Abstract: P395

Not all pericardial thickening is effusion: usefulness of CMR in the characterization of epicardial lipomatous hypertrophy

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Topic(s):
Cardiac Magnetic Resonance: Pericardium

Citation:
European Heart Journal - Cardiovascular Imaging (2019) 20 (Supplement 2), ii306

A 77 year old man with no history of cardiac disease was referred because of exertional dyspnea. A few days ago he was admitted in the emergency department because of odynophagia and chest pain. Echocardiography initially reported a moderate sized global pericardial effusion. Subsequent review suggested that the features may associate pericardial thickening. Cardiovascular magnetic resonance imaging was performed for clarification. A thick layer of epicardial tissue, measuring up to 22 mm deep, was seen to surround the myocardium on (SSFP) cine images. The interatrial septum was slightly thickened (9 mm), with sparing of the fossa ovalis, and had a focal high signal intensity.

On both SSFP and T1-VIBE-Dixon in-phase images, signal intensity was high, identical to that from subcutaneous fat. T1-VIBE-Dixon out-of-phase images showed chemical shift artefact but no cancellation of the epicardial tissue, demonstrating the presence of macroscopic fat. T1-VIBE-Dixon water (equivalent to a fat-suppressed image) as well as native T1 mapping confirmed the epicardial and interatrial septal tissue to be fat. Native T1 mapping of the myocardium showed normal values. No gadolinium was administrated because of severe renal insufficiency. The pericardium itself was also thickened (10 mm) with mild pericardial effusion. STIR and T2 mapping sequences (values 65-80 ms) demonstrated edematization of the pericardium. A diagnosis of epicardial lipomatous hypertrophy with concomitant pericarditis was made.

In the presented case, cine imaging demonstrated normal right heart and caval appearances, and on real-time, compressed sensing free-breathing imaging, ventricular septal motion was seen to be normal, all of which suggested reassuring cardiac filling physiology.

The epicardial surface of the lipomatous tissue was also separately contoured to calculate the mass of lipoma: after subtracting the biventricular volumes and muscle volumes from the surrounding lipoma (green) contour, the remaining volume was multiplied by the specific gravity of fat (0.9) to calculate an approximate fat mass of 117g/m2, twice the combined ventricular mass.

Cardiac lipomatosis is characterized by the accumulation of nonencapsulated mature adipose tissue caused by hyperplasia of lipocytes. The most frequent manifestation is lipomatous hypertrophy of the interatrial septum. Massive epicardial lipomatous hypertrophy is less well documented. Although histologically benign, it has been reported to cause cardiac tamponade, requiring decompressive pericardiectomy.

These case highlights the possibility of mistaking epicardial lipomatous hypertrophy for pericardial effusion on echocardiography. The tissue characterization provided by CMR allowed the diagnosis to be made, avoiding the need for invasive investigation or unnecessary intervention. The functional data provided by CMR suggested that the epicardial lipomatous hypertrophy was not affecting cardiac function.
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