Robotic Surgery Does Not Negatively Affect Operating Room Turnover Time in Ambulatory Surgery

David Weithorn MD, Tara Neves RN, George Mazpule MD, Adam Rosenstock MD, Stephen Pereira MD

Hackensack Meridian
Hackensack University
Medical Center

Objective:

To demonstrate the feasibility of expanding the use of robotic surgery to ambulatory surgery centers.

Description:

Ambulatory surgery centers focus on efficiency in high volume, short duration procedures with fast room turnover between cases. General surgeons often perform Laparoscopic Cholecystectomies and Laparoscopic Inguinal Hernia repairs in ambulatory surgery centers. Robotic surgery has expanded the use of minimally invasive surgery by general surgeons; however, it has been perceived as adding complexity to operating room set up and has been assumed to slow down turnover time.

Our institution operates a hospital-based outpatient surgical center within a building adjacent to the main hospital. This surgical center uses a DaVinci X system (Intuitive Surgical, Sunnyvale, CA). We compared administrative records of wheels-out to wheels-in turnover time comparing laparoscopic to robotic inguinal hernia repairs as well as laparoscopic to robotic cholecystectomies Procedures combined with an unrelated procedure (i.e., lipoma excision) were excluded as were cholecystectomies with cholangiogram. Single incision robotic procedures were also excluded given single incision laparoscopic procedures are not often performed at this institution.

For comparison, the same analysis was done for surgeries performed in the main (inpatient) operating room which uses the DaVinci Xi system (Intuitive Surgical, Sunnyvale, CA). To avoid confounding due to the COVID-19 pandemic, only data from 2018 and 2019 were evaluated. Analysis used a 2-tailed t-test, significant p-values were <0.05.

Results

Inguinal Hernia

Over the study period 70 minimally invasive inguinal hernia repairs done in the ambulatory surgery center were included in the analysis, 61 robotic, 9 laparoscopic. Turnover time for robotic cases was 2.23 (95% CI 7.01 to -2.55) minutes longer on average compared to laparoscopic with mean times of 34.11 vs 31.89 minutes respectively (p=0.03561).

In the main operating room 64 minimally invasive inguinal hernia repairs were included in the analysis, 33 robotic, 31 laparoscopic. Turnover time for robotic cases was 1.39 (95% CI 5.28 to -2.49) faster on average compared to laparoscopic with mean times of 36.12 vs 37.52 minutes respectively (p=0.4760)

Cholecystectomy

Over the study period 54 minimally invasive cholecystectomies done in the ambulatory surgery center were included in the analysis, 14 robotic, 40 laparoscopic. Turnover time for robotic cases was 3.27 (95% CI 7.43 to -0.89) slower on average compared to laparoscopic with mean times of 36.07 vs 32.8 minutes respectively (p=0.1206)

In the main operating room 82 minimally invasive cholecystectomies were included in the analysis, 21 robotic, 61 laparoscopic. Turnover time for robotic cases was 2.09 (95% CI 6.00 to -1.82) minutes faster than laparoscopic with a mean of 37.19 vs 39.28 minutes respectively (p=0.2909).

Conclusions and Future Directions

Turnover times were not significantly different between robotic and laparoscopic surgeries indicating that robotic surgeries do not take longer to set up. This has implications for expanded use of robotic surgery in the ambulatory surgery setting for general surgery as well as urologic and gynecologic procedures. In the future we plan to examine use of the Xi system in a freestanding ambulatory surgery center.