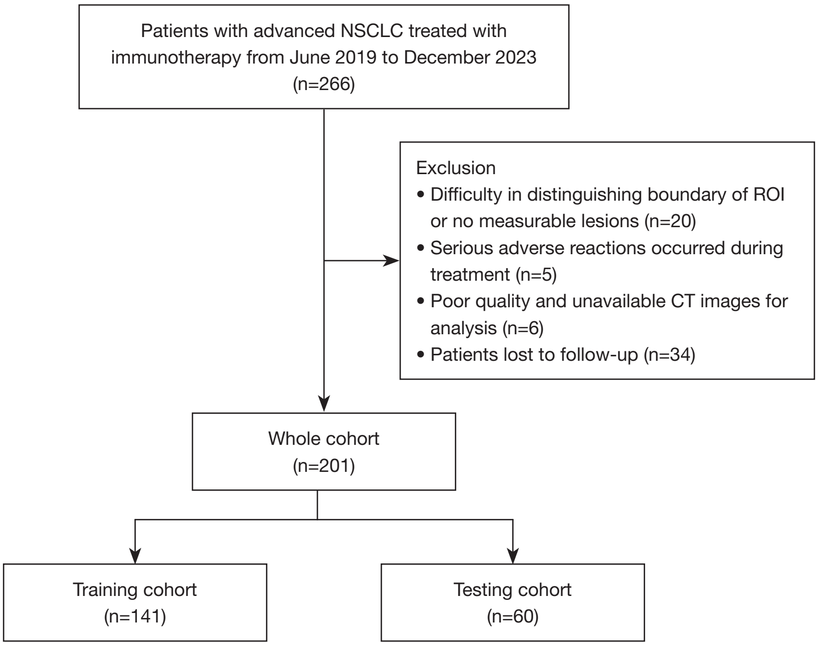

Figure S1 Flowchart of the patient selection process. NSCLC, non-small cell lung cancer; ROI, regions of interest; CT, computed tomography.

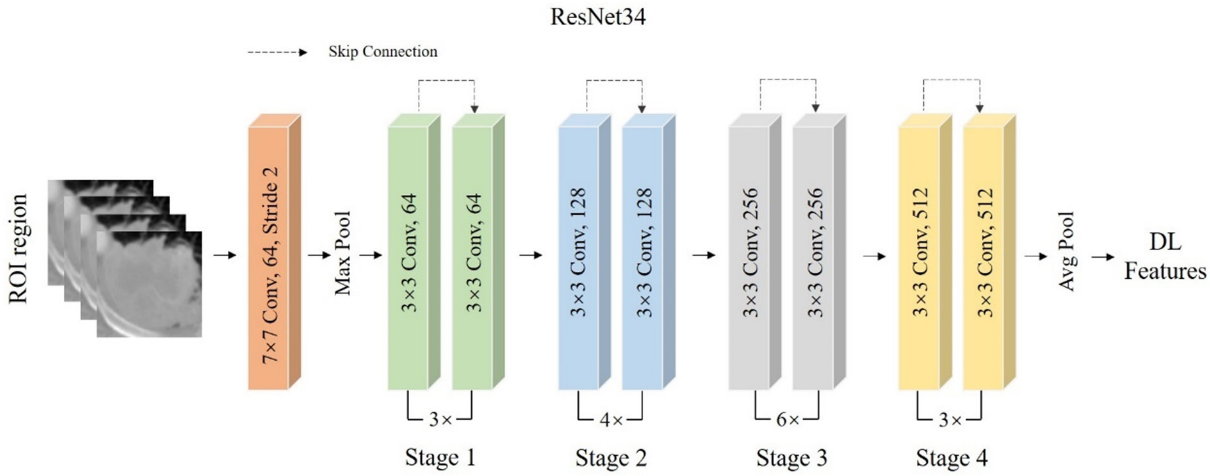

Figure S2 The flowchart of deep learning feature extraction using the ResNet34 Network. ROI, regions of interest; DL, deep learning.

Table S1 Distribution and comparison of related variables between train cohort and test cohort

Characteristics	Train cohort (N=141)	Test cohort (N=60)	P value
Age, years	62.6±9.07	63.6±8.49	0.46
Weight, kg	60.0 (55.0–66.0)	58.0 (50.0–66.0)	0.10
Height, m	1.65 (1.60–1.70)	1.65 (1.60–1.70)	0.55
BMI, kg/m^2	22.2 (20.1–24.2)	21.3 (19.5–23.6)	0.13
Sex			0.44
Female	32 (22.7)	10 (16.7)	
Male	109 (77.3)	50 (83.3)	
Treatment lines			0.13
1	108 (76.6)	48 (80.0)	
2	19 (13.5)	5 (8.33)	
3	9 (6.38)	1 (1.67)	
4	5 (3.55)	6 (10.0)	
Combined chemotherapy			0.89
No	23 (16.3)	11 (18.3)	
Yes	118 (83.7)	49 (81.7)	
Initial efficacy			0.54
Stable	89 (63.1)	38 (63.3)	
Complete or partial response	36 (25.5)	18 (30.0)	
Progressive	16 (11.3)	4 (6.67)	
Intrapulmonary metastases			0.33
No	103 (73.0)	39 (65.0)	
Yes	38 (27.0)	21 (35.0)	
Pleural metastases			0.75
No	118 (83.7)	52 (86.7)	
Yes	23 (16.3)	8 (13.3)	
Brain metastases			0.93
No	108 (76.6)	47 (78.3)	
Yes	33 (23.4)	13 (21.7)	
Bone metastases			0.21
No	99 (70.2)	48 (80.0)	
Yes	42 (29.8)	12 (20.0)	
Adrenal metastase			0.91
No	122 (86.5)	53 (88.3)	
Yes	19 (13.5)	7 (11.7)	

Table S1 (*continued*)

Table S1 (*continued*)

Characteristics	Train cohort (N=141)	Test cohort (N=60)	P value
Hepatic metastases			0.75
No	128 (90.8)	56 (93.3)	
Yes	13 (9.22)	4 (6.67)	
Other metastases			0.80
No	121 (85.8)	53 (88.3)	
Yes	20 (14.2)	7 (11.7)	
Smoking history			0.66
No	46 (32.6)	17 (28.3)	
Yes	95 (67.4)	43 (71.7)	
COPD			0.10
No	105 (74.5)	37 (61.7)	
Yes	36 (25.5)	23 (38.3)	
Hypertension			0.60
No	94 (66.7)	43 (71.7)	
Yes	47 (33.3)	17 (28.3)	
Diabetes			0.84
No	119 (84.4)	52 (86.7)	
Yes	22 (15.6)	8 (13.3)	
Other malignancies history			0.54
No	133 (94.3)	55 (91.7)	
Yes	8 (5.67)	5 (8.33)	
Tumor classification			0.76
Adenocarcinoma	78 (55.3)	31 (51.7)	
Squamous cell carcinoma	51 (36.2)	25 (41.7)	
Large cell carcinoma	3 (2.13)	0 (0.00)	
Others	9 (6.38)	4 (6.67)	
Tumor differentiation			0.75
High differentiation	3 (2.13)	2 (3.33)	
Medium differentiation	68 (48.2)	32 (53.3)	
Low differentiation	68 (48.2)	25 (41.7)	
Undifferentiated	2 (1.42)	1 (1.67)	
T stage			0.22
1	18 (12.8)	3 (5.00)	
2	33 (23.4)	11 (18.3)	
3	19 (13.5)	12 (20.0)	
4	71 (50.4)	34 (56.7)	

Table S1 (*continued*)

Table S1 (*continued*)

Characteristics	Train cohort (N=141)	Test cohort (N=60)	P value
N stage			0.51
1	11 (8.80)	8 (14.5)	
2	40 (32.0)	16 (29.1)	
3	74 (59.2)	31 (56.4)	
M stage			>0.99
0	43 (30.5)	19 (31.7)	
1	98 (69.5)	41 (68.3)	
Tumor staging			0.90
Stage III	44 (31.2)	20 (33.3)	
Stage IV	97 (68.8)	40 (66.7)	
PD-L1 level			0.16
Negative (<1%)	22 (15.6)	7 (11.7)	
Low expression (1–49%)	59 (41.8)	34 (56.7)	
High expression (≥50%)	60 (42.6)	19 (31.7)	
Ki-67 level			0.99
Low expression (<25%)	17 (12.1)	8 (13.3)	
High expression (≥25%)	124 (87.9)	52 (86.7)	
ALK			0.51
Yes	9 (6.38)	2 (3.33)	
No	132 (93.6)	58 (96.7)	
Neutrophil count, ×10^9/L	4.64 (3.21–6.49)	5.20 (3.98–6.22)	0.30
Lymphocyte count, ×10^9/L	1.50 (1.10–1.99)	1.41 (1.21–1.68)	0.52
Monocyte count, ×10^9/L	0.70 (0.52–0.88)	0.73 (0.54–0.89)	0.38
Platelet count, ×10^9/L	276 (213–362)	261 (226–353)	0.77
NLR	3.24 (2.18–5.01)	3.71 (2.57–5.25)	0.15
PLR	186 (127–281)	200 (148–282)	0.34
LMR	2.13 (1.48–3.20)	1.83 (1.36–2.60)	0.10
Hemoglobin, g/L	120±18.2	119±22.9	0.92
Serum albumin, g/L	36.6 (33.4–39.6)	36.2 (31.1–39.4)	0.27

Data are presented as mean ± SD, or n (%). IQR, interquartile range; BMI, body mass index; COPD, chronic obstructive pulmonary disease; T, tumor; N, node; M, metastasis; ALK, anaplastic lymphoma kinase; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; LMR, lymphocyte-to-monocyte ratio; SD, standard deviation.

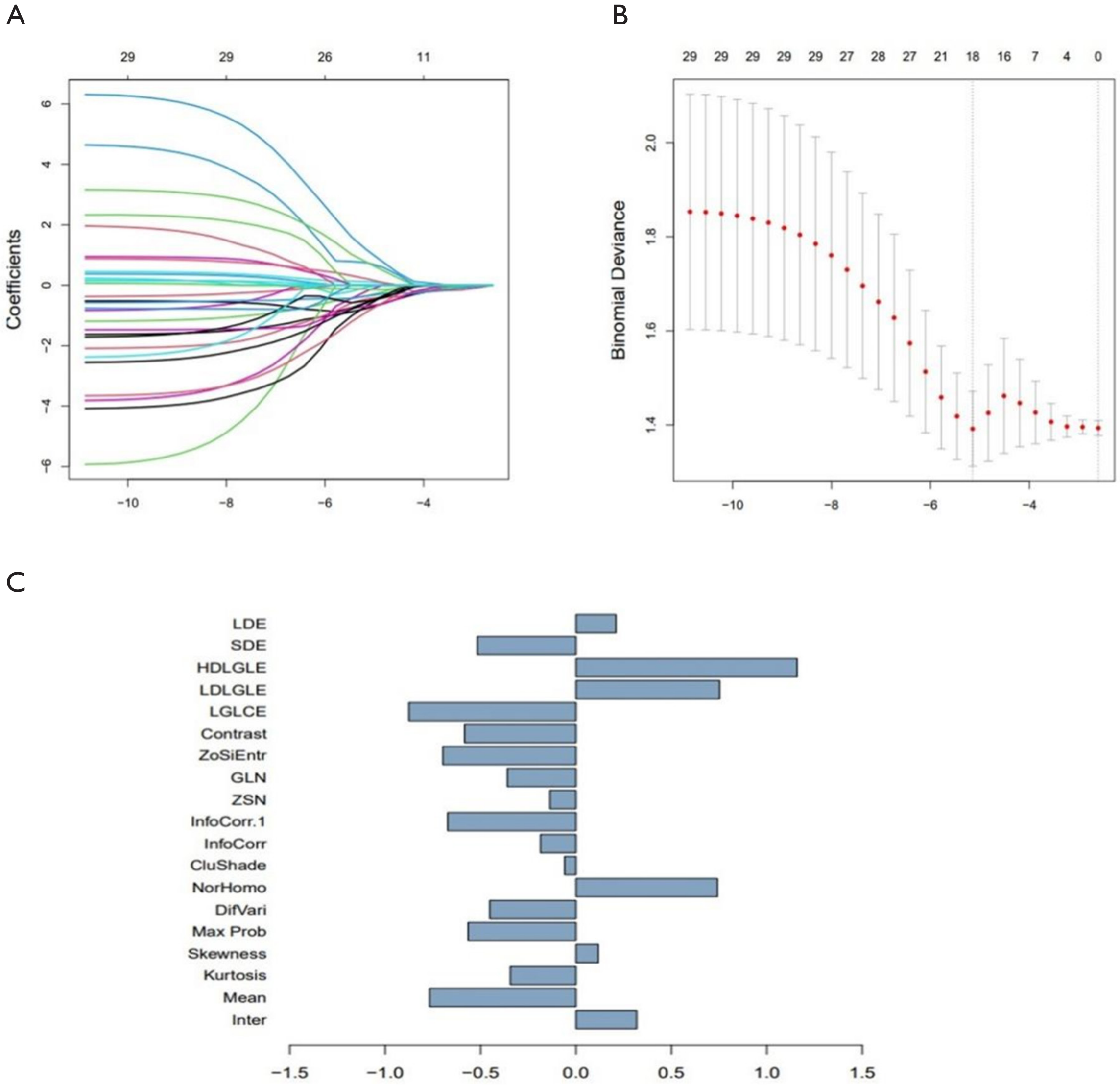

Figure S3 The feature selection of radiomics. (A) The LASSO path map with different parameter λ selections. (B) The coefficient profile plot with different parameter λ selections. (C) The radiomics features with non-zero coefficients. LASSO, least absolute shrinkage and selection operator.

Table S2 Names and meaning of radiomics features with non-zero coefficients

Features	Meaning
Mean	This feature represents the mean value of the pixel intensity histogram within an image or region of interest
Kurtosis	This feature represents the kurtosis of the pixel intensity histogram
Skewness	This feature measures the asymmetry of the gradient (rate of change) in pixel intensity values within an image or region of interest
Max Prob	This feature is derived from the GLCM and represents the maximum probability of co-occurrence of specific gray level pairs in the image
Difference variance	This feature measures the variance of differences in pixel intensities between neighboring pixels, derived from the GLCM
Normalized homogeneity	This feature, derived from the GLCM, measures the similarity of gray levels in neighboring pixels. It is normalized to account for the total number of gray levels
Cluster shade	This GLCM-derived feature quantifies the skewness of the pixel clusters in the image. It measures the asymmetry of the distribution of pixel intensities around the mean, with higher values indicating more asymmetry and potential complexity in the texture, which can be related to structural irregularities
First measure of information correlation	This measure quantifies the degree of linear dependence between the probability distributions of the pixel intensities in a GLCM. It compares the joint entropy (the combined uncertainty) of the GLCM with the entropies of the individual row and column marginal distributions
First measure of information correlation.1	This measure is an alternative way to quantify the correlation between the probability distributions of pixel intensities in the GLCM. It compares the joint entropy of the GLCM with the entropy of the product of the marginal distributions
ZSN	The Zone Size Non-uniformity (ZSN) feature, derived from the GLSZM, measures the variability in the size of zones with the same gray level
GLN	Gray Level Non-uniformity (GLN) measures the variability in gray level values within an image, based on GLSZM
Zone-size entropy	This feature measures the randomness or disorder of the zone sizes within an image, derived from GLSZM
Contrast	Derived from the NGTDM, this feature quantifies the contrast or difference in gray levels between neighboring pixels
LGLCE	Low Gray Level Count Emphasis (LGLCE) is a feature derived from the NGLDM that emphasizes the occurrence of low gray level values in the image
LDLGLE	Low Difference Low Gray Level Emphasis (LDLGLE) measures the joint occurrence of low difference values and low gray levels, derived from NGLDM
HDLGLE	High Difference Low Gray Level Emphasis (HDLGLE) is another NGLDM-derived feature that measures the joint occurrence of high difference values and low gray levels
SDE	Short Distance Emphasis (SDE), derived from the GLDZM, measures the occurrence of short distance zones in the image
LDE	Long Distance Emphasis (LDE) measures the occurrence of long-distance zones in the image, also derived from GLDZM

Table S3 Brier score for calibration performance across different predictive models in the train and test cohorts

Group	Model	Brier score
Train cohort	Radiomics	0.188
	ResNet34	0.204
	Clinical	0.171
	Clinical + radiomics	0.169
	Clinical + radiomics + ResNet34	0.163
Test cohort	Radiomics	0.224
	ResNet34	0.218
	Clinical	0.176
	Clinical + radiomics	0.176
	Clinical + radiomics + ResNet34	0.173

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