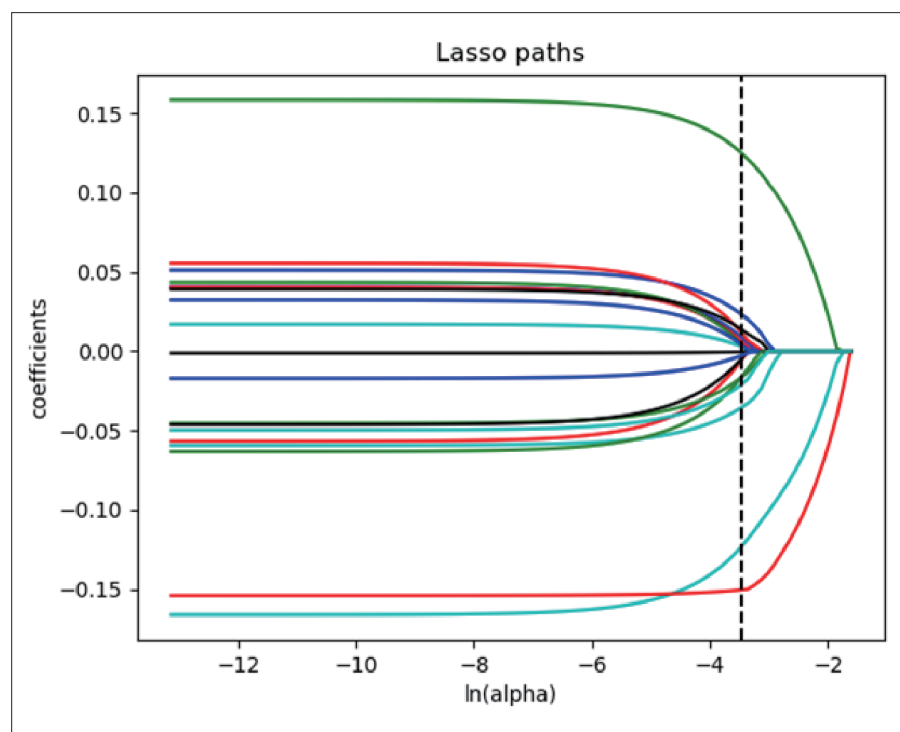


Supplementary Material 1. The detailed parameters of MRI for head examination.

MR images were acquired with 3.0 T scanner (Signa HDxt, GE Healthcare) using a 8-channel phase-array head coil in the supine position, and consisted of six sequences including axial T2-weighted imaging (T2WI), T1 Fluid-attenuated inversion-recovery (FLAIR), T2 FLAIR, diffusion-weighted imaging (DWI) with two b-factors (0 and 1000 s/mm²). Contrast-enhanced T1-weighted imaging (T1 WI) were performed in the axial, sagittal and coronal planes. The detailed parameters of MRI sequences: T1 FLAIR, TI 800~900 ms, TR 2000~2500 ms, TE 20~25 ms; T2WI, TR 4000~4500 ms, TE 100~110 ms; T2 FLAIR, TI 2000~2100ms, TR 8000~8600 ms, TE 150~170 ms, FOV 240 mm × 240 mm, slice thickness 6 mm, slice interval 2 mm, matrix 256 × 256; DWI, TR 4500~5500 ms, TE 70~80ms, FOV 240 mm × 240 mm, slice thickness 6 mm, slice interval 2 mm, matrix 160 × 160. Contrast-enhanced scans were performed after injection of 0.01mmol/kg of Gd-DTPA contrast agent (gadobutrol, Bayer-Schering Pharma) at a rate of 2.0 mL/s with a pump injector (Ulrich CT Plus 150, Ulrich Medical) through the antecubital vein, followed by a saline flush (20 mL). The parameters of contrast-enhanced MRI sequences: sagittal high-resolution T1W1 3D BRAVO, TR 8.1 ms, TE 2.8 ms, FA 12°, slice thickness 0 mm, thickness 1 mm, 175 slices, voxel size 1 mm × 1 mm × 1 mm. T1 FLAIR, TI 800~900ms, TR 2000~2500ms, TE 20~25ms.



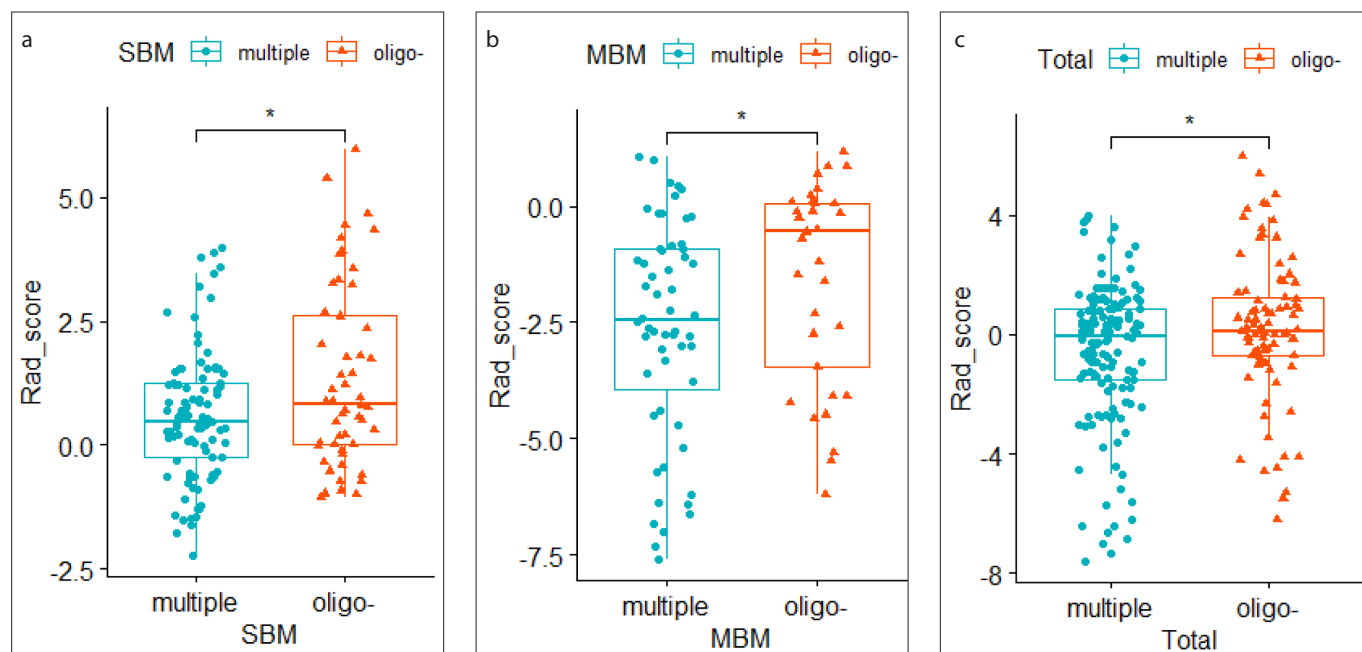
Supplementary Figure S1. LASSO path plot in the training set. Features dimension reduction was performed using the least absolute shrinkage and selection operator (LASSO) algorithm in the training set, and the most distinguishable 19 features were left.

Supplementary Table 1. Comparison of AUC values between models using Delong test in the training and testing sets

	CR model AUC (95% CI)	Radiomics model AUC (95% CI)	Combined model AUC (95% CI)	<i>P</i>
Training set (n=258)	0.712 (0.648-0.776)	0.870 (0.828-0.911)	-	<.001 ^a
	0.712 (0.648-0.776)	-	0.912 (0.879-0.945)	<.001 ^a
	-	0.870 (0.828-0.911)	0.912 (0.879-0.945)	.12
Testing set (n=113)	0.692 (0.592-0.792)	0.824 (0.750-0.898)	-	.038 ^b
	0.692 (0.592-0.792)	-	0.859 (0.793-0.925)	.006 ^b
	-	0.824 (0.750-0.898)	0.859 (0.793-0.925)	.49

CR model, clinicoradiologic model; AUC, area under the receiver operating characteristic (ROC) curve; CI, Confidence interval.

^a $P < .001$; ^b $P < .05$.



Supplementary Figure S2. a-c. The Rad-score of each patient in SBM group (a), MBM group (b), and total group (c). The Mann-Whitney U test was used to evaluate the difference between the oligometastatic and multiple brain metastases. SBM, synchronous brain metastasis; MBM, metachronous brain metastasis; Total, SBM+MBM; Rad-score, radiomics score; *, $P < .05$.