

Robotic proctectomy for rectal cancer: a propensity matching analysis at a single institution

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Background: As the availability and use of robotic surgery increases, retrospective data suggest that outcomes may be comparable to conventional surgery. However, there is ongoing debate regarding benefits of robot for rectal cancer.

Purposes: We utilized propensity matching to compare clinicopathologic and perioperative outcomes of patients underwent curative intention resection for rectal cancer by open, laparoscopy and robotic surgery at a single institution.

Methods: All patients between January 2010 till June 2018 who underwent elective colorectal resection for colorectal cancer were identified. Patients were divided into three groups based on initial operative approach: open, laparoscopic and robotic surgery. Clinicopathologic and 30-day clinical outcomes were compared between groups with and without propensity matching.

Table 2. Comparison of outcomes among the three groups

Outcome	Unweighted							Propensity score weighted						
	Rob	Lap	Open	p	Pairwise comparisons			Rob	Lap	Open	p	Pairwise comparisons		
					Op	Op	Lap					Op	Op	Lap
	n=95	n=52	n=53		Lap	Rob	Rob	n=42	n=33	n=53		Lap	Rob	Rob
Min. distance	1.2 (2.4)	1.5 (2.1)	0.8 (0.9)	.096				1 (2)	1.5 (2)	0.8 (0.9)	.157			
Harvest LN	18 (9)	15.5 (10)	18 (11)	.062				17 (8.7)	16.4 (10)	18 (11)	.336			
LOS	4 (2)	5 (2)	6 (4)	<.001	<.001	<.001	.284	4 (2)	5 (2)	6 (4)	.001	.412	<.001	.123
Operative time	300 (144)	240 (173)	202 (133)	<.001	.245	<.001	.019	300 (162.2)	231.3 (153.3)	202 (133)	.002	1.00	.002	.047
EBL	120 (100)	200 (225)	300 (325)	<.001	<.001	<.001	.681	150 (100)	210.3 (182.7)	300 (325)	<.001	.013	<.001	.987
Morbidity	15 (15.8)	10 (19.2)	9 (17.0)	.868				4 (9.8)	7 (20.6)	9 (17.0)	.411			
Mortality	0 (0)	1 (1.9)	0 (0)	--				0 (0)	1 (2.9)	0 (0)	--			

Conclusions: Robotic rectal surgery decreased length of stay and blood loss. Robotic colorectal surgery at a non-academic institution is safe, feasible and oncologically sound with short-term outcomes comparable to laparoscopic and open technique.

Table 1. Comparison of confounders among the three groups: equal distribution

Factor		Unweighted							Propensity score weighted						
		Rob		Lap		Open		p	Rob		Lap		Open		p
		(n=95)		(n=52)		(n=53)			(n=42)		(n=33)		(n=53)		
Male		56	(58.9)	30	(57.7)	30	(56.6)	(.961)	25	(59.5)	17	(50.0)	30	(56.6)	(.700)
Age	M(SD)	60.0	(60.9)	62.9	(13.5)	14.6	(14.3)	(.480)	63.5	(13.7)	65.7	(14.8)	62.9	(14.3)	(.658)
BMI	M(SD)	27.9	(28.1)	26.8	(6.0)	5.4	(5.9)	(.430)	26.2	(5.7)	27.1	(6.2)	26.8	(5.9)	(.811)
ASA	III or IV	59	(62.1)	31	(59.6)	37	(69.8)	(.514)	31	(75.6)	22	(66.7)	37	(69.8)	(.685)
PSH		34	(35.8)	18	(34.6)	30	(56.6)	(.026)	20	(47.6)	16	(47.1)	30	(56.6)	(.586)
Size in cm		2.5	(2.5)	3.2	(1.7)	1.9	(2.2)	(.089)	3.1	(1.9)	2.9	(2.2)	3.2	(2.2)	(.844)
	M(SD)														
Histologic grade															
	G1	14	(14.7)	10	(19.2)	5	(9.4)	(.023)	4	(9.5)	6	(18.2)	5	(9.4)	(.498)
	G2	76	(80.0)	36	(69.2)	37	(69.8)		32	(76.2)	23	(69.7)	37	(69.8)	
	G3	5	(5.3)	6	(11.5)	11	(20.8)		6	(14.3)	4	(12.1)	11	(20.8)	
T															
	T1	22	(23.2)	9	(17.3)	7	(13.2)	(.048)	6	(14.3)	4	(12.1)	7	(13.2)	(.341)
	T2	28	(29.5)	12	(23.1)	14	(26.4)		15	(35.7)	8	(24.2)	14	(26.4)	
	T3	41	(43.2)	30	(57.7)	27	(50.9)		19	(45.2)	20	(60.6)	27	(50.9)	
	T4	4	(4.2)	1	(1.9)	5	(9.4)		2	(4.8)	1	(3.0)	5	(9.4)	
Stage															
	I	38	(40.0)	16	(30.8)	15	(28.3)	(.069)	13	(31.0)	9	(26.5)	15	(28.3)	(.779)
	II	28	(29.5)	13	(25.0)	15	(28.3)		12	(28.6)	8	(23.5)	15	(28.3)	
	III	29	(30.5)	23	(44.2)	23	(43.4)		17	(40.5)	17	(50.0)	23	(43.4)	
Neoadj. chemotherapy		66	(69.5)	17	(32.7)	27	(50.9)	(<.001)	22	(53.7)	14	(42.4)	27	(50.9)	(.610)
Neoadj. radiotherapy		66	(69.5)	17	(32.7)	27	(50.9)	(<.001)	22	(53.7)	14	(42.4)	27	(50.9)	(.610)