

The Right Way to Teach Left-Handed Residents: Strategies for Training by Right Handers

Nikhil K. Prasad, MB, ChB, Charlotte Kvasnovsky, MD, PhD, Eric S. Wise, MD and Stephen M. Kavic, MD

Department of Surgery, University Of Maryland Medical Center, Baltimore, Maryland

PURPOSE: Left-handed (LH) residents remain underrepresented among surgical trainees, and there are few available data on how best to train them. The challenge is amplified when pairing a LH resident with a right-handed (RH) mentor. This report provides recommendations on how to improve the training of LH surgeons in a safe and effective manner.

METHODS: A comprehensive literature review was performed using different databases and search engines to identify all articles relevant to the training of LH residents.

RESULTS: A total of 40 articles highlighted the challenges for LH surgical residents and RH mentors. Our recommendations are based on the following 4 themes: identifying inherent differences in left vs. RH residents, providing guidance to RH mentors training LH residents, adapting the RH environment to the LH surgeon, and maximizing safety during training.

CONCLUSION: An organized approach needs to be taken in training the LH resident. Changes should be instituted at program-wide and national levels to ensure that the training experience of the sinistral surgical resident is optimized. (J Surg Ed ■■■■-■■■. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

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COMPETENCIES: Systems Based Practice, Practice Based Learning

INTRODUCTION

Approximately 12% of the population is left-hand dominant in the Western world.¹ At times, there is a stigma associated

Correspondence: Inquiries to Stephen M. Kavic, MD, University of Maryland School of Medicine, 29 South Greene Street, GS 631, Baltimore, MD 21201; fax: (410) 328-5919; e-mail: skavic@som.umaryland.edu

with being left-handed (LH). Classically, the association with the Latin “sinister” has extended to multiple idiomatic uses with negative connotations in modern English including “left behind,” “out in left field,” and “two left feet.”

Left-handers must deal with a number of real-life practical concerns that favor the right-hand-dominant population. In technical fields, one might expect a significant amount of study and reflection concerning the use of hands, and handedness in particular. Within surgery, there is little mention of left-handedness. Standard surgical textbooks, such as Sabiston’s Textbook of Surgery, Schwartz’s Principles of Surgery, Greenfield’s Surgery Scientific Principles and Practice, or even The Society of American Gastroenterologists and Surgeons Manual, make no specific mention of left-handedness.

The limited data that exist suggests that there may be proportional underrepresentation of LH surgeons.^{2,3} With this lack of information, there is potential for misattributing early delays in the technical skill acquisition of LH residents to an innate talent deficit. In fact, in a survey of LH surgeons, 10% of the surgeons themselves would feel uncomfortable if they needed surgery, and their surgeon was LH⁴!

In this article, we review all relevant literature concerning the training of LH surgeons. Specifically, we identify the challenges in training. We also provide a list of considerations that may not be apparent to most right-handed (RH) surgeons. Lastly, and most importantly, we aim to provide strategic guidance for improvement of LH training on both individuals and programs.

LITERATURE SEARCH

Two databases (OVID Medline and Pubmed) and the search engine Google Scholar were used for the literature search. The terms “left-handed,” “handedness,” “training,” “trainee,” “resident,” “surgery,” “surgeon,” and “surgical” were combined using Boolean logic to identify all relevant articles. These were then cross-referenced to identify any

missing articles. Articles not written in English were excluded.

RESULTS

The literature search generated 40 articles. These were classified based on the type of article—randomized control trial, cohort study, retrospective case series, survey, or editorial. The first 3 of these categories are summarized in [Table 1](#). We stratified our findings and recommendations into 3 categories based on the core themes that arose in literature. The major issues confronting LH trainees are listed in [Table 2](#).

The Effect of Handedness on Surgical Skill Acquisition

There has been a historic bias against LH surgeons, highlighted in a publication by Schott and Puttick.⁵ This article suggested that LH surgeons may not possess the motor skills necessary to perform surgery. Subsequent studies, however, refuted this assertion; nonetheless, the stigma of the sinistral surgeon persisted.^{2,3}

Some studies have pointed to greater manual dexterity among RH surgeons. For instance, one showed greater ambidexterity among RH surgeons as compared to LH surgeons.⁶ It was also been suggested that LH surgeons tend to make more unnecessary movements and are less accurate when performing laparoscopic tasks.^{7,8} Many of these studies, however, were carried out on small samples of medical students or nonsurgical trainees and rarely tracked the acquisition of skills over time; moreover, the tasks may have inherently favored right-hand–dominant candidates. When assessments of dexterity have been designed to account for handedness, there does not appear to be any difference between RH and LH.²

The first step in training the left-hand–dominant resident is to recognize that inherent differences in the acquisition of psychomotor skills that may exist between RH and LH.^{9,10} Regardless of handedness, practice improves performance.^{11,12} Toward the end of training, LH surgeons may in fact have lower complication rates than RH surgeons.¹³ It is important not to force the LH resident to use their nondominant hand preferentially, as this may be less safe and require a greater degree of baseline skill and understanding to perform the task effectively.¹⁴ Nonetheless, we acknowledge that ambidexterity is invaluable in surgery and may be trained by strengthening exercises and simulation involving primarily the nondominant hand.¹⁵

Skills in endoscopy should, in theory, be simpler to acquire for the LH surgeon, as the left hand must balance the up-down and left-right knobs, as well as irrigation and suction, while the right hand is responsible only for torque,

steering, and advancement. Indeed, the difficulty experienced by the RH endoscopist ostensibly led to the now-abandoned “two-person colonoscopy” technique, wherein an assistant drives the shaft while the endoscopist uses 2 hands to drive.¹⁶ To our knowledge, this apparent innate benefit to LH endoscopists has not been researched.

Challenges to Mentoring

Given the fact that surgical training is in essence an apprenticeship, wherein the trainee acquires skills by observation and emulation, it is essential for surgical mentors to understand the resident’s perspective and anticipate potential deficiencies in technique. Surveys show that RH surgeons are on the whole less comfortable than their sinistral counterparts in training LH residents and are more likely to judge LH residents as having less technical abilities.¹⁷ In addition, given the underrepresentation of left hand in surgery, the vast majority of trainees have never met a LH mentor in medical school or residency.^{18,19}

The first step in effectively training the LH surgical resident is recognition and acknowledgment of their hand preference. Most residents remark that their handedness had never come up in interviews or job applications.¹⁸ Handedness is not included in American Medical College Application Service to medical school, nor in Electronic Residency Application Service to residency. The early identification of the LH trainee allows the mentor to anticipate difficulties that they might face during a case and frees the trainee from the anxiety of being judged poorly.²⁰

Mentors should acknowledge early that LH trainees must learn to use instruments slightly differently than RH trainees. Often, the first skill acquired is cutting suture as a medical student. Using a RH scissor with the left hand will naturally push the blades slightly apart, increasing the likelihood that the LH trainee will require several attempts to cut suture. A brief primer at the beginning of internship or even a medical student clerkship could facilitate skills acquisition for simple tool-handling techniques. Given the preponderance of RH instruments, it is the authors’ opinion that LH trainees should continue to train with RH instruments.

The benefit of early intentional pairing of LH residents and staff surgeons cannot be overstated. Aside from providing reassurance and empathy for difficulties experienced in adapting to system developed by and for RH surgeons, it would allow the transfer of subtleties, tips, and modifications of technique acquired through years of trial and error.

The challenges of training LH residents become more apparent at certain crucial stages of a procedure. Freeman et al.²¹ used a modular training method to teach LH ophthalmology residents how to perform phacoemulsification. The procedure was broken up into 6 stages, and each stage was adapted such that the positioning of the patient and surgical exposure were planned in advance based on the handedness of the trainee. A similar approach to all surgical

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