Years of Training and Operative Performance: Do More Senior Residents Perform Better? Advanced Laparoscopic Course in The Animal Lab

Ahmad Omid Rahimi, MD, MPH[1], Michelle Chang, MD[1], Chiu-Hsieh Hsu, PhD[2], Iman Ghaderi, MD, MSc, MHPE[1]

1. University of Arizona College of Medicine, Tucson, AZ 2. College of Public Health, Tucson, AZ, USA

Banner University Medical Center Tucson

Introduction

It is assumed that years of training correlate with operative performance of surgical residents. The limited evidence in the literature is conflicting on whether surgical residents' operative skills level improve with more experience through residency. The objective of this study was to examine the relationship between years of training and operative performance of senior surgical residents in an advanced laparoscopic training course in the animal lab.

Methods

Senior surgical residents (PGY3-PGY5) performed laparoscopic splenectomy, Nissen fundoplication, low anterior colon resection and jejunojejunostomy procedures on live pigs. Assessment tools with proven validity evidence were used to assess their operative performance (global and procedure-specific rating tools). We used Global Operative Assessment of Laparoscopic Skills (GOALS) for the assessment of splenectomy, a procedure-specific assessment tool and GOALS for Nissen fundoplication, and Operative Performance Rating System (OPRS) for low anterior colon resection and jejunojejunostomy. Assessments were completed immediately after each procedure by one faculty. The ANOVA tests were conducted to compare the average in the operative performance scores between PGY3-PGY5 residents.

Results

Between 2015 and 2022, 113 splenectomy, 133 Nissen fundoplication, 116 colectomy, and 27 jejunojejunostomy procedures were assessed. Except for splenectomy, the improvement of performance was not statistically significant for the remaining procedures. Table 1 summarizes the average scores for 3 variables (average total scores for GOALS, average total score for Nissen's procedure-specific assessment tool, and average OPRS scores).

Table 1: Average scores for PGY3-PGY5 in splenectomy, Nissen fundoplication, colectomy and jejunojejunostomy using global and procedure-specific rating tools.

Operative Performance (Assessment Tool)	Average Score (SD)			p Value
	PGY3	PGY4	PGY5	
Splenectomy (GOALS)				
Total Score*	15.14 (2.87)	16.07 (3.12)	17.92 (3.58)	0.002
Nissen Fundoplication (GOALS and a Procedure-Specific Assessment Tool)				
Total Score (GOALS)*	15.08 (2.85)	15.92 (3.29)	16.68 (2.93)	0.089
Total Score (Procedure-Specific)**	19.74 (4.40)	20.84 (5.99)	20.64 (5.44)	0.601
Colectomy (OPRS)				
Average OPRS score***	2.92 (0.72)	3.07 (0.83)	3.35 (0.84)	0.081
Jejunojejunostomy (OPRS)				
Average OPRS score***	2.38 (0.45)	2.60 (0.30)	2.64 (0.53)	0.407

* Total score for GOALS is out of 25.
** Total score for procedure-specific assessment tool is out of 35.
*** A Likert scale, 1-5 was used for all variables included in average OPRS score.

Discussion and Conclusions

In this study, we demonstrated that there was no significant improvement in operative performance of senior residents with increasing years of training for most of the advanced procedures. The trend noted in laparoscopic splenectomy could be due to limitation of GOALS in assessment of advanced laparoscopic skills. The results support the importance of objective assessment of operative performance in competency-based training where the length of training is not the only criteria to determine ability to perform a procedure independently.

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