


Educational quality and reliability of laparoscopic colorectal cancer surgery videos on YouTube: A cross-sectional analysis using the JAMA benchmark criteria

 Vural Argın

Department of Gastroenterology Surgery, Marmara University Pendik Training and Research Hospital, Istanbul, Türkiye

ABSTRACT

Introduction: YouTube is widely used as a supplementary educational resource by surgical trainees, yet the reliability and educational quality of its content vary considerably. Laparoscopic colorectal cancer surgery demands advanced technical skills, making high-quality visual material essential for safe and effective training. However, despite the growing use of online platforms, systematic evaluations of YouTube content in this field remain limited. The aim is to evaluate the reliability, educational quality, and technical completeness of laparoscopic colorectal cancer surgery videos on YouTube using validated assessment tools.

Materials and Methods: This cross-sectional study evaluated YouTube videos of laparoscopic colorectal cancer surgery identified through predefined search terms. Uploader type, video characteristics, engagement metrics, language, and image quality were recorded. Reliability was assessed using JAMA criteria, educational quality with the GQS, and technical completeness with a 10-item surgical checklist. Pearson correlation and independent samples t-test were used for analysis.

Results: A total of 20 videos met the study criteria, with laparoscopic low anterior resection and right hemicolectomy being the most common procedures (each 35%). The mean video duration was 32.2±30.1 minutes. The mean JAMA, GQS, and technical scores were 3.2±1.1, 10.3±4.5, and 7.7±2.1, respectively. No significant correlations were found between view count and JAMA, GQS, or technical scores. In contrast, GQS showed a strong positive correlation with technical score ($r=0.77$, $p<0.001$). Videos with verbal narration had significantly higher JAMA, GQS, and technical scores than those without narration (all $p<0.05$).

Conclusions: Verbal narration significantly enhances the reliability and educational value of laparoscopic colorectal cancer surgery videos on YouTube, underscoring the need for higher-quality and professionally curated online surgical content.

Keywords: YouTube, laparoscopic colorectal surgery, surgical education, JAMA benchmark criteria, video analysis, colorectal cancer



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Correspondence: Vural Argın M.D., Department of Gastroenterology Surgery, Pendik Training and Research Hospital, Istanbul, Türkiye

e-mail: vuralargin@outlook.com



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Introduction

Laparoscopic colorectal surgery has become the standard approach for treating colon and rectal malignancies, supported by the widespread adoption of minimally invasive techniques and accumulating evidence demonstrating its safety and oncological efficacy.^[1] Mastering these procedures requires advanced technical skills, and the learning process involves a complex combination of visual, cognitive, and hands-on training components. With the digital transformation in medical education, surgeons increasingly rely on online platforms to support their training. Among these platforms, YouTube has emerged as one of the most frequently accessed resources due to its free accessibility, large user base, and the large number of surgical videos available.^[2,3] However, since YouTube lacks a peer review or content verification mechanism, the reliability and educational quality of videos vary greatly.^[4] Videos that do not adhere to evidence-based principles or fail to demonstrate fundamental surgical steps may contribute to misinformation and negatively impact the learning process. Therefore, an objective evaluation of online surgical content is essential. The JAMA Criteria, which evaluate authorship, citation, explanation, and timeliness, provide a widely accepted framework for assessing the reliability of online medical information.^[5]

Another criterion commonly used in the evaluation of surgical training videos is the Global Quality Score (GQS), which rates a video's overall educational value on a five-point scale.^[6] Although YouTube video analyses have been conducted in various surgical fields such as laparoscopic cholecystectomy, appendectomy, and bariatric surgery, systematic evaluations focusing specifically on laparoscopic colorectal cancer surgery remain limited.^[7] Given the technical complexity and anatomical challenges of colorectal surgery, high-quality, step-by-step visual materials are vital for effective education, making the quality assessment of online content particularly important.

The aim of this study is to evaluate the reliability and educational quality of laparoscopic colorectal cancer surgery videos available on YouTube using the JAMA Benchmark Criteria, Global Quality Score, and a structured assessment of surgical technique integrity. By analyzing the current online content, this study aims to highlight the strengths and weaknesses of existing video-based educational resources and contribute to the development of higher-quality surgical training materials.

Materials and Methods

Study Design

This study was designed as a descriptive and cross-sectional analysis aiming to evaluate the educational quality and reliability of laparoscopic colorectal cancer surgery videos available on the YouTube platform. Since the study used only publicly available online videos and did not include any patient data, institutional ethics committee approval was not required.

Search Strategy

A systematic search was conducted on YouTube using the following keywords: "laparoscopic colorectal surgery," "laparoscopic colon surgery," "laparoscopic colectomy," "laparoscopic right hemicolectomy," "laparoscopic left colectomy," and "laparoscopic low anterior resection." The search results were evaluated under a "relevance" filter, and all videos were reviewed in the same session to ensure consistency.

Inclusion Criteria

- Actual laparoscopic colorectal cancer surgery was demonstrated
- Presented in English or Turkish
- Lasted at least one minute
- Sufficient visual quality was provided for evaluation
- Identifiable surgical steps were clearly demonstrated.

Exclusion Criteria

- Open surgery videos
- Animal model or cadaveric procedures
- Animations or non-operative presentations
- Promotional or commercial content
- Duplicate uploads
- Short clips lacking surgical detail

Data Collection

The following characteristics were recorded for each video: uploader type (individual surgeon or institution), upload date, video duration (minutes), number of views, likes, and comments, video language, image quality (scale of 1-3), presence of verbal narration (yes/no), presence of step-by-step explanation, and type of surgical procedure shown.

Reliability Assessment: JAMA Benchmark Criteria

The reliability of the videos was assessed using the JAMA Benchmark Criteria, which include authorship, attribution, disclosure, and currency. Each criterion was scored as 0 or 1, yielding a total JAMA score ranging from 0 to 4.

Educational Quality Assessment: Global Quality Score (GQS)

The overall educational value of each video was evaluated using the Global Quality Score (GQS), graded from 1 to 5. Scores of 1–2 represented low educational quality, 3 indicated moderate quality, and scores of 4–5 reflected high educational quality.

Assessment of Surgical Technique

A 10-item checklist based on established laparoscopic colorectal surgery steps was used to assess the technical completeness of each video. Each step was scored as present (1) or absent (0), generating a total technical score between 0 and 10.

Statistical Analysis

Descriptive statistics, including mean, standard deviation, median, and range, were used to summarize the data. Relationships between continuous variables were assessed using Pearson correlation analysis. Differences between videos with and without verbal narration were analyzed using the independent samples t-test. A p-value below 0.05 was considered statistically significant.

Results

A total of 20 laparoscopic colorectal cancer surgery videos identified on YouTube were included in the analysis. The vast majority of the videos were uploaded by individual surgeons (n=19, 95%), while only one video (5%) origi-

nated from an institutional source. The most frequently demonstrated procedures were laparoscopic low anterior resection (n=7, 35%) and laparoscopic right hemicolectomy (n=7, 35%), followed by laparoscopic transverse colectomy (n=2, 10%), laparoscopic left colectomy (n=2, 10%), total colectomy (n=1, 5%) and anterior resection (n=1, 5%) (Table 1).

The mean duration of the videos was 32.2±30.1 minutes, with a wide range of 9 to 120 minutes. The videos had a mean view count of 14,782±18,014 (range, 649–83,000), with a median of 10,136 views. The mean number of likes was 182±215, and the mean number of comments was 8.4±11.4. Verbal narration was present in 65% of the videos (n=13), while 35% (n=7) contained no explanation. The mean image quality score was 2.1±0.8 on a 3-point scale (Table 1).

The reliability of the videos, assessed using the JAMA Benchmark Criteria, revealed a mean JAMA score of 3.1±1.1 (range, 1.0–5.0), indicating an overall moderate but heterogeneous reliability. The Global Quality Score (GQS) averaged 10.2±4.5 (range, 2–16), and only 40% of the videos (n=8) achieved high educational quality (GQS ≥4), while the remainder exhibited low to moderate educational value (Table 2).

Assessment of the completeness of surgical steps using the 10-item technical checklist showed a mean technical score of 7.7±2.1 (range, 3–10). Although most videos demonstrated essential steps of laparoscopic colorectal surgery, several lacked critical elements such as clear demonstration of the mesocolic/TME plane and explicit identification or preservation of nerves and the ureter (Table 2).

No significant correlation was found between video popularity metrics and educational or reliability parameters. There was no statistically significant association between view count and JAMA score ($r=0.34$; $p=0.142$), GQS ($r=0.23$;

Table 1. Baseline characteristics of the included YouTube videos

Variable	Mean±SD	Median (Range)
Video duration (min)	32.2±30.1	14.5 (9.0–120.0)
Views	14,781.5±18,014.1	10,135.5 (649.0–83,000.0)
Likes	182.3±214.9	149.5 (11.0–985.0)
Comments	8.4±11.4	0.0 (0.0–31.0)
Image quality (1–3)	2.0±0.8	2.0 (1.0–3.0)

Min: Minute; SD: Standart Deviation.

Table 2. Mean scores for reliability, educational quality, and technical completeness

Score	Mean±SD	Median (Range)
JAMA total score	10.2±4.5	10.5 (2.0–16.0)
Global Quality Score (GQS)	3.1±1.1	3.0 (1.0–5.0)
Technical checklist score	7.7±2.1	8.0 (3.0–10.0)

SD: Standart Deviation.

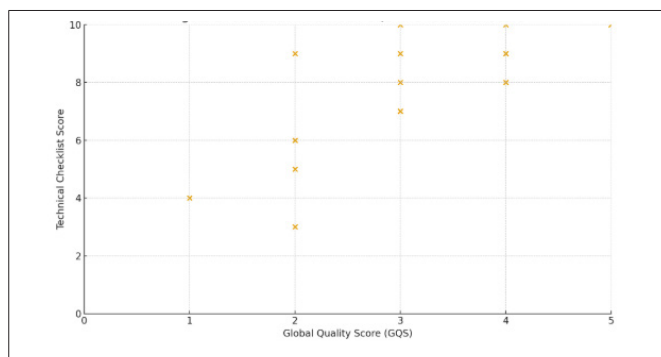
Table 3. Comparison of scores according to presence of verbal narration

Parameter	Narration Present (n=13)	Narration Absent (n=7)	p-value
JAMA total score	11.9±3.6	7.1±4.6	0.038
Global Quality Score (GQS)	3.6±1.0	2.3±0.8	0.004
Technical checklist score	8.5±1.4	6.1±2.3	0.033

$p=0.336$), or the technical score ($r=0.27$; $p=0.256$). These findings indicate that video popularity does not reflect the quality or reliability of the surgical content.

In contrast, a strong positive correlation was detected between GQS and the technical score ($r=0.77$; $p<0.001$) (Fig. 1), demonstrating that videos with higher educational value also tended to present more complete and accurate surgical steps.

When videos were compared according to the presence of verbal narration, those containing narration had significantly higher scores across all evaluated domains. Videos with narration exhibited a mean JAMA score of 3.6 ± 1.0 , mean GQS of 11.9 ± 3.6 , and mean technical score of 8.5 ± 1.4 , whereas videos without narration had respective scores of 2.3 ± 0.8 , 7.1 ± 4.6 , and 6.1 ± 2.3 (all $p<0.05$) (Table 3). These findings indicate that verbal narration substantially improves both the reliability and educational quality of laparoscopic colorectal surgery videos on YouTube.

**Figure 1. Correlation between GQS and technical score.**

Discussion

This study provides one of the few systematic evaluations of the educational quality, reliability, and technical completeness of laparoscopic colorectal cancer surgery videos available on YouTube. The findings demonstrate substantial variability among videos, indicating that publicly accessible content does not consistently meet the standards required for high-quality surgical education. Given the anatomical complexity and technical demands of laparoscopic colorectal surgery, structured and reliable visual resources are essential for trainees and practicing surgeons alike.^[8]

In this study, the mean JAMA score indicated a moderate but heterogeneous level of reliability among videos. Similar findings have been reported in other surgical fields, where YouTube content frequently lacks consistency and evidence-based accuracy.^[9,10] The absence of peer review or professional quality control mechanisms contributes to the uncontrolled variability of online surgical videos, posing potential risks in the context of surgical training and decision-making.

The overall educational quality, reflected by Global Quality Score (GQS), was predominantly low to moderate. Similar patterns have been reported in prior analyses of laparoscopic and endoscopic surgical videos, highlighting that view counts and popularity metrics are poor indicators of true educational value.^[11] Consistently, the present study found no correlation between view count and JAMA, GQS, or technical scores, confirming that user engagement does not reliably reflect instructional quality.

A key finding of this study is the pronounced positive impact of verbal narration on video quality. Videos with narration had significantly higher JAMA, GQS, and technical scores compared with those lacking verbal explanation. This observation aligns with previous research demonstrating that structured narration enhances comprehension, improves recognition of anatomical landmarks, and facilitates understanding of complex surgical steps.^[12,13] These results underscore the importance of purposeful, well-structured commentary in the creation of high-quality surgical educational videos.

Although technical completeness was moderate overall, several videos lacked demonstration of critical steps such as mesocolic or total mesorectal excision (TME) plane preservation and explicit identification of nerves or the ureter. Similar technical deficiencies have been noted in previous evaluations of colorectal surgery videos on online platforms.^[14] Such omissions may limit the usefulness of these videos for novice surgeons and may hinder the safe acquisition of advanced laparoscopic skills.

Overall, the findings highlight the need for more standardized, professionally curated, and educationally robust laparoscopic colorectal surgery videos. Academic institutions, surgical societies, and expert surgeons may play an important role in developing high-quality content to support safe and effective training.

Limitations

This study has several limitations. First, the analysis was restricted to YouTube; therefore, educational content from other platforms such as Vimeo, WebSurg, or institutional surgical databases was not evaluated. Second, only videos presented in English or Turkish were included, potentially excluding informative content in other languages. Third, YouTube-specific engagement metrics (views, likes, comments) may not accurately reflect true educational impact. Fourth, although standardized tools such as the JAMA Benchmark Criteria, Global Quality Score, and a structured technical checklist were used, the assessments inherently involve elements of subjectivity. Fifth, because this was a cross-sectional study, video characteristics may change over time as content creators edit, update, or remove videos. Finally, the sample size was limited to 20 videos, which may not fully represent the entire range of laparoscopic colorectal surgery videos available online.

Conclusion

This study demonstrates that YouTube videos on laparoscopic colorectal cancer surgery exhibit considerable variability in reliability and educational quality. Video popularity was not associated with instructional value, whereas the presence of verbal narration significantly improved reliability, educational quality, and technical completeness. These findings highlight the need for more structured, evidence-based, and professionally produced surgical educational videos to support effective learning in laparoscopic colorectal surgery.

Disclosures

Ethics Committee Approval: This study did not require ethics committee approval because it involved analysis of publicly accessible YouTube videos and did not include human participants, identifiable personal data, or patient records.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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