A 76-year-old man with a history of hypertension, dyslipidemia, and 90 pack-year smoking, presented to his primary care physician with complaints of worsening dyspnea. His ECG finding did not show any pathological Q-wave or ST-T abnormalities (Online Figure I). A 2D transthoracic echocardiogram revealed normal left ventricular (LV) systolic function with inferior and inferolateral wall motion abnormalities. A suspicious aneurysm was also noted (Figure 1). His adenosine stress nuclear perfusion images showed a moderate-sized area of ischemia or jeopardized myocardium involving the infero-lateral LV (Online Figure II). He underwent cardiac catheterization, which revealed an occluded right coronary artery and significant left-to-right collaterals (Figure 2). Left ventriculography revealed a hypokinetic basal inferior wall and an aneurysm (Figure 3, Movie I). A follow-up transesophageal echocardiogram was performed using an x7–2t transducer on an iE33 ultrasound machine (Philips, Andover, MA) capable of both multiplane 2D and real-time 3D, which demonstrated the aneurysm within an intact epicardium (Figure 4, Movie II). This was consistent with a subepicardial aneurysm. Although the transthoracic echocardiogram and LV ventriculogram demonstrated the abnormality, the features were not distinct enough to differentiate aneurysm subtypes. However, multiplane 2D tomographic sections and the real-time 3D volumetric imaging precisely demonstrated a subepicardial aneurysm.

Both “true aneurysms” and “pseudoaneurysms” are outpouching of the LV beyond the outside contour of the chamber. The former contains all three myocardial layers, and the latter represents a true contained rupture of the myocardium by a blood clot with the adjoining parietal pericardium mostly due to ischemia or trauma. A pseudoaneurysm often needs surgical intervention to prevent a pericardial rupture and possible sudden cardiac death. On the other hand, a subepicardial aneurysm is an interruption of the endocardium and myocardium with an intact epicardium.

Figure 1. A transthoracic echocardiogram of both end-diastolic (left panel) and end-systolic (right panel) frame reveals a focal aneurysm (arrow) at basal inferior wall. LV, left ventricle; ANT, anterior wall of LV; interon (INF), inferior wall of LV.

Figure 2. The right anterior oblique (RAO 30°) view of the right coronary artery reveals a proximal high-grade diffuse stenosis and then subtotal occlusion. The distal vessels fill via left-to-right collateral from the left anterior descending and left circumflex coronary artery.
Most often some myocardial elements are seen in the wall formed by the epicardium. The natural history of a subepicardial aneurysm is not well described. However, conservative medical management is considered unless there are high risk features such as a rapid growth on surveillance imaging studies, progression to pseudoaneurysm, or worsening symptoms. Therefore, when a ventriculogram shows an aneurysmal pouch, echo can reveal the status of the epicardium, which is clinically important for management. Furthermore, cardiac MRI and, to a lesser extent, cardiac computed tomography can demonstrate any disruption of the myocardial and pericardial layers with greater spatial resolution. Our patient did not have any symptoms suggestive of recurrent myocardial ischemia and his medical history, echocardiography, and coronary angiographic findings were suggestive of a remote myocardial ischemic insult. Hence, instead of surgery he was given aggressive medical management with risk factor modification.

Disclosures
None.

References
Subepicardial Aneurysm Evaluated by Multiplane 2D and Real-Time 3D Volumetric Transesophageal Echocardiography

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