IMPACT OF AN INDEX ROBOTIC FOREGUT SURGEON ON A GENERAL SURGERY PROGRAM

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Objectives

Index addition of a single robotic foregut surgeon contributes greatly to a teaching hospital. Our hospital is a 404 bed, University affiliated hospital. The general surgery service is comprised of 6 general surgeons primarily performing open and laparoscopic surgery. We analyzed the impact of incorporating a new predominantly robotic foregut and bariatric surgeon on case volume, case mix index, robot utilization, and resident education. We evaluated the financial impact of this expansion on the hospital.

Methods

Using robot manufacturer data and our operative records, we collected robotic general surgery cases performed two years prior to hiring our foregut surgeon and compared this with the following two years. We used a Chi-squared test to determine if the increase in volume was significant. We reviewed hiatal hernia repair, heller myotomy, sleeve gastrectomy, ventral hernia repair, inguinal hernia repair and cholecystectomy. The financial impact of these cases was compiled from their medicare DRG (diagnosis related group) value for uncomplicated procedures (an underestimate of the true reimbursement)

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MIS Bariatric Volumes and Compensation

Case Type (Robotic)	Hiatal Hernia	Heller Myotomy	Sleeve Gastrectomy	Ventral Hernia	Inguinal Hernia	Cholecystectomy	Total
2 Year Pre-Program Volumes	0	0	0	4	84	1	**89**
2 Year Post-Program Volumes	25	3	33	76	142	38	**317**
DRG Compensation*	$10,705	$10,705	$10,261	$8,736	$7,089	$8,453	
2 Year Pre-Program Compensation	$0	$0	$0	$34,944	$595,476	$8,453	**$638,873**
2 Year Post-Program Compensation	$267,625	$32,115	$338,613	$663,936	$1,006,638	$321,214	**$2,630,141**

Figure 1: Robotic case volumes by case type and total DRG based compensation for 2 years before and after bringing on the robotic foregut surgeon. Change in case volume and revenue is statistically significant with p values ≤0.01 excluding Heller myotomy which did not have enough data to accurately assess. *DRG compensation values were taken from 2021 using the no MCC/CC values.

Total Robotic Case Volume Over Time

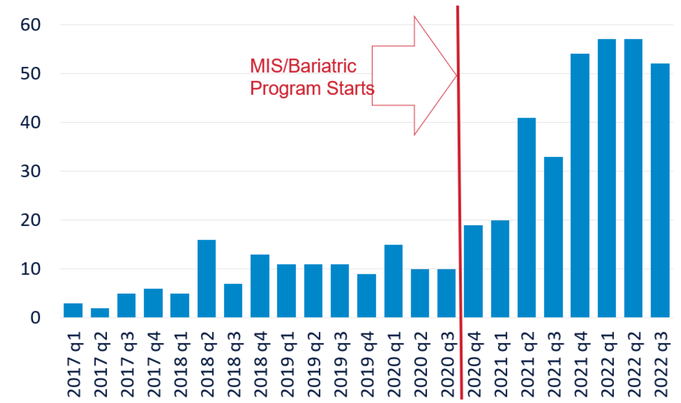


Figure 2: Total general surgery robotic case volumes before and after hiring a robotic foregut surgeon. Average robotic cases per quarter prior to bariatric program 9±4, average after 42±16. $p=2x10^{-7}$

Results

Total robotic general surgery cases pre-foregut surgeon participation was 90. The total number of tracked robotic cases increased to 333 during the timeframe of this review. This was a 270 percent increase. This large difference was also statistically significant according to our Chi-squared test, showing a p-value <.05. Foregut and bariatric procedures underwent dramatic increases in volume. Over the respective two-year window, hiatal hernia repairs increased from zero cases to 25, Heller Myotomies from zero to 3, sleeve gastrectomies from zero to 33, ventral hernias from four to 76, inguinal hernias from 84 to 142 and cholecystectomies from one to 38. The total hospital compensation for the latter epoch cases totaled over 2.6 million dollars. (Figure 1)

Conclusion

Addition of an index foregut robotic surgeon expanded case volume, case variety, and case complexity. Of note, this growth occurred despite the pandemic decrease in elective surgery, a confounding variable. An index robotic champion resulted in broader general surgeon utilization of the robot platform. It generated a new significant stream of revenue. Resident participation and exposure to robotic surgery improved. In conclusion, an index robotic foregut surgeon can have a disproportionate impact on volume growth, revenue generation, and resident education.

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