

Robot-assisted versus open radical cystectomy: complication rates and perioperative results in a single academic center

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Introduction and objectives

The gold standard treatment for muscle invasive bladder cancer is open radical cystectomy (ORC) with pelvic lymph node dissection and urinary diversion. Robot-assisted radical cystectomy (RARC) is still considered not a standard of care because of concerns about perioperative patient safety and long-term functional and oncological outcomes and the added direct cost of robotic surgery. We assessed the perioperative results and complication rates of both procedures in a single academic center.

Methods

Clinical data of the first 67 patients undergoing RARC between May 2013 and October 2015 were prospectively documented (EC 2013/874) and retrospectively compared with the last 50 patients undergoing ORC between November 2010 and May 2013 in a single academic center.

ORC was performed by a senior surgeon or a supervised junior surgeon (KD), whereas RARC was done by a single surgeon (KD) after training by an experienced RARC surgeon (AH). Urinary diversion was predominantly performed intracorporeal (88%). Complications were graded on day 30 and 90 using the Clavien Dindo classification. SPSS v23 was used for statistical analysis.

Results

Both groups are fairly comparable regarding patient and tumor characteristics. However, patients in the ORC group had a slightly higher ASA score and patients in the RARC group received significantly more neo-adjuvant chemotherapy.

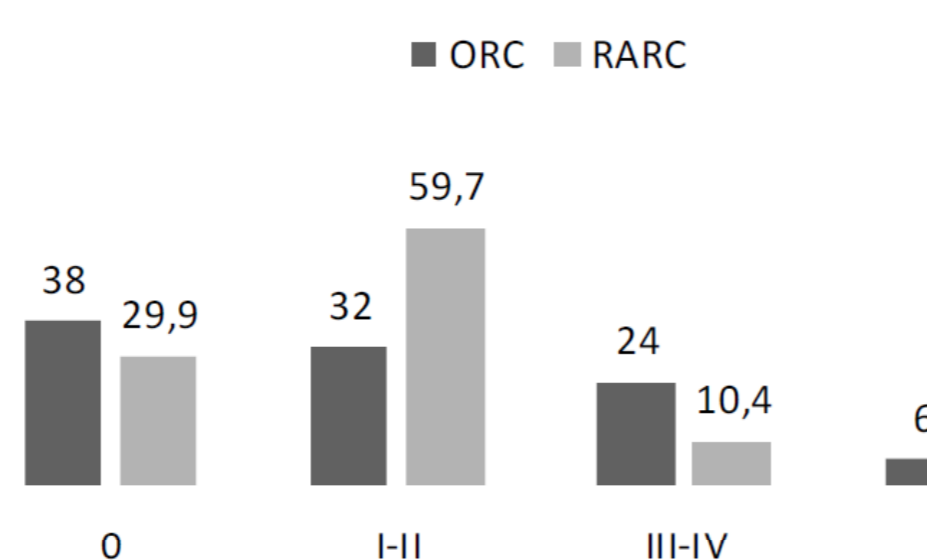
RARC patients had a significant longer operation time, but they received significantly more PLND, more neobladder reconstruction and had less blood loss and a much lower transfusion rate.

	Total (n=117)	Open (n=50)	RARC (n=67)	p-value
Patient and tumor characteristics				
Male [n (%)]	95 (81.2)	40 (80.0)	55 (82.1)	0.775
Age [mean (95%CI)]	69 (67 – 71)	71 (68 – 74)	68 (65 – 70)	0.068
BMI [median (range)]	26 (17 – 38)	25 (18 – 38)	26 (17 – 36)	0.232
ASA [n (%)]				0.045
I	1 (0.8)	1 (2.0)	0 (0.0)	
II	53 (45.3)	17 (34.0)	36 (53.7)	
III	58 (49.6)	28 (56.0)	30 (44.8)	
IV	5 (4.3)	4 (8.0)	1 (1.5)	
Neoadj. chemo [n (%)]	19 (16.6)	3 (6.0)	16 (23.9)	0.009
preop BCG [n (%)]	32 (27.4)	14 (28.0)	18 (26.9)	0.892
pT stage [n (%)]				0.530
pT0	6 (5.2)	2 (4.2)	4 (6.0)	
≤ pT1	40 (34.8)	16 (33.3)	24 (35.8)	
pT2	14 (12.2)	4 (8.3)	10 (14.9)	
pT3	34 (29.6)	14 (29.2)	20 (29.9)	
pT4	2 (18.3)	12 (25.0)	9 (13.4)	
Prostate Ca [n (%)]	31 (32.6)	13 (32.5)	18 (32.7)	0.981
Operative parameters				
PLND [n (%)]	102 (87.2)	37 (74.0)	65 (97.0)	<0.001
pN+ [n (%)]	39 (33.3)	15 (30.0)	24 (35.8)	0.509
N yield [median (range)]	14 (0 – 37)	4 (0 – 37)	17 (0 – 32)	<0.001
Positive margin bladder [n (%)]	14 (12.5)	12 (26.1)	2 (3.0)	<0.001
	5 missing	4 missing	1 missing	
Diversion method [n (%)]				<0.001
ileal conduit	63 (53.8)	26 (52.0)	37 (55.2)	
neobladder	38 (32.5)	9 (18.0)	29 (43.3)	
cutaneostomy	16 (13.7)	15 (30)	1 (1.5)	
Bloodloss [ml, median (range)]	250 (5 – 1200)	300 (50 – 1200)	250 (5 – 1000)	0.042
	28 missing	28 missing		
Transfusion [n (%)]	30 (25.6)	28 (56.0)	2 (3.0)	<0.001
Operation time [min, median (range)]	390 (115 – 720)	355 (115 – 655)	420 (240 – 720)	<0.001
LoS [days, median (range)]	13 (3 – 75)	18 (3 – 75)	11 (5 – 36)	<0.001

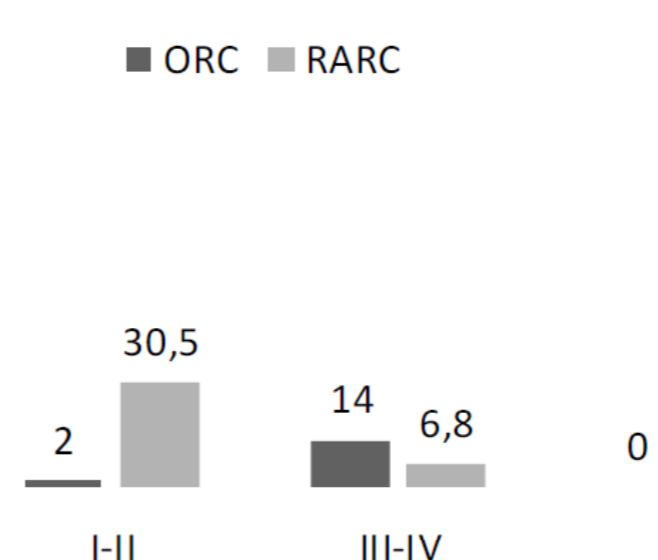
	Total (n=117)	Open (n=50)	RARC (n=67)	p-value
Complications				
Clavien Dindo 0 – 30 days [n (%)]				0.005
0	39 (33.3)	19 (38.0)	20 (29.9)	
I – II	56 (47.9)	16 (32.0)	40 (59.7)	
III – IV	19 (16.2)	12 (24.0)	7 (10.4)	
V	3 (2.6)	3 (6.0)	-	
Clavien Dindo 30 – 90 days [n (%)]				<0.001
0	81 (73.0)	42 (84.0)	39 (63.9)	
I – II	19 (17.1)	1 (2.0)	18 (29.5)	
III – IV	11 (9.9)	7 (14.0)	4 (6.6)	
V	-	-	-	
Clavien Dindo 0 – 90 days [n (%)]				0.001
0	26 (23.4)	15 (30.0)	11 (18.0)	
I – II	55 (49.5)	15 (30.0)	40 (65.6)	
III – IV	27 (24.3)	17 (34.0)	10 (16.4)	
V	3 (2.7)	3 (6.0)	-	
Readmissions < 90 days [n (%)]	14 (12.7)	9 (18.0)	5 (8.3)	0.130

In the RARC group, 16.4% of patients encountered a high-grade complication (CD III-V) in the first 90 days versus 40.0% of patients in the ORC group (p=0.001). More low-grade complications (CD I-II) were registered in the RARC group, which could be due to the nature of the study design (prospective versus retrospective). RARC patients had a significantly shorter length of stay (LoS) in the hospital (11 versus 18 days) and a comparable readmission rate.

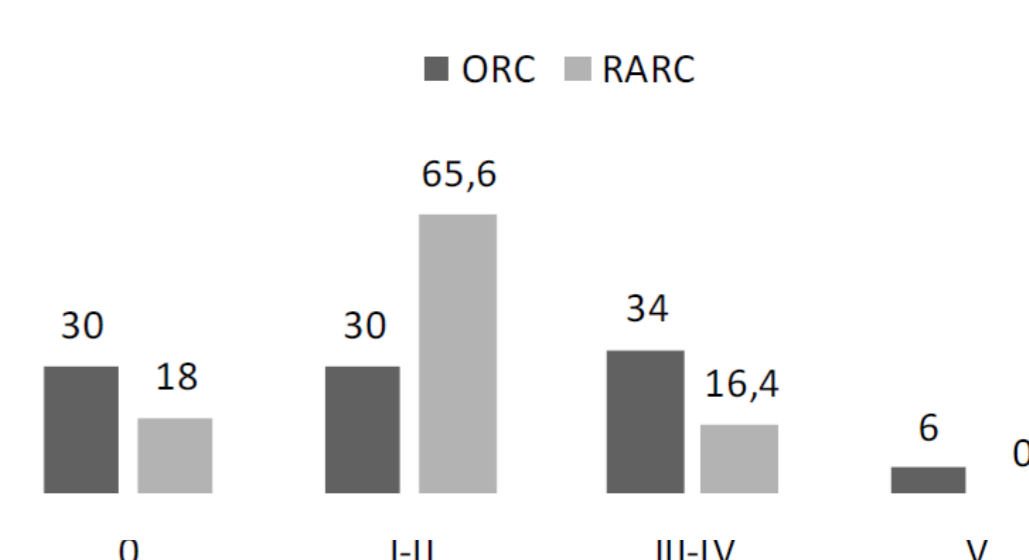
Early complications (%)



Late complications (%)



Total complications (%)



Conclusion

RARC with intracorporeal urinary diversion was safely introduced despite the learning curve and without compromise in oncological correct surgery or possible neobladder reconstruction. RARC can provide significant advantages over ORC regarding bloodloss, transfusion rate, high-grade complications and hospital stay. Accurate and standardized reporting of complications is necessary to guide patient counseling.