Left ventricular hypertrophy: Cardiac magnetic resonance may help differentiate amyloidosis from hypertrophic cardiomyopathy

Hypertrophie ventriculaire gauche : l’IRM cardiaque différencie l’amylose cardiaque de la myocardopathie hypertrophique

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Cardiac amyloidosis is rare, but when diagnosed it has an urgent and specific treatment. Two patients with similar concentric left ventricular hypertrophy on echocardiography were investigated with cardiac magnetic resonance (CMR) to differentiate cardiac amyloidosis from hypertrophic cardiomyopathy.

In the setting of hypertrophic cardiomyopathy, early hyperenhancement occurs around 200 ms, comparable to normal (Fig. 1, arrows in top and middle rows). Late myocardium enhancement is characterized by multiple non-specific interstitial nodules within the hypertrophic myocardium suggesting interstitial fibrosis. When a diagnosis of cardiac amyloidosis is established, CMR demonstrates late subendocardial enhancement on delayed images associated with a short inversion time, around 150 ms (Fig. 1, arrow in bottom row).

The inversion time is assessed according to the Ti scouting technique (Look Locker sequence), which estimates the normal myocardial Ti relaxation time. Briefly, 10 to 15 minutes after gadolinium injection, the same short-axis T1-weighted sequence is acquired sequentially, typically around 50 ms. The inversion time is chosen visually when the myocardium turns black. It is dependent on the dose of gadolinium injected, the time elapsed between gadolinium injection and imaging, and the patient. The normal inversion time ranges from 250 to 300 ms, and normally shortens in patients with cardiac
Figure 1. CMR short axis view at papillary muscle level showing shortened inversion-time in cardiac amyloidosis. HCM: hypertrophic cardiomyopathy.

amyloidosis, which is not observed with the other types of left ventricular hypertrophy.

CMR could therefore be a non-invasive alternative to myocardial biopsy to diagnose cardiac amyloidosis, with a sensitivity of 100% when the analysis is combined with an electrocardiogram and echocardiography. Moreover, in amyloidosis, CMR is useful for following up patients (T1 correlates with left ventricular mass, thickness and systolic function) and to evaluate the response to chemotherapy.

Conflicts of interest and disclosures

None.