Supplementary information

Supplementary Table 1. Comparison of Baseline Characteristics Between LCC and RCC patients

Variables	Patients, No. (%)			P value
	ALL (N = 1510)	LCC (N = 801)	RCC (N = 709)	
Sex				< 0.001
Female	872 (58)	495 (62)	377 (53)	
Male	638 (42)	306 (38)	332 (47)	
Age, median (IQR), years	63 (54, 71)	63 (54, 70)	64 (55, 72)	0.004
Tumor grade				< 0.001
G1-2	1345 (89)	743 (93)	602 (85)	
G3	165 (11)	58 (7)	107 (15)	
Vascular				0.097
invasion	374 (25)	184 (23)	190 (27)	
no-invasion	1136 (75)	617 (77)	519 (73)	
Perineural				0.35
invasion	206 (14)	116 (14)	90 (13)	
no-invasion	1304 (86)	685 (86)	619 (87)	
MMR				< 0.001
dMMR	272 (18)	85 (11)	187 (26)	
pMMR	1238 (82)	716 (89)	522 (74)	
T stage				0.005
T1-2	232 (15)	143 (18)	89 (13)	
T3-4	1278 (85)	658 (82)	620 (87)	
N stage				0.011
N0	884 (59)	446 (56)	438 (62)	
N1	442 (29)	261 (33)	181 (26)	
N2	184 (12)	94 (12)	90 (13)	
AJCC stage				< 0.001
I	197 (13)	121 (15)	76 (11)	
II	687 (45)	325 (41)	362 (51)	
III	626 (41)	355 (44)	271 (38)	
NLR, median (IQR)	2.22 (1.65, 3.05)	2.13 (1.62, 2.92)	2.34 (1.71, 3.18)	< 0.001
PLR, median (IQR)	153.51 (116.52, 208.66)	141.67 (111.31, 183.98)	172.84 (126.46, 229.03)	< 0.001
SII, median (IQR)	540.81 (370.1, 833.6)	502.24 (357.54, 742.37)	614.2 (396.4, 942.74)	< 0.001
PIV, median (IQR)	191.42 (117.22, 332.54)	175.87 (111.92, 286.84)	214.34 (121.78, 386.72)	< 0.001
CEA, median (IQR), ng/ml	3.5 (1.9, 7.85)	3.5 (2, 7.58)	3.45 (1.9, 8.35)	0.743
CA19-9, median (IQR), U/ml	12.8 (7.3, 23.2)	11.6 (7, 20.1)	14.2 (7.7, 25.1)	< 0.001

| Tumor size, median (IQR), cm | 4.5 (3.3, 6) | 4 (3, 5) | 5 (3.5, 6.7) | < 0.001 |

LCC: left-sided colon cancer; RCC: right-sided colon cancer; G1-2: grades well and moderately differentiated; G3: grade poorly differentiated; MMR: mismatch repair; dMMR: mismatch repair-deficient; pMMR: mismatch repair-proficient; PIV: Pan-immune-inflammation value; NLR: neutrophil-to-lymphocyte ratio; PLR: platelet-to-lymphocyte ratio; SII: systemic immune-inflammation index; PLT: platelet; CEA: carcinoembryonic antigen; CA19-9: carbohydrate antigen 19-9.

Supplementary Table 2. Comparison of Baseline Characteristics Between Included and Excluded Participants

Variables	Patients, No. (%)			P value
	ALL (N = 1690)	Stayed group (N = 1510)	Excluded group (N = 180)	
Sex				0.618
Female	980 (58)	872 (58)	108 (60)	
Male	710 (42)	638 (42)	72 (40)	
Age, median (IQR), years	63 (54, 71)	63 (54, 71)	62 (54, 70)	0.258
Tumor location				0.487
LCC	891 (53)	801 (53)	90 (50)	
RCC	799 (47)	709 (47)	90 (50)	
Tumor grade				0.93
G1-2	1492 (89)	1345 (89)	147 (90)	
G3	182 (11)	165 (11)	17 (10)	
Vascular				0.642
invasion	422 (25)	374 (25)	48 (27)	
no-invasion	1268 (75)	1136 (75)	132 (73)	
Perineural				0.681
invasion	228 (13)	206 (14)	22 (12)	
no-invasion	1462 (87)	1304 (86)	158 (88)	
MMR				0.169
dMMR	293 (18)	272 (18)	21 (13)	
pMMR	1375 (82)	1238 (82)	137 (87)	
T stage				0.133
T1-2	268 (16)	232 (15)	36 (20)	
T3-4	1422 (84)	1278 (85)	144 (80)	
N stage				0.677
N0	994 (59)	884 (59)	110 (61)	
N1	489 (29)	442 (29)	47 (26)	
N2	207 (12)	184 (12)	23 (13)	
AJCC stage				0.601
I	225 (13)	197 (13)	28 (16)	
II	769 (46)	687 (45)	82 (46)	
III	696 (41)	626 (41)	70 (39)	
NLR, median (IQR)	2.24 (1.65, 3.1)	2.22 (1.65, 3.05)	2.43 (1.69, 3.4)	0.132
PLR, median (IQR)	154.55 (117.2, 210)	153.51 (116.52, 208.66)	165.87 (123.57, 217.14)	.082
SII, median (IQR)	548.31 (372.21, 847.25)	540.81 (370.1, 833.6)	639.59 (401.64, 961.03)	0.151
PIV, median (IQR)	194.36 (118.01, 337.14)	191.42 (117.22, 332.54)	215.69 (124.6, 391.64)	0.368

CEA, median (IQR), ng/ml	3.5 (1.92, 8.2)	3.5 (1.9, 7.85)	3.71 (2.1, 10.78)	0.333
CA19-9, median (IQR), U/ml	12.8 (7.3, 23.2)	12.8 (7.3, 23.2)	12.65 (6.57, 24.08)	0.995
Tumor size, median (IQR), cm	4.5 (3.3, 6)	4.5 (3.3, 6)	4.5 (3.5, 6)	0.876

LCC: left-sided colon cancer; RCC: right-sided colon cancer; G1-2: grades well and moderately differentiated; G3: grade poorly differentiated; MMR: mismatch repair; dMMR: mismatch repair-deficient; pMMR: mismatch repair-proficient; PIV: Pan-immune-inflammation value; NLR: neutrophil-to-lymphocyte ratio; PLR: platelet-to-lymphocyte ratio; SII: systemic immune-inflammation index; PLT: platelet; CEA: carcinoembryonic antigen; CA19-9: carbohydrate antigen 19-9.

Supplementary Table 3. Comparison of Baseline Characteristics Between LCC and RCC Patients after PSM

Variables	Patients, No. (%)			P value
	ALL (N = 950)	LCC (N = 475)	RCC (N = 475)	
Sex				1
Female	572 (60)	286 (60)	286 (60)	
Male	378 (40)	189 (40)	189 (40)	
Age, median (IQR), years	63 (54, 71)	63 (54, 71)	63 (54, 71)	0.917
Tumor grade				0.732
G1-2	866 (91)	431 (91)	435 (92)	
G3	84 (9)	44 (9)	40 (8)	
Vascular				0.137
invasion	243 (26)	111 (23)	132 (28)	
no-invasion	707 (74)	364 (77)	343 (72)	
Perineural				.707
invasion	131 (14)	68 (14)	63 (13)	
no-invasion	819 (86)	407 (86)	412 (87)	
MMR				0.645
dMMR	138 (15)	72 (15)	66 (14)	
pMMR	812 (85)	403 (85)	409 (86)	
T stage				0.234
T1-2	140 (15)	77 (16)	63 (13)	
T3-4	810 (85)	398 (84)	412 (87)	
N stage				0.556
N0	560 (59)	283 (60)	277 (58)	
N1	271 (29)	138 (29)	133 (28)	
N2	119 (13)	54 (11)	65 (14)	
AJCC stage				0.303
I	124 (13)	70 (15)	54 (11)	
II	436 (46)	213 (45)	223 (47)	
III	390 (41)	192 (40)	198 (42)	
NLR, median (IQR)	2.16 (1.62, 2.97)	2.13 (1.63, 2.98)	2.19 (1.61, 2.97)	0.839
PLR, median (IQR)	154.4 (116.94, 207.94)	144.85 (113.71, 189.84)	165 (121.12, 218.89)	< 0.001
SII, median (IQR)	530.94 (359.56, 810.76)	513.64 (357.1, 784.36)	546.01 (372.09, 820.43)	0.287
PIV, median (IQR)	186.46 (111.31, 309.86)	182.42 (111.88, 297.65)	189.45 (109.44, 316.02)	0.987
CEA, median (IQR), ng/ml	3.5 (1.9, 8)	3.5 (1.98, 7.94)	3.5 (1.83, 8.47)	0.636
CA19-9, median (IQR), U/ml	12.7 (7.4, 22.48)	12 (7.2, 21.1)	13.8 (7.7, 23.2)	0.092

| Tumor size, median (IQR), cm | 4.5 (3.5, 5.68) | 4.5 (3.45, 5.55) | 4.5 (3.5, 5.7) | 0.891 |

LCC: left-sided colon cancer; RCC: right-sided colon cancer; G1-2: grades well and moderately differentiated; G3: grade poorly differentiated; MMR: mismatch repair; dMMR: mismatch repair-deficient; pMMR: mismatch repair-proficient; PIV: Pan-immune-inflammation value; NLR: neutrophil-to-lymphocyte ratio; PLR: platelet-to-lymphocyte ratio; SII: systemic immune-inflammation index; PLT: platelet; CEA: carcinoembryonic antigen; CA19-9: carbohydrate antigen 19-9.

Supplementary Table 4. The Optimal Cut-off Value of PIV for DFS in LCC and RCC

Variables	Cut-off value	
	LCC	RCC
PIV	227.84	145.99
SII	497.73	726.58
NLR	2.0521	4.6071
PLR	218.1818	293.8776
CEA	12.49	7.36
CA19-9	31.5	47.4

LCC: left-sided colon cancer; RCC: right-sided colon cancer; PIV: Pan-immune-inflammation value; NLR: neutrophil-to-lymphocyte ratio; PLR: platelet-to-lymphocyte ratio; SII: systemic immune-inflammation index; CEA: carcinoembryonic antigen; CA19-9: carbohydrate antigen 19-9.

Supplementary Table 5. Baseline Characteristics in RCC

Variables	Patients, No. (%)			P value
	ALL (N = 709)	PIV-high (N = 482)	PIV-low (N = 227)	
Sex				0.071
Female	377 (53)	268 (56)	109 (48)	
Male	332 (47)	214 (44)	118 (52)	
Age, median (IQR), years	64 (55, 72)	65 (55, 73)	63 (56, 71)	0.301
Tumor grade				< 0.001
G1-2	602 (85)	393 (82)	209 (92)	
G3	107 (15)	89 (18)	18 (8)	
Vascular				0.505
invasion	190 (27)	125 (26)	65 (29)	
no-invasion	519 (73)	357 (74)	162 (71)	
Perineural				0.063
invasion	90 (13)	53 (11)	37 (16)	
no-invasion	619 (87)	429 (89)	190 (84)	
MMR				< 0.001
dMMR	187 (26)	146 (30)	41 (18)	
pMMR	522 (74)	336 (70)	186 (82)	
T stage				< 0.001
T1-2	89 (13)	44 (9)	45 (20)	
T3-4	620 (87)	438 (91)	182 (80)	
N stage				0.527
N0	438 (62)	291 (60)	147 (65)	
N1	181 (26)	127 (26)	54 (24)	
N2	90 (13)	64 (13)	26 (11)	
NLR, median (IQR)	2.34 (1.71, 3.18)	2.81 (2.16, 3.86)	1.6 (1.29, 2.03)	< 0.001
PLR, median (IQR)	172.84 (126.46, 229.03)	195.82 (152.33, 264.91)	126.56 (99.5, 160.77)	< 0.001
SII, median (IQR)	614.2 (396.4, 942.74)	807 (593.44, 1157.22)	329 (256.23, 421.5)	< 0.001
PIV, median (IQR)	214.34 (121.78, 386.72)	307.49 (208.53, 499.12)	93.2 (69.55, 119.28)	< 0.001
CEA, median (IQR), ng/ml	3.45 (1.9, 8.35)	3.6 (2, 9.46)	3.04 (1.64, 7.16)	0.013
CA19-9, median (IQR), U/ml	14.2 (7.7, 25.1)	13.7 (7.4, 26.92)	15.4 (8.55, 23.55)	0.455
Tumor size, median (IQR), cm	5 (3.5, 6.7)	5.1 (4, 7)	4 (3, 5.35)	< 0.001

RCC: right-sided colon cancer; G1-2: grades well and moderately differentiated; G3: grade poorly differentiated; MMR: mismatch repair; dMMR: mismatch repair-deficient; pMMR: mismatch repair-proficient; PIV: Pan-immune-inflammation value; NLR: neutrophil-to-lymphocyte ratio; PLR: platelet-to-lymphocyte ratio; SII: systemic immune-inflammation index; PLT: platelet; CEA: carcinoembryonic antigen; CA19-9: carbohydrate antigen 19-9.