Case Report

Splenosis mimicking local recurrence in a case of renal cell carcinoma confirmed using technetium-99m-sulfur colloid scintigraphy and single-photon emission computed tomography/computed tomography

Koramadai Karuppusamy Kamaleshwaran, Kuppurajan Narayanasamy[1], Anjali Maliakkal, Vyshak Mohanan, Ajit Sugunan Shinto

Departments of Nuclear Medicine, PET/CT and Radionuclide Therapy and [1]Urology, Kovai Medical Center and Hospital Limited, Coimbatore, Tamil Nadu, India

ABSTRACT

Heterotropic splenic tissue in the renal fossa is characteristically asymptomatic and is usually an incidental finding that has been reported to mimic renal or adrenal tumors. A 50-year-old man with renal cell carcinoma had undergone radical nephrectomy with splenectomy because of the invasion of the splenic capsule. During a follow-up examination, nodules were detected by computed tomography in the subdiaphragmatic region. Although local recurrence was highly suspected, and these masses were diagnosed as ectopic splenic tissues by a technetium-99m-sulfur colloid scintigraphy and unnecessary surgical exploration was avoided.

Key words: Renal cell carcinoma, single-photon emission computed tomography/computed tomography, splenosis, technetium-99m-sulfur colloid

INTRODUCTION

The term splenosis was first described by Buchbinder and Lipkoff in 1939; splenosis has been reported to occur in 26–67% of patients after trauma associated with splenic rupture or after splenectomy.[1] Most cases of splenosis are intra-abdominal due to direct seeding of surrounding structures, although these ectopic rests may occur almost anywhere in the body, and its diffuse nature may raise the suspicion of metastatic cancer.[2] Splenosis has often been reported to be mistaken for tumor recurrences in patients subjected to radical nephrectomy in whom the spleen was removed due to tumor invasion. Confirmation of splenic tissue can be made by technetium-99m (Tc-99m) sulfur colloid scintigraphy or with Tc-99m heat-damaged red blood cells; however, in some cases, biopsy may be required for definitive diagnosis.[3] Here, the authors present a patient with a remote history of nephrectomy and splenectomy for a renal cell carcinoma who was discovered to have multiple intra-abdominal nodules by computed tomography (CT) scan. A diagnosis of diffuse metastatic disease was initially considered before a diagnosis of intra-abdominal splenosis was ultimately made with the aid of Tc-99m sulfur colloid single-photon emission CT and CT imaging (SPECT/CT).

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CASE REPORT

A 50-year-old male underwent left radical nephrectomy with splenectomy for left renal cell carcinoma 5 years before for left renal lesion infiltrating splenic capsule. He was on follow-up and contrast-enhanced abdominal

Address for correspondence: Dr. Koramadai Karuppusamy Kamaleshwaran, Department of Nuclear Medicine, PET/CT and Radionuclide Therapy, Comprehensive Cancer Care Center, Kovai Medical Center and Hospital Limited, Coimbatore - 641 014, Tamil Nadu, India.
E-mail: dr.kamaleshwar@gmail.com

CT [Figure 1] revealed multiple soft tissue density nodules in the left subdiaphragmatic region largest measuring 17 mm × 11 mm. Based on the CT findings and the previous splenectomy, the diagnostic suspicion of splenosis was high. So to confirm the diagnosis, Tc-99m-sulfur colloid scintigraphy of liver and spleen was done which showed uptake in the splenic area [Figure 2]. SPECT/CT localizes uptake to the CT described soft tissue nodules in the left subdiaphragmatic region compatible with the diagnosis of splenosis [Figure 3]. Hence, a diagnosis of splenosis was confirmed with the Tc-99m sulfur colloid scintigraphy, and unnecessary surgical exploration was avoided.

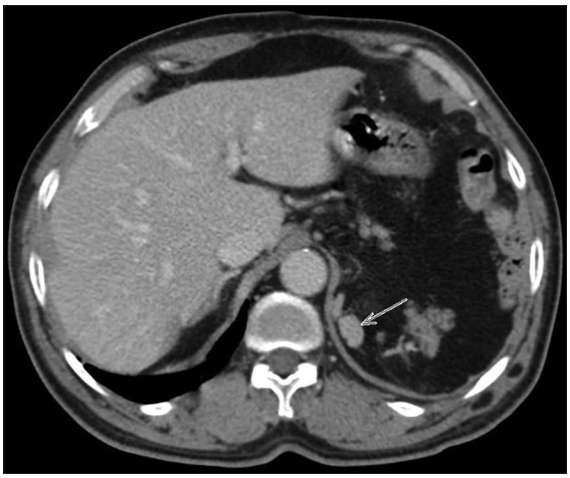

Figure 1: Axial contrast-enhanced computed tomography showing multiple soft tissue nodules in the left subdiaphragmatic region, (arrow)

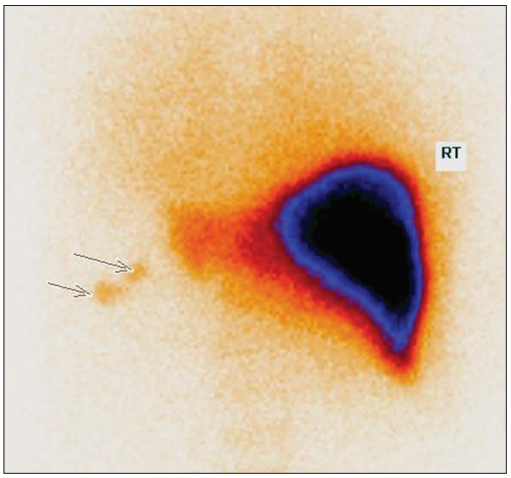

Figure 2: Technetium-99m-sulfur colloid scintigraphy posterior view showing uptake in the nodules in the splenic fossa, (arrows)

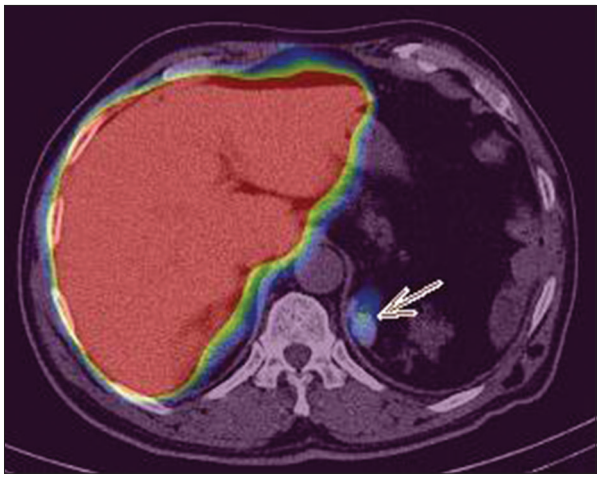

Figure 3: Single-photon emission computed tomography-computed tomography of the abdomen showing increased uptake localized to soft tissue nodule in the subdiaphragmatic region, (arrow)

DISCUSSION

Ectopic splenic tissue can occur in congenital or acquired forms. The congenital form, called accessory spleen, occurs in 10% of the population and is more common in women and patients with hematological diseases. Of varying number and size, accessory spleens are usually located in the splenic hilum and pancreatic tail and have their own blood supply which usually arises from the splenic artery or one of its branches.[1] On the other hand, the term splenosis refers to the existence of viable and functionally active splenic tissue outside of its usual anatomic location as a result of splenic rupture via trauma or surgery that leads to seeding of small fragments of splenic tissue in the abdominal cavity. Of varying size, splenosis shows a sessile growth pattern and lacks its own blood supply, unlike accessory spleen.[2,3] It is most frequently located in the serous surface of the small intestine, followed by the greater omentum, parietal peritoneum, large intestine, diaphragm undersurface, and thorax in cases of associated diaphragmatic injury. The usual mechanism of seeding of splenic tissue is by local dissemination after trauma or surgery that results in rupture of the splenic capsule.[4]

Splenosis is usually asymptomatic. However, some cases may present clinically as intestinal obstruction, bleeding or diffuse abdominal pain.[5] Splenosis requires differential diagnosis with tumors in other locations, such as the pancreas, adrenal gland or kidney, and adequate history is essential to allow us to recognize a history of previous splenic trauma or splenectomy. Splenosis has often been reported to be mistaken for tumor recurrences in patients subjected to radical nephrectomy in whom the spleen was accidentally injured.[4-6]

Conventional imaging methods (ultrasound, CT) do not achieve sufficient specificity for the diagnosis of splenosis, and often lead to a false diagnosis of tumor. However, diagnostic accuracy can be improved by the use of multislice CT. While less definitive than surgical diagnosis, the tests with the greatest specificity for the diagnosis of both normal and ectopic splenic tissue are Tc-99m sulfur colloid liver-spleen scintigraphy, Tc-99m-labeled heat-damaged

erythrocytes spleen scintigraphy and ferumoxide-enhanced magnetic resonance imaging (MRI).[7] On the other hand, ferumoxide-enhanced MRI is used in the detection of hepatic and splenic tumors. Ferumoxides are contrast agents composed of superparamagnetic crystalline particles of ferrous ferric oxide that are preferentially taken up by reticuloendothelial cells, causing a brief increase in T2 signal intensity followed by a characteristic rapid decrease.[8] Liver-spleen scintigraphy is based on the property of the of Tc-99m sulfur colloid to be sequestered by reticuloendothelial cells, with 80% of the particles administered being distributed to the liver, 15% to the spleen and the remaining 5% to the bone marrow. Umemoto *et al*.[2] detected three nodules by CT in the splenorenal area, and they slowly enlarged. Although local recurrence was highly suspected, they successfully diagnosed these masses as ectopic splenic tissues by a technetium sulfur colloid scan and unnecessary surgical exploration was avoided. Horger *et al*.[9] evaluated the use of SPECT/CT for correct localization of heterotopic splenic tissue and differentiation of splenosis from other masses. All 20 lesions demonstrated by CT or MRI were correctly classified by SPECT/CT as splenosis. Three additional lesions initially overlooked by CT or MRI could be detected. Diagnostic relevance was highest for intrahepatic, intrapulmonary or pleural splenic implants. It is concluded that allows exact localization of heterotopic splenic tissue in patients with suspected splenosis. Our case illustrates the use of Tc-99m sulfur colloid scintigraphy and SPECT/CT confirming splenosis in a postnephrectomy with splenectomy in a renal cell carcinoma suspecting recurrence.

CONCLUSION

Heterotropic splenic tissue in the renal fossa is characteristically asymptomatic and is usually an incidental finding that has been reported to mimic renal or adrenal tumors. Clinicians should be aware that unknown origin masses, mainly in the peritoneal cavity, with a history of previous splenic trauma or splenectomy, might represent splenosis. Patients should undergo Tc-99m sulfur colloid scintigraphy. SPECT/CT allows exact localization of heterotopic splenic tissue in patients with suspected splenosis. Therefore, we could avoid unnecessary surgical explorations.

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