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Education

For Your Eyes Only? The Use of Surgical Videos in Urological Residency Training: A European-wide Survey

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Abstract

Background and objective: Video-based learning may be beneficial in surgical education, both in the preparation for surgery and to evaluate surgical performance. The use of a video is not yet anchored in European urology residency programs, and it is unclear how frequently residents use videos. The purpose of this study is to investigate whether and how urology residents utilize videos to prepare for surgical procedures and evaluate their surgical performance.

Methods: We conducted a European-wide, survey-based, needs assessment among urology residents. The survey was distributed electronically among the participants in the European Urology Residents Education Program 2022 and all the members of the European Society of Residents in Urology.

Key findings and limitations: Seventy-two surveys were completed by the residents of 12 nationalities. Of the residents, 98.6% used videos in preparation, mainly for open, laparoscopic, and robotic procedures. YouTube was by far the most used source. Of the residents, 86% believed that a postsurgical video review would be helpful. In total, 39% of the residents actually had this possibility. Of them, 30% had the opportunity to do this together with a supervisor.

Conclusions and clinical implications: This study demonstrated that European urology residents often use videos to prepare surgical procedures. Considering that the majority of the respondents use YouTube as the main source of videos, this seems not to be formalized within their training. Although most residents would value a postsurgical video review, preferably together with a supervisor, the latter is not available to the majority. We recommend the use of professional, and not public, video channels and easier access to postsurgical video review.

Patient summary: Video-based learning may have an important role in surgical education. Videos often are a source of education for European urology residents to prepare for surgical procedures. Although most residents would appreciate a

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postsurgical video review or video-based coaching, this is not available to the majority of them.

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1. Introduction

Technological advancements have changed the medical environment radically over the past few decades [1]. This also has major implications for urology residency training. The introduction of new techniques such as minimally invasive procedures, such as laparoscopy and robot-assisted surgery, has increased the complexity of surgical techniques. This requires higher technical standards. Since 2013, the European School of Urology and European Association of Urology (EAU) Section of Uro-Technology started with a structured European Basic Laparoscopic Urological Skills examinations for residents, after starting hands-on training sessions in 2007. Moreover, the EAU Robotic Urology Section robotics curriculum has been in full development since 2004. For now, the focus is mainly on the development of a structured robotic fellowship for (young) urologists.

Despite the increased complexity of surgical techniques, learning opportunities for residents are reduced by volume standards, greater efficiency in the operating room, and stricter working hours [2,3]. These developments have consequences for urology residency training.

One of the advantages of minimally invasive procedures, in terms of education, is the fact that most procedures are camera guided and, as a result, can be recorded. These recordings could be used in video-based learning.

Video-based learning plays an important role in the search for new, efficient educational opportunities [4] and is defined as the learning process of acquiring knowledge, competence, and skills with the systematic use of video resources [5]. Surgical videos can be used in two ways to maximize educational opportunities regarding surgery. First, videos can be used in preparation for a surgical procedure to increase the knowledge of technique and anatomy [6]. Second, videos can be used as a method to evaluate technical skills and surgical performance.

A recent review indicated that video-based learning is beneficial for training time, learning duration, acquisition of surgical skills, and trainee's satisfaction [7]. In addition, Crawshaw et al [8] demonstrated that video preparation can significantly enhance procedural-specific abilities and the capacity to perform an operation independently.

In general, studies report mixed results regarding the accuracy of self-evaluation of surgical skills by residents. Accurately assessing one's own shortcomings in skills, knowledge, and experience is crucial for growth in the workplace and sustaining self-control [9]. The accuracy of self-evaluation can be enhanced by using videos and implementing structured self-evaluation strategies based on intraoperative performance standards [9,10].

On top of that, a postsurgical video review together with a supervisor (ie, video-based coaching), exhibits significant potential in increasing technical performance and improving objective surgical skill in residents [4,11].

Despite these encouraging indications, the use of video-based learning is not yet embedded in European urology residency training. It is unclear whether and how frequently urology residents use videos for learning.

Therefore, the objective of this questionnaire-based study was to investigate whether and how urology residents utilize videos to prepare for surgical procedures and to evaluate their own surgical performance. To that end, we will answer the following research question: How do European urology residents perceive and use videos in preparation and evaluation of surgical procedures and performances?

2. Methods

2.1. Study design

A questionnaire-based survey was distributed electronically between September 2022 and January 2023 to all the participants in the European Urology Residents Education Program 2022 and to all the members of the European Society of Residents in Urology.

Participation in the study was voluntary, and consent to participate in this facultative survey was implied by filling out the survey.

2.2. Questionnaire

Based on insights from the literature, we developed a questionnaire comprising 17 questions concerning video-based learning in urology resident education, as well as demographic information of the participants. The questionnaire featured mainly multiple-choice questions with the option to select multiple responses. The answer option "Other" was included in these questions, which provided an open text field for further specification. Additionally, there were a few open-ended questions and several questions where participants rated their behaviors and opinions on a 5-point Likert scale (1 = never/strongly disagree and 5 = always/strongly agree).

Some questions were followed by supplementary questions. If a participant provided an answer that rendered follow-up question unnecessary, these were skipped automatically.

Before the questionnaire was distributed, it was piloted by the principal investigator, one supervisor, and two junior doctors. This testing phase was designed to check the clarity and relevance of the questionnaire. After testing, only a few minor textual modifications were made.

The final survey was distributed to all the participants of the European Urology Residents Education Program 2022 and to all the members of the European Society of Residents in Urology. The complete questionnaire is available in the [Supplementary material](#).

2.3. Outcome

The outcome of this study was to provide an overview of residents' customs and preferences regarding the use of videos in the preparation of surgical procedures, as well as an overview of the possibility and preferences regarding a postsurgical video review.

2.4. Data analysis

A statistical analysis was performed using IBM SPSS statistics version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequencies (*n*) and percentages (%) for categorical variables, and as medians and interquartile ranges for continues variables.

For the multiple response questions, descriptive statistics were presented as percentages of all cases.

3. Results

3.1. Demographics

A total of 72 surveys were completed. One participant's data were excluded from the analysis because his residency program was outside Europe. Residents of 12 different countries participated, of whom 33.8% were from The Netherlands. Demographics are described in [Table 1](#).

3.2. Videos to prepare for surgery

Of the respondents, 98.6% (*n* = 70) reported using videos in their preparation for surgery; of these respondents, 12.7% always, 39.4% often, 39.4% sometimes, 7% rarely, and 1.5% never used videos.

Preparing for surgery using videos was used mostly for open surgery (78.6%), laparoscopic surgery (75.7%), and robotic surgery (65.8%); it was used less to prepare for endoscopic surgery (31.4%).

Most respondents indicated using YouTube (92.9%), a source for surgical videos, followed by Websurg (35.7%) and Medtube (14.3%). Incision, EAU resources, Maestro portal, own videos, Gesru steps, and congress content were mentioned under *Other* (20%).

The goals of watching these videos for surgery preparation were to identify the sequence of surgical steps (94.7%) followed by identifying anatomy (72.9%), learning tips and tricks (65.7%), and identifying specific surgical technical skills (eg, suturing; 52.9%).

The most valued features of preparational surgical videos are illustrated in [Figure 1](#).

3.3. Postsurgical video review

According to 47.9% of the respondents, a postsurgical video review was not possible in their current hospital, and 12.7% of the residents did not know whether a postsurgical video review was a possibility in their hospital. Thus, 39.4% of the respondents indicated that a postsurgical review was available to them; however, only 64% of them had used a postsurgical video review in the past. Most of them used it sometimes or rarely (94%).

The main goal of a postsurgical video review was to review own performance (83%) and identify mistakes (72.2%). Comparing own technical skills with an expert video was less common (33.3%).

The primary reasons why residents, who had the possibility, did not utilize a postsurgical video review more frequently were time constraints (72%), followed by difficulty in accessibility (28%), a perception of futility (10%), and low video quality (4%). One "other" reason (4%) mentioned was that it was possible to record robotic videos only.

Out of the residents who had access to a postsurgical video review, only 32.1% indicated they had the opportunity to do this together with their supervisor.

Of the entire group of respondents, 54.9% agreed and 32.4% strongly agreed that they would value the possibility of watching videos of their own surgical performance together with a supervisor, 4.2% neither agreed nor disagreed, 0% disagreed, and 2.8% strongly disagreed. Four respondents did not answer this question.

Finally, we asked respondents in an open question what criteria a video-based coaching program would have to meet to make it useful and feasible in practice; 70.42% of the respondents provided an answer to this question. Common responses were easy accessibility, a step-by-step/structured analysis (with supervisor), frequent analyses with a supervisor, ability to pause/resume video, and the ability to watch specific parts of a video.

4. Discussion

A postsurgical video review and preparation videos may be valuable in educating surgical residents. The purpose of this study was to obtain insight into the use of videos by Euro-

Table 1 – Participants' baseline characteristics

	Participants (<i>n</i> = 71)
Age, mean ± SD	31.0 ± 2.734
Gender, <i>n</i> (%)	
Female	29 (40.8)
Male	41 (57.7)
Other	1 (1.4)
Country, <i>n</i> (%)	
The Netherlands	24 (33.8)
Spain	12 (16.9)
Belgium	9 (12.7)
Italy	9 (12.7)
Germany	5 (7.0)
Portugal	4 (5.6)
Poland	3 (4.2)
Romania	1 (1.4)
Turkey	1 (1.4)
Estonia	1 (1.4)
France	1 (1.4)
Denmark	1 (1.4)
Duration of residency (yr), median (IQR)	6.0 (1.0)
Current year of residency, median (IQR)	5.0 (3.0)

IQR = interquartile range; SD = standard deviation.

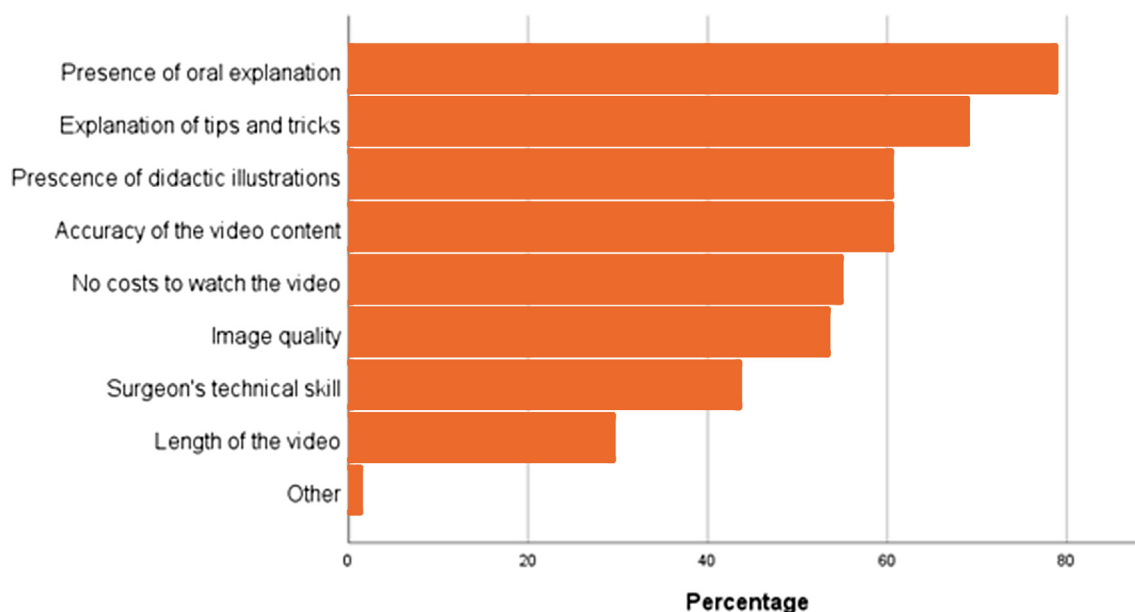


Fig. 1 – Most valorized features of a surgical video.

pean urology residents by answering the following research questions: How do urology residents perceive and use videos in preparation and evaluation of surgical procedures and performances?

First, this study demonstrates that almost all the participating urology residents used videos in preparation of a surgical task. This reflects the ease with technological resources of the current generations of residents. This result is comparable with the study of Sell et al [12] who showed that current surgical residents prefer video-based content to the traditional textbook resources.

Second, residents reported that the main goal of watching preparational videos was to identify both the sequence of surgical steps and the anatomy.

An advantage over conventional educational methods such as anatomy and surgery textbooks lies in the integration of auditory and visual inputs, as well as the representation of the anatomy as seen in real surgery, as opposed to drawn pictures or photographs [6].

Interestingly, endoscopic videos were watched less often than videos of open, laparoscopic, or robotic surgery. A possible explanation may be that endoscopic surgery such as transurethral resection (TUR) or ureterorenoscopy (URS) was considered relatively straightforward. The majority of the respondents were at the end of their residency training and would already be performing endoscopic procedures largely independently. They may not feel the need to watch videos in preparation as they are already familiar with the steps and anatomy. A study among urology chief residents in the USA also demonstrated that the confidence level for procedures such as TUR and URS was higher than for open, laparoscopic, or robotic procedures [13].

YouTube is by far the most widely used source of surgical videos. This is no surprise, as it is one of the most well-known video-sharing websites in general and very easily accessible. However, this is also concerning, considering

that anyone can upload a “surgical video” without the content being validated.

Remarkably, only 60% of the respondents mentioned “accuracy of the video content” as important for using a video. Oral explanation and explanation of the tips and tricks were chosen more often as important. In our opinion, the accuracy of the video should be of concern to the residents.

A review on the quality of surgical videos on YouTube also showed that YouTube contains videos of unsafe procedures or videos with low educational value [14]. According to Jackson et al [15], young residents tend to overestimate video quality. Both these studies suggest developing a validated database of surgical videos as an alternative. Yet, alternative sites with such validated videos already exist, for example, Websurg and Incision. The difference between these sites and YouTube is that it requires a paid account to access the videos, which could be a hurdle to utilizing them.

The possibility of providing all residents with an account at the beginning of their residency could be explored, thereby ensuring that from the start, there will be a focus on websites with accurate video content and accessibility will be made easier and without additional costs for the residents.

Third, this study demonstrates that a postsurgical video review is available only to 39.4% of the residents. However, there has been a considerable increase compared with a survey of general surgery residents in 2010, which reported that only 5% of residents had this option [16].

Of the respondents to whom a postsurgical video review was available, the majority used it only rarely to sometimes, and one-third indicated not using it at all. The primary reasons for residents not to use a video review more often were time constraints and difficulty in accessing the videos.

A possible solution to improve the use of a postsurgical video review is to embed it in the curriculum of the residents and to encourage them to use this learning opportu-

nity. This can, for example, be done by dedicated review sessions in which a specific time frame is scheduled during the week to conduct a video review, ensuring that this task is prioritized.

Another option could be peer review groups in which small groups of residents review videos together, sharing insights and reducing the individual time burden. A postoperative video will hopefully become a routine rather than an extra effort. The prerequisite, of course, is that the videos are available easily. Hospitals will have to invest in centralized, easily accessible digital storage systems for surgical videos to ensure this. A user-friendly interface with search and tagging functions to mark and retrieve relevant videos or key moments in videos would be ideal in this respect. Moreover, better accessibility automatically reduces the time investment by making it more efficient to use.

The majority of respondents indicated that they would appreciate being able to watch videos of their own surgical performance together with a supervisor. However, only a small number of respondents with access to a postsurgical video review could actually do this together with a supervisor. In other domains such as sports and aviation, a video review with a coach or peer has widely been adopted and used for over 50 yr to improve performance [17].

Medical literature showed that video-based coaching, video feedback together with a supervisor, and improved technical surgical skills resulted in faster learning curves and reduced operation time of residents. Furthermore, it allows discussing preoperative decision-making and providing feedback in a less stressed environment than the operating room [4,11,18].

Despite these positive findings, video-based coaching programs are not widespread in urology residency education. This may be attributable to a variety of implementation obstacles including time constraints for residents and supervisors, and the challenging integration of video cameras into the operating room [18]. The latter aspect is for urological videos less relevant as a significant portion of surgeries is camera guided. Based on the residents' suggestions regarding the feasibility and utility of a video-based coaching program, our recommendation is to develop a video coaching program that offers the option of incorporating procedure-specific checks and scoring lists. A procedure-specific scoring list, such as the Objective Structured Assessment of TURB Skills (OASTURBS) [19], can assist in guiding a postoperative video review. A scoring list helps clarify which procedure-specific steps and which technical skills are important to assess during a postoperative video review. This facilitates a more systematic review within a predetermined timeframe.

This study has some limitations. First, as we distributed the invitation of the questionnaire through different channels, it is unclear how many residents actually received the invitation and what percentage of these residents responded. Nonetheless, we selected this distribution method with the intention of reaching as many residents from all European countries as possible. Our efforts, resulted in responses from 12 different countries, but the majority came from The Netherlands, Spain, Belgium, and Italy.

Second, we acknowledge the limitations associated with using a nonvalidated questionnaire. Despite these challenges, the use of this questionnaire was necessary because, to our knowledge, there are no validated questionnaires on this topic. We mitigated the limitations by conducting pilot testing to enhance the clarity and relevance of the questionnaire.

Last, mainly senior residents responded; this might be because the invitation was, among other ways, distributed during a course attended by only senior residents. As a result, the outcomes may not be generalizable to all residents.

Future research may focus on evaluating the feasibility and effectiveness of a video coaching program in practice. In this, it is important to ensure that both junior and senior residents are involved to generate a comprehensive overview of the entire resident population.

5. Conclusions

The results of this study demonstrated that urology residents in Europe often use videos in their preparation for surgery, most frequently via YouTube. Although most residents would value a postsurgical video review together with a supervisor, this seems to be not available to many residents.

It is our recommendation that video-based learning and coaching be integrated into the urology residency training program.

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Study concept and design: van der Leun, Brinkman.

Acquisition of data: van der Leun.

Analysis and interpretation of data: van der Leun.

Drafting of the manuscript: van der Leun.

Critical revision of the manuscript for important intellectual content: van der Leun, Brinkman, Pennings, van der Schaaf, de Kort.

Statistical analysis: van der Leun.

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Other: None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.euros.2024.07.108>.

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