

Table S1 Multicollinearity analysis between group A and group B

CT feature	VIF	Tolerance
CTR	2.205	0.454
Smoking history	2.113	0.473
Gender	2.107	0.475
Solid component distribution	1.873	0.534
Pleural tag	1.548	0.646
Pleural indentation	1.538	0.650
Size	1.513	0.661
CT pattern	1.345	0.744
Spiculation	1.269	0.788
Vacuole	1.183	0.845
Shape	1.149	0.870
Boundary	1.039	0.963

CT, computed tomography; CTR, consolidation-to-tumor ratio; VIF, variance inflation factor.

Table S2 Multicollinearity analysis between well-/moderately and poorly differentiated lesions

CT feature	VIF	Tolerance
Solid component distribution	1.831	0.546
CTR	1.824	0.548
Pleural indentation	1.284	0.779
Spiculation	1.198	0.835
Shape	1.123	0.890
Vacuole	1.102	0.908
Gender	1.067	0.937
Absence of lobulation	1.055	0.948
Boundary	1.027	0.973

CT, computed tomography; CTR, consolidation-to-tumor ratio; VIF, variance inflation factor.

Table S3 Comparison of the clinical characteristics of patients and CT features of well- and moderately differentiated lesions

Characteristic	Univariate analysis			Multivariate analysis		
	Well-differentiated (n=232)	Moderately differentiated (n=1,629)	P value [†]	OR	95% CI	P value
Age (years)	61.7±10.2 [29–84]	60.5±9.6 [21–88]	0.187 [†]			
Gender			0.602 [†]			
Male	87 (37.5)	547 (33.5)				
Female	145 (62.5)	1,082 (66.4)				
Smoking history			0.996 [†]			
Ever	56 (24.1)	1,257 (77.1)				
Never	176 (75.8)	372 (22.8)				
Lung cancer history	3 (1.2)	19 (1.1)	>0.999 [†]			
Other malignant tumor history	7 (3.0)	91 (5.5)	0.600 [†]			
Family malignant tumor history	37 (15.9)	211 (12.9)	0.602 [†]			
TNM stage			0.996 [†]			
T1N0M0	210 (90.5)	1,467 (90.1)				
T1N1M0	0	11 (0.7)				
T1N2M0	1 (0.4)	6 (0.4)				
T2N0M0	21 (9.1)	140 (8.6)				
T2N1M0	0	1 (0.1)				
T2N2M0	0	1 (0.1)				
T3N0M0	0	2 (0.1)				
T4N0M0	0	1 (0.1)				
Size (mm)	17.4±6.5 [5–37]	17.0±7.0 [4–65]	0.320 [†]			
Distribution			0.602 [†]			
Right upper lobe	96 (41.3)	602 (36.9)				
Right middle lobe	12 (5.1)	104 (6.3)				
Right lower lobe	32 (13.7)	282 (17.3)				
Left upper lobe	72 (31.0)	438 (26.8)				
Left lower lobe	20 (8.6)	203 (12.4)				
CT pattern			0.996 [†]			
Pure ground-glass lesion	43 (18.5)	283 (17.3)				
Part-solid lesion	189 (81.4)	1,346 (82.6)				
Solid component distribution			0.187 [†]			
Nonmarginally distributed	204 (87.9)	1,333 (81.8)				
Marginally distributed	28 (12.0)	296 (18.1)				

Table S3 (continued)

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Characteristic	Univariate analysis			Multivariate analysis		
	Well-differentiated (n=232)	Moderately differentiated (n=1,629)	P value [‡]	OR	95% CI	P value
Boundary			0.017 [†]			
Well defined	180 (77.5)	1,397 (85.7)				Reference
Ill defined	52 (22.4)	232 (14.2)		0.590	0.420–0.829	.002
Shape			0.602 [†]			
Round or oval	216 (93.1)	1,479 (90.7)				
Irregular	16 (6.8)	150 (9.2)				
Lobulation	192 (82.7)	1,335 (81.9)	0.996 [†]			
Spiculation	32 (13.7)	258 (15.8)	0.797 [†]			
Vacuole	74 (31.8)	504 (30.9)	0.996 [†]			
Air bronchogram sign	120 (51.7)	833 (51.1)	0.997 [†]			
Pleural indentation	49 (21.1)	340 (20.8)	0.997 [†]			
Pleural tag	68 (29.3)	525 (32.2)	0.791 [†]			
CTR (%)	13.8±14.7 [0–64]	16.7±16.6 [0–89]	0.030 [‡]			

Values are expressed as number (percentage) or mean ± standard deviation [range]. [†], P values corrected by the Benjamini–Hochberg method; [†], chi-squared test; [‡], Mann-Whitney *U* test. CT, computed tomography; OR, odds ratio; CTR, consolidation-to-tumor ratio.

Table S4 Comparison of the clinical characteristics of patients and CT features of lesions between the different pathological grades in group A

Characteristic	Univariate analysis			P value [†]
	Well differentiated (n=45)	Moderately differentiated (n=327)	Poorly differentiated (n=118)	
Age (years)	62.0±11.2 [29–78]	60.3±9.0 [30–88]	59.0±10.6 [23–81]	0.143 [¶]
Gender				0.359 [†]
Male	18 (40.0)	125 (38.2)	54 (45.7)	
Female	27 (60.0)	202 (61.7)	64 (54.2)	
Smoking history				0.887 [†]
Ever	12 (26.6)	95 (29.0)	36 (30.5)	
Never	33 (73.3)	232 (70.9)	82 (69.4)	
Lung cancer history	1 (2.2)	5 (1.5)	0 (0.0)	0.179 [§]
Other malignant tumor history	2 (4.4)	20 (6.1)	5 (4.2)	0.696 [†]
Family malignant tumor history	8 (17.7)	34 (10.3)	21 (17.7)	0.070 [†]
TNM stage				0.009
T1N0M0	210 (90.5)	1467 (90.1)	97 (82.2)	
T1N1M0	0	11 (0.7)	1 (0.8)	
T1N2M0	1 (0.4)	6 (0.4)	3 (2.5)	
T2N0M0	21 (9.1)	140 (8.6)	15 (12.7)	
T2N1M0	0	1 (0.1)	1 (0.8)	
T2N2M0	0	1 (0.1)	1 (0.8)	
T3N0M0	0	2 (0.1)	0	
T4N0M0	0	1 (0.1)	0	
Size (mm)	18.6±6.7 [9–37]	19.1±7.9 [5–65]	17.8±7.2 [5–48]	0.360 [¶]
Distribution				0.398 [§]
Right upper lobe	17 (37.7)	116 (35.4)	40 (33.8)	
Right middle lobe	0 (0.0)	14 (4.2)	6 (5.0)	
Right lower lobe	7 (15.5)	55 (16.8)	24 (20.3)	
Left upper lobe	17 (37.7)	100 (30.5)	29 (24.5)	
Left lower lobe	4 (8.8)	42 (12.8)	19 (16.1)	
CT pattern				0.638 [†]
Pure ground-glass lesion	7 (15.5)	44 (13.4)	20 (16.9)	
Part-solid lesion	38 (84.4)	283 (86.5)	98 (83.0)	
Solid component distribution				0.740 [†]
Nonmarginally distributed	27 (60.0)	178 (54.4)	63 (53.3)	
Marginally distributed	18 (40.0)	149 (45.5)	55 (46.6)	

Table S4 (continued)

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Characteristic	Univariate analysis			P value [†]
	Well differentiated (n=45)	Moderately differentiated (n=327)	Poorly differentiated (n=118)	
Boundary				0.149 [†]
Well defined	27 (60.0)	234 (71.5)	89 (75.4)	
Ill defined	18 (40.0)	93 (28.4)	29 (24.5)	
Shape				0.704 [†]
Round or oval	40 (88.8)	281 (85.9)	99 (83.8)	
Irregular	5 (11.1)	46 (14.0)	19 (16.1)	
Lobulation	38 (84.4)	264 (80.7)	85 (72.0)	0.089 [†]
Spiculation	15 (33.3)	108 (33.0)	46 (38.9)	0.499 [†]
Vacuole	18 (40.0)	122 (37.3)	48 (40.6)	0.790 [†]
Air bronchogram sign	24 (53.3)	172 (52.5)	59 (50.0)	0.875 [†]
Pleural indentation	17 (37.7)	129 (39.4)	39 (33.0)	0.470 [†]
Pleural tag	20 (44.4)	141 (43.1)	41 (34.7)	0.257 [†]
CTR (%)	23.7±20.0 [0–64]	26.4±21.9 [0–89]	29.2±23.5 [0–84]	0.437 [¶]

Values are expressed as number (percentage) or mean ± standard deviation [range]. [†], P values corrected by the Benjamini-Hochberg method; [†], chi-squared test; [‡], Mann-Whitney *U* test. CT, computed tomography; OR, odds ratio; CTR, consolidation-to-tumor ratio.

Table S5 Interobserver agreement of CT features

CT feature	Metric	95% CI
CTR (%)	0.966 [†]	0.935–0.979
Size (mm)	0.964 [†]	0.961–0.968
Solid component distribution	0.964 [‡]	0.948–0.978
CT pattern	0.954 [‡]	0.937–0.971
Pleural tag	0.925 [‡]	0.907–0.942
Vacuole	0.918 [‡]	0.898–0.936
Boundary	0.911 [‡]	0.885–0.935
Pleural indentation	0.902 [‡]	0.878–0.925
Spiculation	0.890 [‡]	0.860–0.916
Air Bronchogram sign	0.883 [‡]	0.861–0.903
Lobulation	0.854 [‡]	0.824–0.883
Shape	0.819 [‡]	0.773–0.864

Metric represents intraclass correlation coefficient for continuous variables and kappa coefficient for categorical variables. [†], intraclass correlation coefficient; [‡], kappa coefficient. CT, computed tomography; CTR, consolidation-to-tumor ratio.

Table S6 Comparison of CT features between lesions with and without LNM

Characteristic	Univariate analysis			Multivariate analysis		
	LNM (-) (n=1,953)	LNM (+) (n=26)	P value ^{**}	OR	95% CI	P value
Size (mm)	17.0±6.9 [4–65]	23.2±8.1 [18–48]	<0.001 [‡]	1.055	1.003–1.111	0.039
Distribution			0.726 [†]			
Right upper lobe	730 (37.4)	8 (30.8)				
Right middle lobe	121 (6.2)	6 (23.1)				
Right lower lobe	332 (17.0)	1 (3.8)				
Left upper lobe	530 (27.1)	9 (34.6)				
Left lower lobe	240 (12.3)	2 (7.7)				
CT pattern			0.586 [†]			
Pure ground-glass lesion	343 (17.6)	3 (11.5)				
Part-solid lesion	1,610 (82.4)	33 (88.5)				
Solid component distribution			<0.001 [†]			
Nonmarginally distributed	1,589 (81.4)	11 (42.3)				
Marginally distributed	364 (18.6)	15 (57.7)				
Boundary			0.726 [†]			
Well defined	1,645 (84.2)	21 (80.8)				
Ill defined	308 (15.8)	5 (19.2)				
Shape			0.150 [†]			
Round or oval	1,773 (90.8)	21 (80.8)				
Irregular	180 (9.2)	5 (19.2)				
Lobulation	1590 (81.4)	22 (84.6)	0.726 [†]			
Spiculation	325 (16.6)	11 (42.3)	<0.001 [†]			
Vacuole	616 (31.5)	10 (38.5)	0.586 [†]			
Air bronchogram sign	995 (50.9)	17 (65.4)	0.232 [†]			
Pleural indentation	411 (21.0)	17 (65.4)	<0.001 [†]	3.535	1.239–10.091	0.018
Pleural tag	619 (31.7)	15 (57.7)	0.011 [†]			
CTR (%)	16.9±16.9 [0–89]	35.0±24.4 [0–73]	<0.001 [‡]	1.025	1.001–1.050	0.045

Values are expressed as number (percentage) or mean ± standard deviation [range]. **, Given the large disparity in the ratio of patients with LNM (+) to those with LNM (-), different weights were assigned to the two groups to mitigate the statistical bias arising from severe sample size imbalance. Furthermore, to control for false-positive events, the weight for each group was defined as the square root of (the total sample size divided by the sample size of the respective group); †, chi-square test; ‡, Mann-Whitney *U* test. LNM (-), the absence of lymph node metastasis in the lesion; LNM (+), the presence of lymph node metastasis of the lesion; CT, computed tomography; OR, odds ratio; CTR, consolidation-to-tumor ratio.