

# Multimodal cardiac imaging of a postinfarction subvalvular left ventricular aneurysm

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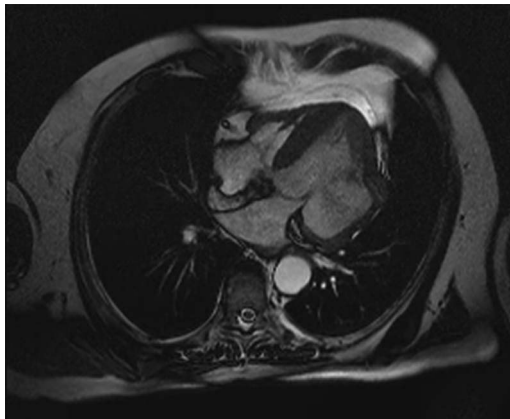
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## DESCRIPTION

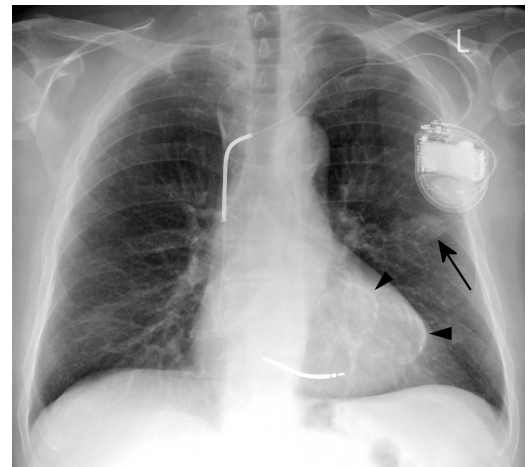
A 61-year-old smoking patient presented with left-sided heart failure. Chest X-ray showed cardiac calcifications. Cardiac MRI confirmed a basolateral left ventricular aneurysm, of size 4.5×3.3 cm, with turbulent flow inside (**video 1**). Besides a thick hypointense fibrous mural scar (**figure 1**, arrow), there was late gadolinium enhancement of the remaining non-contractile thinned myocardium (**figure 1**, arrowheads), consistent with residuals of a transmural infarction. Coronary angiography revealed proximal occlusion of the left circumflex artery. Owing to recurrent ventricular tachycardia,

the patient received an implantable cardioverter-defibrillator. He decided against aneurysmectomy.

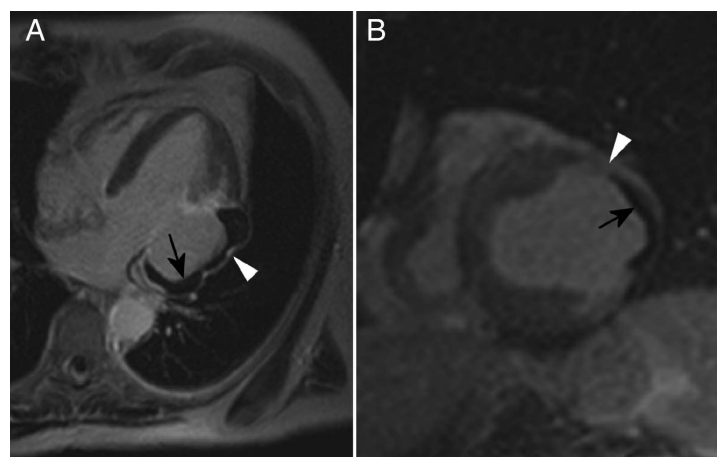
Seven years later, lung cancer was incidentally detected (**figure 2**, arrow). Positron emission tomography (PET) with CT (<sup>18</sup>F-fluorodeoxyglucose PET/CT) depicted the cancer (**figure A**, arrow) and indicated no metastases. The transmural infarction region showed no glucose metabolism (**figure 3B**, arrowheads) whereas the other left ventricular myocardium was viable. CT scan confirmed the aneurysm's hypodense fibrous scar (**figure 3C**, arrow) and the peripheral calcifications (**figure 3C**, arrowheads). In comparison to the previous MRI



**Video 1** MRI cine sequence of the four-chamber view showing the akinetic aneurysm with turbulent flow inside. The basolateral left ventricular aneurysm extended near to the mitral valve.



**Figure 2** Chest X-ray. At follow-up the chest X-ray incidentally showed a shadowing that turned out being lung cancer (arrow). The calcifications of the left ventricular aneurysm are also visible (arrowheads).

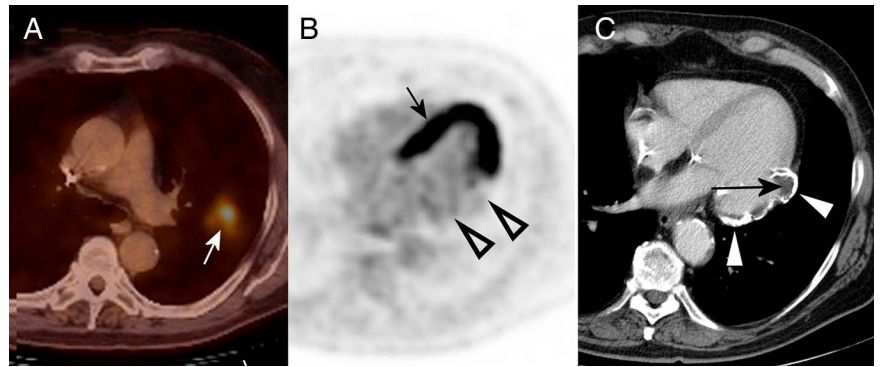


**Figure 1** Cardiac MRI. (A) Four-chamber view and (B) short-axis view of gadolinium-enhanced cardiac MRI. These images show the basal anterolateral to posterolateral left ventricular aneurysm that extended up to the mitral valve. Besides a thick hypointense fibrous mural scar (arrows) there was late gadolinium enhancement of the remaining thinned myocardium (arrowheads).



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**Figure 3** Positron emission tomography (PET) with CT ( $^{18}\text{F}$ -FDG PET/CT) showing the lung cancer (A, arrow) and indicated no metastases. The cardiac transmural infarction region showing no glucose metabolism at PET (B, arrowheads) whereas the other left ventricular myocardium was viable (B, arrow). CT confirmed the aneurysm's hypodense fibrous mural scar (C, arrow) and the peripheral calcifications (C, arrowheads).



the aneurysm's size was unchanged. The lung cancer was resected and has not recurred so far.

These multimodal images show different characteristics of a left ventricular aneurysm.<sup>1 2</sup> About 95% of such aneurysms result from myocardial infarction.<sup>1</sup> They mostly have an anterior/apical location, whereas the presented location is less frequent.<sup>3 4</sup> If the aneurysm's wall is thin then its risk of rupture is increased. Such rupture can be prevented by surgery that may also improve cardiac function.<sup>5</sup> The incidence of ventricular arrhythmia is increased and the aneurysm may be a source of arterial thromboembolism.

### Learning points

- ▶ Most cardiac ventricular aneurysms result from transmural infarction.
- ▶ Left ventricular postinfarction aneurysms have different imaging features, such as a fibrous non-vital mural scar and occasionally peripheral calcifications.
- ▶ These aneurysms have a risk to rupture and the incidence of ventricular arrhythmia is increased; these may be a source of arterial thromboembolism and can be treated by surgery that can also improve cardiac function.

In this patient, the lung cancer was not directly related to the cardiac aneurysm. However, both of the different diseases may have had smoking as the common aetiology. Possibly the smoking has caused (1) coronary artery disease with subsequent myocardial infarction and formation of the cardiac aneurysm and (2) the lung cancer that occurred several years after the cardiac aneurysm.

**Contributors** JM is the guarantor of the study and responsible for the overall content. JM and COS contributed to conception and design of the work, interpreted clinical data, drafted the article and revised it critically for important intellectual content, and approved the final version to be published.

**Competing interests** None.

**Patient consent** Obtained.

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