Letter to the Editor

Analysis of adoption rates for laparoscopy in colorectal surgery: why are they lagging behind?

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Minimally invasive surgery has been widely adopted in general surgery as well as many surgical subspecialties and has multiple benefits including lower perioperative complications and decreased length of stay (1). Despite a consistent increase in the use of laparoscopy in colorectal cases over a 10-year time period, from 22.7% in 2005 to 49.8% in 2014 (2), colorectal surgery tends to lag behind other specialties, including general (3,4). Further, as mentioned by Abu Gazala and Wexner, these rates are likely lower than actual national rates given the more academic and urban makeup of institutions participating in the National Surgical Quality Improvement Program.

In an effort to identify barriers to the adoption of laparoscopy, Fuchs Weizman *et al.* designed a study surveying practicing gynecologists in 2015 (5). Surgeons perceived the most limiting factors to be lack of adequate case volume, reluctance to manage unexpected surgical scenarios laparoscopically, difficulty with "video-eye-hand coordination," altered depth perception, and the challenge of suturing laparoscopically. A 2008 survey of Canadian general surgeons found that recent graduation, male sex, practice location, university-hospital affiliation, and dedicated minimally-invasive training were significant predictors for offering laparoscopic versus open colorectal resection (6). Furthermore, unique to colorectal surgery as compared to general and many other surgical specialties, many colorectal procedures require more advanced laparoscopic skills, especially due to the need for multi-quadrant surgery and the confined workspace in the deep pelvis. Finally, given controversy over laparoscopy for rectal cancer, many surgeons choose to perform these resections open (7).

In order to address the gap in the use of minimally invasive surgery, Houck *et al.* offered workshops in advanced laparoscopy to practicing surgeons (8). Interestingly, they found the workshops to be efficacious in technical education and on follow up, participating surgeons did significantly increase the number of cases they performed laparoscopically. However, surgeons who were exposed to laparoscopy during residency training had much greater benefit to the advanced laparoscopy workshop and experience of greater than 50 laparoscopic cases during residency training predicted significantly higher laparoscopic volume than surgeons with little or no exposure to laparoscopy prior to the workshop. While studying barriers to the adoption of laparoscopy in gynecologists, Fuchs Weizman *et al.* called for improved simulation training and continuing medical education for surgeons to increase the use of minimally invasive surgery (5). In general surgery, a well-evidenced, structured training curriculum is in place for learning basic laparoscopic skills: the Fundamentals of Laparoscopic Surgery. However, a similar program is missing for more advanced laparoscopy and the learning curve required for adoption of these skills is much longer than it is for basic laparoscopy. Thus, a Delphi study of 57 international experienced in advanced minimally invasive surgery was performed in order to establish the essential elements of an advanced minimally invasive surgical curriculum including entry criteria, selection of trainers, equipment, and content of the curriculum (9).

A recent analysis of graduate gynecologic residents' competence in laparoscopy and found that though they were sufficiently trained to perform basic and intermediate but not advanced laparoscopic procedures independently (10). Given that the majority of surgeons more regularly perform bread and butter cases, the authors suggest that a select group of trainees continue to fellowship for more advanced laparoscopic training after residency. Another study specifically examining minimally invasive surgery in colorectal surgery found that colon and rectal surgery fellowship-trained surgeons performed minimally invasive colorectal surgery more often than those who had not completed the fellowship program (3). Interestingly, the group also found that with fellowship-trained surgeons the proportion of pelvic cases being performed robotically was increasing, and that open surgery was decreasing, suggesting that rather than performing cases robotically than laparoscopically, a greater overall proportion of cases were performed using minimally invasive technique.

This leads to a final challenge to the adoption of laparoscopy in colorectal surgery: a large portion of colorectal cases performed in the United States are performed by general surgeons, not by surgeons with advanced fellowship training in minimally invasive or colon and rectal surgery.

A recent paper by Hamilton *et al.* called for the "modern colorectal surgeon" to be open-minded and proactive about evolving surgical technologies in order to always offer the best current available treatment option to the patient (11). Hopefully as general surgery residents become increasingly exposed to higher volume and more advanced laparoscopic procedures and more graduating residents opt into fellowship training, the rate of minimally invasive technique will continue to rise in colorectal surgery. Further, we encourage practicing surgeons to seek formalized training in minimally invasive surgery by simulation, workshop, or peer mentorship.

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Footnote

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