

# Complete regression of multiple biventricular thrombi in dilated cardiomyopathy: the role of cardiovascular magnetic resonance imaging for diagnosis and assessing treatment response

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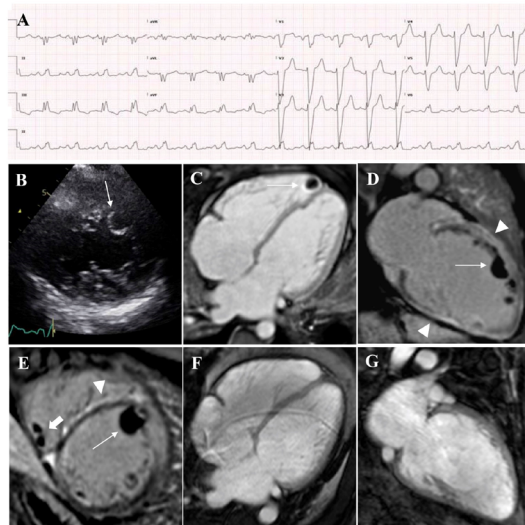
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## DESCRIPTION

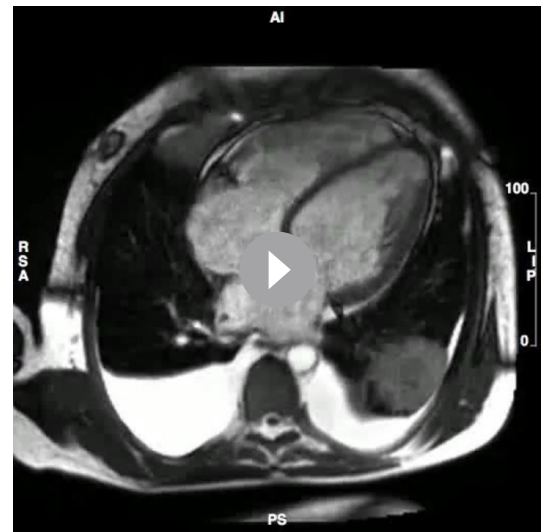
A 40-year-old man presented with a 7-day history of progressive breathlessness, orthopnoea and peripheral oedema. He had a history of excess alcohol intake, cannabis use and learning difficulties. The electrocardiogram revealed left bundle branch block (figure 1A).

Transthoracic echocardiography revealed severely impaired biventricular function associated with a 'cystic' left ventricular mass (figure 1B). There was no evidence of pulmonary or systemic embolism. Warfarin was initiated for suspected thrombus with bridging low molecular-weight heparin.

Cardiovascular magnetic resonance (CMR) imaging to assess heart failure aetiology showed



**Figure 1** (A) The 12-lead ECG showing sinus rhythm with complete left bundle branch block; (B) transthoracic echocardiography parasternal short axis view, depicting a 'cystic' left ventricular mass (arrow); (C) four-chamber long axis image of cardiovascular magnetic resonance (CMR) with early gadolinium enhancement (EGE) demonstrating a round right ventricular apical thrombus (arrow); (D and E) two-chamber long axis and mid short axis CMR images with late gadolinium enhancement showing multiple thrombi adjacent to the anterior left ventricular wall (arrow) and right ventricular free wall (small arrow); there is also extensive subepicardial late gadolinium enhancement (arrowheads); (F and G) four-chamber and two-chamber long axis CMR images with EGE showing complete resolution of biventricular thrombi after 1 year.



**Video 1** Cardiovascular magnetic resonance four-chamber long axis cine

severe biventricular dilatation and dysfunction (ejection fraction approximately 20%) with hypertrabeculation in the range of non-compaction (video 1). Early and late gadolinium imaging confirmed the presence of multiple left ventricular thrombi as well as right ventricular thrombi and extensive subepicardial late gadolinium enhancement (figure 1C–E).

The patient was discharged on warfarin and guideline-based heart failure medication. After 8 months of poor international normalised ratio (INR) control due to erratic compliance, off-label rivaroxaban was initiated. Repeat CMR after a year showed complete resolution of the thrombi despite persistent severe left ventricular dysfunction (figure 1F,G).

## Learning points

- ▶ The occurrence of biventricular thrombi in the setting of dilated cardiomyopathy is rare.
- ▶ The detection of apical left ventricular thrombi and right ventricular thrombi might be difficult using echocardiography.
- ▶ Cardiovascular magnetic resonance is key for making a correct diagnosis and guiding management, especially in the context of off-label use of direct oral anticoagulants.

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The occurrence of multiple biventricular thrombi in the setting of dilated cardiomyopathy is rare and the reported cases are usually associated with other risk factors—hypertrabeculation associated with dilated cardiomyopathy in this patient. CMR is the gold standard for tissue characterisation. In this case, it identified not only one, but multiple biventricular masses. Early and late gadolinium enhancement confirmed they were thrombi. CMR was, therefore, key for diagnosis, guiding management and monitoring of therapeutic efficacy.

**Contributors** MK was responsible for the conception and design of the work. MF was directly involved in patient imaging and was responsible for collecting the data

and drafting the manuscript. KS was directly involved in the care of the patient. Both MK and KS revised the final version of the manuscript that was approved by all authors.

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