

Scintigraphic Diagnosis of Intrathoracic Splenic Implants Post Splenectomy for Gunshot Wound

Authors: Paul D. Rodrigue M.D., Asif A. Fakhri M.D., Jin T. Lim M.D.

Author Information:

Paul D. Rodrigue M.D.

University at Buffalo, Jacobs School of Medicine and Biomedical Sciences

Department of Nuclear Medicine and Molecular Imaging

105 Parker Hall 3435 Main Street

Buffalo, New York 14214-3007

paulrodr@buffalo.edu

Asif A. Fakhri M.D.

University at Buffalo, Jacobs School of Medicine and Biomedical Sciences

Department of Nuclear Medicine and Molecular Imaging

105 Parker Hall 3435 Main Street

Buffalo, New York 14214-3007

asiffakh@buffalo.edu

Jin T. Lim M.D.

University at Buffalo, Jacobs School of Medicine and Biomedical Sciences

Department of Nuclear Medicine and Molecular Imaging

105 Parker Hall 3435 Main Street

Buffalo, New York 14214-3007

jlim7@buffalo.edu

Department of Nuclear Medicine and Molecular Imaging, University at Buffalo, Jacobs School of Medicine and Biomedical Sciences, Buffalo, New York

ABSTRACT:

After a significant trauma to the spleen, small viable splenic fragments may exist in the peritoneal cavity, however less commonly they may be located in the thorax. Thus, the appearance of splenules within the thorax on CT imaging can be easily mistaken for malignancy and lead to unnecessary intervention. Here, we present a case of multiple pulmonary masses initially presumed to be malignancy leading to CT guided biopsy that were eventually imaged using ^{99m}Tc -labeled sulfur colloid scintigraphy and confirmed to be thoracic splenules.

Keywords: correlative imaging; Tc-99m sulfur colloid; splenosis; splenic trauma

Running Title: Splenosis Masquerading as Malignancy

INTRODUCTION:

^{99m}Tc-labeled sulfur colloid scintigraphy is a reliable noninvasive technique for the evaluation of liver and spleen pathology. Visualization of radiotracer uptake on Tc-99m sulfur colloid scintigraphy normally indicates normally functioning hepatic and splenic tissue. Here we present a case of thoracic splenosis in a patient post-splenectomy for gunshot wound detected on ^{99m}Tc-labeled sulfur colloid scintigraphy.

CASE REPORT:

A 46-year-old female patient with remote history of gunshot wound to the abdomen was admitted to the emergency room complaining of abdominal pain. The patient had a 45 pack-year history of smoking since the age of 10. She also provided history of a chronic non-bloody productive cough which she attributed to smoking. CT scan of the abdomen and pelvis demonstrated a large tissue density measuring 4.2 cm above the left diaphragm. Since there was no prior imaging available, there was suspicion for malignancy. Thus, a CT chest and CT-guided needle biopsy was performed due to the patient's smoking history.

Dedicated chest CT (Figure 1) revealed at least 7 nonspecific soft tissue densities in the left hemi-thorax without any other signs of trauma. Due to the absence of a spleen in the upper left abdomen, a ^{99m}Tc-labeled sulfur colloid scan was suggested to confirm accessory splenic tissue. The patient was subsequently injected with 303.4 MBq (8.2 mCi) of ^{99m}Tc-labeled sulfur colloid, and planar and SPECT images were then acquired. Images revealed an elevated radiotracer uptake by implanted tissue confirmed splenic origin (Figure 2). Histopathology from the CT-guided biopsy confirmed these findings of thoracic splenosis.

DISCUSSION:

Due to the patient's remote history of gunshot wound to the abdomen and evidence of post-traumatic splenectomy more than 20 years' prior, the soft tissue masses were easily confirmed as being of splenic origin. Because tobacco use increases the incidence of malignancy in the lungs, gastrointestinal tract, liver, kidneys, and bladder (1) among others, unexplained ectopic tissue in these organs must be further worked up. Similarly, splenic implants may be mistaken for lung cancer (2), renal cancer, peritoneal seeding in patients with prior history of bladder carcinoma, primary or metastatic hepatic malignancy (3), and non-malignant causes such as endometriosis (4) as described in previous literature. Given the patient's extensive smoking history, the likelihood of malignancy could not be comfortably excluded and further workup was necessary.

In a patient with history of trauma requiring splenectomy we may expect to find splenic implants in the abdomen and pelvis, with intrathoracic implants being a remote possibility. According to SNMMI guidelines, revised in 2010, if there is suspicion that the prior trauma may have ruptured the diaphragm then the chest should be imaged as well. Additionally, surgeons may attempt autotransplantation of splenic tissue in an effort to preserve some immune functionality. Functioning splenic tissue may then be imaged with ^{99m}Tc -labeled heat-damaged red blood cells or ^{99m}Tc -labeled sulfur colloid (5). Figure 2 demonstrates increased radiotracer uptake by the pulmonary masses located in the thorax after injection with ^{99m}Tc -labeled sulfur colloid, demonstrating benign ectopic intrathoracic splenosis.

This case demonstrates the value of scintigraphy using the readily available ^{99m}Tc -labeled sulfur colloid can be an easy confirmatory test in a patient with suspected thoracic splenosis, thus eliminating the need for invasive tissue biopsy in these patients.

REFERENCES

- 1) Sasco AJ, Secretan MB, Straif K. Tobacco smoking and cancer: a brief review of recent epidemiological evidence. *Lung Cancer*. 2004;45 (Suppl 2):S3-9.
- 2) Mpe M¹, Schauer C¹. Images In Clinical Medicine. Splenosis Mimicking Cancer. *N Engl J Med*. 2016; 374:1965.
- 3) Lin WC, Lee RC, Chiang JH, et al. MR features of abdominal splenosis. *AJR Am J Roentgenol*. 2003;180:493–496.
- 4) Zitzer P, Pansky M, Maymon R, et al. Pelvic splenosis mimicking endometriosis, causing low abdominal mass and pain. *Hum Reprod*. 1998;13:1683-5.
- 5) Khosravi MR, Margulies DR, Alsabeh R, et al. Consider the diagnosis of splenosis for soft tissue masses long after any splenic injury. *Am Surg*. 2004;70:967-70.

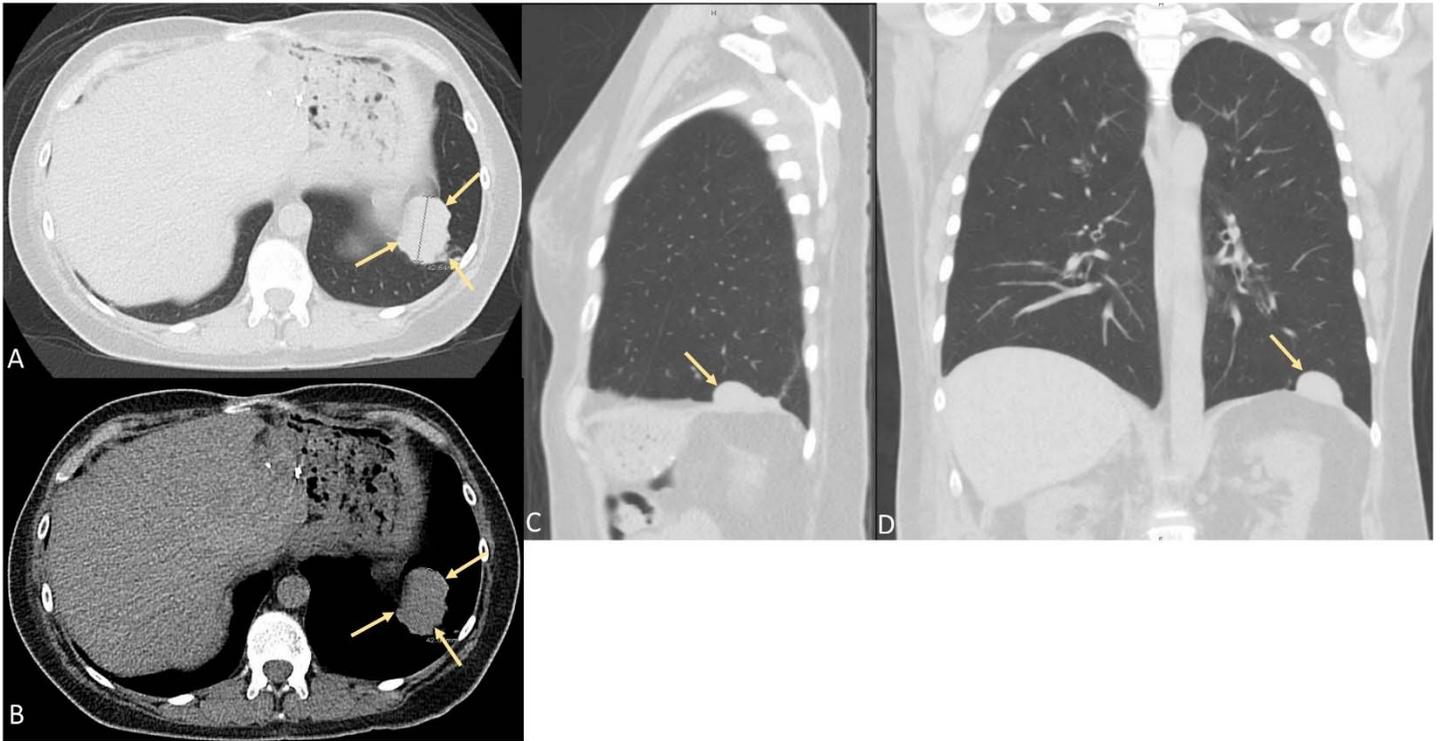


Figure 1. Non-contrast CT chest reformatted in the axial (A, B), sagittal (C), and coronal (D) projections showing a intrathoracic soft tissue mass abutting the left hemidiaphragm (yellow arrows).

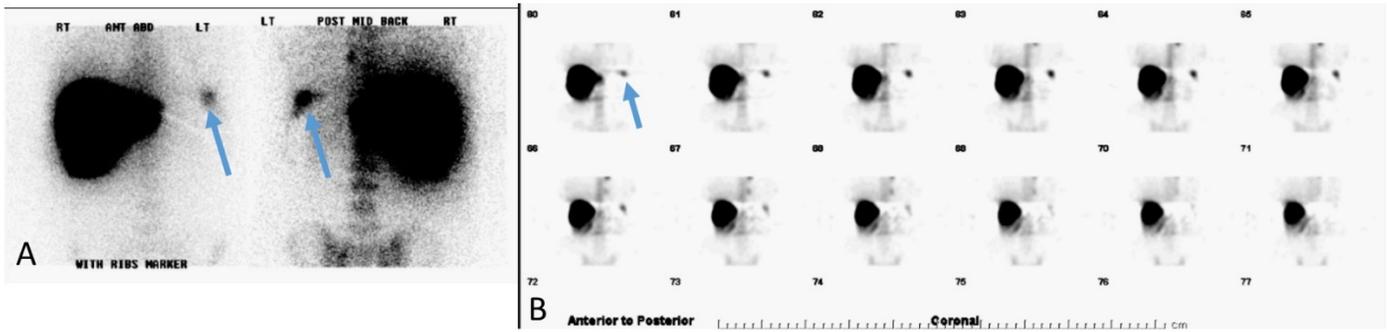


Figure 2. ^{99m}Tc -labeled sulfur colloid planar images in the anterior and posterior projections (A) and SPECT images in the coronal projection (B) showing radiotracer uptake by the thoracic masses (blue arrows). These findings were also thereby confirming the tissue to be of splenic origin.