Left ventricular diverticulum: incidental finding of a rare congenital cardiac abnormality

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A 60-year-old female attended her local hospital with a 2-week history of crescendo exertional angina. This was with a background of mild coronary artery disease diagnosed in 2012.

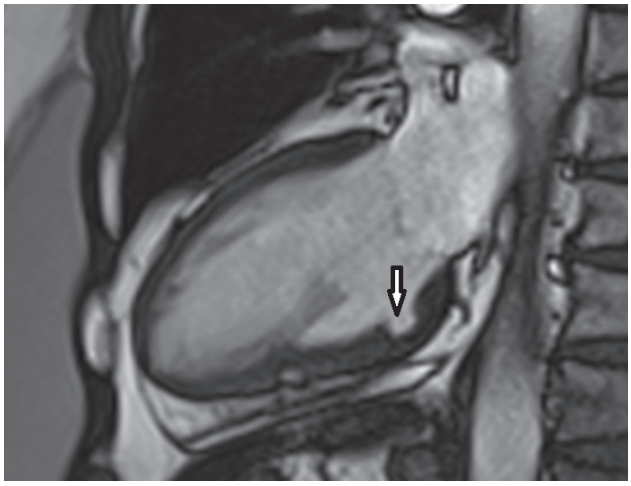
Clinical examination was unremarkable. She was kept in overnight; serial ECGs and troponin T were normal. Her beta-blocker dose was increased and ranolazine added. She was allowed home the following day with plans for an outpatient dobutamine stress echocardiogram (DSE).

Unfortunately, despite using left ventricular opacification contrast, echo image quality was suboptimal because of bilateral breast implants so the DSE was not performed. Instead a stress perfusion cardiac MRI (CMR) was arranged. This showed normal cardiac function with no inducible reversible ischaemia or scar; an incidental small basal left ventricular diverticulum (LVD) was noted in the inferior wall (Figures 1 and 2). No other abnormal features were seen to suggest Cantrell syndrome. Twelve months' follow-up was unremarkable with no reported adverse events.

Congenital LVD is a rare cardiac malformation, first described by O'Bryan in 1838.[1] Over the years the prevalence has increased from 0.4% to 2.2% due to the evolving and increased availability of CT and MRI technology.[2]

LVD may be isolated or associated with midline thoracoabdominal congenital abnormalities, known as Cantrell syndrome.[3] Two common types have been described in the literature. The muscular type, which is often associated with other congenital defects, is usually found at the LV apex and comprises mainly muscular fibres that contract synchronously with the ventricle. The other type is the fibrous

Figure 1 Two chamber long axis cine



diverticulum, composed of mostly fibrous tissue with a wide base and often situated at the inferior or basal surface of the ventricle, that can be easily mistaken for a LV aneurysm.[4,5] Its close morphological appearance to a LV aneurysm poses a diagnostic dilemma for the clinician. Therefore, distinction between these entities is of prime importance to guide proper management as the prognosis differs substantially. Usually a small muscular diverticulum with a preserved contraction in an asymptomatic patient has minimal clinical relevance compared to a fibrotic diverticulum and LV aneurysm that can lead to systemic embolisation, ventricular wall rupture, ventricular tachycardia or sudden cardiac death.[6]

CMR plays a unique role in distinguishing various types of outpouchings. It allows for combined evaluation of morphological features, tissue characterisation and regional

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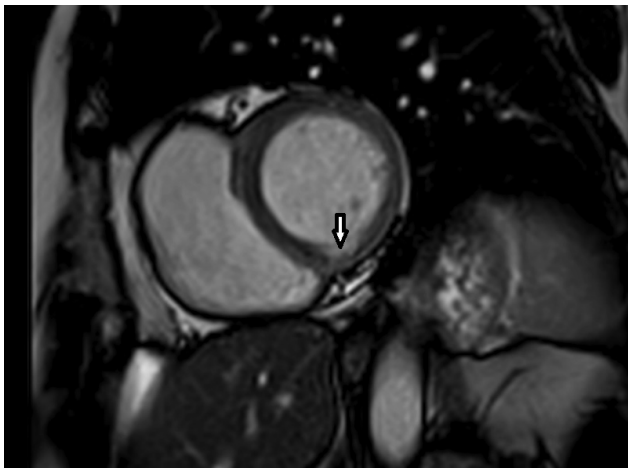
Figure 2 short-axis cine snapshots showing muscular diverticulum in the basal inferior segment of the left ventricle in diastole



wall motion. LVD displays synchronous contractility without enhancement on late gadolinium-enhanced sequences. On the other hand, LV aneurysm appears as a thinned wall outpouching structure usually in the coronary artery territory, with dyskinetic motion and enhancement on delayed post-contrast images. Thus, CMR helps clinicians make an accurate diagnosis, guides appropriate management and has led to a better understanding of the natural history of this rare condition. Close clinical follow-up is usually enough in such cases, and further management should be based on associated abnormalities and potential complications.

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