

Supplementary table A. Common and individual standardized steps for ventral hernia repair

RVHR	LVHR
Abdomen was entered in the right or left upper abdominal quadrant with an optical trocar	
Pneumoperitoneum was created insufflating the abdomen with CO ₂ at an intraabdominal pressure of 10-15mmHg	
Two 8mm and one 12mm ports were placed along the lateral abdominal wall	One or two 5mm ports were placed along lateral abdominal wall and a 12mm port was placed through the fascial defect
Anterior abdominal wall adhesions were taken down with robotic scissor and grasper	Anterior abdominal wall adhesions were taken down with laparoscopic scissor or vessel sealer device
Fascial defect was closed with locking barbed 0-polydioxanone sutures	Fascial defect was closed with conventional 0-polydioxanone sutures
Mid-density hydrogel adhesion-barrier coated polypropylene mesh was inserted through a 12mm port. Mesh size was selected to provide at least 5cm of overlap in all sides	
Mesh was secured with circumferential running locking barbed 2-0 polydioxanone sutures	Mesh was secured with transfascial sutures and circumferential double crown of permanent tacks
Skin was closed with absorbable sutures and dressed with cyanoacrylate glue	

RVHR: Robotic ventral hernia repair, LVHR: Laparoscopic ventral hernia repair

Supplementary table B. Enhanced recovery after surgery protocol utilized for our study

Pre-operative management	<p>Prehabilitation programs: diet and exercise to encourage pre-operative weight loss Smoking cessation for at least 4 weeks prior to surgery Optimization of hemoglobin A1c in diabetic patients Pre-operative chlorhexidine baths</p>
Peri-operative management	<ul style="list-style-type: none"> ● Regional anesthesia: intraoperative transversus abdominis plane (TAP) block ● Prophylaxis for deep venous thrombosis: use of sequential compression devices (SCDs) and/or pharmacologic prophylaxis with unfractionated or low-molecular-weight heparin ● Fluid balance: judicious intraoperative fluid administration for a goal of zero balance ● Intraoperative glycemic control ● Temperature control to maintain euthermia ● Prevention of urinary retention: use of Tamsulosin for patients at high risk for developing urinary retention
Post-operative management	<ul style="list-style-type: none"> ● Multimodal analgesic regimen: included acetaminophen, non-steroidal anti-inflammatory drugs (e.g. ibuprofen or naproxen), gabapentinoids (e.g. gabapentin or pregabalin), and limited narcotics (e.g. tramadol or oxycodone) ● Early ambulation ● Immediate post-operative resumption of normal diet

Supplementary table C: Reasons for prolonged post-operative length of stay and readmissions

	Group	Reason	Number of days
Hospital LOS >1 day	RVHR	8 Patients: Pain management 1 Patient: Extensive lysis of adhesions 1 Patient: Increased oxygen requirement 1 Patient: Acute kidney injury 1 Patient: Late completion of case 2 Patients: Enterotomies	10 days 1 day 1 day 4 days 1 day 5 days
	LVHR	3 Patients: Pain management 1 Patient: Extensive lysis of adhesions 1 Patient: Increased oxygen requirement 1 Patient: Acute kidney injury + hematoma requiring transfusion + post-operative ileus 1 Patient: Multiple comorbidities 1 Patient: Decreased ostomy output	4 days 2 days 1 day 7 days 1 day 3 days
Readmission	RVHR	1 Patient: Post-operative ileus	2 days
	LVHR	1 Patient: Post-operative ileus 1 Patient: Surgical drainage of seroma 1 Patient: Uncontrolled post-operative pain	1 days 2 days 3 days

LOS: Length of stay, RVHR: Robotic ventral hernia repair, LVHR: Laparoscopic ventral hernia repair

Supplementary table D1: Univariable subgroup analysis of operating room time in minutes

Characteristics	RVHR N=65	LVHR N=58	P-value
Hernia Type, mean (SD)			
Primary (N=23)	127 (74)	62 (28)	0.606
Incisional (N=78)	144 (57)	78 (40)	
Recurrent (N=22)	135 (30)	91 (36)	
Hernia Area, mean (SD)			
Small (<20cm ²) (N=79)	118 (40)	65 (28)	0.387
Medium (>20cm ²) (N=44)	173 (60)	107 (40)	
Surgeon, mean (SD)			
Surgeon #1 (N=51)	155 (48)	75 (38)	0.073
Surgeon #2 (N=50)	135 (66)	73 (40)	
Surgeon #3 (N=22)	118 (49)	93 (26)	

RVHR: Robotic ventral hernia repair, LVHR: Laparoscopic ventral hernia repair, SD: Standard deviation

Supplementary table D2: Multivariable subgroup analysis of operating room time in minutes

Multivariable Regression ^a	Mean difference	95% CI	P-Value
Hernia Type			
Primary	Ref		
Incisional	10.4	(-10.7 to 31.4)	0.337
Recurrent	5.4	(-22.0 to 32.8)	0.700
Hernia Area (minutes per cm ²)	0.3	(0.2 to 0.4)	<0.001
Surgeon			
Surgeon #1	Ref		
Surgeon #2	2.7	(-15.7 to 21.2)	0.771
Surgeon #3	6.7	(-16.4 to 29.7)	0.572
Approach			
Laparoscopic	Ref		
Robotic	63.4	(47.5 to 79.3)	<0.001

^aIn this multivariable generalized linear regression, only hernia area and robotic approach were independently associated with increased operative room time

Supplementary table E1: Univariable subgroup analysis of costs in US Dollars

Characteristics	RVHR N=65	LVHR N=58	P-value
Hernia Type, mean (SD)			
Primary (N=23)	\$14,531.17 (\$5,532.15)	\$11,005.69 (\$4,523.98)	0.618
Incisional (N=78)	\$16,258.08 (\$5,073.05)	\$13,603.78 (\$6,445.20)	
Recurrent (N=22)	\$14,789.61 (\$2,469.93)	\$13,698.23 (\$4,671.71)	
Hernia Area, mean (SD)			
Small (<20cm ²) (N=79)	\$13,842.14 (\$3,511.23)	\$11,070.44 (\$3,635.11)	0.443
Medium (>20cm ²) (N=44)	\$18,711.52 (\$5,162.30)	\$17,498.95 (\$7,005.11)	
Surgeon, mean (SD)			
Surgeon #1 (N=51)	\$17,061.61 (\$4,846.77)	\$14,078.04 (\$7,464.09)	0.790
Surgeon #2 (N=50)	\$14,977.79 (\$4,810.73)	\$11,842.91 (\$4,529.58)	
Surgeon #3 (N=22)	\$14,746.54 (\$4,841.50)	\$13,373.75 (\$2,703.45)	

RVHR: Robotic ventral hernia repair, LVHR: Laparoscopic ventral hernia repair, SD: Standard deviation

Supplementary table E2: Multivariable subgroup analysis of costs in US Dollars

Multivariable Regression ^a	Mean difference	95% CI	P-value
Hernia Type			
Primary	Ref		
Incisional	\$1,260.33	(\$-934.65 to \$3,455.33)	0.263
Recurrent	\$-584.67	(\$-3,435.96 to \$2,266.63)	0.689
Hernia Area (\$ per cm ²)	\$36.03	(\$24.82 to \$47.23)	<0.001
Surgeon			
Surgeon #1	Ref		
Surgeon #2	\$-741.61	(\$-2,661.50 to \$1,178.28)	0.451
Surgeon #3	\$373.87	(\$-2,025.36 to \$2,773.10)	0.761
Approach			
Laparoscopic	Ref		
Robotic	\$2,643.53	(\$985.71 to \$4,301.35)	0.002

^aIn this multivariable generalized linear regression, only hernia area and robotic approach were independently associated with increased costs

Supplementary table F: Change in mAAS scores (raw) per question and questionnaire component

	Change in Score from Baseline, median (IQR) ^a		
	RVHR N= 64	LVHR N = 59	P-value
Psychological well-being	0 (-4, 1)	-1 (-5, 0)	0.037
My abdominal wall (your belly) has a huge impact on my health.	-1 (-3, 1)	0 (-5, 0)	0.589
My abdominal wall (your belly) affects how I feel every day.	0 (-4, 1)	0 (-5, 1)	0.337
I often feel sad because of my abdominal wall (your belly).	0 (-4, 1)	-2 (-5, 0)	0.434
Physical Activity	0 (-3, 1)	0 (-4, 0)	0.014
My abdominal wall (your belly) causes me physical pain	-1 (-3, 0)	-1 (-5, 1)	0.912
My abdominal wall (your belly) interferes when I perform strenuous activities (eg, heavy lifting)	-1 (-3, 0)	-1 (-5, 1)	0.465
My abdominal wall (your belly) interferes when I perform moderate activities (eg, bowling, bending over).	0 (-3, 2)	-2 (-4, 0)	0.110
My abdominal wall (your belly) interferes when I walk or climb stairs.	0 (-2, 1)	-1 (-5, 0)	0.194
My abdominal wall (your belly) interferes when I dress myself, take showers and cook.	0 (-2, 2)	0 (-4, 1)	0.358
My abdominal wall (your belly) interferes with my sexual activity.	0 (-1, 1)	0 (-4, 0)	0.784
Social well-being	0 (-1, 2)	0 (-4, 1)	<0.001
I often stay at home because of my abdominal wall (your belly).	0 (-1, 3)	0 (-4, 2)	0.050
I accomplish less at home because of my abdominal wall (your belly).	0 (-1, 3)	0 (-3, 1)	0.101

I accomplish less at work because of my abdominal wall (your belly).	0 (-1, 2)	-1 (-5, 0)	0.001
--	-----------	------------	-------

mAAS: Modified Activity Assessment Scale, RVHR: Robotic ventral hernia repair, LVHR: Laparoscopic ventral hernia repair, IQR: Interquartile range

^aNegative number indicates improved function, positive number indicates worsened function

Supplementary table G: ANCOVA for patient centered outcomes

AW-QOL Scores (mAAS)	Mean difference	95% CI	P-value
Baseline	0.43	(0.26 to 0.59)	<0.001
Surgeon			
Surgeon #1	Ref		
Surgeon #2	1.45	(-8.87 to 11.77)	0.782
Surgeon #3	-7.56	(-21.00 to 5.89)	0.268
Approach			
Laparoscopic	Ref		
Robotic	-9.15	(-18.57 to 0.26)	0.057
Pain Scores (VAS)	Mean difference	95% CI	P-value
Baseline	0.23	(0.07 to 0.38)	0.006
Surgeon			
Surgeon #1	Ref		
Surgeon #2	0.77	(-0.33 to 1.87)	0.168
Surgeon #3	0.75	(-0.66 to 2.16)	0.245
Approach			
Laparoscopic	Ref		
Robotic	0.425	(-0.58 to 1.42)	0.402

AW-QOL: Abdominal wall quality of life, mAAS: Modified Activity Assessment Scale, VAS: Visual analog scale, ANCOVA: Analysis of covariance