

Case Reporting, Competence, and Confidence: A Discrepancy in the Numbers

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PURPOSE: The Accreditation Council for Graduate Medical Education (ACGME) continues to play an integral role in accreditation of surgical programs. The institution of case logs to demonstrate competency of graduating residents is a key component of evaluation. This study compared the number of vascular cases a surgical resident has completed according to the ACGME operative log to their operative proficiency, quality of anastomosis, operative experience, and confidence in both a simulation and operative setting.

MATERIALS AND METHODS: General surgery residents ranging from PGY 1 to 5 participated in a simulation laboratory in which they completed an end-to-side vascular anastomosis. Each participant was given a weighted score based on technical proficiency and anastomosis quality using a previously validated Global Rating Scale (Duran et al, 2014). These scores were correlated to the General Surgery Milestones. Participants completed preoperative and postoperative surveys assessing resident operative experience using the 4-level Zwisch scale (DaRosa et al., 2013), confidence with vascular procedures and confidence performing simulated anastomoses. Confidence was assessed on a scale from 1 to 9 (not confident to extremely confident). Case logs were recorded for each participant. An IRB approved questionnaire was distributed to assess preoperative and postoperative roles of both the resident physician and faculty, with a defined goal. Univariate and multivariate analysis was performed.

RESULTS: Twenty-one general surgery residents were evaluated in the simulation laboratory and 8 residents were assessed intraoperatively. The residents were evenly distributed throughout clinical years. Groups of residents were divided into quartiles based upon the number of vascular cases recorded in the ACGME database. No correlation was

found between number of cases, Milestones score and the weighted score ($p = 0.94$). No statistical significance was found between confidence and quality of anastomosis ($p = 0.1$). Resident operative experience per the Zwisch scale was categorized most commonly as “Smart Help” by both the trainee and attending surgeon, despite mean resident confidence ratings of $6.67 (\pm 1.61)$ with vascular procedures.

CONCLUSIONS: ACGME case logs, which are utilized to assess readiness for completion of general surgery residency, may not be indicative of a resident’s operative competency and technical proficiency. Confidence is not correlated with technical ability. Faculty and resident insight as to their role in a procedure differ, as faculty feel that they are providing less help than the resident perceives. Careful examination of resident operative technique is the best measure of competency. (J Surg Ed ■■■-■■■. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: operative competency, resident education, intraoperative evaluation, operative confidence

COMPETENCIES: Patient care and Procedural Skills

INTRODUCTION

With the ever-changing educational environment, resident autonomy has decreased for the general surgery resident.¹ This lack of autonomy has been well described by general surgery residents and program directors alike. A recent paper surveyed subspecialty program directors in cardiothoracic, minimally invasive, bariatric, colorectal, and hepatobiliary programs. The opinions of these program directors indicated that 21% of fellows were unprepared for fellowship, 30% could not do a laparoscopic cholecystectomy independently, and 66% were unable to operate independently for more than 30 minutes. The conclusions indicated that the fellows showed a lack of operative autonomy and lack of

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progressive responsibility.² Several factors contribute to this decline, including decreased attending confidence in residents, fear of litigation on the part of the attending, decreased work hours which decreases exposure to operative procedures, and an increased focus on patient outcomes.³ The Zwisch scale is a validated measure used to assess a resident's operative performance.⁴ It is currently being used at several institutions to assess resident independence in the operating room. The scale provides a measure of independent resident ability and level of attending guidance needed to complete a procedure. It is used to assess resident autonomy in the operating room.

The Accreditation Council for Graduate Medical Education (ACGME) is private, not-for-profit organization that sets standards for US graduate medical education in residency and fellowship programs and the institutions that sponsor them. The organization accredits programs and specifies minimum numbers of cases which are to be performed by each resident during training. The American Board of Surgery specifies a total number of cases which must be performed and has added experience as a teaching assistant to its requirements. These additional experiences should increase the experience of residents and improve their operative competence. These numbers along with the recommendation of the program director who indicates that the resident can practice independently, allows the resident to become Board certified after passing the Qualifying and Certifying examinations. The implication of this certification is that the resident is a safe surgeon and competent. Operative competency is comprised of cognitive competence, technical and motor competence in addition of the other domains including experience, judgment, and confidence.⁵ The ACGME has developed a series of Milestones to support an improved assessment of resident clinical decision-making and technical skills and to enhance opportunities for early identification of struggling fellows and residents.

The importance of analyzing effective strategies to optimize learning in surgical training is essential. These strategies are more crucial with the reduction in work hours with decreased case exposure. The present number of vascular cases that the ACGME recommends is 50 index cases. With increasing numbers of residents pursuing fellowships and transition to practice programs there are fewer cases filtering down to junior trainees. The Zwisch scale is a reliable and valid measure, which has been used to assess intraoperative performance.^{6,7} An attempt to counteract the loss of operating room experience early in residency has included introduction of a simulation program to train residents.

Simulation is useful as a training tool, and can be used in surgery to accommodate work hour restrictions while providing residents with a surgical experience. Simulation creates a less stressful and often better learning environment for beginners. It affords the ability to repeat technique at a low cost, with reusable materials. Simulation can develop

basic skills early in resident training, reducing complications, and improving patient safety. Previous research with vascular anastomosis models by Wilasrusmee and Duran on anastomotic simulation models with global rating scales has been shown to correlate with trainee experience level.⁸⁻¹⁰ Increased assessment scores on an inanimate vascular anastomosis model have also been found to be predictive of technical competency in the operating room.⁸

Task-based learning and individualized learning plans have also been shown to be effective methods of medical teaching¹¹⁻¹³ and can easily be applied to surgical procedures. Multiple studies have shown the efficacy of preoperative and postoperative debriefing on patient outcomes.^{14,15} Perioperative debriefing has educational value by improving resident satisfaction, intraoperative teaching, and procedural skills.¹⁶

The primary goal of our study was to compare technical competency to the resident's operative experience. Our secondary goals were to determine if confidence was related to technical competency and operative experience. We also determined the effect of goal-directed learning on resident autonomy, learning satisfaction, and satisfaction with the case using preprocedure and postprocedure assessments.

MATERIALS AND METHODS

General surgery residents at East Carolina University rotate on vascular surgery throughout their 5 training years. These residents each have undergone dedicated vascular skills laboratories yearly as part of their curriculum. The teaching was performed by attending surgeons and vascular fellows. All participating residents had undergone at least 1 rotation prior to our study in which they were exposed to vascular anastomoses. These rotations included vascular surgery and transplant surgery, who perform renal transplants and >90% of the hemodialysis access procedures on the teaching service.

This was a prospective study with scheduled simulation laboratories. The residents had the opportunity to opt out of this experience as the skills laboratory did not contribute to their general surgery evaluation in any way. After IRB approval of the study was obtained, subjects were invited to participate in the laboratory and underwent informed consent. Resident's case logs were reviewed and the total number of vascular procedures for each participant were recorded. A didactic lecture outlining the steps of an end-to-side anastomosis was given prior to performance. A 6 mm PTFE graft was supplied as well as a 20 mm Dacron knitted graft pinned to the table with a 15 mm previously drawn graftotomy site. The Debakey forceps, Castroviejo needle driver, and suture were standardized across participants.

The residents were asked to perform a standard end-to-side anastomosis first beveling the PTFE then creating their anastomosis with whichever suturing technique they were

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