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The incremental value of 18F-FDG PET/CT in the differential diagnosis of malignant and non-malignant pericardial effusion: A large tertiary referral centre 10-year experience

Yuhua Yang

The First Affiliated Hospital of Guangxi Medical University Nanning, China

Purpose: Proper diagnosis of pericardial effusion (PE) aetiology is crucial for the treatment and prognosis of patients. We evaluated the incremental value of the non-invasive 18F-FDG PET/CT imaging modality in the etiological diagnosis of PE.

Methods: 18F-FDG PET/CT images of 84 patients with a determined etiological diagnosis of PE were retrospectively reanalyzed (45 malignant PE, 39 non-malignant PE; 50 men, 34 women; average age, 50.67 ± 11.47 years). Clinical features and 18F-FDG PET/CT characteristics were compared between patients with malignant and non-malignant PE. The correlation between SUVmax or RSUVmax and each data was calculated. Multiple 18F-FDG PET/CT data combined diagnostic model was established to identify malignant PE. The incremental values of the combined diagnostic model and 18F-FDG PET/CT parameters in differentiating malignant and non-malignant PE were evaluated.

Results: Elevated tumour biomarkers in clinical features and SUVmax, RSUVmax, pericardial thickness and FDG uptake pattern in 18F-FDG PET/CT characteristics were significantly different between the malignant PE group and the non-malignant PE group. SUVmax (r=0.796, P<0.001) and RSUVmax (r=0.739, P<0.001) had a significant positive linear correlation with pericardial thickness. The sensitivity, specificity, accuracy, positive predictive value and negative predictive value of the differential diagnosis between malignant and non-malignant PE were 93.33%, 74.36%, 84.52%, 80.77%, and 90.63% with SUVmax 3.5 as the cutoff value, while 95.56%, 71.79%, 84.52%, 79.63%, and 93.33% with RSUVmax 2.875 as the cutoff value. Pericardial thickness 8.2mm as the cutoff value, the values were 86.67%, 89.74%, 88.10%, 90.70%, and 85.37%. Combined diagnostic model 0.422 as the cutoff value, the values were 95.56%, 97.44%, 96.43%, 97.73%, and 95.00% (All P <0.05). The incremental value for identifying malignant and non-malignant PE: combined diagnostic model > pericardial thickness > SUVmax = RSUVmax.

Conclusion: The combined diagnostic model, pericardial thickness, SUVmax and RSUVmax had excellent incremental values in differentiating malignant from non-malignant PE. Non-invasive 18F-FDG PET/CT is a valuable modality to provide a great deal of information about PE and detect dormant extra-thoracic lesions, helping to identify malignancy and activinflammation of the pericardium.