

VENTRAL HERNIA PATIENT OUTCOMES POST-OPERATIVELY HOUSED ON SURGICAL VS NON-SURGICAL UNITS



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Background

- Ventral hernia repair (VHR) is a common surgical procedure with over 350,000 performed per year within the United States (Poulose)
- Enhanced recovery protocols for surgery aim to address preoperative comorbidities and intraoperative interventions, as well as postoperative care to reduce variability in care resulting in reduced complications, length of stay, and costs (Nelson, Ueland)
- Inpatient hospital units vary in staffing ratios, monitoring, procedural abilities, and experience with unique patients and diagnoses

Purpose

- To evaluate the impact of postoperative hospital units, including medical, surgical, and intensive care, upon hospital length of stay and early clinical outcomes of VHR patients.

Methods

- An IRB-approved retrospective review of open ventral hernia repairs between August 2013 and July 2017 was performed
- Patient demographics, comorbidities, operative details, cost, and patient outcomes were analyzed
- All patient locations during hospitalization, time at location, post-anesthesia care unit duration (PACU), and intensive care unit (ICU) duration was collected
- Multivariable analysis of log length of stay (LOS) was assessed with adjustment for clinical and operative factors

Results

- 235 patients underwent open ventral hernia repair
- 179 (76.2%) patients were postoperatively boarded exclusively on surgical units, while 56 (23.8%) were admitted to non-surgical units
- Patients housed on a non-surgical unit were more likely to transfer rooms than patients on surgical units, 42.9% versus 10.1% ($p < 0.001$), respectively (Table 1)
- Clinical characteristics including patient age, gender, BMI, and medical co-morbidities were similar between patients boarded on surgical versus non-surgical units (Table 2)
- Hernia characteristics including number of prior hernia repairs, history of infected mesh, and history of abdominal wall infection did not differ between groups

Results, continued

Table 1. Patient lodging and ERAS status by cohorting status

Variable	Surgical unit		Non-surgical unit		Difference p-value
	n	%	n	%	
No. of Patients	179		56		
Any ICU Stay	15	8.4%	10	17.9%	.078
Transferred Facilities	4	2.2%	0	0.0%	.575
Room Transfer Overnight in PACU	18	10.1%	24	42.9%	< .001
	28	15.6%	7	12.5%	.670
Post-ERAS Protocol	92	51.4%	18	32.1%	.014

Table 2. Patient demographics and clinical characteristics

Variable	Surgical unit		Non-surgical unit		Difference p-value
	n	%	n	%	
Age, mean $\pm$ SD	54 $\pm$ 13		56 $\pm$ 11		.290
ASA ^a Class III or IV	118	65.9%	39	69.6%	.630
Female Gender	90	50.3%	27	48.2%	.878
Smoking Status					.708
Never	81	45.3%	22	39.3%	
Former	82	45.8%	28	50.0%	
Current	16	8.9%	6	10.7%	
BMI, kg/m ²					.153
23 – 29.9	60	33.5%	17	30.4%	
30 – 39.9	106	59.2%	30	53.6%	
40 +	13	7.3%	9	16.1%	
Diabetes	41	22.9%	20	35.7%	.080
COPD	11	6.1%	9	16.1%	.028
Cancer	42	23.5%	11	19.6%	.714
CAD	22	12.3%	10	17.9%	.371
HTN	110	61.5%	38	67.9%	.430
Preoperative Opioid Use					
Contraindicating Entereg	83	46.4%	31	55.4%	.284

- Operative characteristics did not differ between groups, including incidence of component separation, concomitant procedures, duration of operation, estimated blood loss (EBL), wound class, and mesh size/type
- Multivariable analysis of natural log-transformed LOS showed any stay on a non-surgical unit increased LOS by 1.0 days (95% CI 0.9-1.2 days, $p = 0.026$)

Table 3. Post-operative clinical outcomes, length of stay, and readmission rates

Variable	Surgical unit		Non-surgical unit		Difference p-value
	n	%	n	%	
Median LOS d, IQR	4 (3.5-6)		6 (4.3-8)		< .001
Cellulitis	8	4.5%	1	1.8%	.691
Wound Complication, any of the below	51	28.7%	17	30.4%	.866
Infected Seroma	18	10.1%	6	10.7%	1.000
Superf. SSI	29	16.3%	11	19.6%	.547
Deep SSI	5	2.8%	1	1.8%	1.000
Readmission w/in 30d	31	17.4%	9	16.1%	1.000

- The median LOS was longer in patients admitted to non-surgical units relative to surgical units (6 days (CI 4.3-8 days) vs 4 days (CI 3.5-6 days), $p < .001$)
- Multivariable analysis of log-transformed LOS with adjustment for all patient, lodging, and operative factors showed an increased LOS by 1.0 days (95% CI 0.9-1.2 days, $p = .026$) among patients admitted to non-surgical units
- Analysis of total cost, with or without adjustment, did not vary based on boarding location
- Boarding on a non-surgical unit was not associated with a difference in early post-operative complications, including cellulitis or wound complications, or rate of readmission (Table 3)

Conclusions

- Post-operative cohorting exclusively on surgical units should be encouraged to significantly reduce LOS and room transfer rates
- There is no increased risk of early post-operative complications, including cellulitis and wound complications, with patients housed on non-surgical units
- In situations when surgical cohorting is not possible, interdisciplinary awareness and protocols may be needed to guarantee equivalent patient care

References

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