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Volume-based quantification using dual-energy computed tomography in patients with cardiac tumors: Comparison with late gadolinium enhancement cardiac magnetic resonance imaging

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It is clinically important to differentiate cardiac tumors from cardiac thrombi because of the difference in therapeutic approaches for these two pathologies. The purpose of this study was to assess the diagnostic value of a volume based quantification using dual-energy Cardiac Computed Tomography (CCT) for differentiating between cardiac tumors and thrombi and to compare quantitative CCT values with late gadolinium enhancement Cardiac Magnetic Resonance (LGE-CMR) parameters. We prospectively enrolled 31 patients who had a cardiac mass on echocardiography or computed tomography (CT). All patients underwent dual-energy CCT (GE HD750) and 20 patients underwent LGE-CMR imaging. For quantitative analysis, the following parameters of the cardiac masses were measured: CT attenuation values in Hounsfield units (HU), iodine concentration (IC, mg/ml), and signal intensity (SI) ratio. A mixed effective model was used to evaluate the significance of differences in mean CT attenuation values, mean iodine concentration, and SI ratios between the cardiac tumor and thrombus groups. Diagnostic performance of each parameter was evaluated by a receiver operating characteristics (ROC) curve. There were a total of 17 cardiac tumors and 15 cardiac thrombi. The mean iodine concentration (mg/ml) was significantly higher in cardiac tumors than cardiac thrombi (3.405±2.624 for cardiac tumors; 2.056±2.793 for cardiac thrombi, p=0.001). The diagnostic performance of the IC and SI ratio for differentiating cardiac tumors from thrombi was not significantly different (AUC; 0.822 vs. 0.945, p=0.084). Dual-energy CCT using volume-based iodine measurements can be used to differentiate between cardiac tumors and thrombi.

Biography

Jin Hur is an Associate Professor of Radiology at Yonsei University College of Medicine. He has completed his PhD in 2010 in Yonsei University College of Medicine. He is now a Visiting Faculty in the Department of Radiology of Stanford University School of Medicine. He has published more than 50 papers in reputed journals.

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