

Supplementary Material 3

Univariate and multivariate Cox regression analysis of overall survival in whole cohort.

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Histopathology										
Adenocarcinoma					1.000 (Reference)					
Squamous cell carcinoma	-0.139	0.237	-0.589	0.556	0.870 (0.547 ~ 1.384)					
Location										
Cervical					1.000 (Reference)					
Upper	0.393	0.754	0.522	0.602	1.482 (0.338 ~ 6.491)					
Middle	0.391	0.730	0.536	0.592	1.479 (0.354 ~ 6.188)					
Lower	0.463	0.719	0.644	0.520	1.589 (0.388 ~ 6.507)					
Liver metastasis										
No					1.000 (Reference)					
Yes	0.355	0.279	1.274	0.203	1.426 (0.826 ~ 2.463)					
Lung metastasis										
No					1.000 (Reference)					
Yes	-0.155	0.373	-0.415	0.678	0.856 (0.412 ~ 1.779)					
Bone metastasis										
No					1.000 (Reference)					
Yes	0.548	0.368	1.489	0.137	1.730 (0.841 ~ 3.559)					
T										
1-2					1.000 (Reference)					1.000 (Reference)
3-4	1.040	0.459	2.267	0.023	2.830 (1.151 ~ 6.956)	1.059	0.459	2.306	0.021	2.883 (1.172 ~ 7.090)
N										
0-1					1.000 (Reference)					

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
2-3	0.340	0.278	1.222	0.222	1.405 (0.814 ~ 2.422)					
M										
0					1.000 (Reference)					
1	0.053	0.215	0.248	0.804	1.055 (0.693 ~ 1.606)					
Clinical stage										
IVA					1.000 (Reference)					
IVB	0.014	0.213	0.067	0.946	1.014 (0.669 ~ 1.539)					
Treatment modality										
Immunotherapy					1.000 (Reference)					
Radioimmunotherapy	-0.076	0.195	-0.391	0.696	0.927 (0.633 ~ 1.357)					
Sex										
Female					1.000 (Reference)					
Male	0.058	0.306	0.190	0.849	1.060 (0.581 ~ 1.933)					
Age	0.002	0.012	0.172	0.863	1.002 (0.979 ~ 1.026)					
Smoking status										
No					1.000 (Reference)					
Yes	-0.000	0.198	-0.001	0.999	1.000 (0.679 ~ 1.473)					
Serum sodium	-0.086	0.033	-2.626	0.009	0.918 (0.861 ~ 0.978)	-0.083	0.032	-2.584	0.010	0.920 (0.864 ~ 0.980)
Serum potassium	-0.371	0.229	-1.623	0.105	0.690 (0.441 ~ 1.080)					
Serum chloride	0.013	0.017	0.758	0.449	1.013 (0.979 ~ 1.049)					
Serum calcium	0.031	0.008	3.918	<.001	1.031 (1.015 ~ 1.047)	0.026	0.008	3.236	0.001	1.026 (1.010 ~ 1.042)
Serum phosphorus	-0.334	0.414	-0.806	0.420	0.716 (0.318 ~ 1.613)					
Serum magnesium	-0.612	0.729	-0.839	0.402	0.542 (0.130 ~ 2.265)					
White blood cells	0.043	0.029	1.479	0.139	1.044 (0.986 ~ 1.106)					

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Neutrophils	0.048	0.029	1.651	0.099	1.049 (0.991 ~ 1.110)					
Lymphocytes	-0.237	0.191	-1.237	0.216	0.789 (0.543 ~ 1.148)					
Platelets	0.002	0.001	1.327	0.184	1.002 (0.999 ~ 1.004)					
Monocytes	0.410	0.462	0.888	0.375	1.507 (0.609 ~ 3.728)					
ALB	-0.058	0.024	-2.391	0.017	0.944 (0.900 ~ 0.990)					
BMI	-0.026	0.031	-0.830	0.406	0.975 (0.917 ~ 1.036)					
NLR	0.031	0.021	1.474	0.140	1.032 (0.990 ~ 1.075)					
SII	0.001	0.000	2.932	0.003	1.001 (1.001 ~ 1.001)	0.001	0.000	2.458	0.014	1.001 (1.001 ~ 1.001)
PLR	0.003	0.001	2.334	0.020	1.003 (1.001 ~ 1.005)					
LMR	-0.023	0.025	-0.947	0.344	0.977 (0.931 ~ 1.025)					
PNI	-0.050	0.019	-2.598	0.009	0.951 (0.916 ~ 0.988)					
KPS	-0.025	0.009	-2.847	0.004	0.976 (0.959 ~ 0.992)					

HR: Hazards Ratio, CI: Confidence Interval

ALB: albumin, BMI: body mass index, NLR: neutrophil-to-lymphocyte ratio, SII: Systemic Immune-Inflammation Index, PLR: platelet-to-lymphocyte ratio, LMR: Lymphocyte-to-Monocyte Ratio, PNI: prognostic nutritional index, KPS: Karnofsky Performance Status.

Univariate and multivariate Cox regression analysis of progression free survival in whole cohort.

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Histopathology										
Adenocarcinoma					1.000 (Reference)					
Squamous cell carcinoma	0.105	0.196	0.537	0.592	1.111 (0.757 ~ 1.631)					
Location										

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Cervical					1.000 (Reference)					
Upper	-0.306	0.503	-0.609	0.543	0.736 (0.275 ~ 1.973)					
Middle	-0.000	0.471	-0.001	0.999	1.000 (0.397 ~ 2.518)					
Lower	0.097	0.461	0.211	0.833	1.102 (0.446 ~ 2.720)					
Liver metastasis										
No					1.000 (Reference)					
Yes	0.357	0.240	1.485	0.138	1.428 (0.892 ~ 2.287)					
Lung metastasis										
No					1.000 (Reference)					
Yes	-0.486	0.329	-1.479	0.139	0.615 (0.323 ~ 1.171)					
Bone metastasis										
No					1.000 (Reference)					
Yes	0.187	0.344	0.543	0.587	1.205 (0.614 ~ 2.365)					
T										
1-2					1.000 (Reference)					
3-4	0.236	0.301	0.786	0.432	1.267 (0.702 ~ 2.284)					
N										
0-1					1.000 (Reference)					
2-3	0.357	0.226	1.582	0.114	1.429 (0.918 ~ 2.225)					
M										

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
0					1.000 (Reference)					
1	0.022	0.174	0.130	0.897	1.023 (0.728 ~ 1.437)					
Clinical stage										
IVA					1.000 (Reference)					
IVB	0.008	0.173	0.046	0.963	1.008 (0.719 ~ 1.414)					
Treatment modality										
Immunotherapy					1.000 (Reference)					1.000 (Reference)
Radioimmunotherapy	0.305	0.159	1.923	0.055	1.357 (0.994 ~ 1.852)	0.371	0.165	2.244	0.025	1.449 (1.048 ~ 2.004)
Sex										
Female					1.000 (Reference)					
Male	0.304	0.250	1.216	0.224	1.355 (0.830 ~ 2.213)					
Age	0.017	0.010	1.726	0.084	0.984 (0.965 ~ 1.002)	0.024	0.010	2.283	0.022	0.977 (0.957 ~ 0.997)
Smoking status										
No					1.000 (Reference)					
Yes	0.119	0.162	0.733	0.464	1.126 (0.819 ~ 1.548)					
Serum sodium	0.055	0.025	2.184	0.029	0.947 (0.901 ~ 0.994)	0.055	0.025	2.229	0.026	0.946 (0.901 ~ 0.993)
Serum potassium	0.179	0.181	0.989	0.323	0.836 (0.587 ~ 1.192)					
Serum chloride	0.005	0.015	0.317	0.751	0.995 (0.967 ~ 1.024)					

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Serum calcium	0.019	0.007	2.557	0.011	1.019 (1.004 ~ 1.034)					
Serum phosphorus	0.150	0.385	0.389	0.697	1.161 (0.547 ~ 2.468)					
Serum magnesium	-0.358	0.495	-0.724	0.469	0.699 (0.265 ~ 1.844)					
White blood cells	0.023	0.029	0.806	0.420	1.024 (0.967 ~ 1.083)					
Neutrophils	0.031	0.028	1.098	0.272	1.032 (0.976 ~ 1.090)					
Lymphocytes	-0.276	0.157	-1.756	0.079	0.759 (0.558 ~ 1.033)					
Platelets	0.000	0.001	0.393	0.694	1.000 (0.998 ~ 1.002)					
Monocytes	0.598	0.381	1.569	0.117	1.818 (0.862 ~ 3.835)					
ALB	-0.028	0.020	-1.415	0.157	0.972 (0.935 ~ 1.011)					
BMI	0.037	0.026	1.441	0.150	1.038 (0.987 ~ 1.091)					
NLR	0.024	0.020	1.201	0.230	1.025 (0.985 ~ 1.066)					
SII	0.001	0.000	2.264	0.024	1.001 (1.001 ~ 1.001)					
PLR	0.002	0.001	1.940	0.052	1.002 (1.000 ~ 1.004)					
LMR	-0.041	0.022	-1.888	0.059	0.960 (0.920 ~ 1.002)					
PNI	-0.034	0.016	-2.111	0.035	0.967 (0.937 ~ 0.998)	-0.048	0.017	-2.834	0.005	0.953 (0.922 ~ 0.985)

Variables	Univariate					Multivariate				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
KPS	-0.013	0.007	-1.782	0.075	0.987 (0.974 ~ 1.001)					

HR: Hazards Ratio, CI: Confidence Interval

ALB: albumin, BMI: body mass index, NLR: neutrophil-to-lymphocyte ratio, SII: Systemic Immune-Inflammation Index, PLR: platelet-to-lymphocyte ratio, LMR: Lymphocyte-to-Monocyte Ratio, PNI: prognostic nutritional index, KPS: Karnofsky Performance Status.