Left ventricular pseudoaneurysm: The role of multimodality cardiac imaging

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A 71-year-old man presented with an inferior ST elevation myocardial infarction. Coronary angiography demonstrated 99% occlusion of the proximal right coronary artery. A posterior wall pseudoaneurysm was incidentally observed on left ventriculography (arrows; Figure 1A). Transthoracic echocardiography revealed a site of rupture in the posterior left ventricular (LV) wall measuring 36 mm in width, communicating with a large, thrombus-free pseudoaneurysm (asterisks; Figure 1B). Cardiac magnetic resonance imaging (MRI) confirmed the presence of an aneurysmal dilation along the basal inferolateral wall with a mouth orifice of 36 mm in diameter and 36 mm deep (arrows; Figure 1C). A rim of delayed enhancement around the aneurysm could have represented either a full-thickness myocardial scar or an enhancing pericardium containing a false aneurysm, although the location was of concern for the latter (arrows; Figure 1D). At surgery, following resection of the aneurysmal sac (Figure 1E), an examination of the interior of the LV wall revealed a zone of transition from healthy-appearing myocardium to thinned scarred myocardium, followed by a thinner fibrous edge, which was compatible with the diagnosis of a pseudoaneurysm. Pathological examination demonstrated organizing fibrous tissue (Figure 1F). The lack of LV wall was consistent with the diagnosis of a pseudoaneurysm.

LV pseudoaneurysms develop when myocardial rupture is contained by pericardial adhesions or scar tissue (1). In contrast, true LV aneurysms

form following myocardial infarction as a result of scar formation and thinning of the myocardial wall. Echocardiography, left ventriculography and cardiac MRI are complementary imaging modalities used to distinguish these two entities. Cardiac MRI, with its higher spatial resolution, is more sensitive and specific for the diagnosis of a pseudoaneurysm than transthoracic echocardiography (2). The absence of delayed enhancement findings of myocardial elements within the sac of the aneurysm on cardiac MRI, and the presence of delayed enhancement of the pericardium, is highly suggestive of a pseudoaneurysm (2). In some cases, however, such as in the present patient, differentiation of a delayed enhancement of the myocardium from an adjacent pericardium may be challenging, leading to an incorrect diagnosis because an enhancing pericardium containing a pseudoaneurysm can mimic an infarcted myocardium (2). Hence, surgical assessment and pathological evaluation is occasionally imperative to make a definitive diagnosis.

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Figure 1) Ao Aorta; LA Left atrium; LV Left ventricle; RV Right ventricle

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