Robotic Colorectal Procedures: Does Operative Start Time Impact Short-Term Outcome?

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Background

- ~250,000 deaths annually attributed to medical errors
- Surgical procedures are impacted by fatigue, circadian rhythm, expertise of operating room staff, etc.
- Differences in outcome between morning vs. afternoon procedures previously reported
- Given complexity of robotic colorectal surgeries, they are ideal in examining potential outcome decay in morning vs. afternoon cases
- **Aim:**

  To assess differences in outcome between morning and afternoon robotic colorectal cases

Methods

- Retrospective review of a prospective database
- 210 robotic colorectal surgeries:

  97 morning vs.

  113 afternoon cases
- Preoperative, intraoperative, and 30-day postoperative outcomes were compared

Results

Preoperative Variables

	Morning (N = 97)	Afternoon (N = 113)	p-value
Male (%)	49 (50.5)	63 (55.3)	0.376
Age (mean, years)	59.5	65.5	**0.004**
BMI (mean)	26.8	26.8	0.982
Smoker (%)	35 (36.1)	30 (26.3)	0.213
Charlson CI (mean)	3.4	4.0	0.070

Intraoperative Variables

	Morning (N = 97)	Afternoon (N = 113)	p-value
Total Operative Time (mean, mins)	249.4	229.6	0.107
Console Time (mean, mins)	130.0	133.1	0.723
Estimated Blood Loss (mean, ml)	102.6	88.3	0.389
Conversions (%)	2 (2.1)	0 (0)	0.212
Intraoperative Complications (%)	6 (6.2)	7 (6.2)	0.998
Intraoperative Transfusions (%)	2 (2.1)	2 (1.7)	1.000

Indications for Surgery

	Morning (N = 97)	Afternoon (N = 113)	p-value
Cancer (%)	57 (58.2)	64 (57.1)	0.756
Diverticulitis (%)	17 (17.3)	22 (19.6)	0.718
IBD (%)	6 (6.1)	7 (6.3)	0.998
Colostomy (%)	7 (7.1)	4 (3.6)	0.233
Prolapse (%)	4 (4.1)	10 (8.9)	0.171
Other (%)	5 (5.1)	6 (5.4)	0.960

Types of Operations

	Morning (N = 97)	Afternoon (N = 113)	p-value
Right Hemicolectomy (%)	22 (22.7)	30 (26.5)	0.517
Transverse Colectomy (%)	0 (0)	2 (1.8)	0.501
Left Colectomy (%)	45 (46.4)	40 (35.4)	0.106
Low Anterior (%)	18 (18.6)	26 (23.0)	0.429
Abdominal Perineal Resection (%)	2 (2.1)	3 (2.7)	0.779
Proctocolectomy (%)	2 (2.1)	1 (0.9)	0.474
Rectopexy (%)	7 (7.2)	7 (6.2)	1.000
Other (%)	5 (5.2)	6 (5.3)	0.960

Postoperative Outcomes

	Morning (N = 97)	Afternoon (N = 113)	p-value
Overall Complications (mean)	0.3	0.3	0.670
Surgical Site Infection (%)	5 (5.2)	8 (7.1)	0.564
GI Complications			
Overall (mean)	0.3	0.3	0.655
Abdominal/Pelvic Abscess (%)	1 (1)	3 (2.7)	0.391
Anastomotic Leak (%)	0 (0)	3 (2.7)	0.251
Ileus and SBO (%)	29 (29.9)	25 (22.1)	0.199
Length of Hospital Stay			
(mean, days)	6.0	8.0	**0.021**
(median, days)	5.0	5.0	1.000
30-Day Readmission	8 (8.2)	8 (7.1)	1.000

When analyzing time of day as a continuous variable, we found no significant associations with intra- or postoperative complications

Conclusion

- **We found no correlation between operative start time and short-term outcome**
- Possible reasons:

  (1) Cases were elective and performed by 2 experienced surgeons with highly trained operating room robotic staff in a large tertiary center

  (2) Decreased fatigue attributed to superior ergonomics of robotic surgery