

Methods

Study Design

A prospective observational study was conducted at a tertiary academic medical center between January and October 2025. The study evaluated the educational impact of self-directed surgical video editing on technical skill development and error recognition. The institutional review board approved the study protocol, and all participants provided informed consent.

Participants

Participants included:

General surgery residents (postgraduate years 2–5)

Early-career attending surgeons within three years of completing training

Inclusion criteria:

Participation in laparoscopic surgical procedures

Willingness to record and review operative videos

Completion of both pre- and post-intervention assessments

Surgeons with prior formal training in video-based surgical coaching were excluded to minimize bias.

Intervention: Surgical Video Editing

Participants recorded laparoscopic procedures using standard operating room recording systems. Each participant selected two procedures for analysis. The intervention consisted of three steps:

1. Video Recording

Entire surgical procedures were recorded using laparoscopic video capture systems.

2. Self-Directed Editing

Participants edited the videos using basic editing software to produce a 10–15-minute summary video highlighting:

Critical operative steps

Technical challenges

Errors or inefficiencies

Decision-making points

3. Faculty Feedback

Experienced faculty surgeons reviewed both the unedited video and the edited summary and provided structured feedback.

Outcome Measures

Primary Outcomes

1. Error Recognition

Measured using pre- and post-intervention self-assessment questionnaires

Participants identified and categorized operative errors

2. Technical Skill Improvement

Measured using the Global Operative Assessment of Laparoscopic Skills (GOALS)

GOALS evaluates five domains:

Depth perception

Bimanual dexterity

Efficiency

Tissue handling

Autonomy

Each domain is scored from 1 to 5, producing a maximum score of 25.

Secondary Outcomes

Participant perceptions of reflective learning

Faculty evaluation of improvement

Reduction in repeated errors during subsequent procedures

Statistical Analysis

Statistical analysis was performed using SPSS version 28. Continuous variables were expressed as mean ± standard deviation. Tests used:

Paired t-test for normally distributed variables

Wilcoxon signed-rank test for non-parametric comparisons

Chi-square test for categorical variables

Statistical significance was defined as p < 0.05.

Background: Video recording of surgical procedures has become increasingly common with advances in minimally invasive technologies. Although surgical videos are widely used for teaching and conference presentations, their potential as a structured self-reflection tool remains underexplored. This study investigates whether editing one’s own surgical videos enhances technical skill development, error recognition, and reflective learning among surgeons.

Metric	Baseline	Post-Intervention	p-value
Error recognition	41% ± 12	78% ± 10	<0.001

Error Recognition

Self-reported recognition of technical errors improved significantly after the video editing intervention.

Participants reported improved ability to identify:

Poor tissue handling

Inefficient instrument movements

Suboptimal trocar placement

Delayed recognition of anatomical landmarks

Technical Skill Improvement

Mean GOALS scores improved significantly following repeated video review and editing.

Overall GOALS score improved from:

17.2 ± 3.1 → 21.2 ± 3.4 (23.3% improvement, p < 0.001).

GOALS Domain	Baseline Score	Post-Intervention	p-value
Depth perception	3.4 ± 0.7	4.1 ± 0.6	<0.01
Bimanual dexterity	3.5 ± 0.8	4.2 ± 0.6	<0.01
Efficiency	3.3 ± 0.7	4.1 ± 0.7	<0.001
Tissue handling	3.6 ± 0.6	4.3 ± 0.6	<0.001
Autonomy	3.4 ± 0.7	4.5 ± 0.5	<0.001

The present study expands upon these findings by emphasizing the educational value of active video editing, rather than passive video viewing. Editing requires participants to repeatedly review their perf.

Another important finding is the improvement in error recognition. Accurate self-assessment is essential for professional development, yet previous studies have shown that surgeons often struggle to objectively evaluate their own skills. Video-based self-assessment can help bridge this gap by providing visual evidence of performance.

The improvement in GOALS scores observed in our study suggests that video editing may accelerate the acquisition of laparoscopic technical skills. Improvements were particularly notable in efficiency, tissue handling, and autonomy, which are key indicators of surgical competence.

Conclusion

Editing one’s own surgical videos is a powerful educational strategy that promotes reflective learning, enhances error recognition, and improves laparoscopic technical skills. By transforming passive video review into an active analytical process, surgeons gain deeper insight into their operative performance. Incorporating structured video editing into surgical training programs may accelerate skill acquisition and ultimately improve patient safety.