

0 + 5 Vascular Surgery Residents' Operative Experience in General Surgery: An Analysis of Operative Logs from 12 Integrated Programs

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OBJECTIVE: Integrated (0 + 5) vascular surgery (VS) residency programs must include 24 months of training in core general surgery. The Accreditation Council for Graduate Medical Education currently does not require specific case numbers in general surgery for 0 + 5 trainees; however, program directors have structured this time to optimize operative experience. The aim of this study is to determine the case volume and type of cases that VS residents are exposed to during their core surgery training.

DESIGN: Accreditation council for graduate medical education operative logs for current 0 + 5 VS residents were obtained and retrospectively reviewed to determine general surgery case volume and distribution between open and laparoscopic cases performed. Standard statistical methods were applied.

SETTING: A total of 12 integrated VS residency programs provided operative case logs for current residents.

PARTICIPANTS: A total of 41 integrated VS residents in clinical years 2 through 5.

RESULTS: During the postgraduate year-1 training year, residents participated in significantly more open than laparoscopic general surgery cases ($p < 0.0001$). This difference was consistent over the first 3 years of training. The most frequently logged open general surgery cases are hernia repair (20%), skin and soft tissue (7.4%), and breast (6.3%). Residents in programs with core surgery over 3 years participated in significantly more general surgery operations

compared with residents in programs with core surgery spread out over 4 years ($p = 0.035$).

CONCLUSIONS: 0 + 5 VS residents perform significantly more open operations than laparoscopic operations during their core surgery training. The majority of these operations are minor, nonabdominal procedures. The 0 + 5 VS residency program general surgery operative training requirements should be reevaluated and case minimums defined. The general surgery training component of 0 + 5 VS residencies may need to be restructured to meet the needs of current and future trainees. (J Surg Ed 73:536-541. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: resident education, operative experience, subspecialty training, technical competence, vascular surgery

COMPETENCIES: Medical Knowledge, Patient Care, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

Integrated (0 + 5) vascular surgery (VS) residency programs are comprised of 24 months of core surgery and 36 months of VS experience as per Accreditation Council for Graduate Medical Education (ACGME) guidelines.¹ The ACGME is not explicit regarding the content of the 24 months of core surgery; however, 0 + 5 VS residency program directors (PD) have emphasized that maximizing operative experience, especially open operative experience, is a central goal.² Minimum case number requirements in general surgery (GS) for 0 + 5 VS trainees have not been defined, despite this emphasis on operative experience.

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Open, as opposed to laparoscopic, GS cases are likely to be of greater value to VS trainees because laparoscopy is not a fundamental skill set for practicing vascular surgeons. Unfortunately, the national GS resident operative case mix has demonstrated a trend toward increasing laparoscopic cases with attendant decreasing open operations.³⁻⁵ This creates a training environment in which it is challenging for vascular and GS residents alike to obtain significant open operative experience. Furthermore, open operative technical skill has been cited as a concern by practicing vascular surgeons when asked about their perception of 0 + 5 VS residency program graduates.⁶ Furthermore, we speculate that open *abdominal* operations, in which trainees learn laparotomy and abdominal anatomy, are a more pertinent training experience compared with minor, nonabdominal operations. This is particularly relevant as abdominal vascular operations, such as abdominal aortic aneurysm repair and revascularization of mesenteric occlusive disease, are increasingly performed endovascularly, decreasing VS trainee experience in laparotomy during their VS training.⁷

The purpose of this study is to evaluate the GS operative experience of 0 + 5 VS residents on a national level with specific attention to distribution of cases between open and laparoscopic. We hypothesize that 0 + 5 VS resident operative experience in GS is dominated by laparoscopic cases. In addition, we theorize that different program structures provide variable levels of operative experience and there may be a best model that can be recommended. Defining the GS operative experience of 0 + 5 VS residents would help PD refine the content and goals of the 24 months of core surgery.

METHODS

In July 2013, 26 0 + 5 VS PD were e-mailed a request to participate in the study by providing deidentified operative logs of their current 0 + 5 VS residents. Overall 21 of the PD's agreed to participate (81% response rate); however, 12 of those 21 programs ultimately provided the requested data for inclusion in the study (57% participation rate).

All 12 of the participating programs were university-based residency programs. The regions of the country represented in the data set include the Northeast, Southeast, Midwest, and West. A sum of 5 programs are new, with residents who have completed the postgraduate year (PGY)-2 training year or less. A total of 7 programs have residents who have completed the PGY-3 training year or more. Overall, 10 of the institutions have large GS residency programs, graduating at least 6 residents per year.

In September 2013, the ACGME operative case logs of 41 active 0 + 5 VS residents were retrospectively reviewed. Institutional Review Board approval was obtained from the University of Wisconsin.

Description of the Data Set

The ACGME operative report chosen for analysis was the "Integrated Vascular Experience Report." Program coordinators provided operative logs in this format via a PDF file e-mailed to the study authors. Separate reports were generated for each PGY of training for each individual resident. All case logs were deidentified on receipt and stored in a password-encrypted computer on site at the University of Wisconsin.

At the time of data collection, 14 residents were beginning PGY-2 of their training, 10 PGY-3, 10 PGY-4, 6 PGY-5, and 1 resident had graduated. Aggregate data from these residents resulted in 41 PGY-1 operative logs, 27 PGY-2 operative logs, 17 PGY-3, 7 PGY-4, and 1 PGY-5 operative log. The PGY-5 data from the single graduate was excluded from analysis due to concerns regarding anonymity.

The Residency Review Committee uses Current Procedural Technology codes for case identification in resident operative logs. These codes are not comprehensive in delineating open and laparoscopic operations. For example, appendectomy is listed as "appendectomy—open" and "appendectomy—laparoscopic." However, ventral hernia repair, an operation that can be performed through either an open or laparoscopic approach, is listed only as "ventral hernia." Accepting this limitation, GS procedures were categorized as "open" or "laparoscopic" cases for analysis. Cases that were clearly identified as "laparoscopic" were coded as such. Cases that did not carry this identifier, such as "ventral hernia," were coded as open cases.

Cases logged as "primary procedures" were included in the analysis. Cases logged as "secondary procedures" were excluded to limit the potential for redundancy (counting 1 operative event as multiple procedures). Cases logged as "surgeon chief" or "surgeon junior" were included in analysis. Cases logged as "first assistant" or "teaching assistant" were excluded to limit the potential for multiple residents to count a single operative event.

The distribution of the 24 months of core surgery experience at each institution was previously identified.² The programs participating in this study were of 2 types—core surgery over 3 years and core surgery over 4 years. Programs were assigned to the 3 or 4 year category based on the model identified by the PD. A total of 6 programs have the core surgery experience over 3 years. These 6 programs accounted for 28 of the 41 residents (68%). A total of 4 programs have core surgery experiences into the fourth year. Of these 4 programs 3 are new, thus accounting for only 9 of the 41 residents in the study (22%). Information on the distribution of the core surgery requirement was not available for the remaining 2 programs. Case volume and mix were analyzed by program type.

Analytical Strategy

The average number of operations performed by residents in programs with core surgery over 3 years and residents in

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