Incidental Finding of Solitary Plasmacytoma in Thallium-201 Myocardial Perfusion Scintigraphy

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A 69-year-old man with a history of coronary artery disease, 6 months after percutaneous transluminal coronary angioplasty and stent insertion over the left anterior descending artery, was referred for thallium-201 myocardial perfusion scintigraphy because of ongoing symptoms of chest tightness and intermittent chest pain. This patient is an ex-smoker and under treatment for hypertension. He had only taken 1 tablet of nitroglycerin after the symptoms occurred. Thallium-201 myocardial perfusion scintigraphy disclosed a partially reversible defect in the inferior wall and intact perfusion in the left anterior descending artery territory, which favored no evidence of restenosis in the poststenting left anterior descending artery territory (Figure 1). The partially reversible defect of the inferior wall may be attributed to previous myocardial infarction in some patients; however, the patient had neither a history of myocardial infarction nor Q-waves in the II, III, and aVF leads on his ECG. Therefore, myocardial ischemia in the right coronary artery territory was favored rather than postmyocardial infarction. In addition, there was an extracardiac finding of marked focal uptake in the anterior upper chest in the raw cinematic data. Single-photon emission computed tomography/computed tomography of the chest revealed a 7×4 cm thallium-avid tumor in the anterior mediastinum with destroyed sternal manubrium (Figure 2 and Movie I, available in the online-only Data Supplement). Therefore, the patient underwent computed tomography–guided biopsy of the lesion and the pathological report showed a plasmacytoma. Bone marrow aspirate was collected and revealed scattered mature plasma cells, which occupied 3% of the total nucleated cells in CD138 immunostains. Immunoelectrophoresis showed mostly IgG monoclonal gammopathy; however, spinal magnetic resonance imaging and x-ray examination of all 4 limbs showed no active bone lesions. The patient was referred for local radiotherapy of sternal plasmacytoma by the hematologists.

Thallium-201 has been used traditionally to measure myocardial perfusion and to identify tumors.1 The possible differential diagnoses of increased extracardiac uptake by different radiotracers over the sternum were listed in our previously published article,2 including primary tumor, sternal metastasis, brown tumor, or osteomyelitis. Solitary plasmacytoma is a rare plasma cell dyscrasia, accounting for <5% of all plasma cell disorders,3 which has not been reported as an extracardiac finding in cardiac thallium imaging. Both Tc-99m sestamibi and thallium-201 were originally developed for myocardial perfusion studies, but these agents are also used to detect tumors. Because Tc-99m compounds are optimal for imaging, we expect that the results of Tc-99m sestamibi scintigraphy are similar to those of thallium-201 but have better image quality because of the different physical characteristics of these 2 agents.4 We presented a case with an inducible ischemia in the right coronary artery territory, intact perfusion in the poststenting left anterior descending artery territory, and a thallium-avid plasmacytoma in the anterior mediastinum. A careful review of the raw cinematic data by physicians should be an integral part of the interpretation of myocardial perfusion scintigraphy to avoid missing potential extracardiac findings.

Disclosures

None.

References


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Figure 1. Thallium-201 myocardial perfusion scintigraphy showed a partially reversible defect in the inferior wall (white arrows) and favored coronary stenosis in the right coronary artery. The myocardial perfusion in the territory of the poststenting left anterior descending artery was intact.
Figure 2. Top, Thallium-201 single-photon emission computed tomography. Middle, Fused images. Bottom, Computed tomography. Each of these rows shows the anterior chest lesion in 3 planes (axial, sagittal, and coronal). The cross cursors indicate the 7×4 cm thallium-avid tumor in the anterior mediastinum with destroyed sternal manubrium.
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Movie Legend

Movie 1. A 3-D Maximum Intensity Projection (MIP) showing a marked thallium-avid focus in the upper chest region. Best viewed with QuickTime™ software.