Efficiency Improvements in Bariatric Robotics

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Introduction

The value and role of robotics in bariatric surgery has been widely disputed for being inefficient and more expensive when compared to traditional methods.[1]

The aim of our study was to demonstrate an increase in efficiency with the implementation of a bariatric surgery robotic program in a Minimally Invasive Surgery (MIS) fellowship.

Interventions

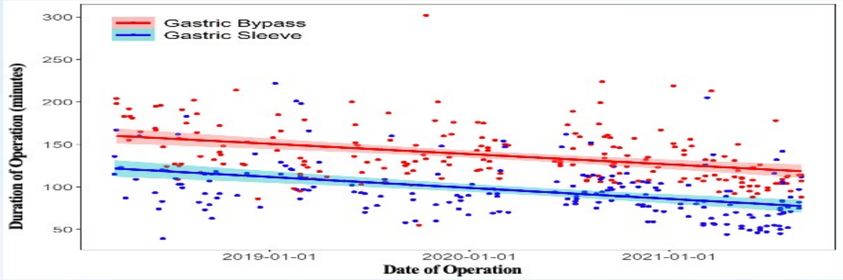
In 2018, a bariatric robotic efficiency program was employed

- Removed all laparoscopic instruments from case-card except those needed for entrance and closure
- ICG intraluminal instillation rather than endoscopy for intraoperative leak checks
- Developed an "On-demand" cart with instruments that are only opened if needed

Methods

- Cohort: Patients who underwent a Roux-en-Y Gastric Bypass or Sleeve Gastrectomy from 2018-2021 by single surgeon (+/- MIS fellow)
- Outcome: Operating times (time from entry to exit of OR)
- Data source: MBSAQIP (patient characteristics), chart review (case times)
- Statistical method: Linear regression analysis

Results



- Operating times decreased by 11 minutes per year for Gastric Bypasses (p<0.01)

Gastric Bypass Linear Regression		
	Coefficient	p-value
Age	0.4 (0, 0.8)	.071
BMI	0.6 (-0.1, 1.2)	.086
Operation Year	-10.9 (-15, -6.9)	<0.01
Duration of operation decreased 11 minutes per year		

Gastric Sleeve Linear Regression		
	Coefficient	p-value
Age	0.6 (0.2, 1)	.002
Male	27 (15, 39)	.000
Operation Year	-10.1 (-14.1, -6.1)	<0.01
Duration of operation decreased 10 minutes per year		

- Operating times decreased by 10 minutes per year for Gastric Sleeves (p<0.01)

- Average Operating Times for:
  - Roux-en-Y Gastric Bypasses were improved from 158 minutes (2018) to 119 minutes (2021)
  - Sleeve Gastrectomy were improved from 107 minutes (2018) to 77 minutes (2021)

Conclusions

- A bariatric robotic efficiency protocol can increase the time efficiency of robotic bariatric surgery
- Gained efficiency persists with introduction of new fellows each year suggesting results are due to the interventions performed rather than surgeon improvement
- There are several factors and learning curves that must be overcome in the early stages but with continued support and "buy-in" from all involved parties, a bariatric robotic program can become efficient and valuable.

Next Steps

- Further relate the improvement in efficiency to a decrease in cost in hopes of approaching that of laparoscopic operations.
- Look at postoperative complication rates including reoperation and unplanned readmissions in terms of healthcare cost between robotic vs laparoscopic operations.

Sources

1. Bauerle, W.B., Mody, P., Estep, A. *et al.* Current Trends in the Utilization of a Robotic Approach in the Field of Bariatric Surgery. *OBES SURG* **33**, 482–491 (2023).

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