

Perioperative Continuation of Blood Thinners does not increase Intraoperative Blood Loss and Transfusion Rates in Cystectomy Patients: An Observational Cohort Study

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OBJECTIVES

- Despite improvements in surgical technique and perioperative care, open radical cystectomy (ORC) with urinary diversion (UD) is associated with **high early postoperative morbidity, substantial intraoperative blood loss** and **transfusion of packed red blood cells (PRBC)** and/or **fresh frozen plasma (FFP)** in up to **60%** of patients.
- An additional issue is that mostly **elderly and comorbid patients** are affected, and these patients are frequently on chronic **blood thinning** treatment (ASS, oral anticoagulants (OAC)) or are **bridged** with low molecular weighted heparin (LMWH bridging).
- The aim of this study is to assess if **uninterrupted blood thinners administration** affects **blood loss** and **blood transfusion during cystectomy**.

METHODS

- We conducted an **observational single-centre cohort study** of a consecutive series of **1431 cystectomy** patients, between 2000 and 2020.
- Blood loss** was depicted according to body weight & duration of surgery (ml/kg/h), and **perioperative blood transfusion** within first 24h after initiation of surgery.
- Open radical cystectomy was performed in patients with uninterrupted low-dose aspirin (ASS), oral anticoagulants (OAC) with international normalized ratio (INR) goal of 2-2.5, or bridging with low weight molecular heparin (LWMH).
- Outcomes were **intraoperative blood loss** and **blood transfusion rate**. We used **propensity score matching analysis** to adjust for imbalances between groups with and without blood thinners.

Patients' surgical and oncological characteristics (after PS matching)

Characteristics	After PS matching	
	With blood thinners	P
n	299	
Preoperative parameters		
Gender = Male (%)	230 (76.9)	0.259
Age	72.40 [66.40, 78.40]	0.861
Body mass index [kg/m ²]	26.80 [23.95, 30.05]	0.241
ASA (%)		0.025
ASA:2	49 (16.4)	
ASA:3	227 (75.9)	
ASA:4	23 (7.7)	
Charlson Comorbidity Index	6.00 [4.00, 7.00]	0.001
Nicotine (pack yrs)	20.00 [0.00, 45.50]	0.087
Hypertension = Yes (%)	227 (75.9)	0.306
Coronary heart disease = Yes (%)	176 (58.9)	0.004
Diabetes = Yes (%)	72 (24.1)	0.847
COPD = Yes (%)	69 (23.1)	0.488
BCG instillation preoperatively = Yes (%)	53 (17.7)	0.829
Intraoperative parameters		
Duration of operation (min)	368.00 [317.50, 419.00]	0.901
Administration of crystalloids (ml/kg/h)	3.92 [3.03, 5.42]	0.308
Administration of colloids (ml/kg/h)	0.00 [0.00, 0.00]	0.044
Administration of noradrenaline-(ug)	999.00 [420.50, 1561.50]	0.389
Laboratory values preoperatively		
Haemoglobin	125.00 [113.00, 139.50]	0.588
Hematocrit	0.37 [0.34, 0.41]	0.681
Thrombocytes	237.00 [197.00, 301.50]	0.223
Glomerular filtration rate (ml/min)	68.42 [49.99, 83.74]	0.611
Creatinine (umol/l)	92.00 [75.50, 116.50]	0.865

Histopathological parameters		
Histology n (%)		0.902
Urothelial cancer pure	223 (74.6)	
Urothelial cancer non-pure	34 (11.4)	
Other type of bladder cancer (e.g. adenocarcinoma, SCC)	9 (3.0)	
Other malignancies (e.g. prostate or cervical cancer)	2 (0.7)	
Benign conditions (e.g. shrunken bladder)	31 (10.4)	
Pathological TNM staging; n (%)		0.994
Tumor stage	79 (26.4)	
T:0-1	72 (24.1)	
T:2	86 (28.8)	
T:3	31 (10.4)	
T:4	31 (10.4)	
T: not applicable (benign condition)	31 (10.4)	
Nodal stage		0.955
N:0	193 (64.5)	
N:1	61 (20.4)	
N:2	10 (3.3)	
N:3	4 (1.3)	
N: not applicable (benign condition)	31 (10.4)	
Tumour grade		0.969
G:0 (no remaining tumor in specimen)	10 (3.3)	
G:1	3 (1.0)	
G:2	14 (4.7)	
G:3	241 (80.6)	
G: not applicable (benign condition)	31 (10.4)	
Vascular invasion		0.897
V:0	199 (66.6)	
V:1	69 (23.1)	
V: not applicable (benign condition)	31 (10.4)	
Positive surgical margins		0.918
R:0	253 (84.6)	
R:1	15 (5.0)	
R: not applicable (benign condition)	31 (10.4)	

RESULTS

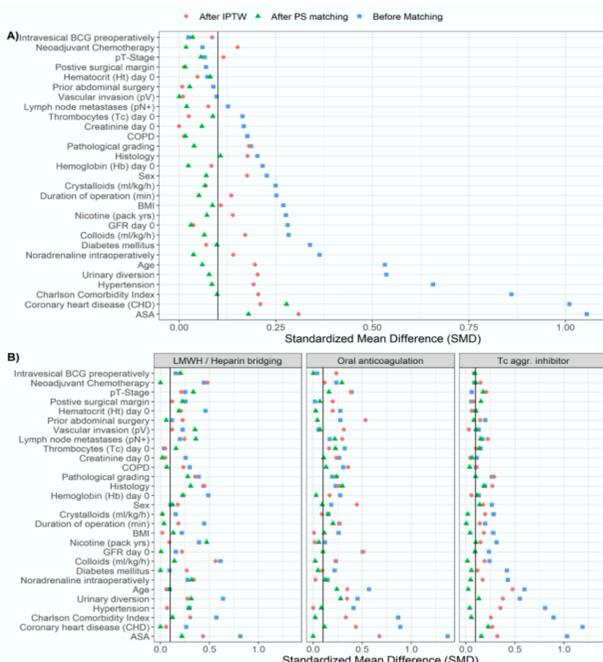
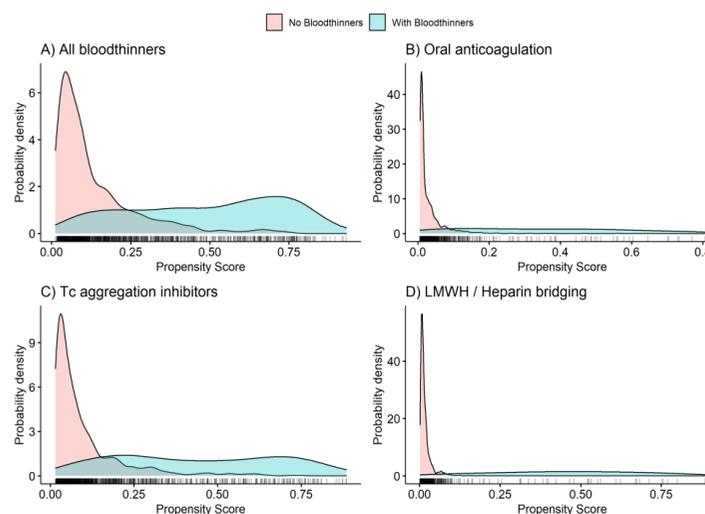


Figure 1: SMD before and after matching for all thinners

Figure 2: Balance and overlap after IPTW matching



We identified **1457 consecutive ORC patients** who fulfilled the inclusion criteria. We excluded 26 patients (1.8%), 4 patients were on dual anti-aggregation therapy clopidogrel and ASS and 22 patients had missing data, resulting in 1431 patients included in the final analysis.

The median age of the cohort was **69 years**. The median **blood loss** was **2.11 ml/kg/h** [95% confidence interval 1.48-3.04] in patients with blood thinners vs. 2.09 without blood thinners [1.50-2.94]; P=0.742.

Blood transfusion rates were 30.1% vs. 26.1% respectively; P=0.317.

A sub-analysis of the three different blood thinners could not detect any significance between ASS, OAC, or LMWH.

CONCLUSION

- Perioperative continuation of ASS, uninterrupted OAC with low INR goal or bridging with LMWH had no impact on blood loss and transfusion rate in cystectomy patients.
- Therefore, there is no need for discontinuation of blood thinners in the perioperative period.