

Supplementary Table 1 Demographic, clinical data and BOA measurements' features and their types used in this study

Demographic & clinical	BOA			
	Each feature contains pre-treatment (pre) or follow-up (f/u) version			
	Tissue quantification (cm ²)	Tissue index (cm ² /height ²)	Ratio	Difference (([f/u]-[pre])/[pre])
gender	muscle	SMI	SATSMR (SATI/SMI)	delta_muscle
age	SAT	SATI	VATSMR (VATI/SMI)	delta_SAT
height	VAT	VATI	TATSMR (TATI/SMI)	delta_VAT
weight	TAT	TATI		delta_TAT
BMI	sarco			delta_SMI
clinicl_T				
clinicl_N				
clinicl_M				
ECOG				
surgery				

BMI: body mass index; ECOG: Eastern Cooperative Oncology Group; SAT: subcutaneous adipose tissue; VAT: visceral adipose tissue; TAT: total adipose tissue; sarco: sarcopenia; SMI: muscle index; SATI: SAT index; VATI: VAT index; TATI: TAT index;

Supplementary Table 2 Radiomics features and their types used in this study

Radiomics							
Each feature contains pre-treatment (pre) or follow-up (f/u) version							Difference
shape	First order	glcm	gldm	glrlm	glszm	ngtdm	at shape features (((f/u)-[pre])/[pre])
Elongation	10 th Percentile	Cluster Tendency	Dependence Entropy	Gray-Level Non-Uniformity	Gray-Level Non-Uniformity	Busyness	delta Elongation
Flatness	90 th Percentile	Contrast	Dependence Non-Uniformity	Gray-Level Non-Uniformity	Gray-Level Non-Uniformity	Coarseness	delta Flatness
Least Axis Length	Energy	Correlation	Dependence Non-Uniformity Normalized	Gray-Level Variance	Gray-Level Variance	Complexity	delta Least Axis Length
Major Axis Length	Entropy	Difference Average	Dependence Variance	High Gray-Level Run Emphasis	High Gray-Level Zone Emphasis	Contrast	delta Major Axis Length
Maximum 2D	Interquartile Range	Difference Entropy	Gray-Level Non-	Long Run	Large Area	Strength	delta Maximum

Diameter Column			Uniformity	Emphasi s	Emphasi s		2D Diameter Column delta Maximum 2D Diameter Row
Maximum 2D Diameter Row	Kurtosis	Difference Variance	Gray-Level Variance	Long Run High Gray- Level Emphasi s	Large Area High Gray- Level Emphasi s	Coarsene ss	
Maximum 2D Diameter Slice	Maximu m	Id (Inverse Difference)	High Gray- Level Emphasis	Long Run Low Gray- Level Emphasi s	Large Area Low Gray- Level Emphasi s	Complexi ty	delta Maximum 2D Diameter Slice
Maximum 3D Diameter	Mean Absolute Deviation	Idm (Inverse Difference Moment)	Large Dependenc e Emphasis	Low Gray- Level Run Emphasi s	Low Gray- Level Zone Emphasi s	Contrast	delta Maximum 3D Diameter
Mesh Volume	Mean	Idmn (Inverse Difference Moment Normaliz ed)	Large Dependenc e High Gray-Level Emphasis	Run Entropy	Size Zone Non- Uniformi ty	Strength	delta Mesh Volume
Minor Axis Length	Median	Idn (Inverse Difference Normaliz ed)	Large Dependenc e Low Gray-Level Emphasis	Run Length Non- Uniformi ty	Size Zone Non- Uniformi ty		delta Minor Axis Length

Sphericity	Minimum	Imc1	Low	Gray-	Run	Normali	delta
		(Informati	Level	Emphasis	Length	zed	
		onal			Non-	Area	
		measure			Uniformi	Emphasi	
Surface	Range				ty	s	delta
		of			Normali		
		correlatio			zed		
		n 1)					
Area		Imc2	Small		Run	Small	delta
		(Informati	Dependenc		Percenta	Area	
		onal	e Emphasis		ge	High	
		measure				Gray-	
Surface						Level	delta
		of				Emphasi	
		correlatio				s	
		n 2)					
Volume	Robust	Inverse	Small		Run	Small	delta
		Variance	Dependenc		Variance	Area	
			e High			Low	
			Gray-Level			Gray-	
Ratio	Absolute		Emphasis			Level	delta
						Emphasi	
						s	
Voxel	Root	Joint	Small		Short	Zone	delta
		Average	Dependenc		Run	Entropy	
			e Low		Emphasi		
			Gray-Level		s		
Volume	Squared		Emphasis				delta
Voxel	Mean	Joint			Short	Zone	delta
		Energy			Run	Percenta	
					High	ge	
					Gray-		
Volume	Skewness				Level		delta
					Emphasi		

			s
Total	Joint	Short	Zone
Energy	Entropy	Run Low	Variance
		Gray-	
		Level	
		Emphasi	
		s	
Uniformit	MCC		
y	(Maximal		
	Correlatio		
	n		
	Coefficien		
	t)		
Variance	Maximum		
	Probabilit		
	y		
	Sum		
	Average		
	Sum		
	Entropy		
	Sum		
	Squares		

glcm: Gray-level co-occurrence matrix; gldm: gray-level dependence matrix; glrlm: gray-level run length matrix; glszm: gray-level size zone matrix; ngtdm: neighboring gray tone difference matrix.

Supplementary Table 3 Features selected by LASSO in feature subset 1 and the results of each

COX regression analysis

Covariate	HR (95%CI)	p-value
gender	1.10 [0.54,2.26]	0.789
age	1.01 [0.99,1.03]	0.571
height	0.99 [0.97,1.02]	0.622
weight	0.99 [0.98,1.01]	0.338
clinical_T	1.90 [1.27,2.84]	0.002
clinical_N	1.32 [1.08,1.61]	0.006
clinical_M	2.04 [1.30,3.18]	0.002
ECOG	1.60 [1.38,2.02]	0.024
muscle0	1.00 [0.99,1.01]	1.000
TAT0	1.00 [1.00,1.00]	0.374
SAT0	1.00 [0.99,1.01]	0.844
SATSMR0	0.98 [0.55,1.76]	0.946
sarco0	1.42 [1.35,1.50]	0.044
muscle1	1.00 [0.99,1.00]	0.440
TAT1	1.00 [1.00,1.00]	0.165
SAT1	1.00 [0.99,1.00]	0.400
TATSMR1	1.23 [0.93,1.33]	0.047
SATSMR1	0.96 [0.55,1.66]	0.880
sarco1	0.84 [0.53,1.33]	0.448
delta_muscle	1.00 [0.99,1.00]	0.393
delta_TAT	1.00 [1.00,1.32]	0.049
delta_SAT	1.00 [1.00,1.37]	0.024
delta_VAT	0.91 [0.66,1.25]	0.554

ECOG: Eastern Cooperative Oncology Group; SAT: subcutaneous adipose tissue; VAT: visceral adipose tissue; TAT: total adipose tissue; TATSMR1: TATI/SMI ratio; SATSMR1: SATI/SMI ratio; sarco: sarcopenia; 0: pretreatment; 1: follow-up.

Supplementary Table 4 Features selected by LASSO in feature subset 2 and the results of each

COX regression analysis

covariate	HR (95%CI)	p-value
age	0.99 [0.97,1.02]	0.702
clinicl_M	2.13 [1.26,3.60]	0.005
clinicl_N	1.40 [1.09,1.79]	0.085
clinicl_T	1.91 [1.23,2.95]	0.004
ECOG	1.60 [0.89,2.88]	0.120
gender	0.46 [0.06,3.35]	0.444
height	1.01 [0.96,1.06]	0.674
weight	0.99 [0.97,1.01]	0.502
muscle0	1.00 [0.99,1.01]	0.663
SAT0	1.00 [0.99,1.01]	0.712
TAT0	1.00 [1.00,1.00]	0.401
sarco0	0.83 [0.29,2.32]	0.718
MUSCLE_firstorder_90Percentile0	1.00 [0.99,1.01]	0.518
MUSCLE_firstorder_Entropy0	0.87 [0.42,1.79]	0.710
MUSCLE_firstorder_Kurtosis0	0.98 [0.87,1.09]	0.694
MUSCLE_firstorder_Mean0	0.99 [0.98,1.01]	0.359
MUSCLE_firstorder_Minimum0	1.00 [1.00,1.01]	0.339
MUSCLE_firstorder_Skewness0	1.15 [0.87,1.52]	0.340
MUSCLE_glcml_ClusterShade0	1.00 [1.00,1.01]	0.219
MUSCLE_glcml_Contrast0	0.87 [0.55,1.39]	0.566
MUSCLE_glcml_Correlation0	3.09 [0.23,41.75]	0.396
MUSCLE_glcml_Idmn0	0.00 [0.00,inf]	0.380
MUSCLE_glcml_InverseVariance0	20.14 [0.00,121728.61]	0.499
MUSCLE_gldm_DependenceNonUniformityNormalized0	inf [0.00,inf]	0.177
MUSCLE_gldm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.309
MUSCLE_gldm_LargeDependenceLowGrayLevelEmphasis0	1.09 [0.89,1.34]	0.399
MUSCLE_gldm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.429
MUSCLE_glszm_GrayLevelNonUniformity0	1.00 [0.99,1.00]	0.184
MUSCLE_glszm_LargeAreaEmphasis0	1.00 [1.00,1.00]	0.892

MUSCLE_glszm_LargeAreaHighGrayLevelEmphasis0	1.00 [1.00,1.00]	0.492
MUSCLE_glszm_LargeAreaLowGrayLevelEmphasis0	1.00 [1.00,1.00]	0.416
MUSCLE_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.362
MUSCLE_glszm_SizeZoneNonUniformityNormalized0	0.04 [0.00,125.68]	0.432
MUSCLE_ngtdm_Coarseness0	inf [0.00,inf]	0.353
MUSCLE_ngtdm_Contrast0	inf [0.00,inf]	0.229
MUSCLE_shape_Elongation0	1.57 [0.22,11.23]	0.652
MUSCLE_shape_Flatness0	inf [0.00,inf]	0.837
MUSCLE_shape_LeastAxisLength0	0.00 [0.00,inf]	0.491
MUSCLE_shape_Maximum2DDiameterSlice0	1.01 [0.99,1.02]	0.300
MUSCLE_shape_MinorAxisLength0	1.00 [0.99,1.01]	0.480
MUSCLE_shape_Sphericity0	0.00 [0.00,0.01]	0.014
MUSCLE_shape_SurfaceVolumeRatio0	35.19 [0.20,6155.67]	0.177
SAT_firstorder_90Percentile0	1.01 [0.99,1.03]	0.273
SAT_firstorder_Energy0	1.00 [1.00,1.00]	0.523
SAT_firstorder_InterquartileRange0	1.00 [0.99,1.01]	0.819
SAT_firstorder_Kurtosis0	0.86 [0.68,1.10]	0.222
SAT_firstorder_Mean0	1.00 [0.99,1.02]	0.742
SAT_firstorder_Median0	1.00 [0.98,1.03]	0.683
SAT_firstorder_Skewness0	0.93 [0.70,1.23]	0.622
SAT_glcm_Contrast0	1.04 [0.92,1.18]	0.517
SAT_glcm_Correlation0	1.44 [0.47,4.40]	0.523
SAT_glcm_Idmn0	0.00 [0.00,1615.63]	0.338
SAT_glcm_InverseVariance0	0.13 [0.00,44.58]	0.489
SAT_gldm_DependenceVariance0	0.99 [0.96,1.02]	0.479
SAT_gldm_LargeDependenceLowGrayLevelEmphasis0	0.96 [0.87,1.07]	0.454
SAT_gldm_LowGrayLevelEmphasis0	173.82 [0.00,inf]	0.527
SAT_glszm_GrayLevelNonUniformity0	1.00 [0.99,1.00]	0.272
SAT_glszm_LargeAreaHighGrayLevelEmphasis0	1.00 [1.00,1.00]	0.384
SAT_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.333
SAT_glszm_SizeZoneNonUniformityNormalized0	0.44 [0.03,6.71]	0.557
SAT_shape_Elongation0	1.50 [0.29,7.66]	0.625

SAT_shape_LeastAxisLength0	0.00 [0.00,3125.79]	0.378
SAT_shape_Sphericity0	1.20 [0.00,506.31]	0.953
SAT_shape_SurfaceVolumeRatio0	1.10 [1.00,1.22]	0.052
VAT_firstorder_10Percentile0	1.00 [0.98,1.02]	0.904
VAT_firstorder_90Percentile0	1.05 [0.99,1.12]	0.084
VAT_firstorder_Entropy0	1.33 [0.45,3.93]	0.606
VAT_firstorder_InterquartileRange0	1.01 [0.98,1.03]	0.461
VAT_firstorder_Kurtosis0	1.04 [0.81,1.32]	0.775
VAT_firstorder_Mean0	1.02 [0.99,1.06]	0.016
VAT_firstorder_MeanAbsoluteDeviation0	1.02 [0.96,1.09]	0.438
VAT_firstorder_Minimum0	1.05 [0.95,1.15]	0.337
VAT_glcm_ClusterProminence0	1.00 [1.00,1.01]	0.266
VAT_glcm_ClusterShade0	1.17 [1.00,1.37]	0.047
VAT_glcm_Correlation0	0.38 [0.01,12.02]	0.582
VAT_glcm_Imc10	205.05 [0.02,inf]	0.252
VAT_glcm_InverseVariance0	5.94 [0.00,15109.01]	0.656
VAT_glcm_JointEnergy0	0.00 [0.00,6.15]	0.144
VAT_gldm_DependenceEntropy0	0.59 [0.15,2.31]	0.446
VAT_gldm_DependenceNonUniformityNormalized0	360.37 [0.00,inf]	0.337
VAT_gldm_DependenceVariance0	0.98 [0.94,1.02]	0.233
VAT_glrlm_LongRunHighGrayLevelEmphasis0	1.00 [0.98,1.01]	0.399
VAT_glrlm_RunEntropy0	0.38 [0.09,1.67]	0.199
VAT_glszm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.556
VAT_glszm_GrayLevelNonUniformityNormalized0	3.24 [0.00,3130.15]	0.738
VAT_glszm_GrayLevelVariance0	0.85 [0.49,1.45]	0.541
VAT_glszm_HighGrayLevelZoneEmphasis0	0.98 [0.92,1.05]	0.593
VAT_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.460
VAT_glszm_SizeZoneNonUniformityNormalized0	11.89 [0.09,1643.89]	0.325
VAT_glszm_SmallAreaHighGrayLevelEmphasis0	0.93 [0.81,1.07]	0.320
VAT_glszm_ZoneEntropy0	0.47 [0.15,1.49]	0.200

VAT_ngtdm_Coarseness0	0.00 [0.00,inf]	0.623
VAT_ngtdm_Complexity0	1.06 [0.94,1.19]	0.366
VAT_shape_Elongation0	33.31 [2.14,519.51]	0.012
VAT_shape_Flatness0	inf [0.00,inf]	0.336
VAT_shape_LeastAxisLength0	0.38 [0.02,6.47]	0.502
VAT_shape_Maximum2DDiameterColumn0	1.00 [0.99,1.01]	0.596
VAT_shape_Maximum2DDiameterRow0	1.00 [0.99,1.02]	0.432
VAT_shape_MinorAxisLength0	1.01 [1.00,1.03]	0.054
VAT_shape_Sphericity0	0.00 [0.00,0.00]	0.001
VAT_shape_SurfaceVolumeRatio0	1.76 [0.97,3.21]	0.045

ECOG: Eastern Cooperative Oncology Group; SAT: subcutaneous adipose tissue; VAT: visceral adipose tissue; TAT: total adipose tissue; sarco: sarcopenia; SMI: muscle index; SATI: SAT index; VATI: VAT index; TATI: TAT index; glcm: gray-level co-occurrence matrix; glszm: gray-level size zone matrix; glrlm: gray-level run length matrix; gldm: gray-level dependence matrix; 0: pretreatment.

Supplementary Table 5 Features selected by LASSO in feature subset 3 and the results of each

COX regression analysis

covariate	HR (95%CI)	p-value
age	0.99 [0.97,1.02]	0.702
clinical_M	2.13 [1.26,3.60]	0.005
clinical_N	1.40 [1.09,1.79]	0.085
clinical_T	1.91 [1.23,2.95]	0.004
ECOG	1.60 [0.89,2.88]	0.120
gender	0.46 [0.06,3.35]	0.444
height	1.01 [0.96,1.06]	0.674
weight	0.99 [0.97,1.01]	0.502
muscle1	0.99 [0.98,1.00]	0.123
sat1	0.99 [0.98,1.00]	0.089
tat1	1.00 [0.99,1.00]	0.060
sarco1	1.10 [0.43,2.80]	0.841
MUSCLE_firstorder_10Percentile1	1.02 [1.00,1.03]	0.058
MUSCLE_firstorder_90Percentile1	1.00 [0.98,1.01]	0.643
MUSCLE_firstorder_Energy1	1.00 [1.00,1.00]	0.500
MUSCLE_firstorder_Entropy1	0.64 [0.31,1.32]	0.227
MUSCLE_firstorder_InterquartileRange1	0.98 [0.95,1.01]	0.112
MUSCLE_firstorder_Kurtosis1	1.07 [0.98,1.17]	0.133
MUSCLE_firstorder_Mean1	1.02 [0.99,1.04]	0.151
MUSCLE_firstorder_Minimum1	1.00 [1.00,1.01]	0.463
MUSCLE_firstorder_Skewness1	1.16 [0.78,1.74]	0.461
MUSCLE_glcm_ClusterShade1	1.00 [1.00,1.01]	0.342
MUSCLE_glcm_Contrast1	0.90 [0.71,1.13]	0.354
MUSCLE_glcm_Correlation1	0.07 [0.00,1.15]	0.062
MUSCLE_glcm_Idmn1	inf [0.00,inf]	0.504
MUSCLE_glcm_InverseVariance1	7047.14 [0.37,inf]	0.078
MUSCLE_gldm_DependenceVariance1	0.96 [0.92,1.00]	0.064
MUSCLE_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.359
MUSCLE_gldm_LargeDependenceLowGrayLevelEmphasis1	1.20 [0.78,1.85]	0.401
MUSCLE_gldm_LowGrayLevelEmphasis1	51144.74	0.415

	[0.00,inf]	
MUSCLE_glszm_GrayLevelNonUniformityNormalized1	12170.09	0.213
	[0.00,inf]	
MUSCLE_glszm_LargeAreaEmphasis1	1.00 [1.00,1.00]	0.003
MUSCLE_glszm_SizeZoneNonUniformity1	1.00 [1.00,1.00]	0.283
MUSCLE_glszm_SizeZoneNonUniformityNormalized1	12.77 [0.00,inf]	0.532
MUSCLE_glszm_ZoneEntropy1	0.61 [0.26,1.46]	0.266
MUSCLE_ngtdm_Busyness1	1.01 [0.99,1.03]	0.206
MUSCLE_ngtdm_Coarseness1	0.00 [0.00,inf]	0.470
MUSCLE_ngtdm_Contrast1	0.00 [0.00,inf]	0.120
MUSCLE_ngtdm_Strength1	0.33 [0.00,436.60]	0.761
MUSCLE_shape_Elongation1	1.11 [0.23,5.30]	0.893
MUSCLE_shape_Flatness1	0.00 [0.00,inf]	0.486
MUSCLE_shape_LeastAxisLength1	25079.67	0.507
	[0.00,inf]	
MUSCLE_shape_Maximum2DDiameterSlice1	1.00 [1.00,1.01]	0.352
MUSCLE_shape_SurfaceVolumeRatio1	27.42	0.168
	[0.25,3025.86]	
SAT_firstorder_90Percentile1	1.02 [1.00,1.03]	0.076
SAT_firstorder_Energy1	1.00 [1.00,1.00]	0.340
SAT_firstorder_Kurtosis1	0.80 [0.61,1.03]	0.089
SAT_firstorder_Mean1	1.01 [0.99,1.02]	0.294
SAT_firstorder_Median1	1.01 [1.00,1.03]	0.135
SAT_firstorder_Skewness1	0.70 [0.45,1.09]	0.114
SAT_glcm_Contrast1	1.09 [0.98,1.22]	0.114
SAT_glcm_Correlation1	0.39 [0.05,2.81]	0.352
SAT_glcm_Idmn1	0.00 [0.00,3.34]	0.076
SAT_glcm_Imc11	2.90 [0.06,135.09]	0.586
SAT_glcm_InverseVariance1	0.02 [0.00,1.79]	0.090
SAT_gldm_DependenceEntropy1	0.78 [0.43,1.40]	0.402
SAT_gldm_DependenceVariance1	0.96 [0.92,1.00]	0.050
SAT_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.541
SAT_gldm_LargeDependenceLowGrayLevelEmphasis1	0.88 [0.75,1.03]	0.107
SAT_gldm_LowGrayLevelEmphasis1	28752.20	0.227

	[0.00,inf]	
SAT_gldm_SmallDependenceHighGrayLevelEmphasis1	1.01 [0.98,1.04]	0.481
SAT_glrIm_LongRunLowGrayLevelEmphasis1	0.18 [0.00,54.94]	0.561
SAT_glszm_GrayLevelNonUniformityNormalized1	0.01 [0.00,6.11]	0.148
SAT_glszm_LargeAreaHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.913
SAT_glszm_LowGrayLevelZoneEmphasis1	259.96 [0.08,inf]	0.178
SAT_glszm_SizeZoneNonUniformity1	1.00 [1.00,1.00]	0.766
SAT_glszm_SizeZoneNonUniformityNormalized1	5.92 [0.13,276.77]	0.365
SAT_glszm_ZoneEntropy1	1.06 [0.64,1.76]	0.817
SAT_ngtdm_Coarseness1	inf [0.00,inf]	0.245
SAT_shape_LeastAxisLength1	0.00 [0.00,0.74]	0.077
SAT_shape_MeshVolume1	1.00 [1.00,1.00]	0.365
SAT_shape_Sphericity1	0.33 [0.00,111.47]	0.707
SAT_shape_SurfaceVolumeRatio1	1.01 [0.99,1.02]	0.283
VAT_firstorder_10Percentile1	1.01 [1.01,1.03]	0.032
VAT_firstorder_90Percentile1	1.11 [1.04,1.19]	0.002
VAT_firstorder_Entropy1	0.55 [0.13,2.33]	0.421
VAT_firstorder_InterquartileRange1	1.02 [0.99,1.05]	0.286
VAT_firstorder_Kurtosis1	1.14 [0.93,1.41]	0.208
VAT_firstorder_Mean1	1.04 [1.01,1.07]	0.002
VAT_firstorder_Minimum1	1.26 [1.26,6.01]	0.049
VAT_glcm_Autocorrelation1	1.08 [1.02,1.14]	0.061
VAT_glcm_ClusterProminence1	1.01 [1.00,1.02]	0.071
VAT_glcm_ClusterShade1	0.90 [0.85,0.96]	0.054
VAT_glcm_ClusterTendency1	1.25 [0.96,1.63]	0.093
VAT_glcm_Contrast1	1.13 [0.83,1.55]	0.440
VAT_glcm_Correlation1	2.48 [0.21,29.42]	0.472
VAT_glcm_DifferenceEntropy1	0.75 [0.18,3.20]	0.701
VAT_glcm_Imc11	84.25 [0.04,inf]	0.255
VAT_glcm_Imc21	0.15 [0.01,2.35]	0.177
VAT_glcm_InverseVariance1	0.01 [0.00,2.24]	0.097
VAT_glcm_JointEnergy1	12.19	0.016
	[1.38,394.85]	
VAT_glcm_JointEntropy1	1.71 [1.32,2.58]	0.040

VAT_gldm_DependenceEntropy1	0.34 [0.14,0.82]	0.165
VAT_gldm_DependenceNonUniformityNormalized1	62.25 [0.19,inf]	0.161
VAT_gldm_DependenceVariance1	0.94 [0.91,0.98]	0.002
VAT_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.235
VAT_gldm_LargeDependenceLowGrayLevelEmphasis1	0.80 [0.66,0.97]	0.238
VAT_gldm_LowGrayLevelEmphasis1	3014.39 [0.00,inf]	0.298
VAT_glrlm_LongRunLowGrayLevelEmphasis1	1.06 [1.05,3.39]	0.009
VAT_glrlm_RunEntropy1	0.09 [0.02,0.37]	0.001
VAT_glszm_GrayLevelNonUniformityNormalized1	1.03 [1.00,6.68]	0.012
VAT_glszm_HighGrayLevelZoneEmphasis1	1.01 [0.92,1.11]	0.825
VAT_glszm_LargeAreaEmphasis1	1.00 [1.00,1.00]	0.212
VAT_glszm_SizeZoneNonUniformityNormalized1	1.06 [1.00,10.47]	0.029
VAT_glszm_SmallAreaHighGrayLevelEmphasis1	0.96 [0.76,1.21]	0.744
VAT_glszm_ZoneEntropy1	1.29 [0.48,3.47]	0.618
VAT_ngtdm_Coarseness1	inf [0.00,inf]	0.332
VAT_ngtdm_Complexity1	1.05 [0.93,1.20]	0.414
VAT_ngtdm_Strength1	33946.34 [0.00,inf]	0.232
VAT_shape_Elongation1	12.42 [0.79,194.47]	0.073
VAT_shape_Flatness1	inf [0.00,inf]	0.630
VAT_shape_LeastAxisLength1	0.45 [0.01,17.37]	0.669
VAT_shape_MeshVolume1	1.00 [1.00,1.00]	0.185
VAT_shape_Sphericity1	0.00 [0.00,35.32]	0.130
VAT_shape_SurfaceVolumeRatio1	1.69 [1.12,2.54]	0.116

ECOG: Eastern Cooperative Oncology Group; SAT: subcutaneous adipose tissue; VAT: visceral adipose tissue; TAT: total adipose tissue; sarco: sarcopenia; SMI: muscle index; SATI: SAT index; VATI: VAT index; TATI: TAT index; glcm: gray-level co-occurrence matrix; glszm: gray-level size zone matrix; glrlm: gray-level run length matrix; gldm: gray-level dependence matrix; 1: follow-up.

Supplementary Table 6 Features selected by LASSO in feature subset 4 and the results of each

COX regression analysis

covariate	HR (95%CI)	p-value
age	0.99 [0.97,1.02]	0.702
clinical_M	2.13 [1.26,3.60]	0.005
clinical_N	1.40 [1.09,1.79]	0.085
clinical_T	1.91 [1.23,2.95]	0.004
ECOG	1.60 [0.89,2.88]	0.120
gender	0.46 [0.06,3.35]	0.444
height	1.01 [0.96,1.06]	0.674
weight	0.99 [0.97,1.01]	0.502
muscle0	1.00 [0.99,1.01]	0.663
muscle1	0.99 [0.98,1.00]	0.123
SAT0	1.00 [0.99,1.01]	0.712
SAT1	0.99 [0.98,1.00]	0.089
TAT0	1.00 [1.00,1.00]	0.401
TAT1	1.00 [0.99,1.00]	0.053
delta_SAT	0.60 [0.38,0.95]	0.053
delta_TAT	0.39 [0.22,0.68]	0.093
sarco0	0.83 [0.29,2.32]	0.718
sarco1	1.10 [0.43,2.80]	0.841
MUSCLE_firstorder_90Percentile0	1.00 [0.99,1.01]	0.518
MUSCLE_firstorder_90Percentile1	1.00 [0.98,1.01]	0.643
MUSCLE_firstorder_Energy1	1.00 [1.00,1.00]	0.500
MUSCLE_firstorder_Entropy0	0.87 [0.42,1.79]	0.710
MUSCLE_firstorder_Entropy1	0.64 [0.31,1.32]	0.227
MUSCLE_firstorder_InterquartileRange1	0.98 [0.95,1.01]	0.112
MUSCLE_firstorder_Kurtosis0	0.98 [0.87,1.09]	0.694
MUSCLE_firstorder_Kurtosis1	1.07 [0.98,1.17]	0.133
MUSCLE_firstorder_Mean0	0.99 [0.98,1.01]	0.359
MUSCLE_firstorder_Mean1	1.02 [0.99,1.04]	0.151
MUSCLE_firstorder_Minimum0	1.00 [1.00,1.01]	0.339
MUSCLE_firstorder_Minimum1	1.00 [1.00,1.01]	0.463

MUSCLE_firstorder_Skewness0	1.15 [0.87,1.52]	0.340
MUSCLE_firstorder_Skewness1	1.16 [0.78,1.74]	0.461
MUSCLE_glcmm_ClusterShade0	1.00 [1.00,1.01]	0.219
MUSCLE_glcmm_ClusterShade1	1.00 [1.00,1.01]	0.342
MUSCLE_glcmm_Contrast0	0.87 [0.55,1.39]	0.566
MUSCLE_glcmm_Contrast1	0.90 [0.71,1.13]	0.354
MUSCLE_glcmm_Correlation0	3.09	0.396
	[0.23,41.75]	
MUSCLE_glcmm_Correlation1	0.07 [0.00,1.15]	0.062
MUSCLE_glcmm_Idmn0	0.00	0.380
	[0.00,11185649	
	13231520000.00	
	]	
MUSCLE_glcmm_Idmn1	inf [0.00,inf]	0.504
MUSCLE_glcmm_InverseVariance0	20.14	0.499
	[0.00,121728.61	
	]	
MUSCLE_glcmm_InverseVariance1	7047.14	0.078
	[0.37,13397457	
	7.20]	
MUSCLE_gldm_DependenceNonUniformityNormalized0	inf [0.00,inf]	0.177
MUSCLE_gldm_DependenceVariance1	0.96 [0.92,1.00]	0.064
MUSCLE_gldm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.309
MUSCLE_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.359
MUSCLE_gldm_LargeDependenceLowGrayLevelEmphasis0	1.09 [0.89,1.34]	0.399
MUSCLE_gldm_LargeDependenceLowGrayLevelEmphasis1	1.20 [0.78,1.85]	0.401
MUSCLE_gldm_LowGrayLevelEmphasis1	51144.74	0.415
	[0.00,inf]	
MUSCLE_gllmm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.429
MUSCLE_glszm_GrayLevelNonUniformity0	1.00 [0.99,1.00]	0.184
MUSCLE_glszm_GrayLevelNonUniformityNormalized1	12170.09	0.213
	[0.00,inf]	
MUSCLE_glszm_LargeAreaEmphasis0	1.00 [1.00,1.00]	0.892
MUSCLE_glszm_LargeAreaEmphasis1	1.00 [1.00,1.00]	0.003

MUSCLE_glszm_LargeAreaHighGrayLevelEmphasis0	1.00 [1.00,1.00]	0.492
MUSCLE_glszm_LargeAreaLowGrayLevelEmphasis0	1.00 [1.00,1.00]	0.416
MUSCLE_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.362
MUSCLE_glszm_SizeZoneNonUniformity1	1.00 [1.00,1.00]	0.283
MUSCLE_glszm_SizeZoneNonUniformityNormalized0	0.04 [0.00,125.68]	0.432
MUSCLE_glszm_SizeZoneNonUniformityNormalized1	12.77 [0.00,37975.27]	0.532
MUSCLE_glszm_ZoneEntropy1	0.61 [0.26,1.46]	0.266
MUSCLE_ngtdm_Busyness1	1.01 [0.99,1.03]	0.206
MUSCLE_ngtdm_Coarseness0	inf [0.00,inf]	0.353
MUSCLE_ngtdm_Coarseness1	0.00 [0.00,inf]	0.470
MUSCLE_ngtdm_Contrast0	2886356656.22 [0.00,inf]	0.229
MUSCLE_ngtdm_Contrast1	0.00 [0.00,11248.83]	0.120
MUSCLE_ngtdm_Strength1	0.33 [0.00,436.60]	0.761
MUSCLE_shape_Elongation0	1.57 [0.22,11.23]	0.652
MUSCLE_shape_Elongation1	1.11 [0.23,5.30]	0.893
MUSCLE_shape_Flatness0	5403362.43 [0.00,inf]	0.837
MUSCLE_shape_Flatness1	0.00 [0.00,15727952 4266026000000 0000000000000 00000000.00]	0.486
MUSCLE_shape_LeastAxisLength0	0.00 [0.00,53538561 45.43]	0.491
MUSCLE_shape_LeastAxisLength1	25079.67 [0.00,inf]	0.507
MUSCLE_shape_Maximum2DDiameterSlice0	1.01 [0.99,1.02]	0.300

MUSCLE_shape_Maximum2DDiameterSlice1	1.00 [1.00,1.01]	0.352
MUSCLE_shape_MinorAxisLength0	1.00 [0.99,1.01]	0.480
MUSCLE_shape_Sphericity0	1.02 [1.00,1.03]	0.049
MUSCLE_shape_Sphericity0	0.00	0.504
	[0.00,11870557	
	152.06]	
MUSCLE_shape_SurfaceVolumeRatio0	35.19	0.177
	[0.20,6155.67]	
MUSCLE_shape_SurfaceVolumeRatio1	27.42	0.168
	[0.25,3025.86]	
SAT_firstorder_90Percentile0	1.01 [0.99,1.03]	0.273
SAT_firstorder_90Percentile1	1.02 [1.00,1.03]	0.076
SAT_firstorder_Energy0	1.00 [1.00,1.00]	0.523
SAT_firstorder_Energy1	1.00 [1.00,1.00]	0.340
SAT_firstorder_InterquartileRange0	1.00 [0.99,1.01]	0.819
SAT_firstorder_Kurtosis0	0.86 [0.68,1.10]	0.222
SAT_firstorder_Kurtosis1	0.80 [0.61,1.03]	0.089
SAT_firstorder_Mean0	1.00 [0.99,1.02]	0.742
SAT_firstorder_Mean1	1.01 [0.99,1.02]	0.294
SAT_firstorder_Median0	1.00 [0.98,1.03]	0.683
SAT_firstorder_Median1	1.01 [1.00,1.03]	0.135
SAT_firstorder_Skewness0	0.71 [0.46,0.99]	0.041
SAT_firstorder_Skewness1	0.70 [0.45,1.09]	0.114
SAT_glcm_Contrast0	1.04 [0.92,1.18]	0.517
SAT_glcm_Contrast1	1.09 [0.98,1.22]	0.114
SAT_glcm_Correlation0	1.44 [0.47,4.40]	0.523
SAT_glcm_Correlation1	0.39 [0.05,2.81]	0.352
SAT_glcm_Idmn0	0.00	0.338
	[0.00,1615.63]	
SAT_glcm_Idmn1	0.00 [0.00,3.34]	0.076
SAT_glcm_Imc11	2.90	0.586
	[0.06,135.09]	
SAT_glcm_InverseVariance0	0.13	0.489
	[0.00,44.58]	

SAT_glcm_InverseVariance1	0.02 [0.00,1.79]	0.090
SAT_gldm_DependenceEntropy1	0.78 [0.43,1.40]	0.402
SAT_gldm_DependenceVariance0	0.99 [0.96,1.02]	0.479
SAT_gldm_DependenceVariance1	0.96 [0.92,1.00]	0.053
SAT_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.541
SAT_gldm_LargeDependenceLowGrayLevelEmphasis0	0.96 [0.87,1.07]	0.454
SAT_gldm_LargeDependenceLowGrayLevelEmphasis1	0.88 [0.75,1.03]	0.107
SAT_gldm_LowGrayLevelEmphasis0	173.82 [0.00,14934837 20.55]	0.527
SAT_gldm_LowGrayLevelEmphasis1	28752.20 [0.00,inf]	0.227
SAT_gldm_SmallDependenceHighGrayLevelEmphasis1	1.01 [0.98,1.04]	0.481
SAT_glrldm_LongRunLowGrayLevelEmphasis1	0.18 [0.00,54.94]	0.561
SAT_glszm_GrayLevelNonUniformity0	1.00 [0.99,1.00]	0.272
SAT_glszm_GrayLevelNonUniformityNormalized1	0.00 [0.00,6.68]	0.119
SAT_glszm_LargeAreaHighGrayLevelEmphasis0	1.00 [1.00,1.00]	0.384
SAT_glszm_LargeAreaHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.913
SAT_glszm_LowGrayLevelZoneEmphasis1	259.96 [0.08,852259.22]	0.178
SAT_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.333
SAT_glszm_SizeZoneNonUniformity1	1.00 [1.00,1.00]	0.766
SAT_glszm_SizeZoneNonUniformityNormalized0	0.44 [0.03,6.71]	0.557
SAT_glszm_SizeZoneNonUniformityNormalized1	5.92 [0.13,276.77]	0.365
SAT_glszm_ZoneEntropy1	1.06 [0.64,1.76]	0.817
SAT_ngtdm_Coarseness1	inf [0.00,inf]	0.245
SAT_shape_Elongation0	1.50 [0.29,7.66]	0.625
SAT_shape_LeastAxisLength0	0.00 [0.00,3125.79]	0.378
SAT_shape_LeastAxisLength1	0.00 [0.00,0.74]	0.055
SAT_shape_MeshVolume1	1.00 [1.00,1.00]	0.365

SAT_shape_Sphericity0	1.20	0.953
	[0.00,506.31]	
SAT_shape_Sphericity1	0.33	0.707
	[0.00,111.47]	
SAT_shape_SurfaceVolumeRatio0	1.10 [1.00,1.22]	0.052
SAT_shape_SurfaceVolumeRatio1	1.01 [0.99,1.02]	0.283
VAT_firstorder_10Percentile0	1.00 [0.98,1.02]	0.904
VAT_firstorder_10Percentile1	1.01 [1.00,1.03]	0.032
VAT_firstorder_90Percentile0	1.05 [0.99,1.12]	0.084
VAT_firstorder_90Percentile1	1.11 [1.04,1.19]	0.002
VAT_firstorder_Entropy0	1.33 [0.45,3.93]	0.606
VAT_firstorder_Entropy1	0.55 [0.13,2.33]	0.421
VAT_firstorder_InterquartileRange0	1.01 [0.98,1.03]	0.461
VAT_firstorder_InterquartileRange1	1.02 [0.99,1.05]	0.286
VAT_firstorder_Kurtosis0	1.04 [0.81,1.32]	0.775
VAT_firstorder_Kurtosis1	1.14 [0.93,1.41]	0.208
VAT_firstorder_Mean0	1.02 [0.99,1.06]	0.160
VAT_firstorder_Mean1	1.04 [1.01,1.07]	0.002
VAT_firstorder_MeanAbsoluteDeviation0	1.02 [0.96,1.09]	0.438
VAT_firstorder_Minimum0	1.05 [0.95,1.15]	0.337
VAT_glcm_Autocorrelation1	1.08 [1.02,1.14]	0.061
VAT_glcm_ClusterProminence0	1.00 [1.00,1.01]	0.266
VAT_glcm_ClusterProminence1	1.01 [1.00,1.02]	0.071
VAT_glcm_ClusterShade1	0.90 [0.85,0.96]	0.054
VAT_glcm_ClusterTendency1	1.25 [0.96,1.63]	0.093
VAT_glcm_Contrast1	1.13 [0.83,1.55]	0.440
VAT_glcm_Correlation0	0.38	0.582
	[0.01,12.02]	
VAT_glcm_Correlation1	2.48	0.472
	[0.21,29.42]	
VAT_glcm_DifferenceEntropy1	0.75 [0.18,3.20]	0.701
VAT_glcm_Imc10	205.05	0.252
	[0.02,1833601.27]	

VAT_glcm_Imc11	84.25 [0.04,174776.28]	0.255
VAT_glcm_Imc21	0.15 [0.01,2.35]	0.177
VAT_glcm_InverseVariance0	5.94 [0.00,15109.01]	0.656
VAT_glcm_InverseVariance1	0.01 [0.00,2.24]	0.097
VAT_glcm_JointEnergy0	0.00 [0.00,6.15]	0.144
VAT_glcm_JointEnergy1	12.19 [0.38,394.85]	0.042
VAT_glcm_JointEntropy1	0.71 [0.32,1.58]	0.396
VAT_gldm_DependenceEntropy0	0.59 [0.15,2.31]	0.446
VAT_gldm_DependenceEntropy1	0.34 [0.14,0.82]	0.165
VAT_gldm_DependenceNonUniformityNormalized0	360.37 [0.00,60316965. 92]	0.337
VAT_gldm_DependenceNonUniformityNormalized1	62.25 [0.19,20001.29]	0.161
VAT_gldm_DependenceVariance0	0.98 [0.94,1.02]	0.233
VAT_gldm_DependenceVariance1	0.94 [0.91,0.98]	0.002
VAT_gldm_LargeDependenceHighGrayLevelEmphasis1	1.00 [1.00,1.00]	0.235
VAT_gldm_LargeDependenceLowGrayLevelEmphasis1	0.80 [0.66,0.97]	0.054
VAT_gldm_LowGrayLevelEmphasis1	3014.39 [0.00,10698371 447.46]	0.298
VAT_glrlm_LongRunHighGrayLevelEmphasis0	1.00 [0.98,1.01]	0.399
VAT_glrlm_LongRunLowGrayLevelEmphasis1	0.00 [0.00,2.39]	0.049
VAT_glrlm_RunEntropy0	0.38 [0.09,1.67]	0.199
VAT_glrlm_RunEntropy1	0.09 [0.02,0.37]	0.001
VAT_glszm_GrayLevelNonUniformity0	1.00 [1.00,1.00]	0.556
VAT_glszm_GrayLevelNonUniformityNormalized0	3.24 [0.00,3130.15]	0.738
VAT_glszm_GrayLevelNonUniformityNormalized1	5606.87 [0.12,27066136	0.041

	5.71]	
VAT_glszm_GrayLevelVariance0	0.85 [0.49,1.45]	0.541
VAT_glszm_HighGrayLevelZoneEmphasis0	0.98 [0.92,1.05]	0.593
VAT_glszm_HighGrayLevelZoneEmphasis1	1.01 [0.92,1.11]	0.825
VAT_glszm_LargeAreaEmphasis1	1.00 [1.00,1.00]	0.212
VAT_glszm_SizeZoneNonUniformity0	1.00 [1.00,1.00]	0.460
VAT_glszm_SizeZoneNonUniformityNormalized0	11.89	0.325
	[0.09,1643.89]	
VAT_glszm_SizeZoneNonUniformityNormalized1	0.06	0.291
	[0.00,10.47]	
VAT_glszm_SmallAreaHighGrayLevelEmphasis0	0.93 [0.81,1.07]	0.320
VAT_glszm_SmallAreaHighGrayLevelEmphasis1	0.96 [0.76,1.21]	0.744
VAT_glszm_ZoneEntropy0	0.47 [0.15,1.49]	0.200
VAT_glszm_ZoneEntropy1	1.29 [0.48,3.47]	0.618
VAT_ngtdm_Coarseness0	0.00 [0.00, inf]	0.623
VAT_ngtdm_Coarseness1	inf [inf,inf]	0.332
VAT_ngtdm_Complexity0	1.17 [1.00,1.37]	0.057
VAT_ngtdm_Complexity1	1.05 [0.93,1.20]	0.414
VAT_ngtdm_Strength1	33946.34	0.232
	[0.00,inf]	
VAT_shape_Elongation0	33.31	0.124
	[2.14,519.51]	
VAT_shape_Elongation1	12.42	0.073
	[0.79,194.47]	
VAT_shape_Flatness0	inf [0.00,inf]	0.336
VAT_shape_Flatness1	1823677443.70	0.630
	[0.00,inf]	
VAT_shape_LeastAxisLength0	0.38 [0.02,6.47]	0.502
VAT_shape_LeastAxisLength1	0.45	0.669
	[0.01,17.37]	
VAT_shape_Maximum2DDiameterColumn0	1.00 [0.99,1.01]	0.596
VAT_shape_Maximum2DDiameterRow0	1.00 [0.99,1.02]	0.432
VAT_shape_MeshVolume1	1.00 [1.00,1.00]	0.185
VAT_shape_MinorAxisLength0	1.01 [1.00,1.03]	0.054

VAT_shape_Sphericity0	0.00 [0.00,0.00]	0.064
VAT_shape_Sphericity1	0.00 [0.00,35.32]	0.130
VAT_shape_SurfaceVolumeRatio0	1.76 [0.97,3.21]	0.045
VAT_shape_SurfaceVolumeRatio1	1.69 [1.12,2.54]	0.062
delta_MUSCLE_shape_Elongation1	0.79 [0.33,1.90]	0.602
delta_MUSCLE_shape_Flatness1	0.63 [0.20,1.94]	0.419
delta_MUSCLE_shape_LeastAxisLength1	inf [0.00,inf]	0.276
delta_MUSCLE_shape_MeshVolume1	1.24 [0.82,1.87]	0.315
delta_MUSCLE_shape_SurfaceVolumeRatio1	1.55 [0.03,76.65]	0.827
delta_SAT_shape_LeastAxisLength1	0.00 [0.00,40549341 5.56]	0.165
delta_SAT_shape_MeshVolume1	0.99 [0.93,1.04]	0.619
delta_SAT_shape_Sphericity1	0.92 [0.74,1.14]	0.423
delta_SAT_shape_SurfaceArea1	0.91 [0.64,1.30]	0.606
delta_SAT_shape_SurfaceVolumeRatio1	0.99 [0.96,1.02]	0.411
delta_VAT_shape_Elongation1	0.28 [0.06,1.31]	0.105
delta_VAT_shape_Flatness1	0.70 [0.32,1.51]	0.358
delta_VAT_shape_LeastAxisLength1	7.48 [0.01,7882.40]	0.571
delta_VAT_shape_Maximum2DDiameterColumn1	0.93 [0.52,1.67]	0.812
delta_VAT_shape_Sphericity1	0.24 [0.06,1.02]	0.042
delta_VAT_shape_SurfaceArea1	0.84 [0.64,1.10]	0.196
delta_VAT_shape_SurfaceVolumeRatio1	1.76 [0.85,3.63]	0.126

ECOG: Eastern Cooperative Oncology Group; SAT: subcutaneous adipose tissue; VAT: visceral adipose tissue; TAT: total adipose tissue; sarco: sarcopenia; SMI: muscle index; SATI: SAT index; VATI: VAT index; TATI: TAT index; glcm: gray-level co-occurrence matrix; glszm: gray-level size zone matrix; glrlm: gray-level run length matrix; gldm: gray-level dependence matrix; 0: pretreatment; 1: follow-up.