Left ventricular pseudoaneurysm

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Case presentation

A 75-year-old man was found to have an unexplained mass attached to the posterior LV on transthoracic echocardiogram (Figures 1–3). He had previously had an inferior-posterior MI several years ago. A CTPA scan carried out at around the same time to investigate breathlessness had shown no evidence of pulmonary embolus, but suggested the presence of an LV aneurysm. Contrast echocardiography did not demonstrate any flow into this suspected LV aneurysm (Figure 4). Cardiac MRI scan was subsequently performed and this confirmed the presence of a thrombosed pseudoaneurysm (labelled as PA in Figures 5 and 6), which would explain the echocardiographic as well as CT findings. CT reconstruction of the heart demonstrating the pseudoaneurysm is shown in Figure 7.

Discussion

LV aneurysms are most commonly caused by myocardial infarction. True aneurysms are defined as areas of thinned myocardium which are dyskinetic and involve the full thickness of the wall. On the other hand, pseudoaneurysms are a result of rupture of the ventricular free wall, contained by overlying adherent pericardium.1 They typically have a neck narrower than the diameter of the aneurysm and are more often located in the posterior and lateral wall segments, in contrast to true aneurysms, which are more often seen in the anterior wall and apex, and have a wide neck. More importantly, pseudoaneurysms have a higher risk of rupture and thus, a surgical approach to management is often undertaken. This risk is estimated to be between 30 and 45%, based on older studies.2–4

Clinical features of LV aneurysms include angina, congestive cardiac failure, ventricular arrhythmias or thromboembolism. The diagnosis of LV aneurysms can be difficult, as patients often are either asymptomatic, or present with non-specific symptoms attributable to other causes. In a series of 52 patients with pseudoaneurysms, 48% were diagnosed incidentally.5

Investigations that can be undertaken to diagnose LV aneurysms include transthoracic/transoesophageal echocardiography, LV angiography, MRI, CT and radionuclide scanning. Differentiation between LV pseudoaneurysms and true aneurysms can be challenging. One way of assessing this on echocardiography is by comparing the diameter of the orifice/neck of the aneurysm with its maximum diameter. In an echocardiographic series,6 it was found that the ratio of the maximum diameter of the orifice to the maximum internal diameter of the cavity was between 0.25 and 0.50 for pseudoaneurysms while the range for true aneurysms was between 0.90 and 1.0. The presence of turbulent flow by pulsed Doppler at the neck of a cavity or within the cavity itself also suggests presence of a pseudoaneurysm.7 Colour Doppler can also be useful in distinguishing between pseudoaneurysm and other abnormalities such as pericardial effusion. There is increasing evidence that MRI is very useful for differentiating between true and pseudoaneurysms.8,9 It allows visualization of the entire heart and is able to clearly distinguish between structures such as pericardium, myocardium thrombus and epicardial fat.

Most investigators recommend surgery as the treatment of choice in suitable patients with LV pseudoaneurysms as the risk of fatal rupture is felt to outweigh the risk of surgery.10,11

The example presented in this case report is interesting because the pseudoaneurysm did not have a typical echocardiographic appearance. CT scan suggested the diagnosis but it was only after MRI scanning that we were able to establish that it was a thrombosed pseudoaneurysm, presumably from a contained rupture that had occurred as a result of his myocardial infarct years ago.
Figure 1  Apical long axis view.

Figure 2  Short axis view.

Figure 3  Four chamber view.

Figure 4  Contrast echo showing no communication.

Figure 5  Cardiac MRI (pseudoaneurysm labelled as PA).

Figure 6  Cardiac MRI (pseudoaneurysm labelled as PA).
References


