REPETITION IS KEY: A ROBOTIC ENTEROTOMY REPAIR TRAINING EXERCISE FOR JUNIOR SURGICAL TRAINEES

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Objective: As surgical education evolves with technological advances in surgery, development of improved training protocols and evaluations are needed. Increasing use of the robot across surgical specialties warrants a more robust robotic surgery curriculum for surgical trainees. Our protocol aimed to establish a method to teach junior surgical trainees the advanced robotic task of enterotomy repair following a brief, focused training session.

Methods and Procedures: Junior surgical trainees, defined by post-graduate years 1 (PGY-1) and 2 (PGY-2), watched a 7-minute video demonstrating performance of a 2-layer robotic enterotomy repair. The first layer was a running baseball stitch with barbed suture and the second consisted of three Lembert stitches with braided suture. A 3 cm transverse enterotomy was then created on a 10 cm segment of porcine bowel. Participants were timed while performing the repair. A leak test was then performed by submerging the bowel under water and performing air insufflation. The number of distinct leaks were recorded. Residents repeated the procedure two additional times (for a total of 3 trials in a span of 4 weeks).

Results: 17 residents participated (11 PGY-1, 6 PGY-2). 11 residents completed a 1-month dedicated surgical skills lab rotation including robotic training (7 PGY-1, 4 PGY-2). Mean repair time improved between trials ($p<0.001$; 1st trial, 19 min 5 sec; 2nd trial, 14 min 23 sec; 3rd trial, 12 min 47 sec). Leak rate decreased with subsequent trials, however, was not statistically significantly ($p=0.26$; 1st trial, 6/17 (35%); 2nd trial, 5/17 (29%); 3rd trial, 2/17 (12%)). There was no difference in leak rate between residents who completed the lab rotation and those who did not, however those with a lab rotation had a faster 3rd trial time ($p<0.05$; 10 min 57 sec vs. 16 min 9 sec). There was no difference between repair time or leak rate between PGY-1 and PGY-2 residents.

Conclusions: This novel method of teaching an advanced robotic task with repeated trials demonstrated effectiveness amongst residents with improvement in mean repair time and a trend towards decreased leak rates. Improvement in mean repair time was more profound in residents who completed a dedicated surgical skills lab rotation. These results suggest that focused robotic training exercises with repetition are effective in developing advanced robotic skills. Educators should consider employing this concept as a mean of training and evaluating resident proficiency in the application of the most useful feature of the robotic platform, suturing.

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