

**Table S1** Baseline characteristics of the metastatic or recurrent subgroup patients (n=234)

Characteristics	No. of patients	Proportion (%)
Gender		
Male	173	73.93
Female	61	26.07
Age (years)		
<70	134	57.26
≥70	100	42.74
BMI (kg/m <sup>2</sup> )		
<23.9	211	90.17
≥23.9	23	9.83
ECOG PS score		
0	32	13.68
1	155	66.24
2	47	20.09
Tumor location		
Upper	30	12.82
Middle	113	48.29
Lower	91	38.89
Tumor length		
<5 cm	119	50.85
≥5 cm	115	49.15
Differentiation		
Well	70	29.91
Moderate	82	35.04
Poor	82	35.04
T classification		
T1-T2	110	47.01
T3-T4	124	52.99

**Table S1** (continued)**Table S1** (continued)

Characteristics	No. of patients	Proportion (%)
N classification		
N0	130	55.56
N1-N3	104	44.44
Distant organ metastasis		
Yes	110	47.01
No	124	52.99
Previous treatments		
CT	61	26.07
RT	11	4.70
CRT	64	27.35
None	98	41.88
ICI modalities		
ICI monotherapy	38	16.24
ICI + CT	105	44.87
ICI + RT	36	15.38
ICI + CRT	55	23.50
ICI agent		
Pembrolizumab	4	1.71
Camrelizumab	135	57.69
Sintilimab	63	26.92
Tislelizumab	27	11.54
Others	5	2.14

BMI, body mass index; ECOG PS, Eastern Cooperative Oncology Group performance status; T, tumor; N, lymph node; CT, chemotherapy; RT, radiotherapy; CRT, chemoradiotherapy; ICI, immune checkpoint inhibitor.

**Table S2** Baseline characteristics of the unresectable subgroup patients (n=443)

Characteristics	No. of patients	Proportion (%)
Gender		
Male	295	66.59
Female	148	33.41
Age (years)		
<70	193	43.57
≥70	250	56.43
BMI (kg/m <sup>2</sup> )		
<23.9	321	72.46
≥23.9	122	27.54
ECOG PS score		
0	49	11.06
1	352	79.46
2	42	9.48
Tumor location		
Upper	143	32.28
Middle	182	41.08
Lower	118	26.64
Tumor length		
<5 cm	184	41.53
≥5 cm	259	58.47

**Table S2** (continued)

**Table S2** (continued)

Characteristics	No. of patients	Proportion (%)
Distant organ metastasis		
Yes	137	30.93
No	306	69.07
Previous treatments		
CT	29	6.55
RT	30	6.77
CRT	54	12.19
None	330	74.49
ICI modalities		
ICI monotherapy	54	12.19
ICI + CT	219	49.44
ICI + RT	61	13.77
ICI + CRT	109	24.60
ICI agent		
Pembrolizumab	12	2.71
Camrelizumab	235	53.05
Sintilimab	93	20.99
Tislelizumab	86	19.41
Others	17	3.84

BMI, body mass index; ECOG PS, Eastern Cooperative Oncology Group performance status; ICI, immune checkpoint inhibitor; CT, chemotherapy; RT, radiotherapy; CRT, chemoradiotherapy.

**Table S3** Relationships between GNRI and characteristics of ESCC patients receiving immunotherapy (n=677)

Characteristics	No. of patients	All patients (n=677)			Metastatic/recurrent subgroup patients (n=234)				Unresectable subgroup patients (n=443)			
		GNRI-L	GNRI-H	P	No. of patients	GNRI-L	GNRI-H	P	No. of patients	GNRI-L	GNRI-H	P
Gender				0.19				0.94				0.19
Male	468	193	275		173	87	86		295	106	189	
Female	209	75	134		61	31	30		148	44	104	
Age (years)				0.59				0.14				0.79
<70	327	126	201		134	62	72		193	64	129	
≥70	350	142	208		100	56	44		250	86	164	
BMI (kg/m <sup>2</sup> )				<0.001				<0.001				<0.001
<23.9	532	248	284		211	116	95		321	132	189	
≥23.9	145	20	125		23	2	21		122	18	104	
ECOG PS score				<0.001				0.06				<0.001
0	81	20	61		32	15	17		49	5	44	
1	507	187	320		155	72	83		352	115	237	
2	89	61	28		47	31	16		42	30	12	
Tumor location				0.64				0.03				0.39
Upper	173	65	108		30	22	8		143	43	100	
Middle	295	115	180		113	53	60		182	62	120	
Lower	209	88	121		91	43	48		118	45	73	
Tumor length				0.88				0.79				0.64
<5 cm	303	119	184		119	59	60		184	60	124	
≥5 cm	374	149	225		115	59	56		259	90	169	
Differentiation				-				0.28				-
Well	-	-	-		70	34	36		-	-	-	
Moderate	-	-	-		82	37	45		-	-	-	
Poor	-	-	-		82	47	35		-	-	-	
T classification				-				0.89				-
T1-T2	-	-	-		110	56	54		-	-	-	
T3-T4	-	-	-		124	62	62		-	-	-	
N classification				-				0.35				-
N0	-	-	-		130	62	68		-	-	-	
N1-N3	-	-	-		104	56	48		-	-	-	

Table S3 (continued)

Table S3 (continued)

Characteristics	No. of patients	All patients (n=677)			Metastatic/recurrent subgroup patients (n=234)				Unresectable subgroup patients (n=443)			
		GNRI-L	GNRI-H	P	No. of patients	GNRI-L	GNRI-H	P	No. of patients	GNRI-L	GNRI-H	P
Distant organ metastasis				<0.001				0.51				<0.001
Yes	247	121	126		110	58	52		137	63	74	
No	430	147	283		124	60	64		306	87	219	
Previous treatments				0.38				0.69				0.45
CT	90	38	52		61	28	33		29	10	19	
RT	41	19	22		11	5	6		30	14	16	
CRT	118	52	66		64	36	28		54	16	38	
None	428	159	269		98	49	49		330	110	220	
ICI modalities				0.002				0.30				0.004
ICI monotherapy	92	52	40		38	24	14		54	28	26	
ICI + CT	324	115	209		105	49	56		219	66	153	
ICI + RT	97	42	55		36	16	20		61	26	35	
ICI + CRT	164	59	105		55	29	26		109	30	79	
ICI agent				0.13				0.85				0.12
Pembrolizumab	16	3	13		4	2	2		12	1	11	
Camrelizumab	370	154	216		135	72	63		235	82	153	
Sintilimab	156	67	89		63	29	34		93	38	55	
Tislelizumab	113	37	76		27	12	15		86	25	61	
Others	22	7	15		5	3	2		17	4	13	

GNRI, Geriatric Nutritional Risk Index; ESCC, esophageal squamous cell carcinoma; BMI, body mass index; ECOG PS, Eastern Cooperative Oncology Group performance status; T, tumor; N, lymph node; CT, chemotherapy; RT, radiotherapy; CRT, chemoradiotherapy; ICI, immune checkpoint inhibitor.

**Table S4** Baseline characteristics of the patients for PD-L1 expression testing (n=45)

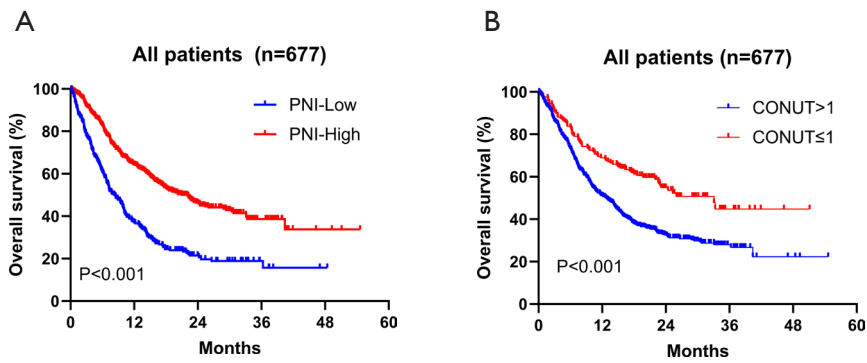
Characteristics	No. of patients	Proportion (%)
Gender		
Male	31	68.89
Female	14	31.11
Age (years)		
<70	22	48.89
≥70	23	51.11
BMI (kg/m <sup>2</sup> )		
<23.9	36	80.00
≥23.9	9	20.00
ECOG PS score		
0	7	15.56
1	34	75.56
2	4	8.89
Tumor location		
Upper	19	42.22
Middle	18	40.00
Lower	8	17.78

**Table S4** (continued)

**Table S4** (continued)

Characteristics	No. of patients	Proportion (%)
Tumor length		
<5 cm	14	31.11
≥5 cm	31	68.89
Distant organ metastasis		
Yes	12	26.67
No	33	73.33
ICI modalities		
ICI monotherapy	9	20.00
ICI + CT	16	35.56
ICI + RT	6	13.33
ICI + CRT	14	31.11
ICI agent		
Pembrolizumab	2	4.44
Camrelizumab	24	53.33
Sintilimab	18	40.00
Tislelizumab	1	2.22

PD-L1, programmed cell death ligand 1; BMI, body mass index; ECOG PS, Eastern Cooperative Oncology Group performance status; ICI, immune checkpoint inhibitor; CT, chemotherapy; RT, radiotherapy; CRT, chemoradiotherapy.



**Figure S1** Overall survival between different groups based on nutritional indices. (A) Survival analysis stratified by PNI in all patients. (B) Survival analysis stratified by CONUT score in all patients. (A) The cut-off value of PNI was established at 40.525, as determined by the time-dependent ROC curve analysis. (B) Patients were divided into two groups based on the CONUT score: those with CONUT  $\leq 1$  (normal nutrition) and those with CONUT  $> 1$  (malnutrition).