

**Table S1.** Results from multivariate analysis for Overall Survival in the whole cohort.

	Clinical Model					Clinical-Radiomic model					Radiomic model				
	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value
<b>Sex</b>															
Women	31	5	—	—		31	5	—	—						
Men	74	34	2.57	0.95, 6.92	0.062	74	34	1.8	0.65, 5.00	0.262					
<b>Age</b>	105	39	1.03	1.00, 1.07	0.076	105	39	1.03	0.99, 1.07	0.118					
<b>Tumour stage</b>															
I-II-III	18	9	—	—		18	9	—	—						
IVA	73	20	0.39	0.17, 0.94	<b>0.035</b>	73	20	0.28	0.11, 0.69	<b>0.006</b>					
IVB	14	10	1.32	0.46, 3.78	0.61	14	10	1.25	0.42, 3.71	0.693					
<b>HPV Status</b>															
Negative	7	6	—	—		7	6	—	—						
Positive	63	12	0.15	0.05, 0.42	<b>&lt;.001</b>	63	12	0.21	0.07, 0.61	<b>0.004</b>					
<b>Lymphocyte/Monocyte Ratio</b>															
≥2.6	52	12	—	—		52	12	—	—						
<2.6	43	21	2.17	0.98, 4.79	0.056	43	21	1.64	0.71, 3.81	0.246					
<b>Radiomic Score</b>						105	39	9.62	3.27, 28.3	<b>&lt;.001</b>	105	39	15.5	6.00, 39.9	<b>&lt;.001</b>

<sup>1</sup>HR = Hazard Ratio, CI = Confidence Interval

n = 105; N events = 39.

**Table S2.** Results from multivariate analysis for Overall Survival on the HPV positive subgroup.

	Clinical model					Clinical Radiomic model					Radiomic model				
	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value
<b>Age</b>	63	12	1.05	0.99, 1.12	0.102	63	12	1.02	0.95, 1.10	0.502					
<b>Lymphocyte/Monocyte Ratio</b>															
≥2.6	34	2	—	—		34	2	—	—						
<2.6	27	9	5.60	1.12, 27.9	<b>0.036</b>	27	9	3.49	0.61, 19.9	0.160					
<b>Radiomic Score</b>						63	12	4.30	2.02, 9.16	<b>&lt;.001</b>	63	12	5.71	2.80, 11.6	<b>&lt;.001</b>

<sup>1</sup>HR = Hazard Ratio, CI = Confidence Interval

n = 63.0; N events = 12.0.

**Table S3.** Results from multivariate analysis for Locoregional Progression Free Survival in the whole cohort.

	Clinical model					Clinical Radiomic model					Radiomic model				
	N	Event N	HR1	95% CI1	p-value	N	Event N	HR1	95% CI1	p-value	N	Event N	HR1	95% CI1	p-value
Age	105	17	1.06	1.01, 1.12	0.032	105	17	1.05	0.99, 1.11	0.106					
Stage (VII)															
IVA	73	8	—	—		73	8	—	—						
IVB	14	5	4.53	1.47, 14.0	0.009	14	5	3.01	0.87, 10.4	0.081					
I-II-III	18	4	2.15	0.64, 7.19	0.215	18	4	1.54	0.44, 5.47	0.500					
Radiomic_Score						105	17	6.45	2.22, 18.7	0.001	105	17	9.79	3.62, 26.5	<.001

<sup>1</sup>HR = Hazard Ratio, CI = Confidence Interval

n = 105; N events = 17.0.

**Table S4.** Results from multivariate analysis for Locoregional Progression Free Survival in HPV positive subgroup.

	Clinical model					Clinical Radiomic model					Radiomic model				
	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value
Age	61	8	1.07	1.00, 1.15	<b>0.040</b>	61	8	1.12	1.03, 1.21	<b>0.009</b>					
Lymphocytes < 1000	61	8	0.99	0.98, 1.00	0.084	61	8	0.99	0.98, 1.01	0.383					
Hb	61	8	0.64	0.42, 0.97	<b>0.038</b>	61	8	0.86	0.53, 1.39	0.533					
Radiomic_Score						61	8	11.1	1.39, 89.2	<b>0.023</b>	63	8	11.5	2.98, 44.4	<.001

n = 61.0; N events = 8.00; statistic.log = 15.1; p.value.log = 0.002; statistic.sc = 18.5; p.value.sc = 0.000; statistic.wald = 15.0; p.value.wald = 0.002; statistic.robust = NA; p.value.robust = NA; R<sup>2</sup> = 0.219; r.squared.max = 0.616; c-index = 0.900; c-index SE = 0.038; Log-likelihood = -21.7; AIC = 49.3; BIC = 49.6; No. Obs. = 61

<sup>1</sup> HR = Hazard Ratio, CI = Confidence Interval.

**Table S5.** Results from multivariate analysis for Distant Metastasis Free Survival in the whole population.

	Clinical model					Clinical Radiomic model					Radiomic model				
	N	Event N	HR <sup>†</sup>	95% CI <sup>†</sup>	p-value	N	Event N	HR <sup>†</sup>	95% CI <sup>†</sup>	p-value	N	Event N	HR <sup>†</sup>	95% CI <sup>†</sup>	p-value
<b>Hb</b>	95	35	0.72	0.59, 0.87	<b>0.001</b>	95	35	0.75	0.62, 0.90	<b>0.002</b>					
<b>Gender</b>															
Female	29	3	-	-		29	3	-	-						
Male	66	32	6.52	1.97, 21.5	<b>0.002</b>	66	32	4.58	1.34, 15.6	<b>0.015</b>					
<b>Neutr_Lymph</b>	95	35	1.39	1.15, 1.67	<b>0.001</b>	95	35	1.32	1.07, 1.61	<b>0.008</b>					
<b>Radiomic_Score*</b>						95	35	1.82	1.25, 2.66	<b>0.002</b>	105	41	2.34	1.68, 3.27	<b>0.000</b>

n = 95.0; N events = 35.0; statistic.log = 32.4; p.value.log = 0.000; statistic.sc = 31.9; p.value.sc = 0.000; statistic.wald = 27.3; p.value.wald = 0.000; statistic.robust = NA; p.value.robust = NA; R<sup>2</sup> = 0.289; r.squared.max = 0.949; c-index = 0.755; c-index SE = 0.038; Log-likelihood = -125; AIC = 257; BIC = 261; No. Obs. = 95

\*HR by 0.1 increase of Radiomic Score.

**Table S6.** Results from multivariate analysis for Distant Metastasis Free Survival in the HPV positive subgroup.

	Clinical model					Clinical Radiomic model					Radiomic model				
	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value	N	Event N	HR <sup>1</sup>	95% CI <sup>1</sup>	p-value
Lymp_Mono	61	13	0.47	0.24, 0.92	<b>0.029</b>	61	13	0.61	0.26, 1.45	0.262					
Radiomic_Score*						61	13	1.35	1.18, 1.55	<b>0.000</b>	63	14	1.38	1.21, 1.59	<b>0.000</b>

n = 61.0; N events = 13.0; statistic.log = 6.11; p.value.log = 0.013; statistic.sc = 5.00; p.value.sc = 0.025; statistic.wald = 4.78; p.value.wald = 0.029; statistic.robust = NA; p.value.robust = NA; R<sup>2</sup> = 0.095; r.squared.max = 0.794; c-index = 0.697; c-index SE = 0.064; Log-likelihood = -45.1; AIC = 92.1; BIC = 92.7; No. Obs. = 61

\*HR by 0.1 increase of Radiomic Score.