

Do YouTube videos on microscopic varicocelelectomy provide reliable information?

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SUMMARY

OBJECTIVE: This study aimed to assess the quality of YouTube videos about microscopic varicocelelectomy.

METHODS: On November 20, 2022, a YouTube search for “Microscopic Varicocelelectomy” was conducted. Non-English videos uploaded by producers for commercial purposes that lacked audio and subtitles were excluded from the study. A total of 50 videos were evaluated using the *Journal of the American Medical Association Benchmark Score* and the Global Quality Score, both of which are recognized internationally. Additionally, the researcher developed the Microscopic Varicocelelectomy Score to evaluate the videos’ technical content. The upload source, video length, number of views, likes, dislikes, and video power indexes were evaluated.

RESULTS: The Global Quality Score, *Journal of the American Medical Association Benchmark Score*, and Microscopic Varicocelelectomy Score of the academically prepared videos were significantly higher than those of the physician-prepared videos ($p<0.05$). The Global Quality Score, *Journal of the American Medical Association Benchmark Score*, and Microscopic Varicocelelectomy Score of uploaded videos with audio, audio, and subtitles were significantly higher than those with only subtitles ($p<0.05$). The video duration was positively correlated with *Journal of the American Medical Association Benchmark Score*, Global Quality Score, and Microscopic Varicocelelectomy Score. The video power index had a strong positive correlation with the number of likes. Moreover, a strong positive correlation was observed, indicating that the Global Quality Score and *Journal of the American Medical Association Benchmark Score* increased as the Microscopic Varicocelelectomy Score increased.

CONCLUSION: YouTube videos regarding microscopic varicocelelectomy were of notably low quality. If the video content created by specialist physicians and academic centers is more meticulously organized, more accurate data can be transmitted. Consequently, viewing video content may not be advised based on the available data.

KEYWORDS: Infertility. Varicocele. Internet. Educational technology. Testis.

INTRODUCTION

Male infertility is a growing issue worldwide, particularly in developed nations.

Varicocele is the most prevalent pathology in male infertility. Although varicocele is seen in 15–22% of the adult male population, it is observed in 30–40% of men who apply for primary infertility and 80% of men who apply for secondary infertility^{1,2}.

Varicocele is dilatation of the veins of the pampiniform plexus; although many factors are shown as etiological reasons, it is the most known and accepted anatomical factor today. The left spermatic vein is approximately 8–10 cm longer than the right and is opened at a right angle to the left renal vein. The valves in the left spermatic vein are dysfunctional, and the left renal vein is compressed between the aorta and the superior mesenteric artery, which increases the pressure in the internal

vein (proximal nutcracker phenomenon) and iliac artery compression on the iliac vein as well as increases the pressure in the external spermatic vein (distal nutcracker phenomenon) and dilatation³.

Many pathophysiological mechanisms have explained the effect of varicocele on semen parameters and infertility. The majority of these mechanisms include an increase in testicular temperature, a rise in venous pressure, hormonal dysfunction, epididymal dysfunction, autoimmunity, acrosome reaction disorders, renal-adrenal reflux, DNA damage, and oxidative stress. The most studied and accepted mechanism is the increase in testicular temperature⁴.

The diagnosis of varicocele is made by physical examination, and additional imaging methods are not needed. However, in conditions that complicate the physical examination, color Doppler ultrasonography may be necessary^{5,6}.

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Various surgical procedures for the treatment of varicocele have been described. These include percutaneous embolization (interventional radiology), open surgery, laparoscopic, and microsurgical procedures. Compared with conventional varicolectomy techniques, microsurgical varicolectomy has been shown to have higher rates of spontaneous pregnancy and lower rates of postoperative recurrence and hydrocele formation in infertile men⁷.

YouTube was founded in 2005. The number of YouTube users worldwide in 2021 is approximately 2,240.03 million, and it is anticipated that, by 2025, it will increase to 2,854.14 million⁸. The increased use of social media and the Internet in recent years has also shown itself in health and medicine. However, information pollution is high in all fields, including urology, and it is not easy to obtain accurate and quality information^{8,9}. Only one study evaluated the varicocele-related website content published in 2011¹⁰.

Research shows that YouTube is the most widely used platform for information and education by both patients and healthcare professionals^{11,12}. Although microscopic varicolectomy is the most recommended and preferred surgical method in treating varicocele, videos about microscopic varicolectomy on YouTube have not been evaluated before. YouTube is an excellent opportunity to learn about surgical techniques and develop skills by watching videos. However, as they are not subject to expert review or quality control, YouTube videos' dependability is in doubt. This study aimed to evaluate the quality of microscopic varicolectomy videos on YouTube with the scoring system prepared with the basic steps of the procedure and current scoring systems.

METHODS

On November 20, 2022, YouTube was searched for videos about "Microscopic Varicolectomy." Non-English videos that were commercially uploaded by the producers and did not contain audio and subtitles were excluded from the study. A total of 50 videos were evaluated using the internationally recognized *Journal of the American Medical Association Benchmark Score* (JAMAS) and Global Quality Score (GQS). In the JAMAS scoring system, there are four questions with a score of 0–1 each (maximum 4 points) to evaluate the content's validity, effectiveness, and reliability¹³. The GQS, on the contrary, is a scale evaluated on a scale of 1–5 to determine whether the content is understandable for patients¹³⁻¹⁵. The Microscopic Varicolectomy Score (MVS) was created to evaluate the invasive procedure using 13 criteria, each of which was calculated by the investigator as either 0 or 1

(Table 1). The videos were divided into groups according to the uploaded country, video content (informational, technical), uploading source (academic center, physician), and transmission of information (audio, audio subtitled, and subtitled). Values such as the length of each video, the time spent after uploading, the number of views, the number of likes and dislikes, and the video power index (VPI) were recorded and evaluated¹³⁻¹⁵.

The rate of likes (likes/likes+dislikes) and views rate (the number of views/time on YouTube) were calculated. VPI was calculated as like rate×view rate/100. Our study was approved by the Ethics Committee on 01/02/2023 (80576354-050-99/222). All ethical rules in the Declaration of Helsinki were complied with. Data were analyzed with SPSS 22 and GraphPad Prism version 9 (GraphPad Software, CA, USA). The Shapiro-Wilk test was used for normality and regular distribution of variables, and the Mann-Whitney U test was used for categorical variables. The Kruskal-Wallis test was used to compare different score groups, and the Spearman correlation test was used to investigate the relationship between continuous variables. A value of p<0.05 was considered statistically significant.

Table 1. Microscopic Varicolectomy Scoring.

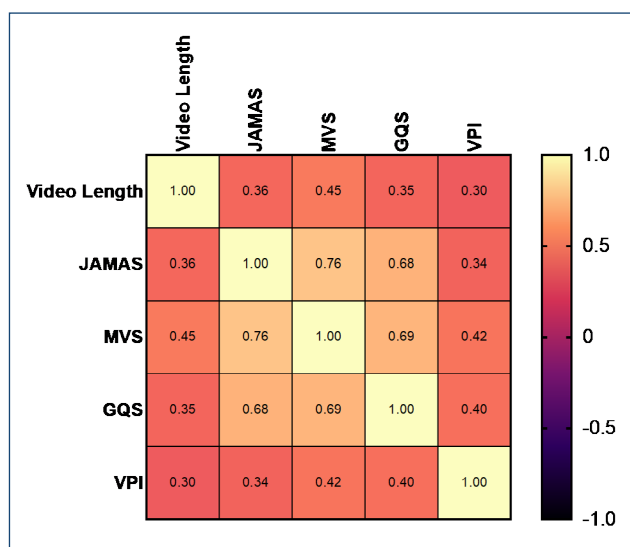
Preoperative evaluation
Are surgical indications stated in the video?
Is there information about spermiogram results in the video?
Is the side to be varicolectomy indicated in the video?
Is the magnification and brand of the microscope mentioned during the surgery in the video?
Intraoperative evaluation
Is there information about the types of surgical incisions in the video?
Is there information about the use of papaverine in the video?
Is there information about the use of mini-Doppler USG in the video?
Is there information about preserving the vas deferens during the operation in the video?
Is there information about the external spermatic vein during the operation in the video?
Is there any information about the gubernacular vein during the operation in the video?
Postoperative evaluation
Is the length of hospital stay specified in the video?
Is there information about post-op complications in the video?
Is there any information about the postoperative control examinations in the video?

RESULTS

Most of the videos (86.3%) were uploaded by physicians (74.5%) for informational purposes. The videos were uploaded mainly by the individuals living in the Asian countries (64.7%). The average video length was 503 s, and the average time since upload was 1,325 days. The average number of views, likes, and VPI were 34,115, 156, and 0.31. The average GQS, JAMAS, and MVS were 2.1, 1.76, and 4.66, respectively.

The GQS, JAMAS, and MVS scores of academically prepared videos were significantly higher than those of physician-prepared videos ($p < 0.05$). The GQS, JAMAS, and MVS scores of uploaded videos with audio, audio, and subtitles were significantly higher than those with only subtitles ($p < 0.05$). The GQMS, MAMAS, and MVS scores of videos uploaded with only audio, audio, and subtitles did not differ significantly ($p = 0.639$, $p = 0.123$, and $p = 0.547$, respectively). The length of the video was positively correlated with JAMAS, GQS, and MVS. There was a strong correlation between VPI and the number of likes. In addition, as the MVC score increased, a strong positive correlation was observed, indicating that the GQS and JAMAS scores also increased (Graph 1).

The effect size (Cohen's d) and power value ($1 - \beta$) for MVS, GQS, and JAMAS scores, compared between the groups of videos, were calculated using the G*Power software (version 3.1.9.2). The alpha level used for this analysis was 0.05. The effect size and power values were 1.78 and 0.98, for MVS, 0.80 and 0.75 for GQS, and 1.53 and 0.98 for JAMAS scores.



Graph 1. Correlation of video length with JAMAS, MVS, GQS, and VPI scores. JAMAS: *Journal of the American Medical Association Benchmark Score*; MVS: *Microscopic Varicocele Score*; GQS: *Global Quality Score*; VPI: *video power index (like ratio × view ratio / 100)*; Like: *like ratio (like / like + dislike)*.

DISCUSSION

Today, the Internet is an easy-to-access, inexpensive, unrestricted source of information. However, the relevance, accuracy, and completeness of this information are crucial. It is known that 7% of daily Google searches pertain to health¹⁶. Two out of three adults in the United States regularly search online for health-related information¹⁷. In Germany, 40% of Internet users search the Internet for health information before and a half after their appointment¹⁸. However, online sharing about health is done mainly by non-physicians. These posts include patient experiences, advertisements, alternative treatment techniques, and commercial centers. These posts sometimes contain misleading information that puts human health at risk¹⁴.

Varicocele is known as the most common surgically correctable cause of male infertility. Approaches such as retroperitoneal and inguinal open techniques, microsurgical inguinal and subinguinal procedures, laparoscopic repair, and radiological embolization have been reported in the treatment of varicocele. Microscopic varicocelectomy is the gold standard treatment for men with varicocele due to its low rate of complications and high spontaneous pregnancy rate¹⁹. As microscopic varicocelectomy is a frequently performed surgery, there is much information about this surgery on the Internet and YouTube. Information about varicocele on the Internet has been evaluated before. However, there has been no research in the literature evaluating YouTube videos about microscopic varicocelectomy. Referencing the European Association of Urology Guidelines, they devised a 14-point evaluation scoring system and evaluated 20 different websites. As a result of the evaluation, it was seen that 4 of the 20 sites were established and operated by a urologist, 4 were established and operated by an obstetrician and gynecologist, and 5 of them were commercial sites. It is not clear who founded the remaining seven sites. They found that the sites established by urologists received the highest scores¹⁰.

The purpose of this study was to examine the information, content quality, and trustworthiness of YouTube videos pertaining to “microscopic varicocelectomy,” as well as the information, content quality, and trustworthiness of YouTube videos pertaining to “microscopic varicocelectomy.” This is the first study in the literature to investigate this issue. Notably, 50 videos with a total duration of approximately 7 h and 1.7 million views were evaluated. It was observed that 88% of the videos were for information purposes, 39% had a voice, and 22% had both voice and subtitles. In three studies examining YouTube video quality related to retrograde inter-renal surgery, percutaneous nephrolithotomy, mini-percutaneous nephrolithotomy, it was

determined that the quality of the audio videos was higher²⁰⁻²². In our study, it was observed that the MVS, JAMAS, and GQS scores of the videos with audio, audio and subtitles were significantly higher than the videos with only subtitles ($p < 0.05$, $p < 0.05$, and $p < 0.05$). This is because giving information by voice is faster and easier than text.

Adorisio et al. evaluated videos on robotic pyeloplasty in children, Yilmaz et al. evaluated mini percutaneous nephrolithotomy videos, and Sogutdelen et al. evaluated videos on holmium laser enucleation of prostate. As a result, they concluded that the quality scores of academically uploaded videos in these three studies were high²²⁻²⁴. In our study, it was observed that 24% of the videos were uploaded academically, and the MVS, JAMAS, and GQS scores of the videos uploaded academically were significantly higher than the videos uploaded by physicians ($p < 0.05$, $p = 0.02$, and $p < 0.05$), which is due to the fact that the academically uploaded videos contain more detailed information, as they are uploaded for educational purposes as well as for informing patients.

In addition, Aydoğan's study examining the quality of the information in YouTube videos on prostate fusion biopsy and Taş et al.'s study on the quality of the information in testicular cancer self-examination videos found that video quality increased as video duration increased^{13,25}. In our study, in parallel with these studies, a low positive correlation was found between video length and MVS, JAMAS, and GQS scores. In other words, as the video length increases, it is seen that the scores increase, which is because the longer the period, the more the time to give information.

Looking at the literature, there are YouTube publications containing more than 90 topics in the Urology section. Most of these publications' video quality and content were inadequate¹¹. In our study, it is observed that the scores of the videos were lower than expected. We think that information about human health, especially surgical procedures, should be given by experts and that the level of knowledge should be at a sufficient level and in an orderly manner.

REFERENCES

1. Pelit ES, Yeni E. Varikoselektomide cerrahi tekniklerin karşılaştırmalı analizi. *Androl Bul.* 2018;20:85-9. <https://doi.org/10.24898/tandro.2018.60352>
2. Dubin L, Amelar RD. Etiologic factors in 1294 consecutive cases of male infertility. *Fertil Steril.* 1971;22(8):469-74. [https://doi.org/10.1016/s0015-0282\(16\)38400-x](https://doi.org/10.1016/s0015-0282(16)38400-x)
3. Kohler FP. On the etiology of varicocele. *J Urol.* 1967;97(4):741-2. [https://doi.org/10.1016/S0022-5347\(17\)63109-4](https://doi.org/10.1016/S0022-5347(17)63109-4)

There were some potential limitations to this study. First, videos in the study were watched and scored by a single urologist. In addition, the opinions of the person rating the quality of the video may be subjective. However, we still think that determining the general quality of the existing videos according to the previously validated scoring systems will form the basis for giving readers and video producers an idea.

CONCLUSION

Videos on YouTube providing information about Microscopic Varicolectomy surgery are of poor quality and they lack content. Advances in technology and the Internet have made it easier for patients and healthcare professionals to access information. However, we think that, to recommend watching Microscopic Varicolectomy surgery videos, experts should prepare videos with better quality and standardized content. We think that this study can guide content producers who consider publishing new videos in the field of microscopic varicolectomy.

ETHICAL ASPECTS

Our study was approved by the Ethics Committee on 01/02/2023 (80576354-050-99/222). All ethical rules in the Declaration of Helsinki were complied with.

AUTHORS' CONTRIBUTIONS

MU: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. **ME:** Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing. **ÜY:** Conceptualization, Investigation, Methodology, Resources, Writing – review & editing. **BÖ:** Methodology, Software, Supervision, Validation, Visualization.

4. Mieusset R, Bujan L, Mondinat C, Mansat A, Pontonnier F, Grandjean H. Association of scrotal hyperthermia with impaired spermatogenesis in infertile men. *Fertil Steril.* 1987;48(6):1006-11. [https://doi.org/10.1016/s0015-0282\(16\)59600-9](https://doi.org/10.1016/s0015-0282(16)59600-9)
5. Sharlip ID, Jarow JP, Belker AM, Lipshultz LI, Sigman M, Thomas AJ, et al. Best practice policies for male infertility. *Fertil Steril.* 2002;77(5):873-82. [https://doi.org/10.1016/s0015-0282\(02\)03105-9](https://doi.org/10.1016/s0015-0282(02)03105-9)
6. Aydos K, Baltaci S, Salih M, Anafarta K, Bedük Y, Gülsoy U. Use of color Doppler sonography in the evaluation of varicoceles. *Eur Urol.* 1993;24(2):221-5. <https://doi.org/10.1159/000474298>

7. Cayan S, Shavakhabov S, Kadiođlu A. Treatment of palpable varicocele in infertile men: a meta-analysis to define the best technique. *J Androl.* 2009;30(1):33-40. <https://doi.org/10.2164/jandrol.108.005967>
8. Statista. Youtube users in the world 2025 [Internet]. [cited on 2022 Dec 19]. Available from: <https://www.statista.com/forecasts/1144088/youtube-users-in-the-world>
9. Pratsinis M, Babst C, Langenauer J, Schmid HP, Piller A, Neuenschwander A, et al. Qualitative assessment of medical information on YouTube: a multilingual comparison of common urological conditions. *Urol Int.* 2021;105(9-10):757-63. <https://doi.org/10.1159/000517292>
10. Tepeler A, Ersöz C, Erdem MR, Akman T, Armađan A, Önel ŞY. Evaluation of information about urologic disorders on the internet: a pilot study of varicoceles. *Urol Res Pract.* 2011;37(4):321-5. Available from: <http://turkishjournalofurology.com/en/evaluation-of-information-about-urologic-disorders-on-the-internet-a-pilot-study-of-varicoceles-13270>
11. Rapp AK, Healy MG, Charlton ME, Keith JN, Rosenbaum ME, Kapadia MR. YouTube is the most frequently used educational video source for surgical preparation. *J Surg Educ.* 2016;73(6):1072-6. <https://doi.org/10.1016/j.jsurg.2016.04.024>
12. Mota P, Carvalho N, Carvalho-Dias E, João Costa M, Correia-Pinto J, Lima E. Video-based surgical learning: improving trainee education and preparation for surgery. *J Surg Educ.* 2018;75(3):828-35. <https://doi.org/10.1016/j.jsurg.2017.09.027>
13. Aydogan TB. Quality of information in YouTube videos on prostate fusion biopsy. *New J Urol.* 2022;17(3):149-57. <https://doi.org/10.33719/yud.2022;17-3-1105871>
14. Kuru T, Erken HY. Evaluation of the quality and reliability of YouTube videos on rotator cuff tears. *Cureus.* 2020;12(2):e6852. <https://doi.org/10.7759/cureus.6852>
15. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: caveat lector et viewer – let the reader and viewer beware. *JAMA.* 1997;277(15):1244-5. PMID: 9103351
16. Rawal A. Google's new health-search engine. *The Startup*; 2022. Available from: <https://medium.com/swlh/googles-new-healthcare-data-search-engine-9e6d824b3ccd>
17. Bach R, Wenz A. Studying health-related internet and mobile device use using web logs and smartphone records. *PLoS One.* 2020;15(6):e0234663. <https://doi.org/10.1371/journal.pone.0234663>
18. Berg A, Digital Health. Vier von zehn informieren sich vor Arztbesuch online; 2019. Available from: https://www.bitkom.org/sites/default/files/2019-05/190508_bitkom-pressekonferenz_e-health_presentation.pdf
19. Erdemir D, Varikosel Varicocele F, Erdemir F, Özet ŞK. Varikosel. *Gaziosmanpaşa Univ Tıp Fak Derg [Internet].* 2011. [cited on 2022 Dec 19];3(2):1-11. Available from: <https://dergipark.org.tr/tr/pub/gutfd/issue/34286/378883>
20. Tonyali S. YouTube: a good source for retrograde intrarenal surgery? *Investig Clin Urol.* 2021;62(2):180-5. <https://doi.org/10.4111/icu.20200314>
21. Yahşi S, Medyadaki S, Ameliyatı PN, Kaliteli V, Sağlıyor B. Do the videos on social media about percutaneous nephrolithotomy surgery provide quality information? *J Contemp Med.* 2022;12(5):647-52. <https://dergipark.org.tr/en/pub/jcm/issue/71238/1149853>
22. Yılmaz M, Eğitim B, Hastanesi A, Şahin Y, Hacibey İ, Zeki S, et al. How effective and reliable is YouTube videos about mPCNL in the treatment planning process? 2022. <https://doi.org/10.21203/rs.3.rs-1469092/v1>
23. Sogutdelen E, Tonyali S. Analyzing the quality and validity of holmium laser enucleation of prostate (HoLEP) videos on social media. *Wideochir Inne Tech Maloinwazyjne.* 2022;17(1):226-31. <https://doi.org/10.5114/wiitm.2021.107758>
24. Adorisio O, Silveri M, Torino G. Evaluation of educational value of YouTube videos addressing robotic pyeloplasty in children. *J Pediatr Urol.* 2021;17(3):390.e1-e4. <https://doi.org/10.1016/j.jpuro.2020.12.025>
25. Taş T, Arda E, Çakırođlu B, Uçar T. Evaluation of the reliability, utility, and quality of the information in testicular cancer self-exam videos shared on YouTube. *J Reconstr Urol.* 2020;10(3):80-7. <https://doi.org/10.5336/urology.2020-78508>

