

2023 臺中榮民總醫院國際醫學研討會

TCVGH International Medical Conference

10.28-29 | 09:00-16:30 | 研究大樓、教學大樓、第二醫療大樓 |



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Cardiac MRI in the Diagnosis and Management of Nonischemic Cardiomyopathy

Abstract :

Cardiac Magnetic Resonance Imaging (CMR) is highly recommended for the evaluation of cardiomyopathies according to the 2021 European Society of Cardiology (ESC) guidelines. It provides accurate measurements of ventricular volumes and function, especially when echocardiograms are equivocal. Late gadolinium-enhanced MRI differentiates ischemic from non-ischemic cardiomyopathies by showing myocardial fibrosis. In dilated cardiomyopathy, midwall fibrosis predicts risks such as ventricular arrhythmias and sudden cardiac death. Recent advances in CMR allow detailed analysis of myocardial properties. Measurements such as native T1 and extracellular volume (ECV) fraction are key to the diagnosis of secondary myocardial disease. Fabry disease often shows reduced native T1 relaxation time. In contrast, amyloidosis shows increased native T1 and ECV. In dilated cardiomyopathy, native T1 and ECV provide insight into the extent of myocardial fibrosis and potential cardiac events. T2 mapping is an indicator of myocardial edema and is critical in conditions such as myocarditis. However, it's important to standardize CMR mapping for wider, consistent use because T1 values can vary depending on MR equipment and techniques.