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Faculty feedback versus residents' self-assessment of operative performance: Different but complementary

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ABSTRACT

Background: Surgical training requires development of both technical and cognitive skills. The study analyzed feedback by faculty and residents' self-assessments during a laparoscopic training course to identify structure of feedback in this context and compared the focus of trainees to faculty.

Methods: This study collected assessments by surgical residents and faculty during an intensive laparoscopic training course at a single institution. The residents' operative performance was assessed using validated assessment tools including free text feedback. Assessments were completed immediately following procedures. Feedback was analyzed using qualitative method.

Results: Eighty (80) residents participated. Three themes were identified: Assessment, instruction and occasion. Faculty provided significantly more feedback than trainees. Moreover, the content of feedback was different. Residents focused on technical performance, while faculty commented on technical and cognitive skills, efficiency and level of independence. Errors were mainly addressed by faculty.

Conclusion: This study demonstrated differences in cognitive focus of trainees and faculty. Text feedback is informative in understanding perceived challenges. Faculty provided explicit assessment and instruction for improvement. The effectiveness of self-assessment and feedback should be further studied.

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1. Background

The recent evolution of surgical education includes a movement toward competency-based training. An essential part of that training involves assessment of operative performance and directed feedback. Such feedback has proven essential in skill development and performance improvement.¹ Previous research has explored the use of self-assessment and reflection by residents in surgical education programs and multiple studies have closely examined the structure of the feedback provided by faculty to surgical residents.^{2–4}

There is a growing body of literature demonstrating the value of standardized evaluation and feedback in the development of surgical skills. Notably, Williams and colleagues have demonstrated the reliability and validity of standardized operative performance ratings.^{5,6} A number of other assessments of operative skill have been researched and developed as well, with similarly validated results across reviewers.^{7,8} Sanfey and colleagues have

incorporated similar findings into their operative assessment, separating the type of evaluation between juniors and seniors based on their level of decision making within the operating room.⁹

While we are aware of the limitations of self-assessment,¹⁰ we aimed to examine the utility of self-assessment when used in combination with expert feedback. This study builds on our previous investigation of qualitative and quantitative analysis of an advanced laparoscopic fellow's performance in the operating theater¹¹ by comparing surgical residents' self-assessment of performance to the evaluation of surgical skills by experienced faculty. The goal of the study is to identify the cognitive focus of residents at various levels of training (junior and senior residents) and evaluate the differences between their thought process and that of the faculty by analyzing the narrative feedback portion of standard operative performance rating tools.

2. Materials and methods

2.1. Animal lab course description

This study took place during 3-day intensive laparoscopic training courses from 2014 to 2016 at The University of Arizona,

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Department of Surgery in Tucson, Arizona. This course was conducted at the Arizona Center for Endoscopic Surgery (ACES) to develop basic and advanced laparoscopic skills of general surgery residents. The course involved interactive lectures, laboratory simulations, and in-vivo porcine model laparoscopic surgery training facilitated by faculty with expertise in minimally invasive surgery (MIS). Junior (PGY1 and PGY2) residents practiced laparoscopic cholecystectomy and incisional hernia repair while senior residents (PGY3, PGY4 and PGY5) trained on advanced procedures, including laparoscopic Nissen fundoplication, splenectomy, and low anterior resection.

2.2. Study design

2.2.1. Procedure

The first day of the training course, residents practiced elements of laparoscopic surgery including FLS (the fundamentals of laparoscopic surgery) tasks and other inanimate simulators in the Arizona Simulation Technology and Education Center (ASTEC).¹² The residents performed the assigned surgical procedures on live pigs on the second and third days under the supervision of MIS surgeons. Residents performed the same procedures on two consecutive days on live pigs. The residents' operative performance was assessed using validated assessment tools (global and procedure-specific rating tools) including free text feedback. The animals were anesthetized under the care of veterinarians throughout the day.

2.2.2. Operative performance assessment

This study utilized both general and procedure specific assessment tools for each procedure when available.¹³ General laparoscopic skills in Nissen fundoplication, incisional hernia repair and splenectomy were assessed using the Global Operative Assessment of Laparoscopic Skills (GOALS) rating scale.¹⁴ The procedure-specific assessment tools for Nissen fundoplication (a modified Objective Structured Assessment of Operative Skills (OSATS)¹⁵ and Incisional hernia (GOALS-IH)¹⁶ were used. The Operative Performance Rating System (OPRS),¹⁷ which includes both general and procedure specific components, were used for assessment performance during laparoscopic cholecystectomy and colectomy. In the beginning of the course, we provided residents with assessment forms and a brief training on how to complete them (criterion based vs. normative assessments). This was to assure the validity of "response process" when completing the assessments.¹³ Immediately following each in-vivo procedure, residents completed the relevant assessment that included space for free-text feedback. The faculty also completed the same assessment form on the residents' intra-operative performance at the same time. Since the aim of this study was to compare the thought process of residents and faculty using free text feedback, we avoided any direct intervention and residents and faculty remained blinded to each other's assessments.

At the end of each day, the residents participated in debriefing and discussion regarding their performance and strategies to improve for the following day. On the second day of the training course, the process was repeated. Residents performed laparoscopic procedures in the porcine model, completed assessments, and participated in a final discussion with a focus on efficiency, ergonomics and a plan for continued improvement.

This study received approval from both the Institutional Animal Care and Use Committee (IACUC) to use a live swine model and the Human Subjects Institutional Review Board (IRB) at The University of Arizona. (Protocol #09-079 and IRB #1410542709).

2.3. Analysis

Qualitative analysis of free text feedback was performed. Statements from the free-text feedback were sorted according to themes and subthemes. After coding each statement, the feedback was tallied and compared by level of experience (junior resident, senior resident, and attending). Additionally, the content of the feedback was examined for qualitative comparison.

3. Results

3.1. Quantitative analysis

Eighty (80) residents participated in this study over the two years. Two faculty assessed the residents' performance. The response rate for completion of the comment section was high. For the junior residents, the completion rate of self-assessments was 87.3%. Faculty response provided narrative feedback in 97.3% of cases. For the senior residents, the self-assessment rate and feedback from faculty were 70.9% and 91.2%, respectively. Moreover, faculty provided significantly more feedback on residents' performance than the residents included in their self-assessments (1449 comments versus 536, respectively, P value < 0.05). Overall tallies are noted in [Table 1](#).

3.2. Qualitative analysis for narrative feedback

Three general themes were identified: 1) Assessment (overall performance, technical and cognitive skills, flow of the operation, errors, efficiency); 2) Instruction (technical/cognitive instruction, advanced skills), and 3) Occasion (interaction with attending, interaction with other staff (assistants, scrub technician and anesthesiologist) ([Tables 2 and 3](#)).

When the content of the feedback was qualitatively examined, several differences were noted between resident and faculty assessments. Generally, trainees focused more on technical performance, including instrument handling skills and bimanual dexterity. Faculty comments were directed at overall performance, error, efficiency, and independence in the operating room in addition to the technical and cognitive skills.

3.3. Junior residents

Junior resident comments were primarily concerned with technical skills and accurately following the steps of the operation. The majority of the comments alluded to instrument handling or bimanual dexterity ("Unfamiliar with proper instrument handling", "underutilized left hand", "should be more precise when using bovie", "unsure of trocar placement"). Other themes of free-text feedback included efficiency, as well as a focus on mistakes made ("Unnecessary moves", "inefficient and awkward", "got into liver", "missed tie steps for mesh sutures"). Similarly, faculty comments and instruction on junior resident cases was mainly limited to improving and practicing technical skills and instrument handling. Faculty commonly advised better use of both hands, pointed out unnecessary hesitation, and provided tips for ergonomic positioning. Additionally, there were a number of comments directing better use of assistants during the surgery.

3.4. Senior residents

For senior residents, text-feedback demonstrated less concern with technical skills and familiarity with instruments than the junior residents. Instead, greater attention was placed on technique, optimization, and strategies for the operation ("formulated and

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