Table 1. The characteristics of the studies included.

Study	Ethnicity (country)	Sample size	Gender (M/F)	Age	Stage	NLR cutoff	PLR cutoff	LMR cutoff	PNI cutoff	SII cutoff	GPS cutoff	mGPS cutoff	CAR cutoff	Follow-up (months)	Treatment	Outcome	pathology	TP /FP /FN /TN (OS)
Wang L et al. (2017)[1]	China	280	233/47	64.071±7.412	0-IV	2	159	5.3	NR	560	NR	NR	NR	36	surgery	OS/DFS	SCC	SII:81 32 53 114
Feng JF et al. (2017)[2]	China	298	260/38	NR	I-III	5	150	NR	NR	410	NR	NR	NR	NR	surgery	CSS	SCC	SII:165 52 39 42
Nakatani M et al. (2017)[3]	Japan	66	56/10	64.7 ± 6.1	II-III	NR	NR	NR	45	NR	NR	NR	NR	31.9	surgery	OS/RFS	SCC	NR
Kubo N et al. (2017)[4]	Japan	202	162/40	63.73 ± 7.93	I-IV	NR	NR	NR	44	NR	NR	NR	NR	47.1	surgery	OS/RFS	SCC	NR
Hirahara N et al. (2018)[5]	Japan	169	150/19	PNI＜49.2：67.1±8.2 PNI≥49.2：65.4±8.0	Ia-IIIc	NR	NR	NR	49.2	NR	NR	NR	NR	NR	surgery	OS/CSS	SCC	NR
Dai YQ et al. (2019)[6]	China	106	79/27	<65:82; ≥65:24	T1-4/N0-1	2.1	104.1	3.45	48.15	305.6	NR	NR	NR	19(2–190)	CRT	OS	SCC	PNI: 43 7 33 23
Ishibashi Y et al. (2018)[7]	Japan	143	121/22	70.6 ± 8.4(43–90)	I-IV	3	135	NR	NR	650	NR	NR	0.085	NR	surgery	OS/CSS	SCC/ADC /Others	SII: 39 17 46 41 NLR: 42 14 45 42 PLR: 66 28 24 25 CAR: 60 15 27 41
Zhang HD et al. (2018)[8]	China	655	537/118	61(27–88)	0-III	1.87	140.09	NR	52.28	387.65	NR	NR	NR	36.0(3–144)	surgery	OS	SCC	PLR: 148 81 236 190 SII: 259 146 125 125 PNI: 264 137 138 116
Yang YC et al. (2018)[9]	China	515	418/97	61(33–92)	I-III	1.2	130	NR	57	NR	NR	NR	NR	35(2–106)	surgery	OS	SCC	PLR: 143 67 168 137 PNI: 217 117 90 91
Wu CC et al. (2018)[10]	China	126	122/4	58(37–80)	IIIa-IIIc	2.5	103	NR	NR	NR	NR	0/1,2	0.95	NR	mixed	OS	SCC	CAR: 57 1 52 17 mGPS: 77 2 34 15
Wei XL et al. (2015)[11]	China	423	341/82	58(24–88)	I-IV	1.835	163.8	NR	49.05	NR	NR	0,1,2	0.095	35.7(0.6–95.6)	surgery	OS	SCC	CAR: 90 57 119 157
Geng YT et al. (2016)[12]	China	916	696/220	60.0(37–84)	0-III	1.7	120	3.57	NR	307	NR	NR	NR	39(3–146)	surgery	OS	SCC	SII: 279 227 113 140 LMR: 239 181

																	258 238 PLR: 275 183 238 220
Gao YB et al. (2019)[13]	China	468	376/92	59.5(36–81)	I-III	2.27	117.05	5.26	NR	479.72	NR	NR	NR	49.1±32.6(3.2–114.5)	surgery	OS/DFS	SCC	SII: 93 50 162 163 PLR: 93 60 164 151 LMR: 96 69 155 148
Liu JS et al. (2015)[14]	China	326	283/43	59.2±7.9(38-80)	T1-4/N0-3	3.45	166	2.3	NR	NR	0/1,2	NR	NR	45	surgery	CSS	SCC	GPS: 108 31 95 92 PLR: 114 28 89 95 LMR: 112 36 81 87
Hirahara N et al. (2016)[15]	Japan	147	132/15	<70：46 ≥70：101	Ia-IIIc	1.6	147	4	NR	NR	NR	NR	NR	42(3-111)	surgery	OS/CSS	SCC	LMR: 59 24 35 29 PLR: 56 23 38 30
Han LH et al. (2015)[16]	China	218	177/41	60.5(32-84)	I-III	2.6	244	2.57	NR	NR	NR	NR	NR	38.6(3-71)	surgery	OS/DFS	SCC	NR
Gao QF et al. (2018)[17]	China	153	128/25	61.93±6.72	0-III	2.1	145.9	2.3	NR	NR	NR	NR	NR	NR	surgery	OS	SCC	NR
Kunkzaki M et al. (2018)[18]	Japan	116	98/18	66(44-83)	0-IV	5	150	NR	45	NR	0/1,2	0/1,2	0.042	NR	mixed	OS	SCC	CAR: 29 22 29 36
Xu XL et al. (2015)[19]	China	468	416/52	58	I-IIIc	2.4	147	NR	NR	NR	0/1/2	0/1/2	0.5	49.9(10.9–88.0)	surgery	OS	NR	CAR: 72 15 216 165
Toyokawa T et al. (2016)[20]	Japan	185	152/33	64(59–70)	I-IV	3.612	193	NR	NR	NR	0/1,2	NR	NR	81.5(IQR:45.8–112.3)	surgery	OS/RFS	SCC	NR
Li KJ et al. (2019)[21]	China	204	171/33	65.8(38-85)	T1-4/N0-2	2.64	NR	3.03	NR	NR	NR	NR	NR	11.5(2.1-77.4)	CRT	OS/RFS	SCC	NR
Fu XB et al. (2019)[22]	China	357	279/78	57(34-77)	I-IVa	2.27	NR	2.57	NR	SIS:0/1/2	NR	NR	NR	58(1–84)	surgery	OS	SCC	NLR: 77 50 100 128
Zhang F et al. (2016)[23]	China	468	376/92	60(36-81)	I-III	2.5	117.07	NR	NR	NR	NR	NR	NR	49.1±32.6(3.2-114.5)	surgery	OS/DFS	SCC	NR
Xie X et al. (2016)[24]	China	317	244/73	58.1±8.9(34–76)	I-III	2.1	103	NR	NR	NR	NR	NR	NR	46(36–62)	surgery	DSS	SCC	NR
Wu YF et al. (2019)[25]	China	105	98/7	57.69±8.6(38-81)	I-III	4.35	NR	NR	NR	NR	NR	NR	NR	19.5±14.1	CRT	OS/PFS	SCC	PLR: 44 9 34 18 NLR: 45 8 33 19
Feng JF et	China	483	411/72	59.1±8.0(34-80)	T1-4/N-+	3.5	150	NR	NR	NR	NR	NR	NR	NR	surgery	OS	SCC	NLR:115 63 129

al. (2014)[26]																	176 PLR: 148 72 96 167
Zhu YM et al. (2017)[27]	China	220	117/103	≤60/>60:124/96	T3N0M0	NR	NR	3.364	NR	NR	NR	NR	NR	DFS:40.0(34.2–45.8) OS:53.0(48.0–58.0)	mixed	OS/DFS	SCC	LMR: 81 45 51 43
Song Q et al. (2019)[28]	China	680	582/98	61(56-67)	Ia-IIIc	NR	NR	3.17	NR	NR	NR	NR	NR	NR	mixed	OS/DFS	SCC	LMR: 182 161 135 202
Chen MF et al. (2018)[29]	China	1168	1113/55	(<50/50-64/>64): 344/609/215	≤T2/T3-T4,N0/N+	3	NR	NR	NR	NR	NR	NR	NR	NR	mixed	OS/DFS	SCC	NLR: 567 77 419 105
Duan H et al. (2015)[30]	China	371	276/95	57.7±8.9	Ib-IIIc	3	NR	NR	NR	410	NR	NR	NR	66(49-76)	surgery	CSS/RFS	SCC	NR
Gao GD et al. (2017)[31]	China	1281	988/293	Survival/Dead(634/647) 57.7±8.9/60.2±27.7	0-IV	2.86	NR	NR	NR	NR	NR	NR	NR	NR	mixed	OS	SCC	NR
Han FY et al. (2019)[32]	China	354	267/87	<60/>=60:100/254	I-IV	1.88	NR	NR	NR	NR	NR	NR	NR	26(2-80)	surgery	OS/DFS	SCC/ADC /Others	NR
Hirahara Noriyuki et al. (2018)[33]	Japan	148	132/16	CONUT 0/1/2-3(48/37/11) 61.5±5.4/61.8±5.9/60.4±5.3	Ia-IIIc	3.5	NR	NR	NR	NR	NR	NR	NR	NR	surgery	CSS	SCC	NR
Kosumi K et al. (2016)[34]	Japan	313	248/35	<65/≥65(118/165)	0-IV	1.94	NR	NR	NR	NR	NR	NR	NR	33.6	surgery	OS/CSS	SCC	NR
Lu YJ et al. (2019)[35]	China	315	259/56	59(35-75)	I-IVa	3.18	NR	NR	NR	NR	NR	NR	NR	NR	surgery	OS	SCC	NLR: 87 37 107 84
Nakamura K et al. (2017)[36]	Japan	245	219/26	<65/≥65:110/135	T1a-b/N0-3	2.42	NR	NR	NR	NR	NR	NR	NR	37.2	surgery	OS/DFS	SCC/ADC /Others	NLR: 16 22 16 101
Sharaiha RZ et al. (2011)[37]	USA	295	237/58	62.8	I-IV	5	NR	NR	NR	NR	NR	NR	NR	31(13–61)	surgery	OS/DFS	SCC/ADC /Others	NR
Xiao Q et al. (2016)[38]	China	121	106/15	62(30–76)	I-III	1.77	NR	NR	NR	NR	NR	NR	NR	28.0(1–102)	surgery	OS/RFS	SCC	NLR: 45 13 37 26
Zhou XL et al. (2017)[39]	China	517	407/110	65(36–74)	II-IV	5	NR	NR	NR	NR	NR	NR	NR	17(2-76)	CRT	OS/PFS	SCC	NLR: 188 12 244 69
Arigami T et al. (2015)[40]	Japan	238	210/28	65(37–87)	I-III	3	NR	NR	NR	NR	NR	0/1,2	NR	26(1-182)	surgery	OS	SCC	mGPS: 44 26 54 114
Lindenmann J et al. (2017)[41]	Austria	174	148/26	61.1(22-81)	T0-4/N0-3	NR	NR	NR	NR	NR	1-2 vs 0	NR	NR	NR	mixed	AC/CSS	ADC/SCC	GPS: 33 6 41 25
Ma QL et	China	725	539/186	58(32-80)	TNM I/II/III	NR	NR	NR	NR	NR	1-2 vs	NR	NR	28	surgery	CSS	SCC	NR

al. (2016)[42]											0						
Okuno T et al. (2017)[43]	Japan	142	119/12	62(37–75)	(UICC 5th) IIB/III/IVa/IVb	NR	NR	NR	NR	NR	1 vs 0 2 vs 0	NR	NR	NR	CRT	OS	SCC	NR
Sugawara K et al. (2018)[44]	Japan	47	32/15	63(47–81)	I/II/III/Iva/IVb	NR	NR	NR	NR	NR	1 vs 0 2 vs 0	NR	NR	26.5(4.4–97.9)	surgery	OS	SCC/ADC	GPS: 16 1 23 7
Vashist YK et al. (2011)[45]	Germany	495	391/104	63.2(34.5–85.2)	T1-4/N-+/M-+	NR	NR	NR	NR	NR	0 vs 1	NR	NR	NR	surgery	OS/CSS	ADC/SCC	GPS: 188 20 161 66
Hirahara N et al. (2015)[46]	Japan	141	97/12	NR	Ia-IIIc	2.5	NR	NR	NR	NR	1-2 vs 0	NR	NR	NR	surgery	OS	NR	GPS: 19 3 33 31
Kitagawa H et al. (2017)[47]	Japan	140	112/28	65(43–85)	I-IV	NR	NR	NR	NR	NR	1-2 vs 0	NR	NR	36.6	mixed	OS/DFS	SCC/ADC /others	NLR: 25 45 21 49
Jomrich G et al. (2017)[48]	Austria	449	225/58	63(31–88)	UICC stage:0-4	NR	NR	NR	NR	NR	1 vs 0 2 vs 0	1 vs 0 2 vs 0	0.95	63(35-95)	surgery	OS/DFS	SCC/ADC	NR
Kimura J et al. (2016)[49]	Japan	142	131/11	65.1(40–82)	III and IV	NR	NR	NR	NR	NR	1 vs 0 2 vs 0	1 vs 0 2 vs 0	NR	NR	CT+RT	PFS/DFS/ CSS	SCC	NR
Chen P et al. (2017)[50]	China	163	134/29	57(31–79)	II/IV	NR	NR	NR	NR	NR	NR	0 vs 1 0 vs 2	NR	NR	radiotherapy	OS	SCC	NR
Otowa Y et al. (2016)[51]	Japan	100	88/12	68(44–82)	II/III	NR	NR	NR	NR	NR	NR	Pre-NAC 0 vs 1/2 Post-NAC 0 vs 1	NR	20.8(4.6–79.5)	surgery	OS	SCC	NR
Tian R et al. (2016)[52]	China	442	331/111	60.0(20.0-88.0)	I/II/III	NR	NR	NR	NR	NR	NR	1-2 vs 0	NR	DFS:35.6(24.3-46.9) OS:57.4(37.8-77.0)	surgery	OS/PFS	SCC	mGPS: 52 30 169 191
Walsh SM et al. (2016)[53]	Ireland	223	187/36	64(30–87)	I/II/III	NR	NR	NR	NR	NR	NR	1-2 vs 0	NR	21	surgery	OS/RFS	ADC	mGPS: 34 15 70 104
Zhang P et al. (2014)[54]	China	212	166/46	60.0(37-81)	I-II/ III/IV	NR	NR	NR	NR	NR	NR	0 vs 1 vs 2	NR	35.0(2-72)	radiotherapy	OS/PFS	SCC	mGPS: 103 19 59 31
Sun P et al. (2013)[55]	China	502	382/120	58.23±9.33	I–IV	NR	NR	NR	50	NR	NR	NR	NR	30	NR	OS	SCC	PNI: 92 47 194 169
Chen S al. (2016)[56]	China	308	268/40	NR	I–III	3.5	150	NR	45	NR	GPS1 vs GPS0, GPS2 vs	NR	NR	NR	Surgery		SCC	PNI: 83 19 129 74 GPS: 105 24 110 69 PLR:: 108 27

											GPS0						107 66
Okadome K et al. (2018)[57]	Japan	337	300/37	65.9	I–IV	NR	NR	NR	45	NR	NR	NR	NR	60	Surgery	OS/CSS	SCC/ADC /Others	PNI: 63 24 62 92
Migita K et al. (2018)[58]	Japan	137	76/16	NR	T1-T4/N0-N+	2.2	NR	NR	47	NR	NR	NR	NR	NR	mixed	OS	SCC	NR
Zhang H et al. (2019)[59]	China	266	172/94	67(48-87)	I–III	3.06	145.26	NR	NR	NR	NR	NR	0.13	NR	curative RT only or concurrent CRT	OS	SCC	NLR: 107 28 68 63 PLR: 100 33 74 59 CAR: 104 10 59 93
Otowa Y et al. (2017)[60]	Japan	149	129/20	66.9±8.3	II/III	NR	NR	NR	NR	NR	NR	NR	0.030	NR	Mixed	OS	SCC	NR
Liu XQ et al. (2019)[61]													0.15		radical radiotherapy	OS		NR
Shao YJ et al. (2015)[62]	China	916 primary:633 validation:283	primary :484/149 validation:211/72	Primary:60(37–83) Validation:61(38–84)	I–III	1.7	120	3.57	NR	NR	0/1/2	0/1/2	0.06/0.12	39(3-146.2)	Surgery	OS	SCC	NR
Liu DQ et al. (2016)[63]	China	260	217/43	59(39–83)	I-IV	NR	NR	NR	NR	NR	0/1/2	NR	NR	40.5 (2–91)	surgery	OS/DFS	SCC	NR
Wang CY et al. (2012)[64]	Taiwan, China	271	261/10	NR	I-IV	NR	NR	NR	NR	NR	0/1,2	NR	NR	30 (5–81)	mixed	OS	SCC/ADC	NR
Feng JF et al. (2014)[65]	China	493	420/73	59.1(34 to 80)	T1-4a/N-+	NR	NR	NR	NR	NR	2/0	NR	NR	45	surgery	NR	SCC	NR
Lindenmann J et al. (2014)[66]	Austria	214	181/33	67 ± 11.84(21–93)	III-IV	NR	NR	NR	NR	NR	0/1/2	NR	NR	NR	CT+RT	NR	SCC/ADC	NR
Matsuda S et al. (2015)[67]	Japan	199	180/19	62.9 ± 8.29	I-IV	NR	NR	NR	NR	NR	0/1/2	NR	NR	28.5	mixed	OS/DFS	SCC/ADC /Others	NR
Liu XM et al. (2017)[68]	China	162	127/35	63 (38–70)	II-III	NR	NR	4.02	NR	NR	NR	NR	NR	23.3 (8–43.7)	mixed	OS/PFS	SCC	LMR: 61 20 43 38
Tian R et al. (2016)[69]	China	260	193/67	59.0 (20.0-87.0)	I-III	NR	NR	NR	NR	NR	NR	0/1,2	NR	46.5	surgery	OS/DFS	SCC	NR
Nakamura M et al. (2014)[70]	Japan	168	135/33	67(47–85)	0-IV	NR	NR	NR	NR	NR	NR	0 vs 2	NR	39(5–99)	mixed	NR	SCC	NR
Han LH et al. (2015)[71]	China	206	165/41	60(32-84)	I-IV/T1-4/N0-3	NR	NR	2.9	45.5	NR	NR	NR	NR	39.5(3-71)	surgery	OS/DFS	SCC	NR
Miyazaki T et al.	Japan	192	173/19	65.8(42-86)	I-IV/T1-4/N0-3/M0-1	3.49	NR	NR	47.7	NR	NR	NR	NR	26.5(1-108)	surgery	OS	NR	PNI: 31 34 39 88

(2016)[72]	

Abbreviations: OS, overall survival; CSS, cancer-specific survival; DFS, disease-free survival; EC, esophageal carcinoma; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; LMR, lymphocyte-to-monocyte ratio; CAR, c-reactive protein-to-albumin ratio; SII, systemic inflammation index; PNI, prognostic nutritional index; GPS, Glasgow Prognostic Score; mGPS, modified Glasgow Prognostic Score; TP, true-positive; FP, false-positive; TN, true-negative; FN, false-negative

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