dermatol Ther (Heidelb) 2019;32(06):e13119

2 Mack WP. Blepharoplasty complications. Facial Plast Surg 2012; 28(03):273–287

3 Weissman JD, Most SP. Upper lid blepharoplasty. Facial Plast Surg 2013;29(01):16–21

4 Hacker HD, Hollsten DA. Investigation of automated perimetry in the evaluation of patients for upper lid blepharoplasty. Ophthalmic Plast Reconstr Surg 1992;8(04):250–255

5 Biesman BS. Blepharoplasty. Semin Cutan Med Surg 1999;18(02): 129–138

6 Hegarty E, Campbell C, Grammatopoulos E, DiBiase AT, Sherriff M, Cobourne MT. YouTube as an information resource for orthognathic surgery. J Orthod 2017;44(02):90–96

7 Ozsoy-Unubol T, Alanbay-Yagci E. YouTube as a source of information on fibromyalgia. Int J Rheum Dis 2020;24(02):197–202

8 Almarghoub MA, Alghareeb MA, Alhammad AK, Alotaibi HF, Kattan AE. Plastic surgery on YouTube. Plast Reconstr Surg Glob Open 2020;8(01):e2586

9 Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis–a wakeup call? J Rheumatol 2012;39(05):899–903

10 Lee KN, Son GH, Park SH, Kim Y, Park ST. Youtube as a source of information and education on hysterectomy. J Korean Med Sci 2020;35(25):e196

11 Wu V, Lee DJ, Vescan A, Lee JM. Evaluating YouTube as a source of patient information for functional endoscopic sinus surgery. Ear Nose Throat J 2020 (e-pub ahead of print). Doi: 10.1177/0145561320962867

12 Hassona Y, Taimeh D, Marahleh A, Scully C. YouTube as a source of information on mouth (oral) cancer. Oral Dis 2016;22(03): 202–208

13 Biggs TC, Bird JH, Harries PG, Salib RJ. YouTube as a source of information on rhinosinusitis: the good, the bad and the ugly. J Laryngol Otol 2013;127(08):749–754

14 Desai T, Shariff A, Dhingra V, Minhas D, Eure M, Kats M. Is content really king? An objective analysis of the public's response to medical videos on YouTube. PLoS One 2013;8(12):e82469

15 Korkmaz YN, Buyuk SK. YouTube as a patient-information source for cleft lip and palate. Cleft Palate Craniofac J 2020;57(03): 327–332

16 Kuçuk B, Sirakaya E. An analysis of YouTube videos as educational resources for patients about refractive surgery. Cornea 2020;39 (04):491–494

17 Balasopoulou A, Kokkinos P, Pagoulatos D, et al. Symposium Recent advances and challenges in the management of retinoblastoma Globe - saving Treatments. BMC Ophthalmol 2017;17 (01):1

18 Zoumalan CI, Roostaeian J. Simplifying Blepharoplasty. Plast Reconstr Surg 2016;137(01):196e–213e

19 Mangan MS, Cakir A, Yurttaser Ocak S, Tekcan H, Balci S, Ozcelik Kose A. Analysis of the quality, reliability, and popularity of

information on strabismus on YouTube. Strabismus 2020;28(04): 175–180

20 Sorensen JA, Pusz MD, Brietzke SE. YouTube as an information source for pediatric adenotonsillectomy and ear tube surgery. Int J Pediatr Otorhinolaryngol 2014;78(01):65–70

21 Rogers SAG, Khan-Lim D, Manners RM. Does upper lid blepharoplasty improve contrast sensitivity? Ophthal Plast Reconstr Surg 2012;28(03):163–165

22 Hollander MHJ, Contini M, Pott JW, Vissink A, Schepers RH, Jansma J. Functional outcomes of upper eyelid blepharoplasty: a systematic review. J Plast Reconstr Aesthet Surg 2019;72(02): 294–309

23 Papadopulos NA, Hodbod M, Henrich G, et al. The effect of blepharoplasty on our patient's quality of life, emotional stability, and self-esteem. J Craniofac Surg 2019;30(02):377–383

24 Jacobsen AG, Brost B, Vorum H, Hargitai J. Functional benefits and patient satisfaction with upper blepharoplasty - evaluated by objective and subjective outcome measures. Acta Ophthalmol 2017;95(08):820–825

25 Briceño CA, Fuller ML, Bradley EA, Nelson CC. Assessment of the Abbreviated National Eye Institute Visual Function Questionnaire (NEI VFQ 9) in blepharoptosis and dermatochalasis. Arq Bras Oftalmol 2016;79(04):226–228

26 Bruce-Brand RA, Baker JF, Byrne DP, Hogan NA, McCarthy T. Assessment of the quality and content of information on anterior cruciate ligament reconstruction on the internet. Arthroscopy 2013;29(06):1095–1100

27 Nicholl H, Tracey C, Begley T, King C, Lynch AM. Internet use by parents of children with rare conditions: findings from a study on parents' web information needs. J Med Internet Res 2017;19(02):e51