

Diagnostic accuracy of cardiac computed tomography and 18F-fluorodeoxyglucose with positron emission tomography/computed tomography in cardiac masses

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Background: Understanding the nature of cardiac masses represents a challenge for clinicians in order to select the appropriate therapeutic strategies. The diagnostic accuracy of cardiac computed tomography (CT) and 18F-fluorodeoxyglucose (18F-FDG) with positron emission tomography/CT (PET/CT) in identifying the nature of cardiac masses has not been evaluated before in a large population.

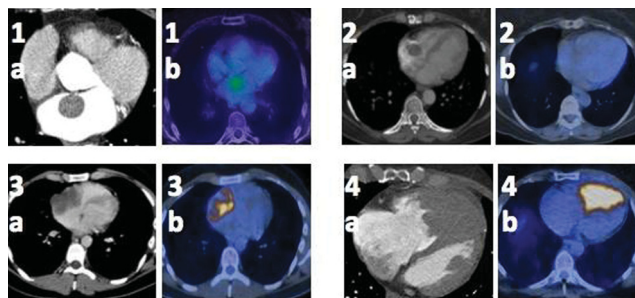
Purpose: To assess the diagnostic value of CT and 18F-FDG PET/CT in defining the nature of cardiac masses, integrating morphologic features and metabolic activity.

Methods: Out of 223 we selected a final cohort 60 patients which underwent cardiac CT scan and 18F-FDG PET/CT. All masses had histological certain, apart from thrombi, in which was defined radiologic resolution after adequate anticoagulant treatment. For each mass, eight morphologic CT signs and standardized uptake value (SUVmax, SUVmean), metabolic tumour volume (MTV) and total lesion glycolysis (TLG) in 18F-FDG PET, were evaluated.

Results: Twenty patients had benign cardiac masses and 40 patients ma-

lignant cardiac masses. Irregular tumour margins, pericardial effusion, invasions, solid nature of the mass, mass diameter, TC contrast up-take and pre-contrast characteristics were strongly associated with the malignant nature of cardiac masses ($p < 0.001$). Additionally, the presence of at least four CT signs was able to discriminate malignancies, with sensitivity of 95% and specificity of 95% (AUC=0.988, 95% CI 0.969–1). The mean value of SUVmax, SUVmean, MTV and TLG was significantly higher in malignant cardiac masses than in benign lesions ($p < 0.001$). ROC curve for diagnostic accuracy of 18F-FDG PET/CT parameters in detecting malignant lesions showed an excellent performance of SUV (AUC=0.948, 95% CI 0.891–1), MTV (AUC=0.928, 95% CI 0.841–1) and TLG (AUC=0.961, 95% CI 0.902–1).

Conclusions: In patients with cardiac masses, cardiac computed tomography and 18F-FDG PET/CT findings provide independent and incremental prognostic information regarding their nature. A systematic use of CT and 18F-FDG PET/CT is therefore useful for diagnostic and therapeutic purposes.



PET-CT evaluation of cardiac masses