

Usefulness of Tc99m HMPAO Labeled Leukocyte Scintigraphy in differentiating Splenic Abscess from Infarct

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Citation

V Vijayakumar, E Briscoe. *Usefulness of Tc99m HMPAO Labeled Leukocyte Scintigraphy in differentiating Splenic Abscess from Infarct*. The Internet Journal of Nuclear Medicine. 2005 Volume 3 Number 1.

Abstract

Radionuclide labeled leukocyte studies are routinely performed in the evaluation of patients with fever of unknown origin and occult infections. Cerebral perfusion agent Tc99m hexamethylpropyleneamine oxime (Tc99m — HMPAO) is one of the radiopharmaceuticals widely used for labeling of mixed leukocytes. It is a lipophilic agent which crosses cell membranes readily and preferentially labels granulocytes. This mechanism is used for labeling of leukocytes. Tc99m labeled leukocytes normally accumulate in spleen by sequestration. At sites of acute infection, focal increased radiotracer labeled leukocyte uptake is seen. Hence, focal defects in spleen represent infarcts. We present in this report two cases of splenic infarct diagnosed by Tc99m HMPAO labeled leukocytes.

INTRODUCTION

Tc99m HMPAO labeled leukocytes accumulate in foci of acute infectious processes. Acute pyrogenic infections are usually associated with elevated neutrophil counts. Various infections that localize radiolabeled leukocytes include osteomyelitis and other orthopedic infections as well as intra abdominal, renal, cardiovascular and pulmonary infections. Since the introduction of labeling of leukocytes by Tc99m HMPAO by Peters et al (1) till now, it has also proven very efficacious in the evaluation of occult infectious processes. In addition, Tc99m HMPAO labeled leukocytes play an important role in the diagnosis of non-infectious etiology of fever of unknown origin. Use of Tc99m HMPAO in the evaluation of cerebral infarcts is well known. Here we present two cases of splenic infarct diagnosed by Tc99m HMPAO labeled leukocytes.

MATERIALS AND METHODS

LEUKOCYTE LABELING AND IMAGING TECHNIQUES

Leukocyte labeling of Tc99m HMPAO is performed using standard labeling methods (1,2,3). 10mci of Tc99m HMPAO labeled leukocytes were injected intravenously. Whole body and spot images were obtained at 4 and 24 hours using a GE dual head gamma camera equipped with a low energy high resolution collimator with 140 keV and a 15 % window.

CASE ILLUSTRATIONS

CASE 1

41 y/o paraplegic male presented with sepsis and fever of unknown origin. A Computed tomography (CT) of the abdomen demonstrated a multiple hypodense lesions throughout the spleen likely representing abscesses. A follow-up ultrasound indicated intrasplenic infarction with a hematoma, necrotic tissue and/or infected collection. A radiolabeled leukocyte study was requested to differentiate an abscess versus infarct in the spleen.

CASE 2

A 37 y/o male status post pancreas renal transplant presented with fever. A CT scan reported a peripheral hypodensity in the posterior spleen suspicious for infection or an infarct. A radiolabeled leukocyte study was requested to localize the source of infection.

Figure 1

Figure 1: Tc99m HMPAO labeled leukocyte whole body and spot images demonstrating a focal defect in the spleen indicating splenic infarct (arrow).

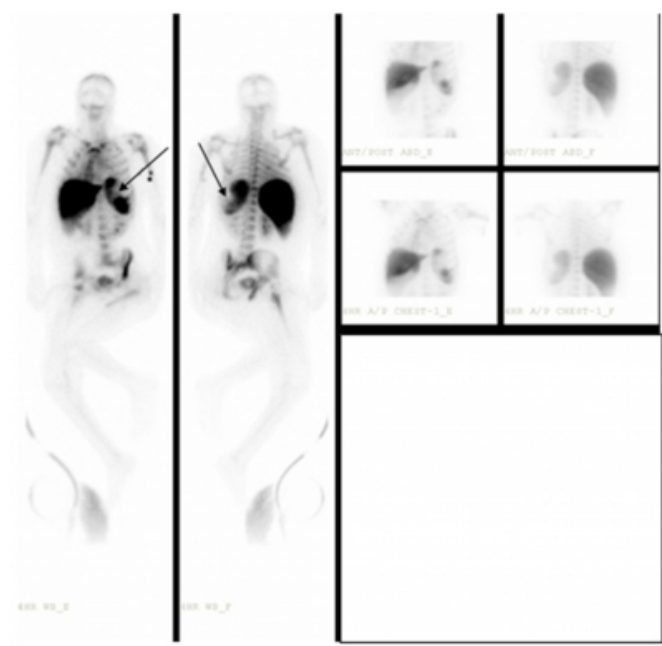
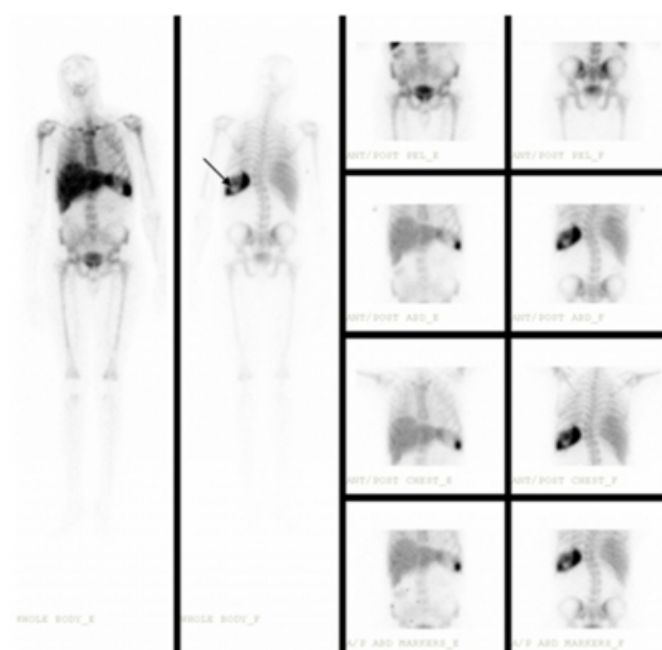


Figure 2

Figure 2: Tc99m HMPAO labeled leukocyte whole body and spot images demonstrating focal areas of decreased uptake in spleen indicating splenic infarcts (arrow). Also noted uptake in the pancreas renal transplant in the right lower quadrant and thoracolumbar scoliosis.



DISCUSSION

Occurance of splenic infarcts are rare (4). There are several vascular and non-vascular causes contributing to acute or chronic splenic infarction (5,6). Common hemotologic and thromboembolic conditions contributing to splenic infarcts include atherosclerosis, arterial emboli and vasculitis. Other causes include myeloproliferative disorders, sickle cell disease and sepsis. Patients with splenic infarcts can be asymptomatic or present with symptoms like abdominal pain, fever, nausea and vomiting (4,5,6,7). Differentiating infection from infarction is important in the clinical management since often times clinical presentation is similar in both conditions. CT is a valuable tool in the evaluation of abdominal symptoms. However, sometimes differentiating splenic infarct from trauma, inflammation or tumor by CT may be difficult and complications associated with splenic infarctions like pseudocysts, abscesses, hemorrhage, subcapsular hematoma and splenic rupture requires accurate and difficult CT diagnosis (8,9,10,11,12). Hence, radionuclide studies play an important role in the evaluation of spleen.

Various radionuclide studies have demonstrated the usefulness of radionuclide scintigraphy in the evaluation of splenic infarcts. Liver spleen scintigraphy, In-111 and Tc99m labeled leukocyte scintigraphy, Tc labeled red blood cell and Gallium 67 scintigraphy have demonstrated splenic infarcts (5, 13,14,15,16,17,18,19). Role of Tc99m HMPAO in the evaluation of cerebral infarcts is well known. However, case reports of splenic infarct by Tc99m HMPAO labeled leukocytes are few (3). Clinical history and wedge shaped defects help to differentiate splenic infarcts from other cold space occupying lesions. Here we present two cases where Tc99m HMPAO labeled leukocyte studies helped to differentiate splenic abscess from splenic infarcts.

CONCLUSION

Differentiating splenic abscess from infarct is crucial in the management of acutely ill patients. In situations where the CT scan is unable to differentiate the etiology of the hypodense lesions in the spleen, Tc99m HMPAO labeled leukocyte imaging plays a major role in this aspect. It is easy to perform, noninvasive with good image quality. In addition whole body scintigraphy can provide other sources of infection as well as identify splenic infarct.

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