Radionuclide ventriculography is an accepted method for diagnosing left ventricular aneurysms, but false-negative studies have been associated with a mural thrombus filling the left ventricular cavity. We describe a patient with a left ventricular aneurysm due to myocardial infarction whose aneurysm scintigraphically “disappeared” from serial radionuclide ventriculograms. This was documented echocardiographically and pathologically to be due to the formation of a large mural thrombus. Review of the literature suggests that radionuclide ventriculography and echocardiography may be complementary techniques in the diagnosis of left ventricular aneurysm. Echocardiography may remain diagnostic when a mural thrombus has caused the loss of the characteristic scintigraphic findings on radionuclide ventriculography. (Chest 1993; 104:946-47)

**RNVA = radionuclide ventriculography**

Equilibrium radionuclide ventriculography (RNVA) is frequently used to detect left ventricular aneurysms following myocardial infarction and has a high degree of accuracy vs contrast ventriculography. False-negative RNVA studies, in which aneurysms are not detected, have been ascribed to filling of the aneurysm by mural thrombus. However, to our knowledge, no previous reports have documented the disappearance of a true left ventricular aneurysm due to deposition of intracavitary thrombus. In this report, we describe a patient who sustained a large anterior myocardial infarction and developed an apical aneurysm that was detected by RNVA. On follow-up RNVA, the aneurysm disappeared. This was proven echocardiographically and pathologically to be due to deposition of thrombus within the aneurysm.

**CASE REPORT**

A 40-year-old man suffered a large anterolateral myocardial infarction documented by cardiac isoenzyme levels and electrocardiographic criteria. His hospital course was complicated by cardiogenic shock and pericarditis.

An initial RNVA showed a dilated left ventricle with a diastolic deformity of the anteroseptal and inferoseptal. The anterolateral wall, apex, inferoseptal, and the apical portion of the septum were dyskinetic. These findings were consistent with a large aneurysm. Left ventricular ejection fraction was 18 percent. Echocardiography also showed an apical aneurysm. No mural thrombus was noted (Fig 1).

**FIGURE 1.** Radionuclide ventriculography (RNVA) and two-dimensional (2-D) echocardiographic studies performed January and August 1989. The end-systolic frame of the RNVA is pictured. A indicates LAO-60 degree view. Arrows indicate aneurysm. B indicates apical four-chamber 2-D echocardiogram. TH = a large mural thrombus occupying the left ventricular (LV) apex, not seen on the 1/89 study (small arrows). RA = right atrium; RV = right ventricle; LA = left atrium.

**FIGURE 2.** Cardiac pathologic specimen. The left ventricular cavity is partially occupied by a large apical thrombus (arrow).
Cardiac catheterization revealed severe three-vessel coronary disease with a total occlusion of the proximal left anterior descending artery. Left ventriculography confirmed the RNAV findings of severely reduced left ventricular function and an apical aneurysm.

The patient was successfully treated with conventional medical therapy and was discharged from the hospital 21 days after admission.

He was readmitted to the hospital eight months later with severe congestive heart failure. On repeated RNAV (Fig 1), the diastolic deformity of the anteroseptal and inferoseptal was no longer present. Anterolateral, apical, inferoapical, and septal akinesia, rather than dyskinesia, was now present. Compared with the original study, the left ventricular apex appeared truncated on the anterior view, and there was an increase in separation between the left and right ventricular blood pools on the LAO-40 view (not shown). No definite aneurysm could be appreciated. Echocardiography now revealed a large left ventricular mural thrombus filling the aneurysm cavity.

The patient failed to respond to inotropic support, and he underwent cardiac transplantation.

Pathologic examination of the heart revealed marked cardiac enlargement. The heart weighed 475 g. There was a large aneurysm of the left ventricular apex, which was almost entirely filled by a 4-cm thrombus (Fig 2).

DISCUSSION

Left ventricular aneurysms may develop in 20 to 35 percent of patients following myocardial infarction.1,2 The presence of an aneurysm is associated with a significantly increased mortality, even controlling for overall left ventricular ejection fraction.3 The noninvasive diagnosis of a left ventricular aneurysm is frequently made using equilibrium RNAV. Accepted criteria for the diagnosis include the presence of a segmental area of dyskinesia and a deformity of the left ventricle in systole and diastole.4,5 Radionuclide ventriculography also provides information concerning wall motion in myocardial segments unaffected by the aneurysm, which is important when surgical intervention is being considered.6

A highly sensitive method of identifying left ventricular aneurysms, RNAV can achieve an accuracy rate of 96 percent vs contrast ventriculography.7 False-negative studies may occur when left ventricular ejection fraction is very low and when a lateral view is not obtained to detect posterobasal aneurysms.8 False-negative studies have also been associated with the presence of thrombus in the aneurysmal cavity.9,10 Presumably, the thrombus prevents filling of the aneurysmal cavity by the technetium-labeled blood pool, so that the diastolic deformity and systolic dyskinesia are eliminated.

To our knowledge, this is the first case report to actually demonstrate a true ventricular aneurysm, previously diagnosed by RNAV, scintigraphically “disappearing” due to the formation of thrombus within the aneurysm cavity. This case is also unique in that echocardiographic and pathologic documentation of the thrombus is available. A previous report11 presented a patient with a left ventricular pseudoaneurysm diagnosed by RNAV and angiography. A follow-up RNAV showed disappearance of the pseudoaneurysm, which the authors believed had thrombosed. However, no echocardiographic or pathologic confirmation was obtained.

Two-dimensional echocardiography may be complementary to RNAV in the diagnosis of left ventricular aneurysm. Echocardiography, which images the left ventricle from different planes than does RNAV, has a high sensitivity for identifying ventricular thrombi.12 This technique may reveal evidence of an aneurysm even when very poor left ventricular function, or left ventricular thrombus, results in a negative RNAV.

In the patient we describe, the second RNAV showed no aneurysm. The presence of a ventricular thrombus masking the aneurysm could be suspected only from a blunted left ventricular apex and increased separation of right and left ventricular blood pools.13 These findings could have been overlooked if the original RNAV was not available for comparison. The second echocardiogram documented the continued presence of the apical aneurysm; it also identified the large thrombus that was responsible for the false-negative RNAV.

The development of thrombus within a left ventricular aneurysm can cause the disappearance of the characteristic scintigraphic findings on RNAV and result in a false-negative study. When clinical and/or electrocardiographic results suggest the presence of a ventricular aneurysm in a patient with a normal RNAV, echocardiography should be performed to evaluate the possibility that a thrombus has “filled in” the aneurysm, rendering it undetectable by RNAV.

REFERENCES

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