

Supplemental Table 1. Selection Criteria in the Current Study

	Inclusion criteria*	Exclusion criteria
Intestinal obstruction patients	(1) Patients were admitted with a clinical diagnosis of intestinal obstruction (4 or more signs and symptoms, including abdominal tenderness, vomiting, abdominal distention, obstipation, intestinal air-fluid levels on plain films, or computed tomography scan findings of the intestinal transition point and/or a subsequent diagnostic laparotomy), (2) SIM-IO was defined as merely obstructed intestinal contents, while STR-IO was accompanied simultaneously with the blocked blood flow of the intestinal wall, which was confirmed by post-operation pathological results. ⁶⁷	(1) Hematopathy, including all types of leukemia and anemia, <i>etc.</i> , (2) Metabolic disease, such as diabetes mellitus, gout, hyperlipidemia, <i>etc.</i> , (3) Pregnancy or lactation, (4) Established gastrointestinal diseases, such as inflammatory bowel disease, <i>etc.</i> , (5) Benign or malignant gastrointestinal tumors (except those with colon cancer included in the study), (6) Urinary diseases, such as pyelonephritis, cystitis, urethritis, <i>etc.</i> , (7) Any symptoms of other acute diseases during the last two weeks, such as fever, cough, headache, nausea, vomit, stomach ache, diarrhea, hematuria, <i>etc.</i> , (8) Severe stress during the last two weeks, such as psychic trauma and a large area of empyrosis, <i>etc.</i> , (9) Any medical treatments before current admission, such as radiotherapy and chemotherapy, <i>etc.</i>
Acute simple appendicitis (ASA) patients	(1) Patients were admitted with a clinical diagnosis of ASA (4 or more signs and symptoms, including abdominal tenderness, rebound tenderness, metastatic right lower abdominal pain, abdominal plain films, and/or a subsequent diagnostic laparotomy), (2) The pathological results of post-operation were consistent with pre-operative diagnosis.	(1) Any acute and chronic gastrointestinal symptoms during the last 2 weeks, (2) Severe stress during the last 2 weeks, such as a large area of empyrosis and psychic trauma, <i>etc.</i>
Colon cancer patients	(1) The diagnosis was confirmed by post-operation pathological results, (2) Both clinical symptoms and intraoperative findings showed no evidence of intestinal obstruction.	
Healthy controls	All routine laboratory examinations, such as blood glucose, routine blood tests, electrocardiogram and the plain film chest X-ray, were normal.	

* Inclusion criteria for all subjects included (1), age of 18-75 years, and (2), body mass index of 20-28.

Supplemental Table 2. Sequences of Oligonucleotide Primers and Conditions for QRT-PCR

Gene target	GenBank number (mRNA)	Oligonucleotide* (5' to 3')	Annealing temperature (°C)	Product size (bp)
ZO-1	NM_003257	Forward Primer: TTCTCAGGGTASAACASACG Reverse Primer: TTAGGGAGGTCASAGCAG	60	76
occludin	NM_002538	Forward Primer: TTAGGAGGTAGTGTAGGC Reverse Primer: TGCTCTTGGGTCTGTAT	60	117
claudin-1	NM_021101	Forward Primer: CASATGCCAGGTACGASAT Reverse Primer: GGTGTTGGGTASAGAGGTT	60	123
HDC	NM_002112	Forward Primer: GCAGCASAGGASAGASACASA Reverse Primer: GAGTCGGGCATTTAGGC	60	78
CP	NM_000096	Forward Primer: AGGAGATTCGGTCGTGT Reverse Primer: TTGTTTGAGGGASAGAGG	60	131
GAPDH	NM-002046	Forward: GGTGASAGGTCGGAGTCASACG Reverse: CCATGTAGTTGAGGTCASATGASAG	60	122

CP, ceruloplasmin; GAPDH, glyceraldehyde-3-phosphate dehydrogenase; HDC, histidine decarboxylase; QRT-PCR, quantitative real-time polymerase chain reaction; ZO-1, zonula occludens-1.

*Primers were designed based on sequences of human corresponding genes from the GenBank database.

Supplementary Table 3. The Expression Levels of Serum Biomarkers among STR-IO, SIM-IO, ASA and Normal Control Samples ^a

Biomarkers	STR-IO (n = 35)	SIM-IO (n = 20)	ASA (n = 20)	Normal (n = 20)	P-value
HDC (ng/ml)	71.29 ± 22.39	46.02 ± 13.38	29.99 ± 8.19	25.40 ± 7.24	< 0.001 ^b
CP (ng/ml)	265.26 ± 98.49	198.37 ± 72.83	162.47 ± 58.36	150.12 ± 59.28	< 0.001 ^b
D-lactate (ng/ml)	392.43 ± 171.42	279.01 ± 106.65	242.39 ± 97.58	216.57 ± 103.18	< 0.001 ^b
α-GST (ng/ml)	209.81 ± 72.43	132.98 ± 38.44	134.66 ± 29.89	114.75 ± 24.96	< 0.001 ^b
I-FABP (pg/ml)	499.94 ± 182.32	271.31 ± 47.20	210.02 ± 66.76	191.50 ± 50.82	< 0.001 ^b
DAO (mg/ml)	341.23 ± 130.42	200.99 ± 89.06	163.91 ± 69.61	146.15 ± 49.22	< 0.001 ^b

α-GST, alpha-glutathione S-transferase; ASA, acute simple appendicitis; CP, Ceruloplasmin; DAO, diamine oxidase; HDC, histidine decarboxylase; I-FABP, intestinal fatty acid binding proteins; STR-IO, strangulated intestinal obstruction; SIM-IO, simple intestinal obstruction.

^a HDC, CP, D-lactate, α-GST, I-FABP and DAO levels in serum were determined by enzyme-linked immunosorbent assay, and median value (mean ± SD) are given for the indicated groups. Mean age ± SD and gender distribution for the individual groups are also indicated.

^b One way ANOVA analysis.

Supplementary Table 4. The Expression Levels of Urine Biomarkers among STR-IO, SIM-IO, ASA and Normal Control Samples ^a

Biomarkers	STR-IO (n = 25)	SIM-IO (n = 15)	ASA (n = 15)	Normal (n = 15)	P-value
HDC (ng/ml)	57.71 ± 14.22	42.73 ± 13.16	28.60 ± 6.98	23.11 ± 4.77	< 0.001 ^b
CP (ng/ml)	78.73 ± 19.77	71.03 ± 19.66	64.90 ± 11.92	59.35 ± 17.52	< 0.001 ^b
I-FABP (pg/ml)	139.48 ± 24.27	114.86 ± 23.14	94.67 ± 22.60	88.75 ± 19.59	< 0.001 ^b
TXB2 (ng/ml)	40.95 ± 15.65	33.70 ± 10.36	24.38 ± 6.49	24.47 ± 7.00	0.009 ^b

ASA, acute simple appendicitis; CP, Ceruloplasmin; HDC, histidine decarboxylase; I-FABP, intestinal fatty acid binding proteins; STR-IO, strangulated intestinal obstruction; SIM-IO, simple intestinal obstruction; TXB2, thromboxane B2.

^a HDC, CP, I-FABP and TXB2 levels in urine were determined by enzyme-linked immunosorbent assay, and median value (mean ± SD) are given for the indicated groups. Mean age ± SD and gender distribution for the individual groups are also indicated.

^b One way ANOVA analysis.

Supplementary Table 5. The Area under the Curve of Serum Biomarkers

Test Result Variable(s)	Area	Std. Error ^a	Asymptotic Significance ^b	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
D-lactate	0.763	0.054	< 0.001	0.657	0.869
α -GST	0.849	0.040	< 0.001	0.771	0.926
DAO	0.865	0.043	< 0.001	0.781	0.949
I-FAPB	0.915	0.035	< 0.001	0.846	0.984
HDC	0.937	0.023	< 0.001	0.893	0.981
CP	0.770	0.051	< 0.001	0.669	0.870

α -GST, alpha-glutathione S-transferase; CP, Ceruloplasmin; DAO, diamine oxidase; HDC, histidine decarboxylase; I-FABP, intestinal fatty acid binding proteins.

The test result variable(s), D-lactate, α -GST, DAO, I-FAPB, HDC or CP, has at least one tie between the positive actual state group and the negative actual state group.

Statistics may be biased.

^a Under the nonparametric assumption

^b Null hypothesis: true area = 0.5

Supplementary Table 6. The Area under the Curve of Urine Biomarkers

Test Result Variable(s)	Area	Std. Error ^a	Asymptotic Sig. ^b	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
I-FABP	0.884	0.040	< 0.001	0.806	0.963
TXB2	0.772	0.060	< 0.001	0.654	0.889
HDC	0.916	0.032	< 0.001	0.852	0.979
CP	0.708	0.064	0.004	0.583	0.833

CP, Ceruloplasmin; HDC, histidine decarboxylase; I-FABP, intestinal fatty acid binding proteins; TXB2, thromboxane B2.

The test result variable, I-FABP, TXB2, HDC or CP, has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

^a Under the nonparametric assumption

^b Null hypothesis: true area = 0.5