Table S1 Occurrence of other postoperative complications. Demonstrates the occurrence and definitions of other postoperative complications

Complications	UMS[a]=0 (n=606)	UMS[a]=1-2 (n=39)	UMS[a]≥3 (n=16)	P value
Pulmonary complications				
Pulmonary infection [b]	41 (6.8%)	4 (10.3%)	3 (18.8%)	0.144
Pleural effusion [c]	6 (1.0%)	1 (2.6%)	1 (6.3%)	0.120
Atelectasis [d]	24 (4.0%)	1 (2.6%)	0 (0.0%)	0.657
Respiratory failure [e]	19 (3.1%)	2 (5.1%)	2 (12.5%)	0.110
Surgical bleeding [f]	14 (2.3%)	0 (0.0%)	0 (0.0%)	0.523
New onset arrhythmia [g]	20 (3.3%)	4 (10.3%)	0 (0.0%)	0.058
Acute myocardial infarction [h]	10 (1.7%)	0 (0.0%)	0 (0.0%)	0.631
Hemodynamic insufficiency [i]	44 (7.3%)	5 (12.8%)	3 (18.8%)	0.120
Stroke [j]	10 (1.7%)	0 (0.0%)	1 (6.3%)	0.257
Ileus [k]	14 (2.3%)	1 (2.6%)	1 (6.3%)	0.598
Anastomotic leakage [l]	24 (4.0%)	1 (2.6%)	1 (6.3%)	0.810
Intra-abdominal abscess [m]	6 (1.0%)	2 (5.1%)	0 (0.0%)	0.066
Acute liver injury [n]	10 (1.7%)	0 (0.0%)	0 (0.0%)	0.631
Wound infection [o]	12 (2.0%)	0 (0.0%)	0 (0.0%)	0.574
Wound dehiscence [p]	7 (1.2%)	1 (2.6%)	0 (0.0%)	0.667
Urinary tract infection [q]	7 (1.2%)	0 (0.0%)	0 (0.0%)	0.725
Sepsis [r]	33 (5.4%)	1 (2.6%)	4 (25.0%)	0.003
Disseminated intravascular coagulation [s]	7 (1.2%)	0 (0.0%)	0 (0.0%)	0.725
Digestive tract bleeding [t]	14 (2.3%)	1 (2.6%)	0 (0.0%)	0.822
Venous thromboembolism				
Pulmonary embolism [u]	0 (0.0%)	0 (0.0%)	0 (0.0%)	–
Deep venous thrombosis [v]	19 (3.1%)	0 (0.0%)	1 (6.3%)	0.405

Data are presented as number of patients (percentage) and compared by chi-squared test. [a], Urine microscopy score after 6 hours of admission. [b], Presence of at least one of the following manifestations (increased or color-changed sputum, new or changed pulmonary infiltrates, fever, leukocyte count >12,000/mm^3) and required antibiotic therapy. [c], Confirmed by chest X-ray or ultrasound examination and required therapeutic intervention (drainage, aspiration, and/or diuresis after albumin administration). [d], Confirmed by chest X-ray examination, with or without oxygen desaturation, and required therapeutic intervention (oxygenation inhalation, physical therapy, and/or mechanical ventilation). [e], Presence of the following manifestations (PaO$_2$ <60 mmHg on room air, ratio of PaO$_2$ to inspired oxygen fraction <300 mmHg, or oxygen saturation <90%) and required therapeutic intervention (oxygen therapy or mechanical ventilation) for more than 24 hours. [f], Bleeding after surgery that required secondary surgical hemostasis. [g], New onset atrial fibrillation or paroxysmal supraventricular tachycardia that necessitated medical treatment. [h], Concentration of cardiac troponin I exceed the diagnostic criteria for myocardial infarction as well as new Q waves (lasts for 0.03 s) or continuous (4 days) abnormal ST-T segment. [i], Requirement of continuous infusion of inotropic agents or vasoconstrictors to maintain MAP≥65mmHg after surgery. [j], Persisted new focal neurologic deficit and confirmed by neurologic imaging. [k], Lack of bowel movement, flatulence, and requirement of parenteral nutrition for more than 1 week after surgery. [l], Extravasation of contrast agent in the body cavity or retroperitoneal space that required percutaneous drainage. [m], Clinical manifestations combined with evidence from B ultrasound or CT scan. [n], Elevation of serum transaminase level above 3 times the upper limit, excluded myocardial and skeletal muscle injury. [o], Pus expressed from the incision, and bacteria cultured from the pus. [p], Wound rupture that required secondary suturing. [q], Confirmed by urinalysis and urine culture and necessitated antibiotic therapy. [r], Defined as infection with acute change of SOFA score≥2, according to sepsis 3.0 diagnostic criteria. [s], Symptoms of bleeding combined with prolonged prothrombin time and activated partial thromboplastin time, decreased fibrinogen and increased level of D-Dimer and fibrinogen degradation product. [t], Decrease of hemoglobin level combined with positive gastrointestinal occult blood test results that required treatment. [u], Pulmonary embolism: confirmed by CTPA. [v], Deep venous thrombosis: confirmed by deep venous ultrasonography.

Table S2 Preoperative variables. Demonstrates preoperative variables between patients with or without severe AKI

	Total (n=661)	Without severe AKI (n=514)[a]	With severe AKI (n=147)	P value
Age (y)	69±15	68±15	73±14	<0.001
Male sex	402 (60.8%)	310 (60.3%)	92 (62.6%)	0.618
BMI (kg/m^2)	24.0±4.0	23.7±3.9	24.9±4.3	0.002
Preoperative comorbidities				
Diabetes mellitus	187 (28.3%)	142 (27.6%)	45 (30.6%)	0.478
Hypertension	403 (61.0%)	306 (59.5%)	97 (66.0%)	0.157
Coronary heart disease	223 (33.7%)	165 (32.1%)	58 (39.5%)	0.096
Congestive heart failure	86 (13.0%)	63 (12.3%)	23 (15.6%)	0.281
Cerebrovascular disease	122 (18.5%)	89 (17.3%)	33 (22.4%)	0.157
Chronic kidney disease	76 (11.5%)	54 (10.5%)	22 (15.0%)	0.135
ASA classification				0.076
I–II	113 (17.1%)	95 (18.5%)	18 (12.2%)	
III–IV	548 (82.9%)	419 (81.5%)	129 (87.8%)	
Preoperative Hb (g/L)[b]	124±22	125±21	121±22	0.041
Preoperative albumin (g/L)[b]	38.8±5.2	39.2±5.2	37.4±5.0	<0.001
Baseline serum Cr (umol/L)[c]	81.1±31.0	80.3±30.7	84.0±31.8	0.192
Baseline eGFR (mL/min/1.73 m^2)[d]	80.2±21.7	81.4±21.3	76.0±22.5	0.007
Radiocontrast exposure[e]	56 (8.5%)	43 (8.4%)	13 (8.8%)	0.854
On ACEI/ARB	104 (15.7%)	73 (14.2%)	31 (21.1%)	0.043
Smoking habit[f]	213 (32.2%)	161 (31.3%)	52 (35.4%)	0.354

Data are presented as mean ±SD, or number of patients (percentage) and compared by independent samples *t*-test, Mann-Whitney U test or chi-squared test/Fisher's exact test respectively. ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; ASA, American society of anesthesiologists; BMI, body mass index; Cr, creatinine; eGFR, estimated glomerular filtration rate; Hb, hemoglobin. [a], Including patients without AKI and with mild AKI. [b], Measured within 3 days before surgery. [c], Determined by the minimal value of serum creatinine measured within 3 months before admission and in hospital before surgery; if neither value was available, the modification of diet in renal disease formula was adopted to estimate the baseline serum creatinine according to the Kidney Disease Improving Global Outcomes guideline. [d], Estimated by the modification of diet in renal disease formula. [e], Including patients who had radiocontrast exposure within 2 days before surgery. [f], Smoking for more than 10 cigarettes per day for more than 1 year, including current or past smokers.

Table S3 Intra- and postoperative variables. Demonstrates intra- and postoperative variables between patients with or without severe AKI

	Total (n=661)	Without severe AKI (n=514) [a]	With severe AKI (n=147)	P value
Duration of anesthesia (min)	292±141	294±142	282±140	0.372
Duration of surgery (min)	212±134	214±135	206±134	0.534
Emergency surgery	39 (5.9%)	31 (6.0%)	8 (5.4%)	0.789
Open surgery [b]	243 (46.2%)	181 (45.0%)	62 (50.0%)	0.331
Type of surgery				0.278
Abdominal and pelvic surgery	447 (67.6%)	339 (66.0%)	108 (73.5%)	
Thoracic surgery	67 (10.1%)	54 (10.5%)	13 (8.8%)	
Neurosurgery	33 (5.0%)	30 (5.8%)	3 (2.0%)	
Orthopedic surgery	98 (14.8%)	79 (15.4%)	19 (12.9%)	
Others [c]	16 (2.4%)	12 (2.3%)	4 (2.7%)	
Estimated blood loss (mL)	100 (50, 300)	100 (50, 300)	100 (50, 300)	0.503
Urine output (mL/kg/h)	1.5 (0.9, 2.6)	1.7 (0.9, 2.7)	1.2 (0.7, 1.9)	<0.001
Intraoperative management				
Vasopressors infusion [d]	334 (50.5%)	256 (49.8%)	78 (53.1%)	0.486
Blood products transfusion [e]	146 (22.1%)	140 (23.3%)	26 (17.7%)	0.145
Fluid balance (mL/kg.h)	6.5±4.2	6.7±4.4	5.8±3.0	0.005
Postoperative variables				
Elevated UMS at admission [f]	56 (8.5%)	37 (7.2%)	19 (12.9%)	0.028
Elevated UMS 6 hours after admission [f]	55 (8.3%)	32 (6.2%)	23 (15.6%)	<0.001
Elevated UMS 12 hours after admission [f]	61 (9.3%)	32 (6.3%)	29 (19.7%)	<0.001
Non-renal SOFA score [g]	3 (2, 4)	3 (2, 4)	3 (2, 5)	0.003
APACHE II score [g]	12±4	12±4	13±5	<0.001
D0 Fluid balance (mL/kg)	32.0 (19.8, 46.5)	31.1 (18.6, 45.9)	33.5 (22.7, 48.9)	0.058
D0 Urine output (mL/kg)	20.4 (12.7, 31.7)	23.7 (14.3, 34.0)	12.6 (8.3, 18.4)	<0.001

Data are presented as mean ±SD, median (interquartile range), or number of patients (percentage) and compared by independent samples *t*-test, Mann-Whitney U test or chi-squared test/Fisher's exact test respectively. [a], Including patients without AKI and with mild AKI. [b], Open or laparoscopic surgery referred to 526 patients. [c], Including peripheral vascular surgery, ear, nose and throat surgery and thyroid or breast surgery. [d], Including use of phenylephrine, norepinephrine, epinephrine, and dopamine. [e], Including packed red blood cell, plasma, and platelet. [f], Defined as UMS ≥1. [g], Calculated after 24 hours of SICU admission. APACHE, acute physiology and chronic health evaluation; D0, the day of surgery; SOFA, sequential organ failure assessment score; UMS, urine microscopy score.

Table S4 Pre-and intra-operative risk factors of postoperative severe AKI. Demonstrates uni-and multi-variate Logistic model of severe AKI

	Univariate Logistic model		Multivariate Logistic model [a]	
	OR (95% CI)	P value	OR (95% CI)	P value
Age (y)	1.029 (1.014–1.044)	<0.001	1.026 (1.010–1.042)	0.002
BMI (kg/m^2)	1.073 (1.026–1.122)	0.002	1.082 (1.028–1.140)	0.003
History of coronary heart disease	1.378 (0.944–2.014)	0.097	–	–
ASA classification (III–IV vs. I–II)	1.625 (0.946–2.791)	0.079	–	–
Preoperative Hb (g/L) [b]	0.991 (0.983–1.000)	0.042	–	–
Preoperative albumin (g/L) [b]	0.939 (0.907–0.972)	<0.001	0.956 (0.919–0.994)	0.023
Baseline eGFR (mL/min/1.73 m^2) [c]	0.989 (0.980–0.997)	0.008	–	–
On ACEI/ARB	1.614 (1.012–2.576)	0.045	–	–
Intraoperative urine output (mL/kg.h)	0.732 (0.620–0.865)	<0.001	0.818 (0.688–0.972)	0.023
Intraoperative fluid balance (mL/kg.h)	0.941 (0.894–0.991)	0.021	–	–

[a], After excluding variables of collinearity, factors with P values < 0.10 in univariate analyses or considered clinically important were included in the multivariate logistic regression model with backward LR method for adjustment. [b], Measured within 3 days before surgery. [c], Estimated by the modification of diet in renal disease formula. ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; ASA, American society of anesthesiologists; BMI, body mass index; CI, confidence interval; eGFR, estimated glomerular filtration rate; Hb, hemoglobin; OR, odds ratio.