

Issue & Updates in Myocardial & Pericardial Disease
Acute & Fulminant Myocarditis

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'Myocarditis' is referred to a disease status characterized by inflammation of myocardium. Dallas criteria have been frequently cited for the diagnosis criteria of myocarditis and this differentiates active myocarditis and borderline myocarditis according to the histologic evidence of inflammatory cell infiltration and myocardial damage. However, invasiveness of endomyocardial biopsy and low sensitivity of Dallas criteria raised concerns about its clinical usefulness by many experts.

Acute and fulminant myocarditis is clinicopathologic classification using both pathologic and clinical features and well correlated with disease courses and prognostic information. Fulminant myocarditis is referred to a condition of acute and very severe heart failure following a relatively distinct viral prodromal period, which is usually less than one or two weeks. Patients usually have severe hemodynamic collapse and may require mechanical circulatory support. Many experts use the term 'fulminant' when patients needed higher doses of inotropics (usually more than 5 mg/kg/min of dobutamine or dopamine or other inotropics of equivalent doses). Multiple lymphocytic infiltrations are found consistently if endomyocardial biopsy is performed in timely manner. Interestingly long term prognosis is exceptionally good and ventricular systolic dysfunction usually normalized if patients survive the acute phase of the illness. Recent advance in the management of fulminant myocarditis depends on the advances and technical improvement of mechanical circulatory support during acute critically-ill patients. According to a recent analysis, the minimum and maximum rates of survival to hospital discharge were 60.0% and 87.5%, respectively when veno-arterial extracorporeal membrane oxygenation (VA-ECMO) was applied. In other hands, acute myocarditis is characterized as an acute heart failure with a less distinct onset of illness, persistent ventricular systolic dysfunction, and may have a potential to progression to dilated cardiomyopathy. However, since sensitivity of myocardial biopsy is quite low due to the patchy nature of the inflammatory infiltrates in the myocardium and the reluctance of clinicians to perform an invasive diagnostic procedure, acute myocarditis is frequently underdiagnosed. Actually it is frequently very challenging to diagnose in case if myocardial biopsy is delayed or myocardial inflammation is located predominantly in LV epicardial site. For these reasons, current diagnosis criteria for acute myocarditis include evidence of myocardial inflammation and damages backed up by various biochemical markers and cardiac imaging. Among the various imaging modalities, cardiac magnetic resonance imaging (CMR) has been proven to be useful in detection of various features of myocarditis, including inflammatory hyperemia and edema, myocyte necrosis and fibrosis, regional and global wall motion abnormalities, and identification of accompanying pericardial effusion. However, CMR has clinical limitation in critically-ill subjects like patients with fulminant myocarditis. Thus echocardiography is most useful method of detecting

and differentiating fulminant myocarditis. Typically echo findings of fulminant myocarditis are characterized by near normal left ventricular diastolic dimensions and mildly increased interventricular septal thickness, while those of acute myocarditis are normal or increased left ventricular diastolic dimensions and normal or increased septal thickness.

Finally, fulminant myocarditis can be accompanied by pericardial tamponade, malignant arrhythmia and biventricular failure, bedside evaluation and continuous monitoring is absolutely indicated and prompt initiation of invasive mechanical support is required for the patients to survive critical hemodynamic instability. In this review, I would like to demonstrate typical and interesting cases of fulminant and acute myocarditis and show role of cardiac imaging for the diagnosis and management of myocarditis.