Increased Pulmonary Uptake of Sestamibi

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Case
79 male with several weeks exertional dyspnea, cough, clear/yellow sputum
PMH
• LAD stent 2005
• Hypertension
• Hyperlipidemia
• Spinal stenosis
• 25 pack year smoking, quit 1982
• Minimal asbestos exposure
Nuclear stress test ordered

ECG
Normal perfusion images
EF 83%
Diffusely increased pulmonary uptake of sestamibi
RV dilation with increased RV uptake of sestamibi

Stress Planar Sestamibi Image

Physical Exam: rales 1/3 up bilaterally
Limited echo: hyperdynamic LVEF, dilated RV, small pericardial effusion
Labs and Chest X-ray ordered
Impression: possible diastolic CHF
Furosemide 40 mg po qd started

Nuclear Stress Test Result
More Data
**Chest X-ray**

**Subsequent Course**
- No improvement with diuretic
- BNP normal

**Chest CT**

**Pulmonary Evaluation**
- PFTs
  - Restrictive Lung Disease
  - Marked impairment diffusion capacity: 37% predicted
- Diagnosis
  - Idiopathic Pulmonary Fibrosis
  - Usual Interstitial Pneumonia

**Increased Pulmonary Uptake of Radionuclide**
- Thallium Stress Testing
  - Potassium analogue with marked redistribution over time
  - Marker of increased wedge pressure and greater extent of coronary artery disease

**Tc-99m Sestamibi**
- Positively charged ion which binds to mitochondria
- Minimal redistribution
- Clinical Uses
  - Cardiac imaging
  - Parathyroid imaging
  - Breast imaging
Pulmonary Uptake Tc-99m Sestamibi
- Congestive Heart Failure
- Malignancy
- Pulmonary Embolism
- Pulmonary Fibrosis

Idiopathic Pulmonary Fibrosis
One of many forms of interstitial lung disease
- Risk Factors
  - Tobacco, viral infection, toxins/drugs, aspiration, genetics
- Injury to alveolar epithelium followed by fibrotic response that extends into the interstitial space
- Poor prognosis: 70-80% mortality at 5 years

Idiopathic Pulmonary Fibrosis: Pathology

Idiopathic Pulmonary Fibrosis: Treatment
- Nintedanib
  - Receptor blocker for tyrosine kinases that stimulate fibrosis
- Pirfenidone
  - Transforming growth factor beta stimulated collagen synthesis inhibitor
  - Fibroblast proliferation blocker
- Lung Transplant