Detection of Occult Thymoma During Exercise Thallium 201, Technetium 99m Tetrofosmin Imaging for Coronary Artery Disease*

Douglas E. Paull, MD, FCCP; Joan Graham, DO; Joan Forgetta, MD; Thomas Turissini, MD; and Bruce Saidman, MD

Thallium (Tl) 201 and technetium (Tc) 99m tetrofosmin single-photon emission CT are routinely used in the evaluation of coronary artery disease. Mediastinal tumors demonstrate Tl 201 and Tc 99m tetrofosmin uptake. We report a 56-year-old man who developed chest pain after a previously successful angioplasty and stent of the left anterior descending coronary artery. He underwent a Tl 201, Tc 99m tetrofosmin exercise study. Abnormal mediastinal activity was visualized in both the Tl 201 and Tc 99m tetrofosmin images. Subsequently, the patient underwent resection of a stage II thymoma. Unanticipated focal extracardiac accumulation during myocardial scintiscanning should lead to further investigation to exclude mediastinal tumor.

(CHEST 2000; 118:550–551)

Key words: technetium 99m tetrofosmin; thallium 201; thymoma

Abbreviations: SPECT = single photon emission CT; Tc = technetium; Tl = thallium

CASE REPORT

A 56-year-old white male smoker had undergone left anterior descending coronary artery angioplasty and stent placement for symptomatic coronary artery disease. After the procedure the patient remained asymptomatic while receiving aspirin and a calcium-channel blocker. Routine follow-up exercise thallium (Tl) 201 single-photon emission CT (SPECT) imaging 2 months later was negative.

Two years after angioplasty and stent placement, the patient underwent dual isotope Tl 201 and technetium (Tc) 99m tetrofosmin SPECT exercise testing for recurrent chest pain. All images were obtained on an Optima SPECT scanner, a twodetector system with camera heads configured at 90°, and reconstructed on a GENIE workstation (General Electric Medical Systems; Milwaukee, WI). Four mCi of Tl 201 (Mallinckrodt Medical; St. Louis, MO) were injected IV for the resting phase. A treadmill stress test was performed using a standard Bruce protocol. Exercise was terminated at 7 min 36 s, at a maximum heart rate of 130 beats/min (79% predicted), due to dyspnea and fatigue. At peak exercise, 30 mCi of Tc 99m tetrofosmin (Myoview; Nycomed Amersham; Arlington Heights, IL) were administered. After a 30-min delay to allow clearance of hepatic uptake, stress images were obtained. Additional acquisition parameters consisted of ECG gating for R-wave trigger information and a 15% energy window centered on a photopeak of 140 keV. There was uniform perfusion of the left ventricle. Extracardiac mediastinal activity was visualized on both the resting and stress images (Fig 1).

The patient was referred to the oncologist for further evaluation of the SPECT abnormalities. Physical examination, laboratory studies, and chest radiographs were normal. MRI demonstrated a 6-cm, inhomogenously enhancing mass, with areas of necrosis in the anterior superior mediastinum (Fig 2). α-Fetoprotein (2.7 ng/mL) and human chorionic gonadotropin (2 mIU/mL) levels were normal.

Median sternotomy and resection of the tumor were accomplished. There were no complications, and the patient was discharged on the fourth postoperative day. Pathologic examination demonstrated thymoma, mixed lymphoepithelial type, with extension through the capsule, stage II. The patient received 50 Gy postoperative mediastinal radiation. He was free of chest pain at the time of this report.

DISCUSSION

Mediastinal tumors, including thymoma, seminoma, and lung cancer, demonstrate Tl 201 and Tc 99m tetrofosmin uptake.1 Of all thymomas found, 70% will be positive on Tl 201 scanning.2 In the vast majority of cases, however, the patient receives an established clinical diagnosis of mediastinal mass. The patient is usually undergoing noninvasive cardiac testing prior to resection.1,3 While the extracardiac uptake of isotope is interesting in such cases, the SPECT study does not normally lead to the diagnosis of a previously unsuspected mediastinal tumor. The current case report is unusual. The patient deve-
oped recurrent chest pain in the setting of known coronary artery disease and underwent exercise Tl 201, Tc 99m tetrofosmin myocardial imaging. Chest radiograph was normal. While myocardial perfusion was normal, there was extracardiac uptake in the mediastinum. This single nuclear finding led to further investigation and, ultimately, to resection of a stage II thymoma.

Maticke et al4 reported a 78-year-old woman with previous left anterior descending coronary artery stent and recurrent chest pain. Tl 201 stress study showed normal myocardial perfusion, but uptake in the mediastinum. CT scan of the chest revealed a 5-cm mediastinal mass. The patient underwent resection of a benign thymic mass. Adalet et al5 described a 72-year-old man with exertional chest pain, Tl 201 reversible myocardial defects, and mediastinal uptake of Tl 201. The mediastinal mass was a benign thymoma. However, the uptake was not entirely unsuspected, because the chest radiograph clearly demonstrated the mediastinal mass. Tl 201 and Tc 99m tetrofosmin uptake by thymomas may also provide a sensitive means of detecting recurrence after surgery and radiation.6

In conclusion, we report the unusual discovery of an unsuspected stage II thymoma during a Tl 201 and Tc 99m tetrofosmin SPECT exercise stress test performed in a patient with coronary artery disease. Extracardiac uptake should lead to further studies to exclude mediastinal tumor.

REFERENCES

Metastatic Ocular Melanoma to the Left Ventricle Inducing Near-Syncope Attacks in an 84-Year-Old Woman*

Raymond T. Rosario, MD; Dominick J. DiMaio, MD; Rosanna L. Lapham, MD; Michael Sweeney, MD; Richard Smiuling, MD, PhD; and Eddy Barasch, MD

Cardiac tumors may represent mechanical causes for syncope by limiting left ventricular filling and/or by obstructing the left ventricular outflow tract. Malignant melanoma is known to metastasize to the myocardium or pericardium, but there are only a very limited number of reports describing endocardial involvement by the tumor. We describe herein an 84-year-old woman who presented with daily near-syncope episodes, 9 years after treatment for a choroidal melanoma. The echocardiography and the pathologic examination revealed a metastatic melanoma. This is the first reported case of an ocular melanoma metastasizing to the heart and presenting as a left ventricular intracavitary pedunculated mass.

(CHEST 2000; 118:551–553)

Key words: echocardiography; near-syncope; ocular melanoma; surgery

Abbreviation: LVOT = left ventricular outflow tract

Syncope in elderly patients represents a frequent clinical problem,1 and multiple chronic diseases are implicated in its etiology. Metastases of malignant tumors spread to the heart are rare causes of syncope. We herein report the first case of choroidal melanoma that metastasized to the left ventricle as an intracavitary mass that intermittently obstructed the left ventricular outflow tract (LVOT) producing syncope episodes.

CASE REPORT

An 84-year-old white woman presented with a 3-month history of frequent near-syncope episodes and a new systolic murmur.

*From the Department of Internal Medicine, Division of Cardiology (Drs. Rosario, Smiuling, and Barasch), the Department of Cardiothoracic Surgery (Dr. Sweeney), and the Department of Pathology and Laboratory Medicine (Drs. DiMaio and Lapham), University of Texas Medical School, Houston, TX.

Manuscript received September 21, 1999; revision accepted January 28, 2000.

Correspondence to: Eddy Barasch, MD, University of Texas Health Science Center at Houston, MSB 1.257, 6431 Fannin, Houston, TX 77030

Figure 2. MRI of the chest demonstrating a mass in the anterior superior mediastinum.