Does the implementation of an Enhanced Recovery After Surgery program improve postoperative outcomes for patients undergoing radical cystectomy?

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OBJECTIVE:

Radical Cystectomy (RC) for bladder cancer is associated with a high risk of postoperative complications. Enhanced Recovery After Surgery (ERAS) is a multimodal concept combining pre, intra and postoperative evidence-based care elements to reduce surgical stress. Our objective is to evaluate the results of the implementation of an ERAS protocol for RC, compared to a historical cohort of our hospital.

MATERIAL & METHODS:

A retrospective study of 399 consecutive patients who underwent open or laparoscopic/robotic RC from January 2012 to December 2017 (47 ERAS vs 352 historical). We assessed preoperative clinical and demographics characteristics, intraoperative events and postoperative complications, as well as length of hospital stay. Statistical analysis was performed by SPSS Inc software.

RESULTS:

Patients following ERAS program had a statistically significant shorter hospital stay. The ERAS group had a significant decrease in intraoperative bleeding and in transfusion rate. The need for total parenteral nutrition was lower in the ERAS group. No statistically significant differences in overall complication rate were found.

Table 1. Demographics and clinical characteristics

	ERAS	pre-ERAS	P
N	47 (11.78)	352 (88.22)	
Age**	69.6 (7.9)	69.4 (10.2)	0.897
BMI**	27 (4.7)	27.2 (4.2)	0.763
ASA physical status (I/II/III/IV)	2(4.3) / 22(46.8) / 20(42.6) / 3 (6.3)	21(6) / 149(42.3) / 160(45.5) / 22(6.3)	0.923
Hypertension	30 (63.8)	182 (51.7)	0.160
Coronary artery disease	6 (12.8)	24 (6.8)	0.241
COPD	15 (31.9)	88 (25)	0.402
Smokers/former smokers	14 (29.8) / 20 (42.6)	93 (26.4) / 142 (40.3)	0.750
Diabetes	11 (23.4)	72 (20.5)	0.788
Peripheral artery disease	7 (14.9)	49 (13.9)	0.970
Cerebrovascular disease	2 (4.3)	18 (5.1)	0.905
Chronic kidney disease	14 (29.8)	72 (20.5)	0.205
Surgical approach (open/ LPC robotic)	33 (70.2) / 14 (29.8)	232 (65.9) / 120 (34.1)	0.673
Type of anaesthesia (general / combined)	2 (4.3) / 45 (95.7)	55 (15.6) / 297 (84.4)	0.063
Duration of procedure*	300 (250-360)	355 (300-415)	0.019

* Median (25-75th percentile); ** Mean (95% CI)

Table 2. In-hospital Postoperative Events

	ERAS	pre-ERAS	P
N	47 (11.78)	352 (88.22)	
Complications (any)	27 (57.4)	210 (59.7)	0.886
Respiratory complications	1 (2.1)	33 (9.4)	0.160
Cardiac complications	0 (0)	19 (5.4)	0.205
Neurologic complications	0 (0)	13 (3.7)	0.366
Septicaemia	1 (2.1)	16 (4.5)	0.702
Urinary Tract Infection	4 (8.5)	56 (15.9)	0.264
AKI	18 (38.3)	45 (12.8)	0.001
Wound infection	3 (6.4)	49 (13.9)	0.228
Paralytic ileus	9 (19.1)	111 (31.5)	0.117
Postoperative nutritional support	10 (21.3)	119 (33.9)	0.120
Re-operation	8 (17)	77 (21.9)	0.561
Postoperative ICU	2 (4.2)	12 (3.4)	0.887
Mortality (1 year)	2 (4.2)	37 (10.6)	0.262
Hospital stay (days)*	9 (7-11)	12 (9-16)	0.002

* Median (25-75th percentile); ** Mean (95% CI)

Table 3. Blood loss, haemoglobin changes and transfusion

	ERAS	pre-ERAS	P
N	47 (11.78)	352 (88.22)	
Haemoglobin before surgery**	135.7 (18.9)	131.2 (18.7)	0.123
In-Hospital minimum haemoglobin	96.1 (23.5)	91.9 (14.8)	0.149
Estimated blood loss (ml)*	350 (300–600)	500(300–800)	< 0.001
Blood transfusion (n,%)	5 (10.6)	137 (38.9)	< 0.001

* Median (25-75th percentile); ** Mean (95% CI)

Table 4. The Clavien-Dindo classification

	ERAS	
0	20 (42.6)	39 (83)
I	9 (19.2)	
II	10 (21.3)	
IIIb	5 (10.6)	8 (17)
IVa	3 (6.3)	

CONCLUSION:

Implementation of an ERAS program in RC reduce the length of stay and decrease the need of blood transfusion and postoperative parenteral nutrition without increasing morbidity and mortality.