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Texture analysis predicting EGFR mutation and recurrence in lung adenocarcinoma

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Objectives: We aimed to investigate the discriminative value of texture feature in EGFR mutation of lung adenocarcinoma and prognostic value of texture features using 18Fluorine-Fluorodeoxyglucose (18F-FDG) Positron Emission Tomography/Computed Tomography (PET/CT).

Methods: 63 lung adenocarcinoma patients with preoperative 18F-FDG PET/CT between January 2010 and December 2014 were included. Texture features are extracted automatically by using LIFEx software (University of Paris-Saclay, France), which provided texture features of gray level co-occurrence matrix, neighborhood gray-level different matrix, gray-level run length matrix and gray-level zone length matrix.

Results: Contrast (p=0.0179), dissimilarity (p=0.024), entropy (p=0.0097), HGRE (p=0.0093), HGZE (p=0.0044), LRHGE (p=0.0076), RLNU (p=0.0249), SRHGE (p=0.0105), SZHGE (p=0.014), ZLNU (p=0.011), SUVmax (p=0.0087), SUVmean (p=0.0084), SUVpeak (p=0.0105), TLG (p=0.0138) were lower in adenocarcinoma with mutant EGFR, while energy (p=0.102), homogeneity (p=0.0318), LGRE (p=0.0079), LGZE (p=0.0055), LRLGE (p=0.0084), LZLGE (p=0.037), SRLGE (p=0.0059), SZLGE (p=0.0417) were higher in adenocarcinoma of mutant EGFR. Entropy (odd ratio 0.2548, 95% CI 0.09-0.7209, p=0.01) was the independent predictor of EGFR mutation. In addition, LRHGE (hazard ratio 1.0017, 95% CI 1.0008-1.0026, p=0.0002) predicted the recurrence in lung adenocarcinoma.

Conclusion: Texture features predicted EGFR mutation in lung adenocarcinoma. In addition, LRHGE was an independent predictor of recurrence in patients with lung adenocarcinoma.

Biography

Yun Seong Kim has completed his PhD from Pusan National University and Postdoctoral studies from University of Massachusetts, USA. He is the Director of Pulmonology and Critical Care Medicine in Pusan National Yangsan Hospital. He has published more than 30 papers in reputed journals.

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