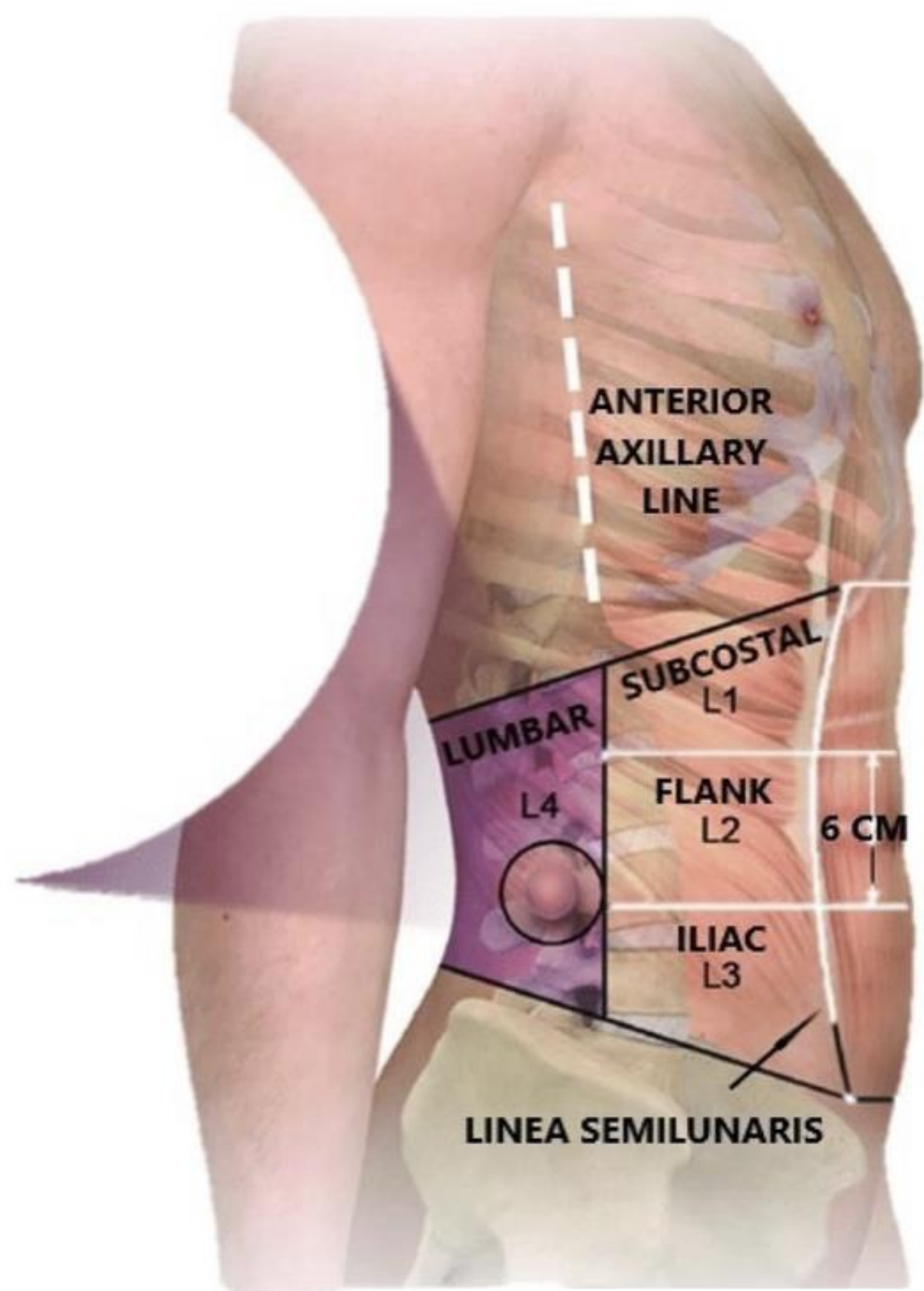


Robotic Versus Open Flank Hernia Repair: An ACHQC Propensity-Matched Analysis

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Background

Flank hernias are anatomically complex hernias that have traditionally been repaired via an open approach. These hernias are generally acquired with obfuscation and lack of reliable tissue planes. This results in anatomic complexity around named neurologic structures, a higher recurrence rate, and higher morbidity Little data exists on the use of robotic techniques for flank hernia repair, and it remains unknown whether the outcomes from these different approaches are comparable



Methods

Patient cases and characteristics were identified through a prospectively maintained database on the Abdominal Core Health Quality Collaborative (ACHQC). We included elective cases only, and those that were classified as isolated L1 to L4 hernias within the database. We excluded all laparoscopic and recurrent cases. Demographic and intraoperative variables were compared using bivariate testing to identify variables that were significantly different between the groups. Propensity score matching analysis was then performed to identify potential differences in length of stay (LOS) and recurrence.

N = 2,294

Total cases identified from ACHQC database

1,435 Open | 859 Robotic

Cohort Characteristics and Matching

Key Pre-Match Characteristics

Variable	Open (N=1,435)	Robotic (N=859)	p
Age (mean ± SD)	59.8 ± 14.1	61.9 ± 13.7	<0.001
Female	53%	63%	<0.001
BMI (mean ± SD)	30.1 ± 6.1	30.7 ± 6.2	0.062
Dialysis	1.3%	0.5%	0.046
Independent Func.	95%	98%	0.021
Antiplatelet use	16%	13%	0.039
Steroid use	8.9%	4.0%	<0.001
Hx Open Abdomen	6.6%	4.5%	0.046
ASA III–IV	60%	52%	0.006
Ascites	0.6%	0%	0.026
Hernia Length* (cm)	5 (3–9)	4 (3–6)	<0.001
Hernia Width* (cm)	5 (3–8)	4 (3–5)	<0.001

Surgical Characteristics (Pre-Match)

Surgical Variable	Open	Robotic	p
Mesh Used	88%	95%	<0.001
Drains Used	50%	8.0%	<0.001
Myofasc. Release	26%	16%	<0.001
Hernia Grade 3	25%	9.8%	<0.001
VHWG Grade 3–4	30%	12%	<0.001

Prior to matching, robotic patients were healthier and had smaller, less complex hernias. Propensity score matching was used to control for these differences before outcome comparisons.

Matched Cohort Characteristics

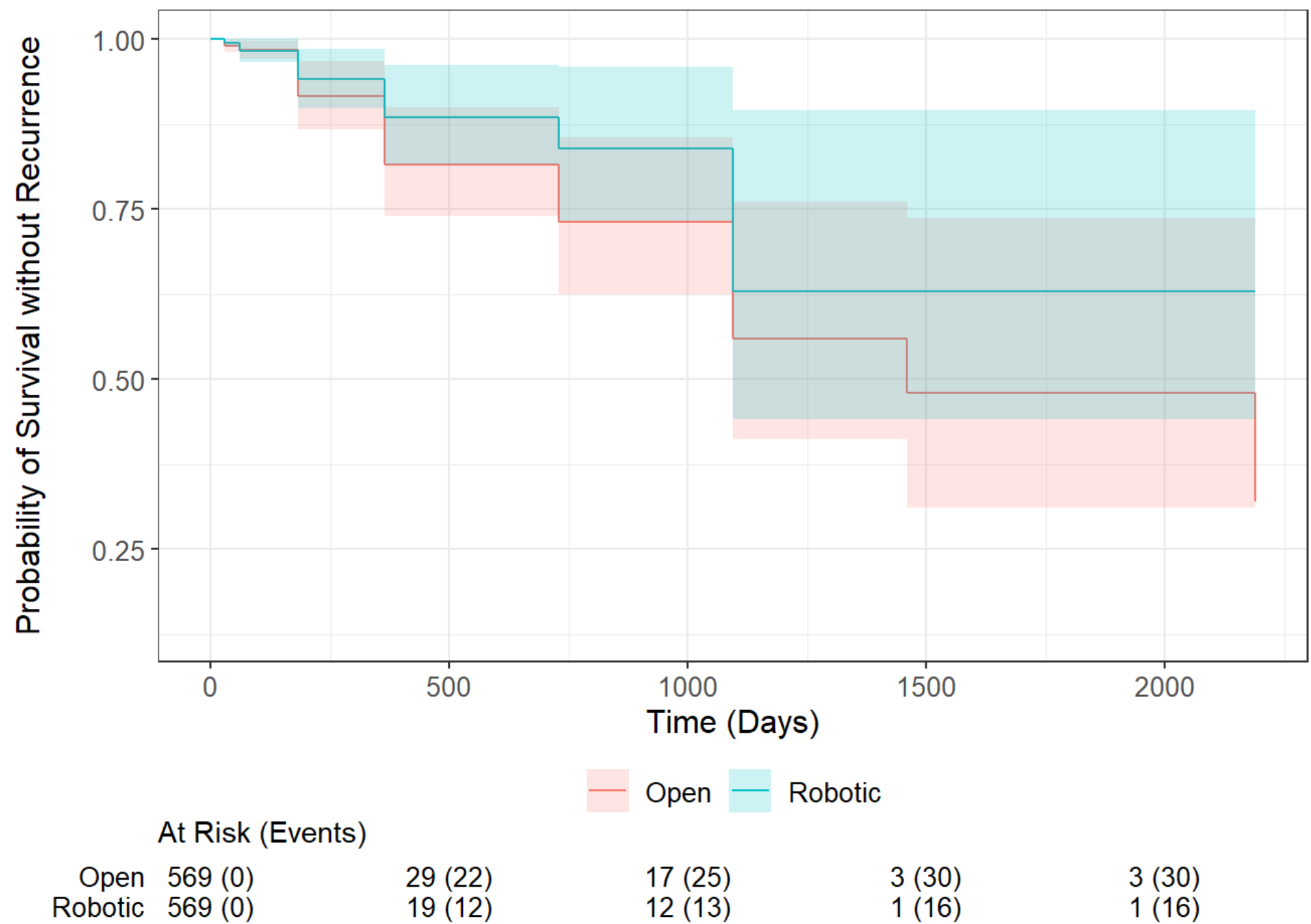
Variable	Open (N=569)	Robotic (N=569)	SMD
Age (mean ± SD)	61.2 ± 13.8	61.5 ± 13.4	−0.024
Female	59%	60%	0.03
BMI (mean ± SD)	30.5 ± 6.2	30.8 ± 6.2	−0.039
Hypertension	51%	52%	0.02
Diabetes	19%	18%	0.01
Dialysis	0.5%	0.5%	0.00
Steroid use	4.0%	4.6%	0.03
Antiplatelet	14%	14%	0.02
Hx Open Abdomen	4.0%	4.2%	0.01
ASA Class III	53%	53%	0.02
Hernia Grade 3	9.3%	8.8%	0.03
Hernia Length (cm)	4.9 ± 3.8	5.1 ± 3.3	−0.063
Hernia Width (cm)	4.8 ± 3.6	4.9 ± 3.2	−0.041

Outcomes

Recurrence (Pre-Match)

Timepoint	Open (N=1,435)	Robotic (N=859)	p
30-day	0.7% (8/1,156)	0.4% (3/675)	0.762
90-day	1.4% (4/282)	1.6% (2/125)	>0.99
6-month	13% (19/207)	6.1% (4/66)	0.113
1-year	18% (29/207)	8.7% (4/46)	0.143
2-year	22% (11/66)	12% (2/17)	0.492
3-year	28% (9/42)	40% (4/10)	0.702

Recurrence (Matched)



Length of Stay (Matched)

2.3

day mean LOS
± 4.0 SD
Median: 1.0 (0-3) days

1.3

day mean LOS
± 3.4 SD
Median: 0.0 (0-1) days

p < 0.001 — Robotic associated with significantly shorter LOS

Conclusion

For patients undergoing primary flank hernia repair in this propensity-matched analysis, the robotic approach demonstrated a decreased length of stay and equivalent short-term risk of recurrence.. Future studies with longer-term follow-up are needed to assess the durability of robotic flank hernia repair.