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Cardiovascular magnetic resonance imaging in an incidental case of a left anterior descending coronary artery–left ventricular fistula

Yukun Cao[1,2], Yumin Li[1,2†], Xiaoqing Liu [1,2*†], and Heshui Shi [1,2]

[1]Department of Radiology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430022, China; and [2]Hubei Province Key Laboratory of Molecular Imaging, Wuhan 430022, China

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A 53-year-old male was admitted to our hospital because chest computed tomography (CT) examination revealed left ventricular (LV) apex aneurysm-like lesion. One month ago, he was diagnosed with late-stage rectal cancer due to experiencing diarrhoea and haematochezia. He had no history of coronary artery disease or chest trauma and had no cardiovascular symptoms. The electrocardiogram showed normal sinus rhythm with negative T-waves in leads V3 and V4. The T_1-weighted black blood magnetic resonance imaging (MRI) revealed a dilation in the left anterior descending coronary artery (LAD) with an inner diameter of 10 mm (*Panels A–C*, arrowhead), along with an observed aneurysm measuring 48 × 42 mm (*Panels A–C*, asterisk). Balanced steady-state free procession cine MRI showed flow between the proximal segment of the LAD and the aneurysm sac (*Panel D*; see Supplementary material online, *Video S1*). Furthermore, simultaneous flow between the ventricular apex and the aneurysm sac was observed (*Panels E* and *F*; see Supplementary material online, *Videos S2* and *S3*). First-pass perfusion MRI showed almost simultaneous visualization of the dilated LAD and aneurysm sac (*Panels G–I*; see Supplementary material online, *Video S4*). Late gadolinium enhancement showed diffuse subendocardial enhancement surrounding the aneurysm sac (*Panels J* and *K*). Multiplanar reconstruction MRI showed a branch of dilated LAD directly draining into the aneurysm (*Panel L*). Furthermore, coronary CT confirmed LAD–LV fistulas with LV apical aneurysm and excluded any other coronary artery lesions (see Supplementary material online, *Figure S1*). Surgical repair was not considered at the time because of a history of late-stage rectal cancer.

The LAD–LV fistula with LV apical aneurysm is an extremely rare condition and associated with various causes, such as acquired disorders, iatrogenic factors, traumatic injuries, or congenital issues. Due to the increased blood flow resulting from the presence of the fistula, the affected coronary artery undergoes dilation and develops tortuosity. We speculated that coronary artery steal led to the development of ischaemia and infarct in the LV apex segment perfused by the coronary artery distal to the fistula. Coronary CT is a key test to assess the coronary anatomy and any associated coronary artery disease. However, cardiac MRI has unique advantages over CT in the assessment of myocardial viability, function, and haemodynamics.

* Corresponding author. Tel: +86 13419680032, Email: lxq_xh@163.com
† These authors contributed equally to the study and share co-senior authors.
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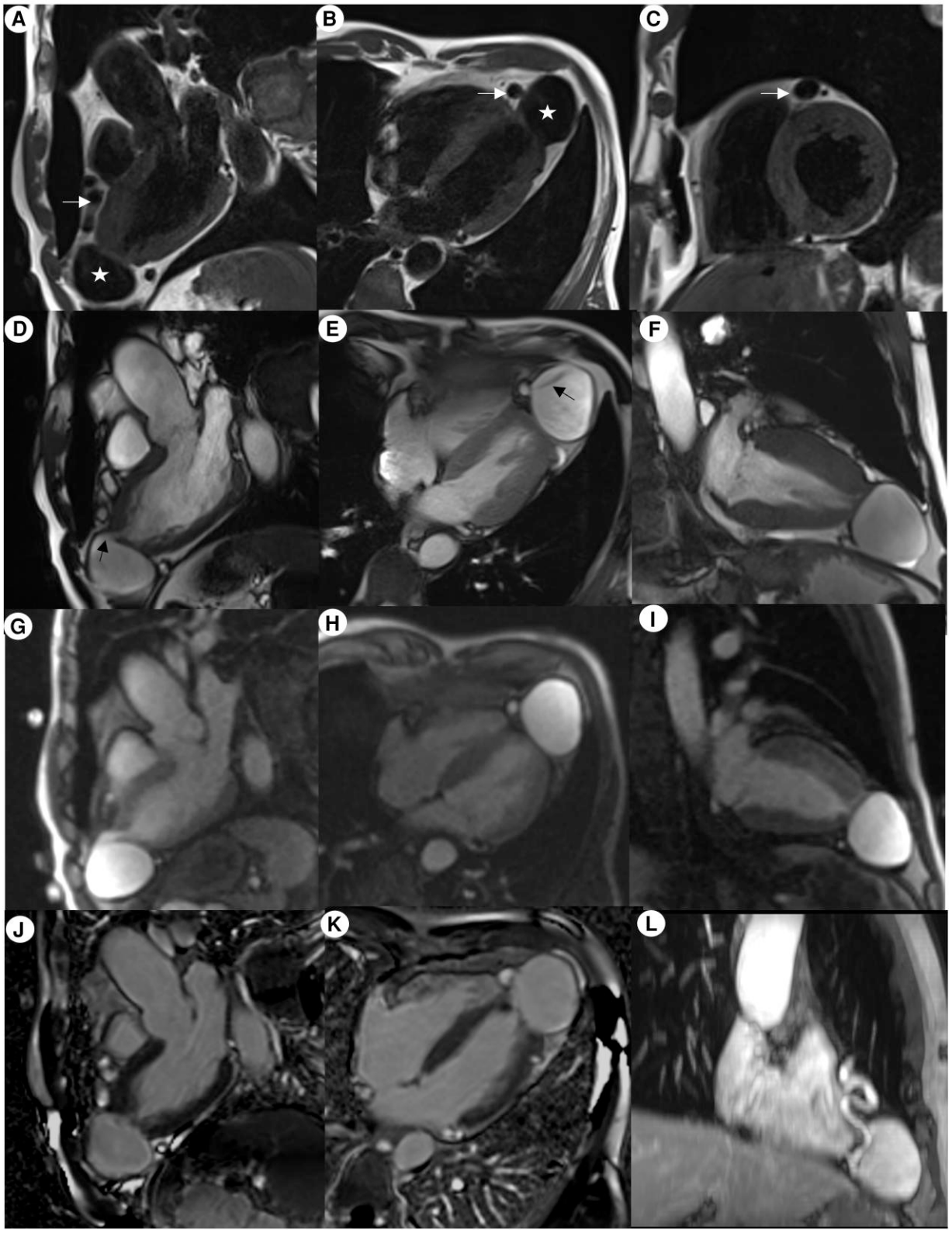
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Supplementary material

Supplementary material is available at *European Heart Journal – Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this case report, including images and associated text, has been obtained from the patient in line with COPE guidance.

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Data availability

Data will be made available upon request.