Supplementary

Table S1 Baseline characteristics of patients for cancer-specific survival in training and test sets

Variables	Total (n=2,279)	Test (n=684)	Train (n=1,595)	Statistic (χ^2)	P
Age				1.30	0.25
<60 years	1,041 (45.68)	300 (43.86)	741 (46.46)		
≥60 years	1,238 (54.32)	384 (56.14)	854 (53.54)		
Sex				0.03	0.87
Female	969 (42.52)	289 (42.25)	680 (42.63)		
Male	1,310 (57.48)	395 (57.75)	915 (57.37)		
Race				0.13	0.72
Other	436 (19.13)	134 (19.59)	302 (18.93)		
White	1,843 (80.87)	550 (80.41)	1,293 (81.07)		
Grade				0.40	0.53
I/II	2,100 (92.15)	634 (92.69)	1,466 (91.91)		
III/IV	179 (7.85)	50 (7.31)	129 (8.09)		
T stage				0.37	0.54
T1	1,094 (48.00)	335 (48.98)	759 (47.59)		
T2	1,185 (52.00)	349 (51.02)	836 (52.41)		
Surgery options				1.30	0.25
Local resection	489 (21.46)	157 (22.95)	332 (20.82)		
Radical resection	1,790 (78.54)	527 (77.05)	1,263 (79.18)		
Radiation				2.79	0.10
No/unknown	1,741 (76.39)	507 (74.12)	1,234 (77.37)		
Yes	538 (23.61)	177 (25.88)	361 (22.63)		
Chemotherapy				2.27	0.13
No/unknown	1,736 (76.17)	507 (74.12)	1,229 (77.05)		
Yes	543 (23.83)	177 (25.88)	366 (22.95)		
CEA				0.58	0.45
Negative	1,827 (80.17)	555 (81.14)	1,272 (79.75)		
Positive	452 (19.83)	129 (18.86)	323 (20.25)		
Tumor size				0.22	0.64
<18 mm	833 (36.55)	255 (37.28)	578 (36.24)		
≥18 mm	1,446 (63.45)	429 (62.72)	1,017 (63.76)		
Treatment sequence				2.22	0.33
Adjuvant therapy	151 (6.63)	48 (7.02)	103 (6.46)		
Neoadjuvant therapy	393 (17.24)	129 (18.86)	264 (16.55)		
Only surgery	1,735 (76.13)	507 (74.12)	1,228 (76.99)		
Histology				3.21	0.07
0	53 (2.33)	10 (1.46)	43 (2.70)		
1	2,226 (97.67)	674 (98.54)	1,552 (97.30)		

Data are presented as n (%). χ^2, Chi-squared test. CEA, carcinoembryonic antigen.

https://dx.doi.org/10.21037/tcr-24-1888

Table S2 Univariate and multivariate Cox analysis for cancer-specific survival of patients in the training set

Characteristics	Univariate analysis		Multivariate analysis	
	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Age (years)		0.003*		0.004*
<60	Ref		Ref	
≥60	1.80 (1.23–2.65)		1.77 (1.20–2.61)	
Sex		0.35		
Female	Ref			
Male	1.19 (0.82–1.73)			
Race		0.74		
Others	Ref			
White	1.08 (0.68–1.74)			
Grade		0.002*		0.02*
I/II	Ref		Ref	
III/IV	2.20 (1.33–3.63)		1.90 (1.13–3.18)	
Histology		0.02*		0.13
Others	Ref		Ref	
Adenocarcinoma	0.40 (0.19–0.86)		0.54 (0.25–1.20)	
T stage		0.22		0.64
T1	Ref		Ref	
T2	1.26 (0.87–1.81)		1.11 (0.73–1.68)	
Surgery options		0.02*		0.04*
Local resection	Ref		Ref	
Radical resection	0.61 (0.41–0.91)		0.61 (0.39–0.97)	
Radiation		<0.001*		0.34
No	Ref			
Yes	1.85 (1.28–2.69)		0.61 (0.22–1.70)	
Chemotherapy		<0.001*		>0.99
No	Ref		Ref	
Yes	2.05 (1.42–2.96)		1.28 (0.53–2.04)	
CEA		0.02*		0.02*
Negative	Ref		Ref	
Positive	1.61 (1.08–2.38)		1.59 (1.07–2.36)	
Perineural invasion		0.40		0.64
No	Ref		Ref	
Yes	1.53 (0.56–4.15)		1.27 (0.46–3.49)	
Tumor size (mm)		0.46		0.68
<18	Ref		Ref	
≥18	1.16 (0.79–1.70)		1.09 (0.72–1.66)	

*, statistically significant. CEA, carcinoembryonic antigen.

https://dx.doi.org/10.21037/tcr-24-1888

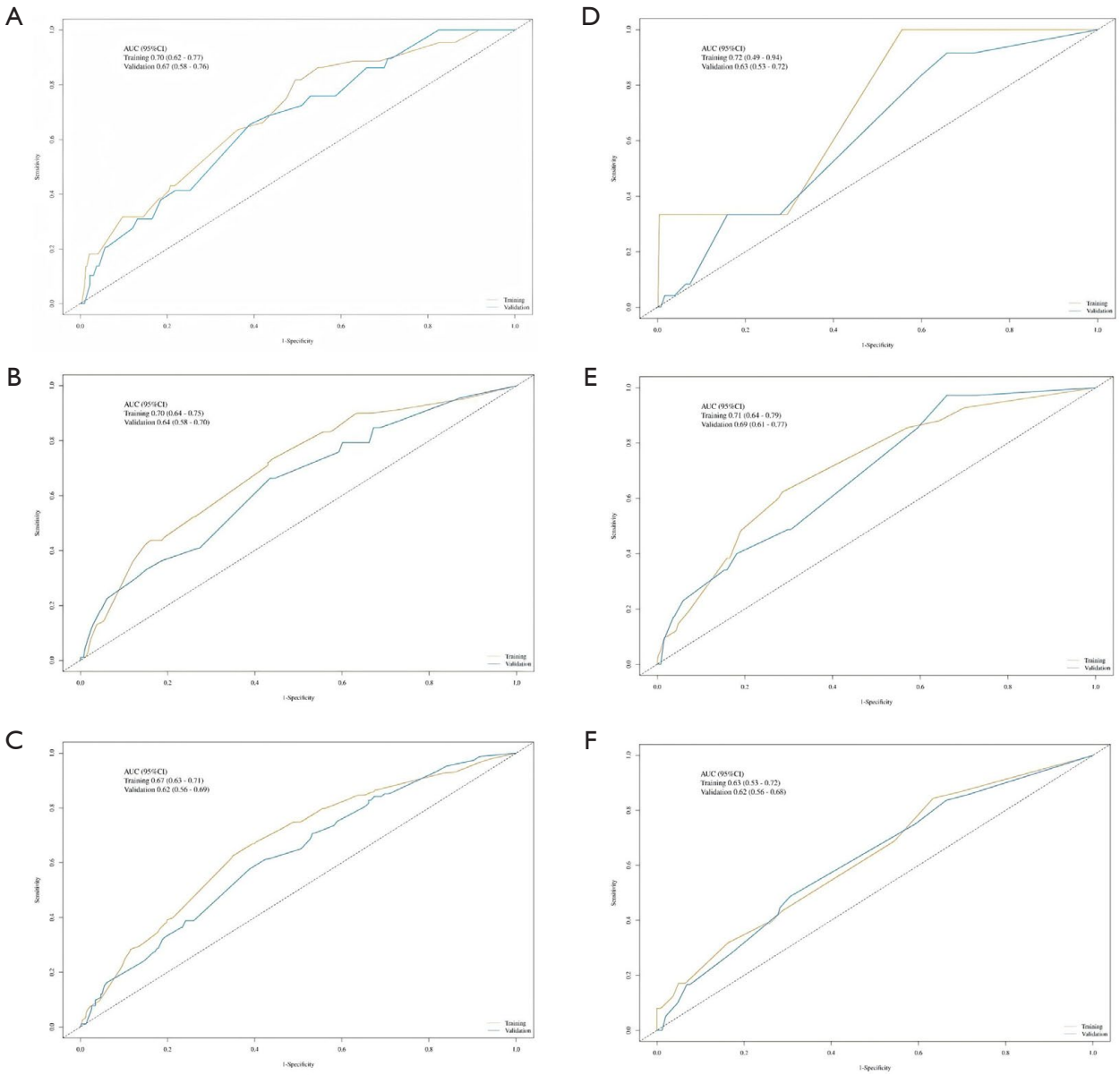

Figure S1 The ROC curves for 1-year (A), 3-year (B), and 5-year (C) OS and 1-year (D), 3-year (E), and 5-year (F) CSS in the training set and validation set. ROC, receiver operating characteristic; OS, overall survival; CSS, cancer-specific survival; CI, confidence interval; AUC, area under the curve.

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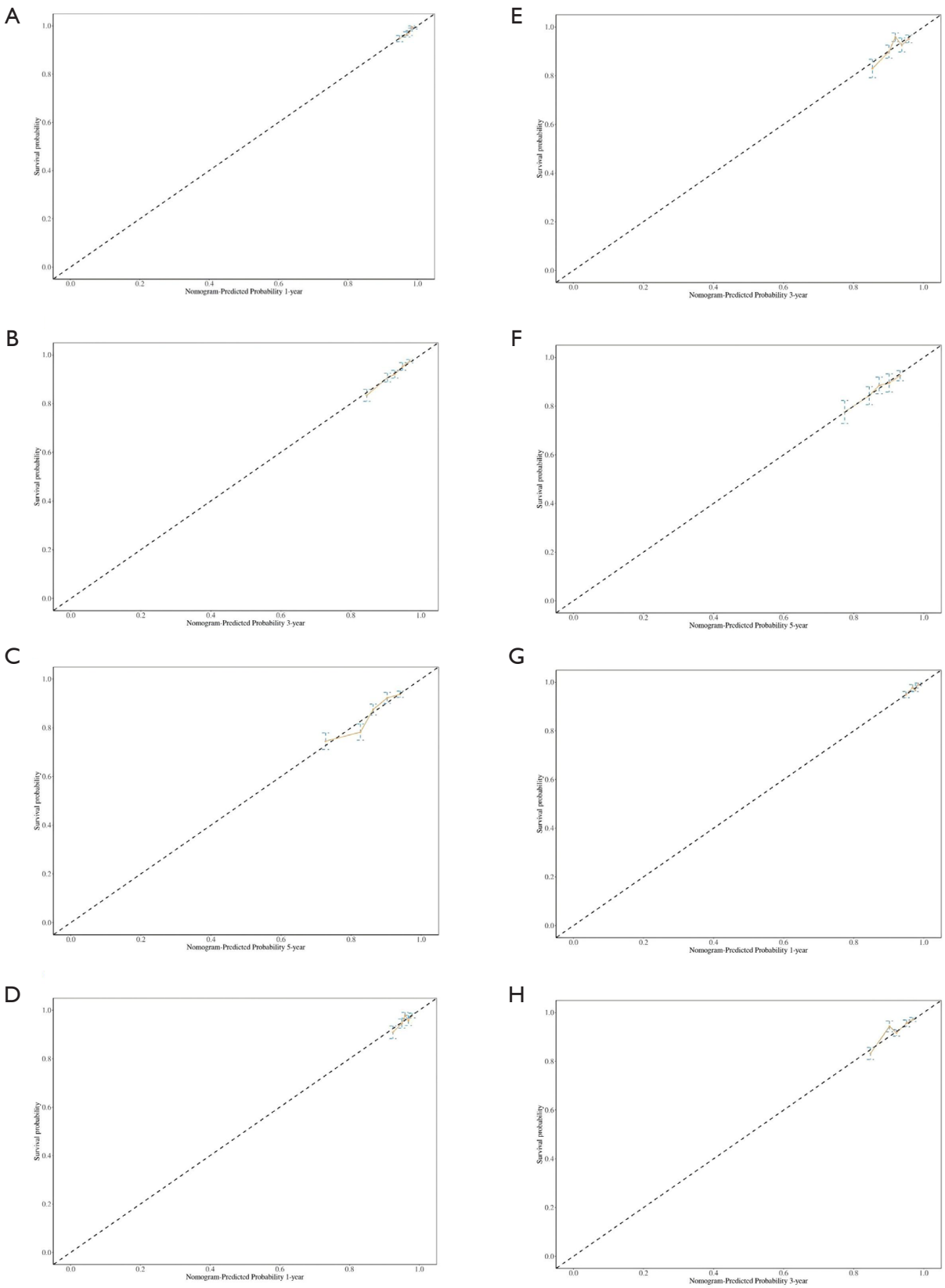

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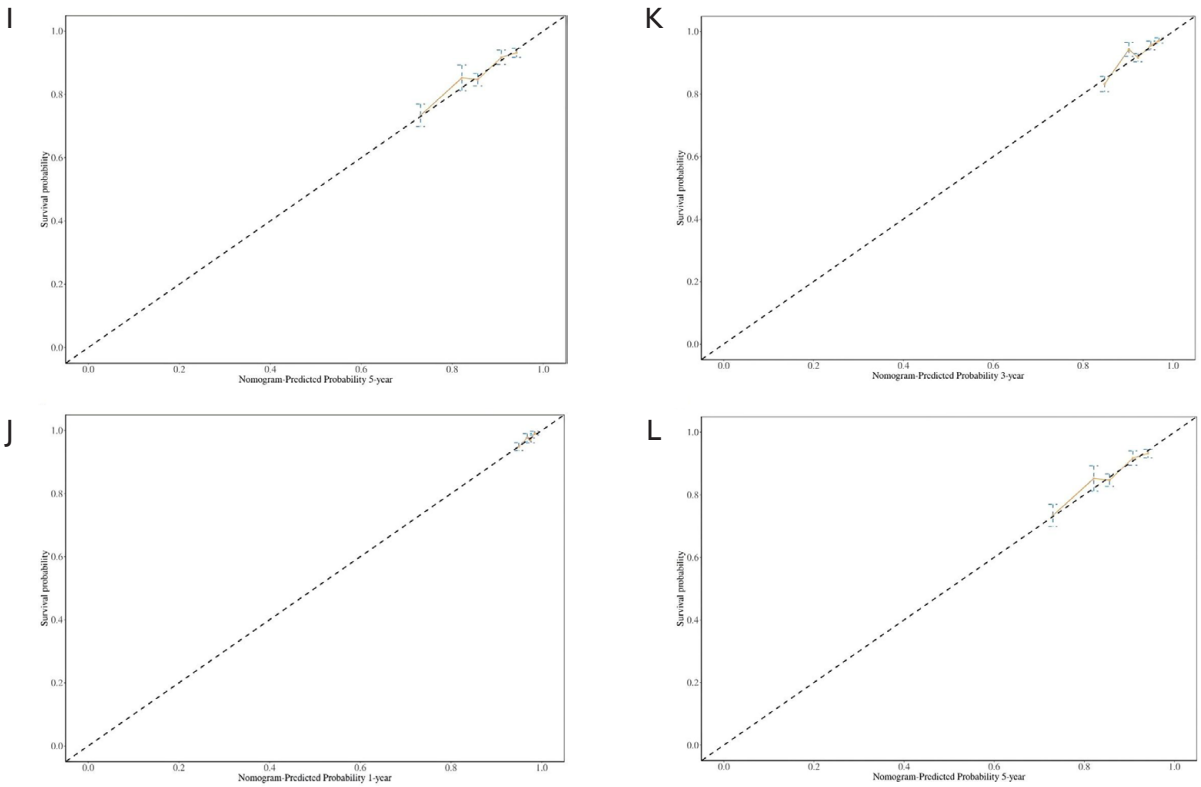

Figure S2 The calibration curves for 1-year (A), 3-year (B), and 5-year (C) OS in the training set and 1-year (D), 3-year (E), and 5-year (F) OS in the validation set and 1-year (G), 3-year (H), and 5-year (I) CSS in the training set and 1-year (J), 3-year (K), and 5-year (L) CSS in the validation set. OS, overall survival; CSS, cancer-specific survival.

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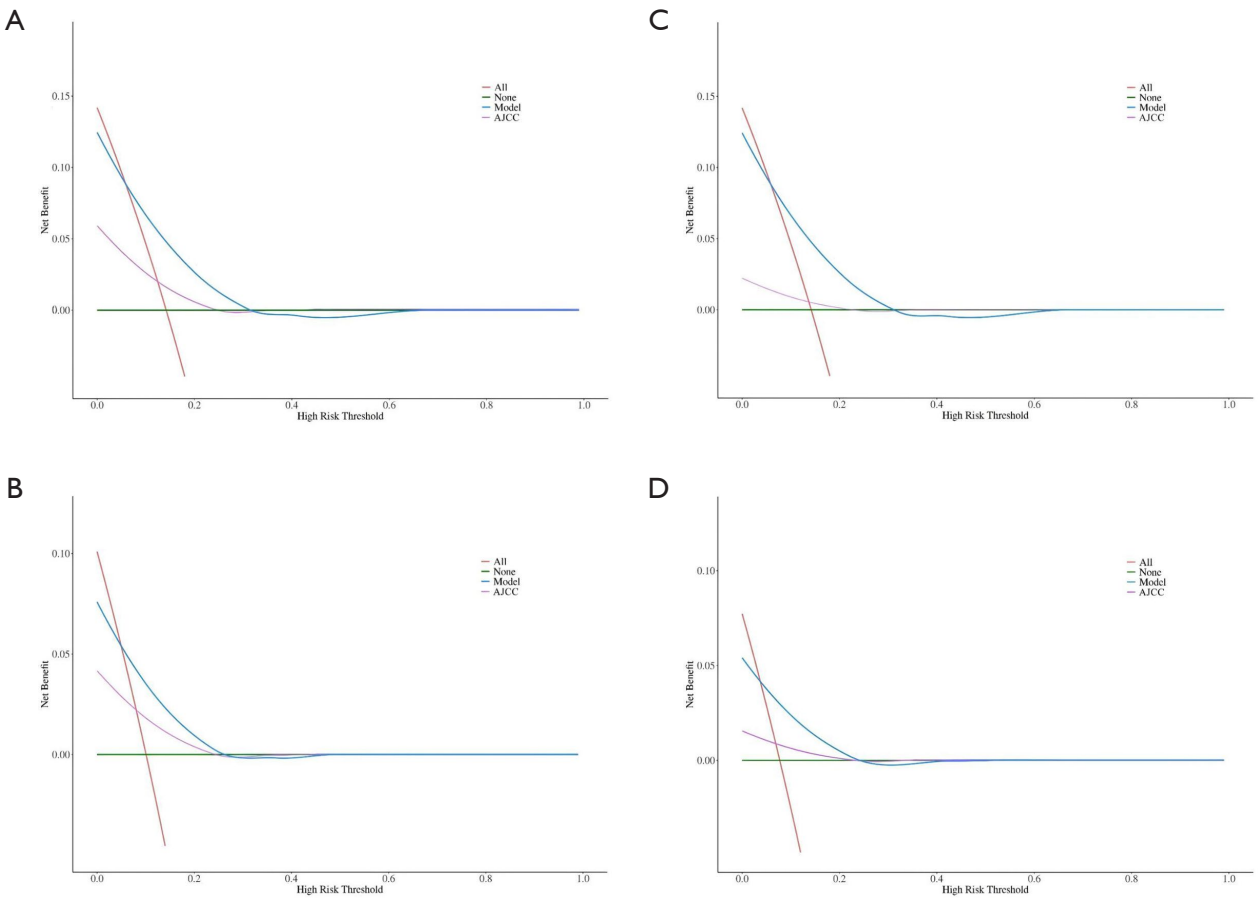

Figure S3 The DCA curves for OS in the training set (A) and validation set (B) and for CSS in the training set (C) and validation set (D). DCA, decision curve analysis; OS, overall survival; CSS, cancer-specific survival; AJCC, American Joint Committee on Cancer.

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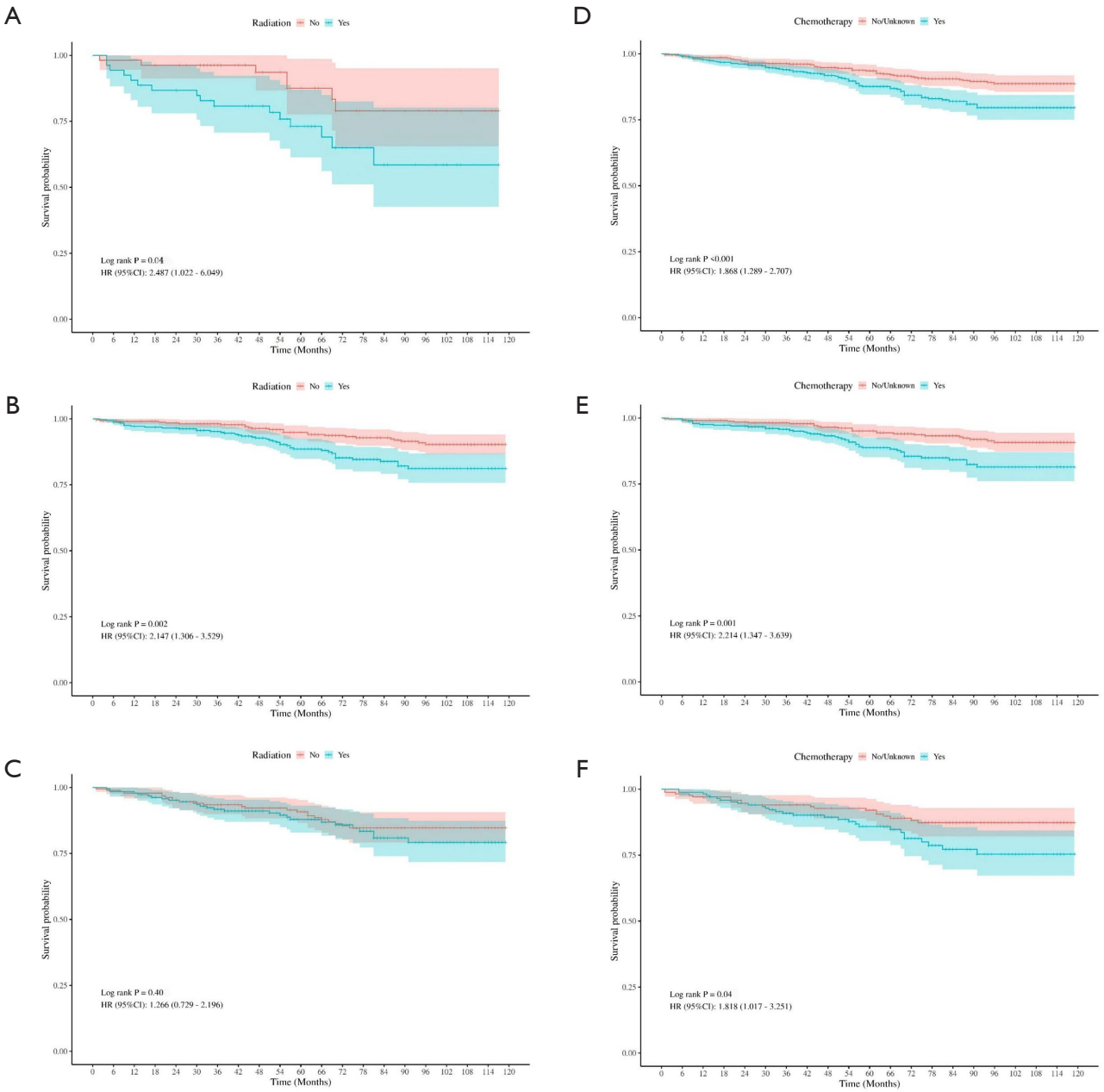

Figure S4 The Kaplan-Meier survival curves of CSS under radiation therapy in all (A), low-risk group (B), high-risk group (C) patients and under chemotherapy in all (D), low-risk group (E), high-risk group (F) patients. CSS, cancer-specific survival; HR, hazard ratio; CI, confidence interval.

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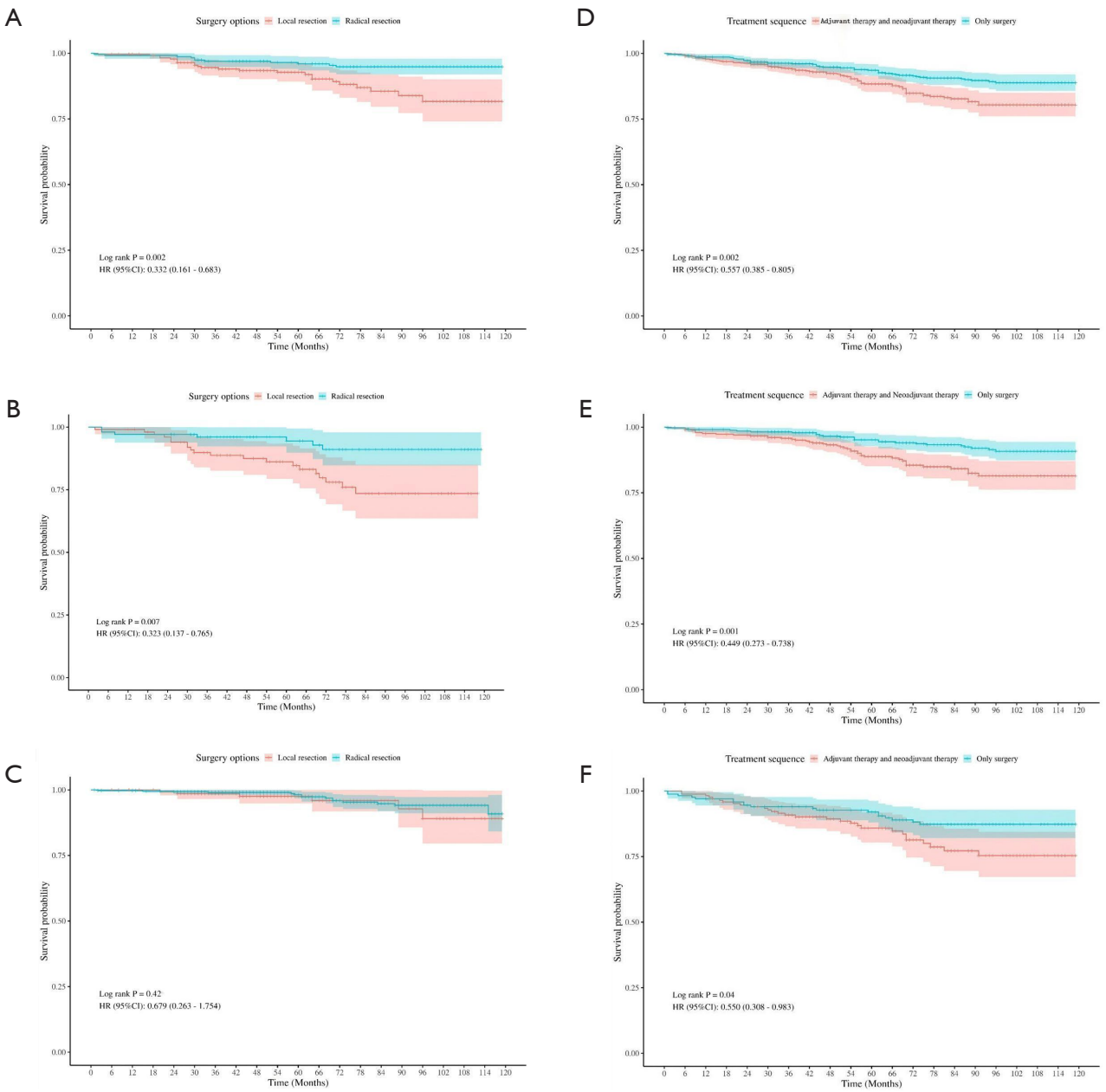

Figure S5 The Kaplan-Meier survival curves of CSS under different surgical options in all (A), low-risk group (B), high-risk group (C) patients and under different treatment options in all (D), low-risk group (E), high-risk group (F) patients. CSS, cancer-specific survival; HR, hazard ratio; CI, confidence interval.

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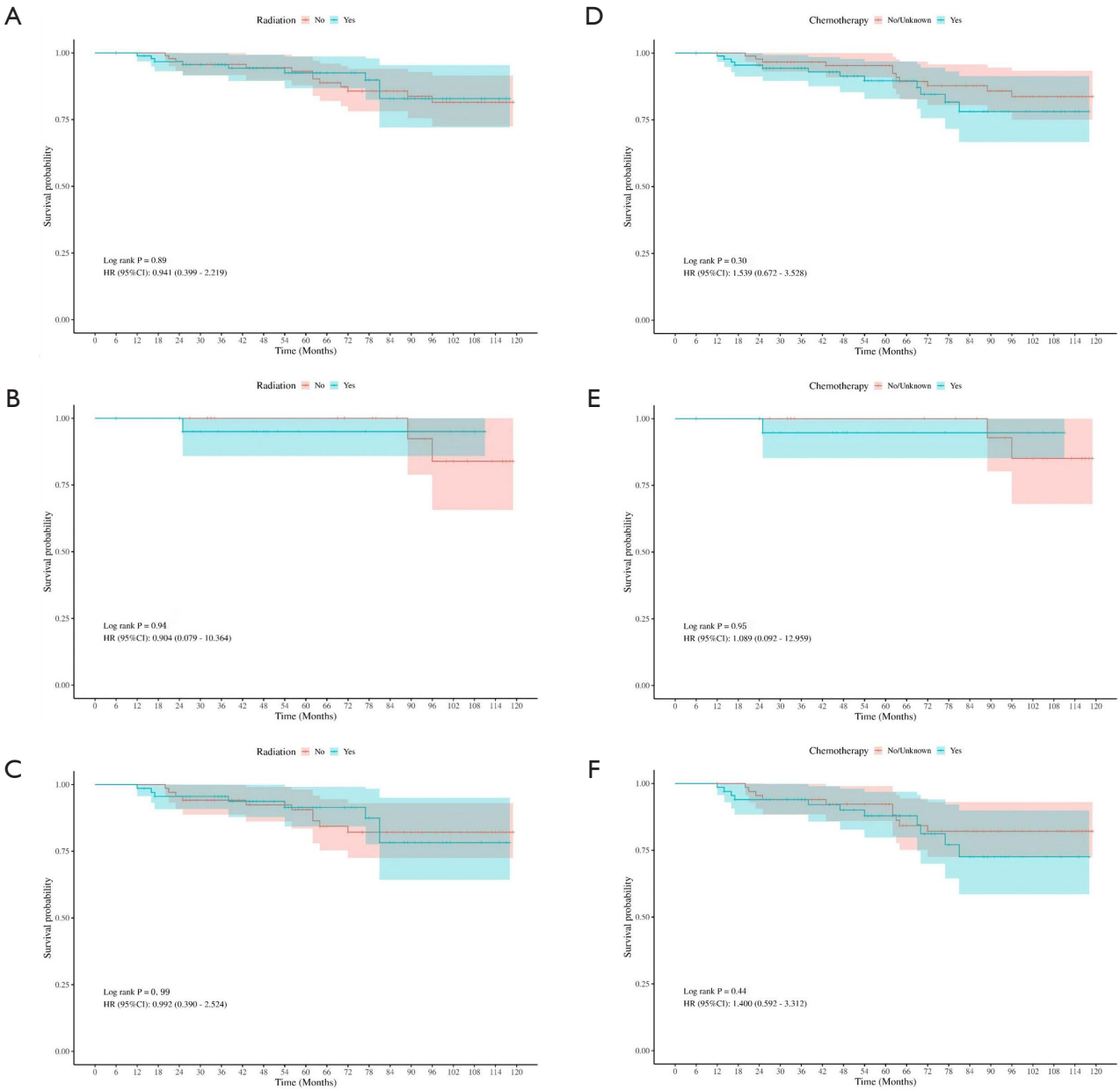

Figure S6 The Kaplan-Meier survival curves of OS under radiation therapy in all (A), low-risk group (B), high-risk group (C) patients and under chemotherapy in all (D), low-risk group (E), high-risk group (F) patients after local resection. OS, overall survival; HR, hazard ratio; CI, confidence interval.

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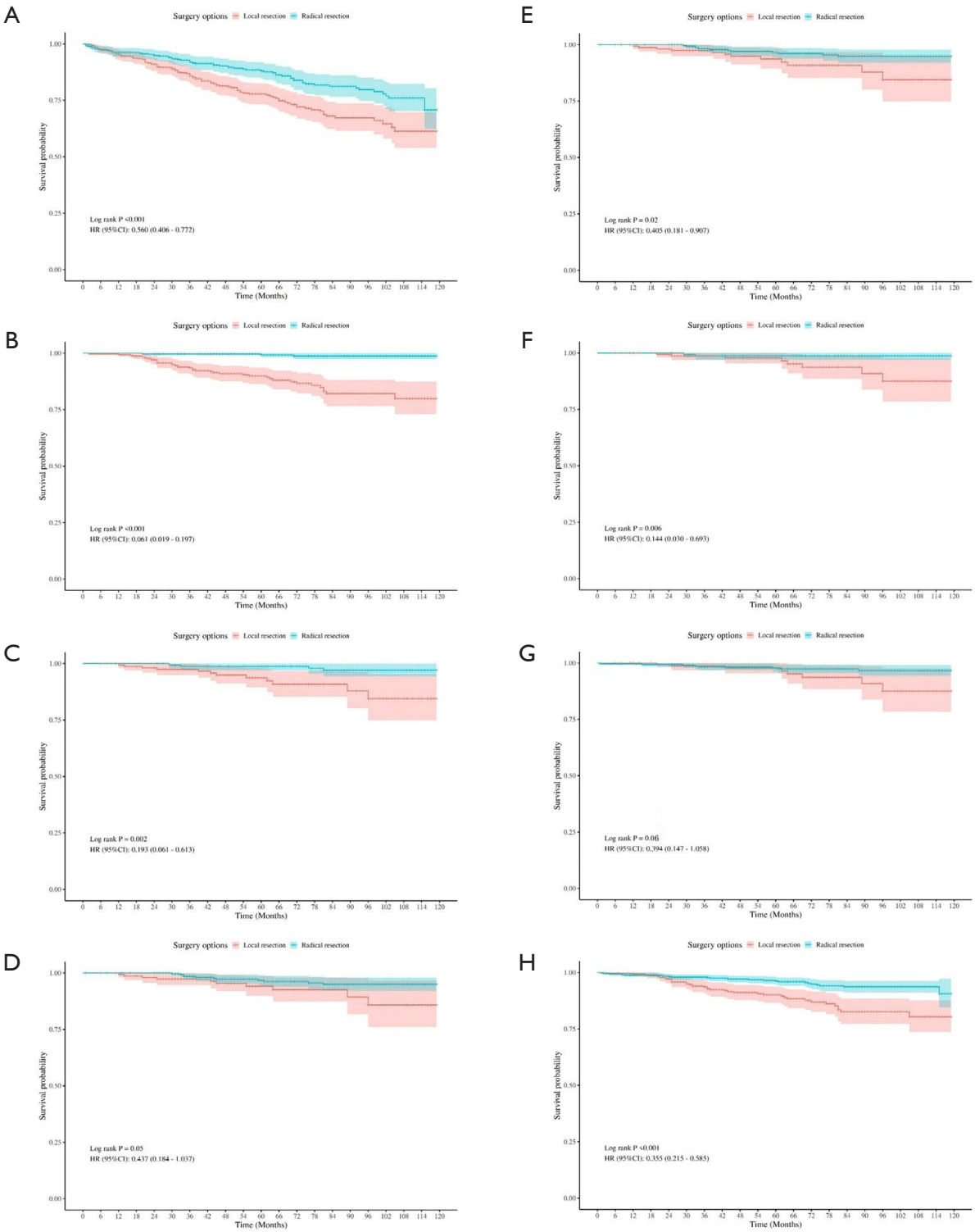

Figure S7 The Kaplan-Meier survival curves of OS and CSS under different surgery options in all, low-risk group, high-risk group for different patients. (A) OS for old patients; (B) CSS for old patients; (C) OS for young patients; (D) OS for young patients in low-risk group; (E) OS for old patients in high-risk group; (F) CSS for young patients; (G) CSS for young patients in low-risk group; (H) CSS for young patients in high-risk group. OS, overall survival; CSS, cancer-specific survival; HR, hazard ratio; CI, confidence interval.

https://dx.doi.org/10.21037/tcr-24-1888