

Use of Three-Dimensional Computed Tomography to Image Archived Fatty Tissue of Arrhythmogenic Cardiomyopathy

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The left ventricular (LV) phenotype of arrhythmogenic cardiomyopathy (ACM) is widely recognized. However, clinical evaluation of LV lesions cannot be performed using the Task Force Criteria (TFC). Recently, we reported an LV-dominant ACM case diagnosed with the 3-dimensional (3D) fatty images of computed tomography (CT).¹ CT is commonly used to detect fatty tissue (FT), but the usefulness in diagnosing ACM has not been confirmed.

A 67-year-old man with ACM was evaluated. His ECG profile met the TFC, but neither family history nor genetic etiology was evident. Late gadolinium enhancement (LGE) of magnetic resonance imaging revealed large areas of enhancement running from the mid-layer to the epicardium of the LV, interventricular septum (IVS), and right ventricular (RV) wall (Figure A; Supplementary Movie 1). Contrast-enhanced ECG-gated CT using a 64-row detector scanner revealed low-density FT in both ventricles (Figure B). The archived CT scans were reconstructed by coloring the FT (<50 Hounsfield units) and then subtracting the contrast-enhanced region (Figure C; Supplementary Movie 2). On postmortem analysis, RV dilatation, thinning of the LV wall, and biventricular FT were evident (Figure D). The FT presented as low-density areas on contrast-CT images and as colored regions on 3D-CT. The histopathologic findings revealed massive FT infiltration and mild fibrosis

in the RV wall (Figure E), and moderate fibrofatty replacement in the IVS (Figure F). FT infiltration and mild-to-moderate fibrosis were apparent on the LV epicardial side (Figure G). This case (featuring CT-based fatty imaging) highlights the importance of a radiologic/pathologic comparison when seeking a rational diagnosis of ACM.

Conflict of Interest

None.

Disclosures

N.H. is a member of *Circulation Journal's* Editorial Team.

Reference

1. Imamura Y, Nagara K, Uto K, Kimura Y, Nagao M. Use of 3D computed tomography to image fatty tissue: A case of left-dominant arrhythmogenic cardiomyopathy. *Eur Heart J Cardiovasc Imaging*, doi:10.1093/ehjci/jeaa419.

Supplementary Files

Supplementary Movie 1. LGE-MRI.

Supplementary Movie 2. 3D-CT.

Please find supplementary file(s);
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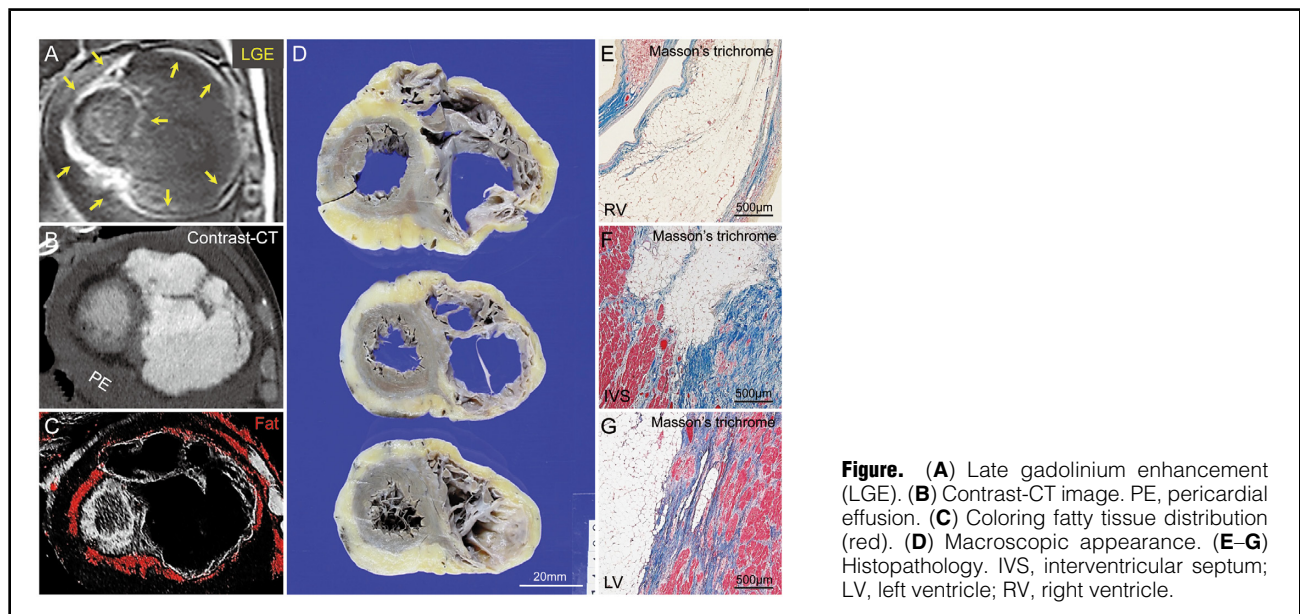


Figure. (A) Late gadolinium enhancement (LGE). (B) Contrast-CT image. PE, pericardial effusion. (C) Coloring fatty tissue distribution (red). (D) Macroscopic appearance. (E–G) Histopathology. IVS, interventricular septum; LV, left ventricle; RV, right ventricle.