Can Rural Minimally Invasive Surgery Fellowships Provide Operative Experience Similar to Urban Programs?

James Patrick Ryan, MD,[*] Andrew J. Borgert, PhD,[†] Kara J. Kallies, MS,[†] Lea M. Carlson, RNC,[*] Howard McCollister, MD, FACS,[*] Paul A. Severson, MD, FACS,[*] and Shanu N. Kothari, MD, FACS[‡]

[*]Minnesota Institute for Minimally Invasive Surgery, Cuyuna Regional Medical Center, Crosby, Minnesota; [†]Department of Medical Research, Gundersen Medical Foundation, La Crosse, Wisconsin; and [‡]Department of General Surgery, Gundersen Health System, La Crosse, Wisconsin

OBJECTIVE: Operative experience in rural fellowship programs is largely unknown. The 2 of the most rural minimally invasive surgery (MIS)/bariatric fellowships are located in the upper Midwest. We hypothesized that these 2 programs would offer a similar operative experience to other U.S. programs in more urban locations.

DESIGN: The 2011 to 2012 and 2012 to 2013 fellowship case logs from 2 rural Midwest programs were compared with case logs from 23 U.S. MIS/bariatric programs. All rural Midwest fellowship graduates completed a survey describing their fellowship experience and current practice. Statistical analysis included Wilcoxon rank-sum test.

SETTING: Setting included the 2 rural Midwest U.S. MIS/bariatric fellowship programs.

PARTICIPANTS: Graduates from MIS/bariatric fellowship programs participated in the study.

RESULTS: Mean volumes for bariatric, foregut, abdominal wall, small intestine, and hepatobiliary cases for rural Midwest fellows vs. other U.S. programs were 123.8 ± 23.7 vs. 150.2 ± 49.2 ($p = 0.20$); 44.3 ± 19.4 vs. 66.3 ± 35.5 ($p = 0.18$); 48.3 ± 28.0 vs. 57.9 ± 27.8 ($p = 0.58$); 11.3 ± 1.9 vs. 12.0 ± 8.7 ($p = 0.58$); and 55.0 ± 34.8 vs. 48.1 ± 42.6 ($p = 0.63$), respectively. Mean endoscopy volume was significantly higher among rural Midwest fellows (451.0 ± 395.2 vs. 99.7 ± 83.4; $p = 0.05$). All rural Midwest fellows reported an adequate number of cases as operating surgeon during fellowship. A total of 60% of fellows currently practice in a rural area. In all, 87% and 13% reported that their fellowship training was extremely or somewhat beneficial to their current practice, respectively.

CONCLUSIONS: Rural MIS fellowship programs offer a similar operative experience to other U.S. programs. A greater volume of endoscopy cases was observed in rural Midwest fellowships. (J Surg Ed 73:793-798. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: minimally invasive surgery, advanced laparoscopic techniques, surgical education, rural surgery, fellowship training, case volume

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

INTRODUCTION

In 2010, 17% of the U.S. population lived in nonmetropolitan areas,[1] yet only 6% of nonsurgical and surgical procedures were performed nationally in those facilities.[2] Of more notable concern is the observation that 61% of trauma deaths occur in rural areas and rural trauma fatality rates are more than twice as high as urban rates.[3,4] This limited access to surgical care for the U.S. rural population is expected to worsen over the next decade as we see evolving changes in the number and distribution of graduating general surgery residents.[5] Currently, nearly 80% of these graduates pursue additional fellowship training in a surgical subspecialty.[6]

Given an apparent need for general surgeons practicing modern, advanced minimally invasive surgery (MIS) in rural areas,[7] there is an obvious role for rural postgraduate training programs. However, despite evidence demonstrating similar operative experience and surgical outcomes in

Correspondence: Inquiries to Shanu N. Kothari, MD, FACS, Department of General Surgery, Gundersen Health System, 1900 South Avenue, C05-001, La Crosse, WI 54601; fax: (608) 775-4460; e-mail: snkothar@gundersenhealth.org

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rural and urban teaching hospitals,[8] rural training programs are rare, and often these programs are questioned as to whether a comprehensive training experience can be achieved in a rural setting.

Two of the most rural MIS fellowship programs in the United States are those at the Gundersen Medical Foundation, established in 2003, and the Minnesota Institute for Minimally Invasive Surgery (MIMIS), established in 2007. We hypothesize that these 2 fellowship programs offer a similar operative experience to their more urban counterparts. The objective of this study was to evaluate the operative experience and satisfaction of all fellows who have graduated from these 2 rural MIS fellowship programs and compare their operative experience to the other MIS/bariatric programs in the United States and Canada, located in primarily urban areas.

METHODS

Gundersen Health System, located in La Crosse, WI (population 51,320) is a 325-bed integrated multispecialty group health system serving 19 counties over a 3-state region. The Gundersen Medical Foundation supports an accredited general surgery residency program and an accredited minimally invasive bariatric surgery and advanced laparoscopy fellowship. Gundersen's bariatric surgery program is a Bariatric Surgery Center of Excellence, accredited by the American Society for Metabolic and Bariatric Surgery and given Level 1a designation by the American College of Surgeons. The MIMIS is located within the medical campus of Cuyuna Regional Medical Center in Crosby, MN (population: 2386) and is triple accredited in MIS/bariatric surgery and endoscopy.

The case logs of all graduates from 2 rural Midwest programs (Gundersen Medical Foundation and MIMIS) from the inception of each program through the 2012 academic year were evaluated and compared to national case logs for all other U.S. MIS/bariatric fellows in 2011 to 2012 and 2012 to 2013. Case logs for all U.S. programs are available to the public on the Fellowship Council website.[9] Case volumes were calculated from beginning and ending dates of July 1 each year. All fellowship graduates from the programs at Gundersen Medical Foundation and MIMIS were surveyed via e-mail. Survey questions included current practice characteristics and fellowship experience (breadth of operative experience and overall satisfaction). Rural urban continuum codes for 2013 were used to determine current practice area classification; a code ≥ 3 was considered "rural." Statistical analysis included Wilcoxon rank-sum test. Case volumes were normalized for programs with more than 1 fellow during an academic year. A $p < 0.05$ was considered significant.

RESULTS

The case logs of 15 rural Midwest fellowship graduates were compared with the case logs of 46 fellowship graduates from 23 urban MIS/bariatric fellowship programs in the United States. No significant differences were observed in mean case volumes of rural Midwest fellows compared to other U.S. fellowship programs regarding bariatric, hepatobiliary, abdominal wall, foregut, colorectal, peritoneum/omentum/mesentery, appendix, small intestine, or solid-organ cases (Fig. 1). Mean endoscopy volume was significantly higher among rural Midwest fellows as this is a large component of one of these fellowship programs (451.0 ± 395.2 vs. 99.7 ± 83.4; $p = 0.05$). Total procedural volume refers to the number of procedures performed, whereas case volume refers to the number of patients, regardless of the number of procedures a single patient may have undergone. The increased endoscopy volume among Midwest fellows may contribute to the increased total procedure number if a high volume of patients underwent endoscopy as well as a surgical procedure.

All 15 rural Midwest fellowship graduates completed the survey, and all (100%) reported an adequate number of

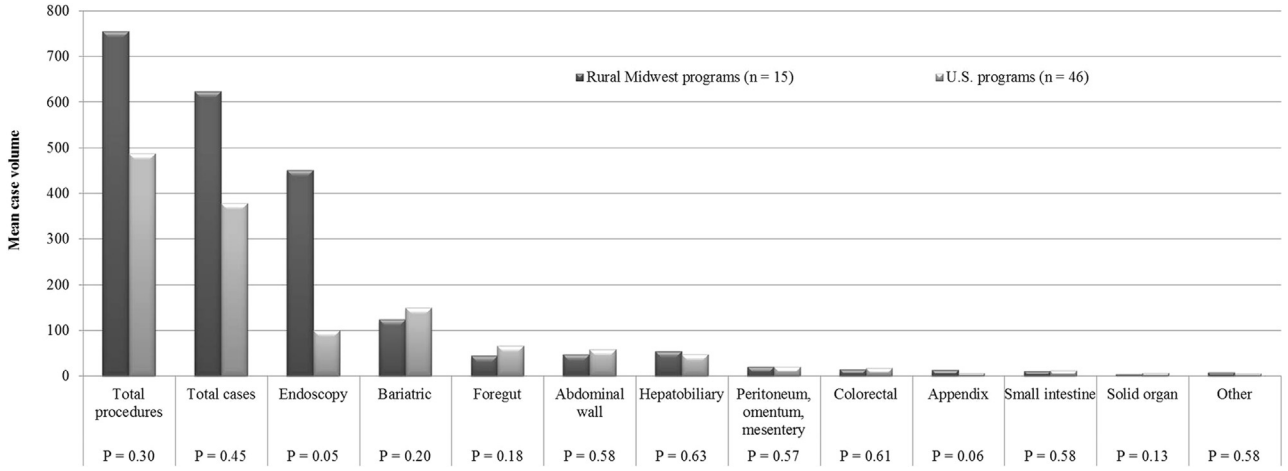

FIGURE 1. Mean case volumes for rural Midwest fellowship programs compared with other U.S. MIS programs.