Novel Tools to Support Video-Based Coaching in Robotic-assisted Surgery

AUTHORS

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BACKGROUND

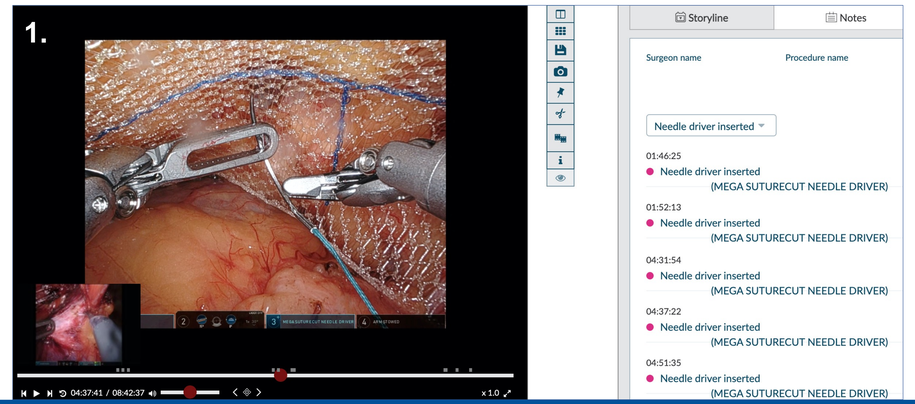
Video-based coaching methods incorporating performance goals, feedback, and action-planning have been shown to promote improvement in technical performance of surgeons and trainees.[1-3]

Objective: to describe early experience applying two novel technologies to support video-based coaching in robotic-assisted surgery for feedback and performance improvement

DESCRIPTION OF TECHNOLOGY

1. Hub is a media capture and streaming platform that facilitates capture, viewing, editing, and sharing of images and video from robotic procedures. Hub is accessible through web and mobile applications locally and on a secure distributed network. Bookmarking of key events such as instrument use, energy activation, and telestration is automated.

2. Procedure review (PR) application is a machine-learning enabled tool that segments video into procedural steps or tasks and produces objective performance indicators (OPIs) from kinematic and system event data such as step duration, instrument paths, and economy of motion.



METHOD OF APPLICATION

Hub and PR technologies are currently being incorporated into a video-based coaching program for general surgery trainees (PGY3-5) at Washington University School of Medicine in St. Louis through a partnership with the Academy for Surgical Coaching (A4SC).

Weeks 1-2

- Resident performs robotic case with faculty
- Case video-captured and analyzed by Hub and PR application
- Faculty provides RO-SCORE[4] assessment of trainee performance

Weeks 2-3

- Resident meets with assigned coach for 1-hour coaching session
- Hub/PR application used for review of case video in session
- Session audio-recorded for further qualitative analysis

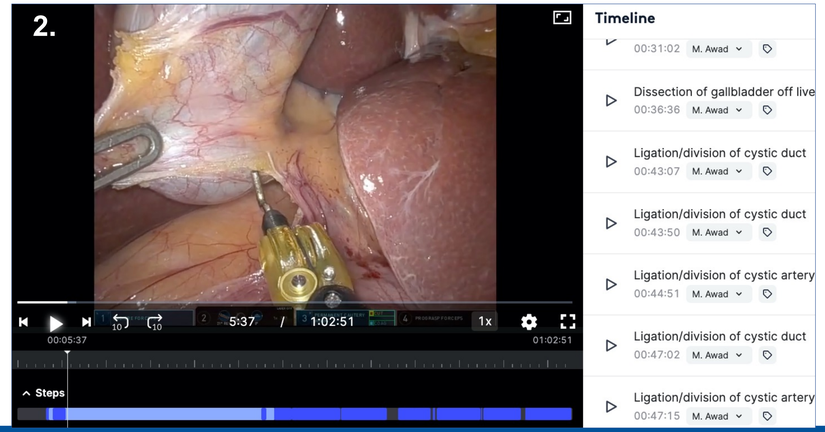
Weeks 3-4

- Resident performs 2nd robotic case with faculty
- Faculty provides 2nd RO-SCORE assessment
- PR application used to compare OPIs pre- and post- coaching

PRELIMINARY RESULTS

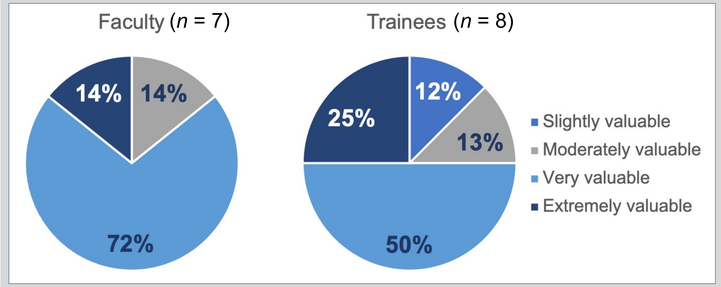
Seven faculty in the Department of Surgery (minimally invasive, colorectal, transplant specialties) have been formally trained as surgical coaches with the A4SC. None have previous experience serving as coach.

Eight trainees are currently enrolled and divided into coaching and control groups. Of those residents enrolled, half have prior experience working with a coach (sports, leadership, life).



PRELIMINARY RESULTS (continued)

- *How valuable is coaching as a tool for continuing professional development in surgery?* (pre-program)



FUTURE DIRECTIONS

Data collection is ongoing over next 6 months with expected enrollment of total 20 residents. Full cohort analysis will include a **quantitative comparison** of faculty operative assessments, OPIs, and attitudes on feedback in coaching. **Qualitative analysis** will examine coaching session content and feedback on the use of Hub and PR application.

AFFILIATIONS

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