Cardiac Sarcoidosis and Arrhythmogenic Right Ventricular Cardiomyopathy—Potential Differential Diagnoses for Arrhythmogenic Ventricular Cardiomyopathy

Fumio Terasaki¹ ² and Nobukazu Ishizaka²

Key words: arrhythmogenic right ventricular cardiomyopathy, isolated cardiac sarcoidosis, differential diagnosis

(Intern Med 55: 1041-1042, 2016)

DOI: 10.2169/internalmedicine.55.6422

Arrhythmogenic right ventricular cardiomyopathy (ARVC) is characterized by the pathological fibrofatty replacement of the myocardium that leads to right ventricular (RV) dysfunction and life-threatening arrhythmia (1). The diagnostic criteria for ARVC have been advocated by an International Task Force (2). Structural changes may be absent or subtle and confined to a localized region of the RV in the early stage of the disease, but commonly progress to more diffuse right ventricular disease and left ventricular (LV) involvement (3, 4). Clinical manifestations vary with age and with the stage of disease (5); individuals are often asymptomatic in the early ‘concealed phase’, but may nonetheless be at risk of sudden cardiac death during exertion (6).

In this issue of Internal Medicine, Yoshihara et al. (7) reported a unique case of ARVC in which dynamic T-wave changes were documented during the clinical course. Notably, in this case, cardiac magnetic resonance imaging (MRI) showed late gadolinium enhancement (LGE) at the LV mid-portion. Yoshihara et al. discussed how LV involvement preceded the evident onset of significant RV dysfunction, a condition that may correspond to the under-recognized clinical entity “left-dominant arrhythmogenic cardiomyopathy” (5).

Indeed, ARVC may manifest various clinicopathological abnormalities; however, we cannot ignore the fact that some patients who are initially diagnosed with or suspected to have ARVC based on the guideline criteria are eventually diagnosed with cardiac sarcoidosis (8-10). For example, Vasiaiwala et al. demonstrated in their prospective study that, among 20 patients with suspected ARVC, cardiac sarcoidosis was histologically found in three (15%) (10). In addition, Philips et al. demonstrated that, among patients (mis)diagnosed with ARVC, the presence of certain electrocardiographic abnormalities (e.g., PR prolongation, high-degree atrioventricular block on electrocardiography), LV dysfunction, LGE of the interventricular septum, and mediastinal lymphadenopathy may raise the possibility of cardiac sarcoidosis (11). These findings suggest that the above-mentioned diagnostic criteria for ARVC may not completely discriminate ARVC from cardiac sarcoidosis.

Sarcoidosis is, however, a systemic disease that may affect various organs and frequently presents with bilateral hilar lymphadenopathy, pulmonary infiltrates, and ocular and skin lesions (12). Cardiac involvement (cardiac sarcoidosis), which is a major cause of mortality, is reported to occur in 25% to 60% of patients with systemic sarcoidosis (13, 14). The following question then arises: Can one distinguish ARVC from cardiac sarcoidosis by the presence or absence of other organ involvement? The situation may not be that simple - cardiac sarcoidosis that is not accompanied by sarcoidosis in other organs has been gathering increasing attention as a condition termed “isolated cardiac sarcoidosis” (15, 16). For patients with isolated cardiac sarcoidosis, it is possible that sarcoidosis lesions are in fact present in other organs, but at a clinically undetectable level. In addition, the heart may be the primary organ involved, but the sarcoidosis lesions may spread to other organs over time; in the latter case, if it occurs at all, the actual location affected by sarcoidosis may not reside exclusively in the heart. Regardless, the point is that the differential diagnosis between ARVC and isolated sarcoidosis in cases with electrocardiographic abnormalities and cardiac remodeling, such as the case of Yoshihara et al., may be challenging. Histopathological findings of sarcoid granuloma in the heart confirm a diagnosis of cardiac sarcoidosis; unfortunately, however, the sensitivity of endomyocardial biopsies is reported...
to be less than 20%.

Steckman et al. reported that several morphological features, such as a left ventricular septal scar, and the presence of mediastinal lymphadenopathy may increase the likelihood of cardiac sarcoidosis (17). In their study, all patients were diagnosed with ARVC and, notably, 19 (48%) of 40 patients diagnosed with cardiac sarcoidosis had RV involvement. In their study, when sole LV involvement was present, the possibility of ARVC was excluded. However, it can be imagined that, if left-dominant arrhythogenic cardiomyopathy is taken into consideration, the differential diagnosis will not be so straightforward.

Several recent studies have demonstrated the utility of MRI and 18F-fluorodeoxyglucose positron emission tomography (18F-FDG PET) in diagnosing isolated cardiac sarcoidosis (9, 14-16, 18-20). In addition, 18F-FDG PET imaging may provide useful information regarding disease activity and responsiveness to therapy, as well as the prognosis of cardiac sarcoidosis (21). By contrast, little information is available regarding the pattern of 18F-FDG PET among patients with ARVC. Tung et al. reported in a recent study that nearly half of the patients referred with unexplained cardiomyopathy and ventricular arrhythmia demonstrated ongoing focal myocardial inflammation on 18F-FDG PET (22). Thus, for the purpose of not only differential diagnosis from isolated cardiac sarcoidosis, but also the assessment of disease activity and extent of myocardial involvement, greater knowledge should be accumulated regarding the 18F-FDG PET findings in patients with a presumed diagnosis of ARVC and cardiac sarcoidosis.

On one hand, we now know that cardiac sarcoidosis may exert a phenotype only in the heart (i.e., isolated cardiac sarcoidosis). On the other hand, it seems that we are still halfway along the road to defining the criteria for the optimal diagnosis of isolated cardiac sarcoidosis and ARVC. We may have to make a more accurate differential diagnosis between these two clinical entities, not only because their clinical appearances may resemble each other, but also—and above all else—their therapeutic strategies may differ.

The authors state that they have no Conflict of Interest (COI).

References


© 2016 The Japanese Society of Internal Medicine
http://www.naika.or.jp/imonline/index.html