15. DOES ADOPTION OF NEW TECHNOLOGY INCREASE SURGICAL VOLUME? THE ROBOTIC INGUINAL HERNIA REPAIR MODEL

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Background: Robotic surgery is an appealing option for patients undergoing elective surgery. However given the high startup, maintenance and operating costs, it is unknown whether robotic technology increases operative volume for specific diagnoses. Our hypothesis is that the hospital adoption of robotic technology increases the total volume of inguinal hernia repairs as compared to non-robotic hospitals.

Methods: The 2010-2018 Florida Agency for Health Care Administration Ambulatory Patient data was queried for Open, Laparoscopic and Robotic inguinal hernia repairs. A combination of ICD9, ICD10 and CPT codes were used to maximize the number of cases included. Total annual volume of hospital specific inguinal hernia repairs was calculated. Using Poisson regression based difference in difference (DID) technique, differences of the total hernia volume of robotic hospital pre and post adoption of robotic technology was compared to difference of total hernia volume of non-robotic hospitals. In addition, hospitals that were early adopters of robotic technology were compared to their surrounding non robotic competitor hospitals in the same geographic region. Incident Rate Ratios- IRR, from the difference in difference analysis determined the significance of robotic technology. Hospital and patient demographic data were evaluated and chi square tests were used to determine statistical significance, $p < 0.05$ was considered significant.

Results: There were 258,785 inguinal hernia repairs (5,774 Robotic, 88,265 Laparoscopic and 164,746 Open) performed at 398 hospitals, 94 had robotic capabilities. 90% of the procedures were primary inguinal hernia repairs. The majority of patients were white non-Hispanic or Latino males (85%, 84%, 92%), aged 51-70(46%), holding commercial health insurance (43%), with minimal comorbidities as defined by their Charlson Comorbidity index category 1(82%). 99% of robotic facilities were designated as hospitals, while 65% of non-robotic hospitals were ambulatory surgery centers or other hospital types. Robotic hospitals experienced a 9.5% increase in total volume of inguinal hernia repairs after the introduction of robotic technology (Incident Rate Ratios- IRR 1.095, p value < 0.0001). A significantly greater increase in total hernia volume was observed for the early adopter hospitals with the IRR(s) ranging 1.20-2.51(all p values < 0.0001).

Conclusion: Hospital adoption of robotic technology increases overall volume of inguinal hernia repairs. Analysis of additional procedures is required to validate the generalizability of these findings and provide insight into the clinical and financial implications for hospitals considering robotic platforms at their facilities.