**Supplementary Figure S1**

Histogram analysis: A, Clinical data can be summarised as a histogram, from which numerous parameters are derived. Skew describes a measure of the asymmetry of a parameter distribution and kurtosis describes a measure of how peaked a parameter distribution is (17). B, Histogram analysis allows data from part of a complex distribution to be analyzed and some studies (42) have shown benefit of such analyses.

**Supplementary Figure S2**

Number of histogram analyses of tumor imaging data between January 1990 and October 2014. PubMed search performed October 22, 2014, using terms ‘histogram,’ ‘tumor *OR* tumour *OR* cancer’ and ‘imaging *OR* CT *OR* MRI *OR* magnetic resonance *OR* PET *OR* positron emission *OR* ultrasound.’

**Supplementary Figure S3**

Feature analysis: A, A binarized parameter map is successively divided using boxes of decreasing scale, *s*. The number of boxes, *n*, occupied by the tumor is recorded at each scale. B, Filled box count is plotted against the reciprocal of the scale on log–log axes. Box counting dimension (d0) is the line gradient.