Table S1. Employed 57 radiomic features.

Intensity based features (first order statistics) Let **X** denote the three dimensional image matrix with N voxels; $\overline{\mathrm{X}}$ be the mean of **X**; **P** be the first order histogram with N_l discrete intensity levels.			
Feature	**Formula**	**Feature**	**Formula**
1. Energy	$\sum_{i=1}^{N}\mathbf{X}(i)^2$	2. Entropy	$\sum_{i=1}^{N_l}\mathbf{P}(i)log_2\mathbf{P}(i)$
3. Kurtosis	$\frac{\frac{1}{N}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^4}{\left(\sqrt{\frac{1}{N}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^2}\right)^2}$	4. Maximum	$\max(\mathbf{X})$
5. Mean	$\frac{1}{N}\sum_{i=1}^{N}\mathbf{X}(i)$	6. Mean absolute deviation	$\frac{1}{N}\sum_{i=1}^{N}\mathrm{abs}(\mathbf{X}(i)-\bar{X})$
7. Median	$\mathrm{median}(\mathbf{X})$	8. First quartile	Value that splits off the lowest 25% of data from the highest 75%
9. Third quatile	Value that splits off the highest 25% of data from the highest 75%	10. Minimum	$\min(\mathbf{X})$
11. Range	$\max(\mathbf{X})-\min(\mathbf{X})$	12. Root mean square (RMS)	$\sqrt{\frac{\sum_{i=1}^{N}\mathbf{X}(i)^2}{N}}$
13. Skewness	$\frac{\frac{1}{N}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^3}{\left(\sqrt{\frac{1}{N}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^2}\right)^3}$	14. Standard deviation	$\sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^2}$
15. Uniformity	$\sum_{i=1}^{N_l}\mathbf{P}(i)^2$	16. Variance	$\frac{1}{N-1}\sum_{i=1}^{N}(\mathbf{X}(i)-\bar{X})^2$
Shape/Size based features Let V denote the tumor volume and A the surface area of the volume.			
17. Compactness 1	$\frac{V}{\sqrt{\pi}A^{2/3}}$	18. Compactness 2	$36\pi\frac{V^2}{A^3}$
19. Maximum 3D diameter	The largest pairwise Euclidean distance between voxels on the surface of the tumor volume.	20. Spherical disproportion	$\frac{A}{4\pi R^2}$
21. Sphericity	$\frac{\pi^{\frac{1}{3}}(6V)^{\frac{2}{3}}}{A}$	22. Surface area	$\mathrm{A}=\sum_{i=1}^{Ns}\frac{1}{2}\lvert a_ib_i\times a_ic_i\rvert$ *Ns* is the total number

			of triangles covering the surface and *a*, *b* and *c* are vertices of the triangles.
23. Surface to volume ratio	$\frac{A}{V}$	24. Volume	The number of pixels in the tumor region multiplied by the voxel size.

Table S1 (cont.). Employed 57 radiomic features.

Textural features (gray-level co-occurrence matrix based features)

Let $\mathbf{P}(\delta, \alpha)$ be the co-occurrence matrix for an arbitrary distance δ and direction α; N_g be the number of discrete intensity levels in the image; p_x(i) be the marginal row probabilities; p_y(i) be the marginal column probabilities; μ_x be the mean of p_x; μ_y be the mean of p_y; σ_x be the standard deviation of p_x; σ_y be the standard deviation of p_y; *HXY* be the entropy of **P**; *HX* be the entropy of p_x; *HY* be the entropy of p_y;

$p_{x+y}(k) = \sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \mathbf{P}(i,j), i + j = k, k = 2,3, \dots, 2N_g;$

$p_{x-y}(k) = \sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \mathbf{P}(i,j), |i - j| = k, k = 0,1, \dots, N_g - 1;$

$\mathrm{HX} = -\sum_{i=1}^{N_g} p_x(i) \log\big(p_x(i)\big)$, $\mathrm{HY} = -\sum_{i=1}^{N_g} p_y(i) \log\Big(p_y(i)\Big);$

$\mathrm{HXY1} = -\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \mathbf{P}(i,j) \log\left(p_x(i)p_y(j)\right)$, $\mathrm{HXY2} = -\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} p_x(i)p_y(j) \log\left(p_x(i)p_y(j)\right)$

25. Autocorrelation	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} ij\mathbf{P}(i,j)$	26. Cluster Prominence	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \big[\boldsymbol{i} + \boldsymbol{j} - \boldsymbol{\mu_x} - \boldsymbol{\mu_y}\big]^{\mathbf{4}} \mathbf{P}(i,j)$
27. Cluster Shade	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \big[\boldsymbol{i} + \boldsymbol{j} - \boldsymbol{\mu_x} - \boldsymbol{\mu_y}\big]^{\mathbf{3}} \mathbf{P}(i,j)$	28. Cluster Tendency	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \big[\boldsymbol{i} + \boldsymbol{j} - \boldsymbol{\mu_x} - \boldsymbol{\mu_y}\big]^{\mathbf{2}} \mathbf{P}(i,j)$
29. Contrast	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \boldsymbol{|i-j|^2} \mathbf{P}(i,j)$	30. Correlation	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \frac{ij\mathbf{P}(i,j) - \mu_x(i)\mu_y(j)}{\sigma_x(i)\sigma_y(j)}$
31. Difference entropy	$\sum_{i=0}^{N_g - 1} p_{x-y}(i) log_2\big[p_{x-y}(i)\big]$	32. Dissimilarity	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \boldsymbol{|i-j|} \mathbf{P}(i,j)$
33. Energy	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} [\mathbf{P}(i,j)]^{\mathbf{2}}$	34. Entropy (*HXY*)	$-\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \mathbf{P}(i,j) \log_2 (\mathbf{P}(i,j))$
35. Homogeneity 1	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \frac{\mathbf{P}(i,j)}{1+\boldsymbol{|i-j|}}$	36. Homogeneity 2	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \frac{\mathbf{P}(i,j)}{1+\boldsymbol{|i-j|^2}}$
37. Informational measure of correlation 1	$\frac{HXY - HXY1}{\max(HX, HY)}$	38. Informational measure of correlation 2	$\sqrt{1 - e^{-2(HXY2 - HXY)}}$
39. Inverse Difference Moment Normalized	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \frac{\mathbf{P}(i,j)}{1+\left(\frac{\boldsymbol{|i-j|^2}}{N^2}\right)}$	40. Inverse Difference Normalized	$\sum_{i=1}^{N_g} \sum_{j=1}^{N_g} \frac{\mathbf{P}(i,j)}{1+\left(\frac{\boldsymbol{|i-j|}}{N}\right)}$

41. Inverse variance	$\sum_{i=1}^{N_g}\sum_{j=1}^{N_g}\frac{\mathbf{P}(i,j)}{\lvert i-j\rvert^2}, i \neq j$	42. Maximum Probability	$\max\big(\mathbf{P}(i,j)\big)$
43. Sum average	$\sum_{i=2}^{2N_g}\big[i\mathbf{P}_{x+y}(i)\big]$	44. Sum entropy	$-\sum_{i=2}^{2N_g}\mathbf{P}_{x+y}(i)log_2\big[\mathbf{P}_{x+y}(i)\big]$
45. Sum variance	$\sum_{i=2}^{2N_g}(i-SE)^2\mathbf{P}_{x+y}(i)$	46. Variance	$\sum_{i=1}^{N_g}\sum_{j=1}^{N_g}(i-\mu)^2\mathbf{P}(\mathbf{i},\mathbf{j})$
Textural features (gray-level run-length matrix based features) Let $p(i,j\lvert\theta)$ be the (*i,j*)th entry in the given run-length matrix *p* for a direction θ; N_g be the number of discrete intensity levels in the image; N_r be the number of different run lengths.			
47. Short Run Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\left[\frac{p(i,j\lvert\theta)}{j^2}\right]}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$	48. Long Run Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}j^2p(i,j\lvert\theta)}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$
49. Gray Level Non-Uniformity	$\frac{\sum_{i=1}^{N_g}\left[\sum_{j=1}^{N_r}p(i,j\lvert\theta)\right]^2}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$	50. Run Length Non-Uniformity	$\frac{\sum_{j=1}^{N_r}\left[\sum_{i=1}^{N_g}p(i,j\lvert\theta)\right]^2}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$
51. Run Percentage	$\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\frac{p(i,j\lvert\theta)}{N_p}$	52. Low Gray Level Run Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\left[\frac{p(i,j\lvert\theta)}{i^2}\right]}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$
53. High Gray Level Run Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}i^2p(i,j\lvert\theta)}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$	54. Short Run Low Gray Level Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\left[\frac{p(i,j\lvert\theta)}{i^2j^2}\right]}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$
55. Short Run High Gray Level Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\left[\frac{p(i,j\lvert\theta)i^2}{j^2}\right]}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$	56. Long Run Low Gray Level Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}\left[\frac{p(i,j\lvert\theta)j^2}{i^2}\right]}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$
57. Long Run High Gray Level Emphasis	$\frac{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}i^2j^2p(i,j\lvert\theta)}{\sum_{i=1}^{N_g}\sum_{j=1}^{N_r}p(i,j\lvert\theta)}$		