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RESPIRATORY CASE REPORTS

# A Case of Thoracic Splenosis Diagnosed with Spleen Scintigraphy

## Dalak Sintigrafisi ile Tanı Konulan Torasik Splenozis Olgusu

Hasan Yavuz[1], Fatih Tamer[4], Akın Çinkooğlu[3], Ayşegül Akgün[2], Ufuk Çağırıcı[1]


### Abstract

Splenosis is the autotransplantation of spleen tissue to different parts of the body following a traumatic spleen and diaphragmatic rupture. Thoracic localization is very rare, usually asymptomatic, and detected incidentally. This paper describes a patient who had nonspecific symptoms and was diagnosed with thoracic splenosis using imaging methods without any invasive procedures. In cases with a history of trauma and spleen or diaphragmatic injury secondary to trauma, thoracic splenosis should be suspected when any pulmonary, pleural, or intrathoracic space-occupying lesion is detected in the left hemithorax, and the diagnosis should be made by effective and minimally invasive exclusion of malignant lesions.


***Keywords:*** *Splenosis, traumatic spleen/diaphragmatic injury, spleen scintigraphy.*


### Öz

Splenosis, travmatik dalak ve diyafragma rüptürü sonrası dalak dokusunun çeşitli vücut bölgelerine ototransplantasyon şeklinde yayılmasıdır. Torasik yerleşimi ise çok nadirdir, genellikle asemptomatiktir ve insidental olarak saptanır. Travma öyküsü ve travmaya sekonder dalak/diafragma yaralanması olan olgularda sol hemitoraksta pulmoner/plevral veya intratorasik yerleşimli herhangi bir yer kaplayan lezyon saptandığında torasik splenozisten şüphelenilmelidir ve tanı malign lezyonların etkin ve minimal invazif şekilde dışlanmasıyla konulmalıdır. Bu yayında, nonspesifik semtomplar ile başvuran ve invazif işlem uygulanmadan görüntüleme yöntemleri ile torasik splenozis tanısı konan bir olgu sunulmaktadır.


***Anahtar Kelimeler:*** *Splenozis, travmatik dalak/diyafragma yaralanması, dalak sintigrafisi.*

[1]Department of Thoracic Surgery, Ege University Faculty of Medicine, İzmir, Türkiye
[2]Department of Nuclear Medicine, Ege University Faculty of Medicine, İzmir, Türkiye
[3]Department of Radiology, Ege University Faculty of Medicine, İzmir, Türkiye
[4]Department of Nuclear Medicine, Niğde Ömer Halisdemir University Training and Research Hospital, Niğde, Türkiye

[1]Ege Üniversitesi Tıp Fakültesi Göğüs Cerrahisi Anabilim Dalı, İzmir
[2]Ege Üniversitesi Tıp Fakültesi, Nükleer Tıp Anabilim Dalı, İzmir
[3]Ege Üniversitesi Tıp Fakültesi, Radyoloji Anabilim Dalı, İzmir
[4]Niğde Ömer Halisdemir Üniversitesi Eğitim Ve Araştırma Hastanesi, Nükleer Tıp Anabilim Dalı, Niğde

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***Correspondence (İletişim):*** Hasan Yavuz, Department of Thoracic Surgery, Ege University Faculty of Medicine, İzmir, Türkiye

**e-mail:** hasanyavuzdr@gmail.com

Splenosis is the autotransplantation of spleen tissue to various body parts after traumatic spleen and diaphragmatic rupture. Thoracic splenosis (TS) is a very rare clinical entity, observed in less than 0.25% of those who undergo posttraumatic splenectomy. Most cases of TS are asymptomatic and diagnosed during the evaluation of incidentally detected pulmonary lesions (1). Herein, we present a case admitted with nonspecific symptoms and diagnosed with TS by a scintigraphic method without any invasive operational procedure.

## CASE

A 61-year-old male patient with a history of splenectomy and diaphragmatic rupture after a traffic accident 27 years ago was examined for symptoms of respiratory system infection. Pleural-based opacities were observed in the left hemithorax in the chest X-ray. Thorax computerized tomography (CT) revealed a peripheral pleural solid mass with dimensions of 33x30 mm, extending from the major fissure in the left upper lobe apicoposterior segment to the superior segment of the left lower lobe and subpleural nodules. Pleural plaque-like soft tissue was found in the lower left lung lobe, as well as an ovoid mass formation in the left anterior diaphragmatic level (Figure 1, a-d). A defect in the abdominal wall and ovoid nodular formations adjacent to this defect were also observed (Figure 1, e–f). Fluorine-18-fluorodeoxyglucose positron emission tomography-computed tomography (F-18 FDG PET/CT) imaging was performed for metabolic characterization, in which all showed low-level FDG uptake. In addition, a 3-cm lesion was observed in the left kidney with no FDG uptake. Transthoracic fine needle aspiration biopsy (FNAB) and bronchoscopy were performed. Pathological examination of the specimens was reported as benign cytology, and the result of FNAB was reported as follows: the usual lymphoid cell population showed polyclonal staining with CD3 and CD20 in blood and fibrinoid materials in hematoxylin-eosin sections obtained from the cell block, and no malignancy was observed. The density values of the solid lesions were similar to those of the soft tissue in the spleen. The radiologists recommended magnetic resonance imaging (MRI) to characterize the three-cm-sized lesion in the left kidney's upper pole since it showed a malignant enhancement pattern. The renal mass was interpreted primarily in favor of a malignant lesion. Soft tissue and other foci in the spleen lodge showed similar signal characteristics and contrast enhancement patterns as in the CT examination (Figure 2, a–b). However, considering the case's splenectomy history and the lesions' location and morphology, selective spleen scintigraphy with Tc-99 m (technetium)-labeled denatured erythrocytes was recommended for the differential diagnosis of splenosis. In scintigraphic imaging, marked denatured erythrocyte involvement was observed in the lung lesion defined at the level of the left lung's upper lobe apicoposterior segment, in the nodular lesions observed in the splenectomy site, in the anterior parapericardial fatty tissue, and between the muscle planes of the left posterolateral wall of the thorax. (Figure 3, a–c). The patient, who decided to be followed up in terms of thoracic splenosis, was referred to the urology department to be evaluated for renal malignancy for the lesion identified in the upper pole of the left kidney in the MR imaging. The patient was diagnosed with renal cell carcinoma by kidney biopsy, and treatment was planned.

## DISCUSSION

Posttraumatic abdominal, pulmonary, pleural, subcutaneous, intracranial, and scrotal splenosis have been reported and are typically characterized by multiple lesions when present (2). The overall incidence of splenosis after a splenic injury is estimated to be approximately 76%, whereas the incidence of TS in the presence of a diaphragm injury is relatively low (3).It has been reported that 37%–78% of posttraumatic diaphragmatic ruptures develop after blunt trauma and 22–65% after penetrating trauma (4). Our case also had a history of diaphragmatic injury and splenectomy due to splenic injury caused by blunt trauma. In a CT, splenic implants show similar density values and contrast enhancement patterns to normal splenic tissue. Likewise, splenic foci are expected to show a signal pattern similar to normal splenic tissue in an MRI. Although the findings in thoracic splenosis are characterized mainly by multiple pleural and subpleural nodules, large masses can also be observed rarely. During radiological follow-up, the nodules may grow slowly or disappear (5). A fine-needle aspiration biopsy is insufficient for a definitive diagnosis.

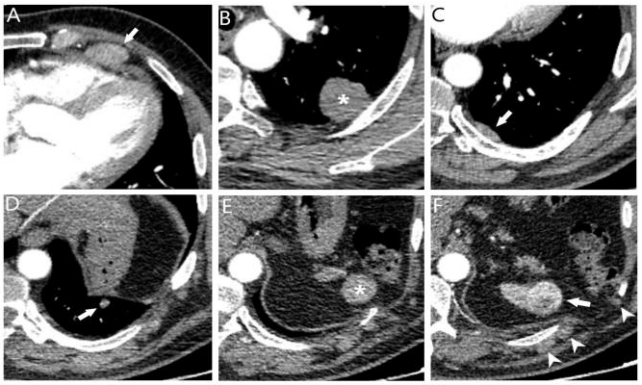


***Figure 1:*** *In axial CT, sections passing through the thorax, a mass formation at the left anterior diaphragmatic level (arrow)* ***(a)****, a mass lesion in the apicoposterior segment of the left upper lobe (asterisk)* ***(b)****, pleural plaque-like soft tissue in the lower lobe of the left lung (arrow)* ***(c)****, and a subpleural nodule in the same lobe (arrow)* ***(d)****. In axial CT sections passing through the upper abdomen, there is ovoid soft tissue (asterisk) in the spleen lodge* ***(e)****, a defect in the abdominal wall, ovoid*

*nodular formations (arrowheads) in the area adjacent to this defect, and a contrasting mass (arrow) in the kidney* ***(f)***

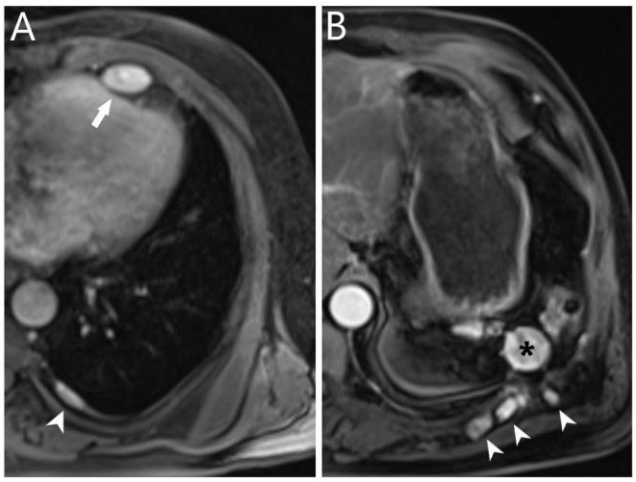


***Figure 2:*** *Contrast-enhanced MR images obtained in the axial plane show a similar pattern of enhancement in the mass formation at the left anterior diaphragmatic level (arrow) and pleural plaque-like soft tissue in the lower lobe of the left lung (arrowhead)* ***(a)****, as well as spleen lodge soft tissue (asterisk) and ovoid nodular formations in the area adjacent to the existing defect in the abdominal wall (arrowheads)* ***(b)***

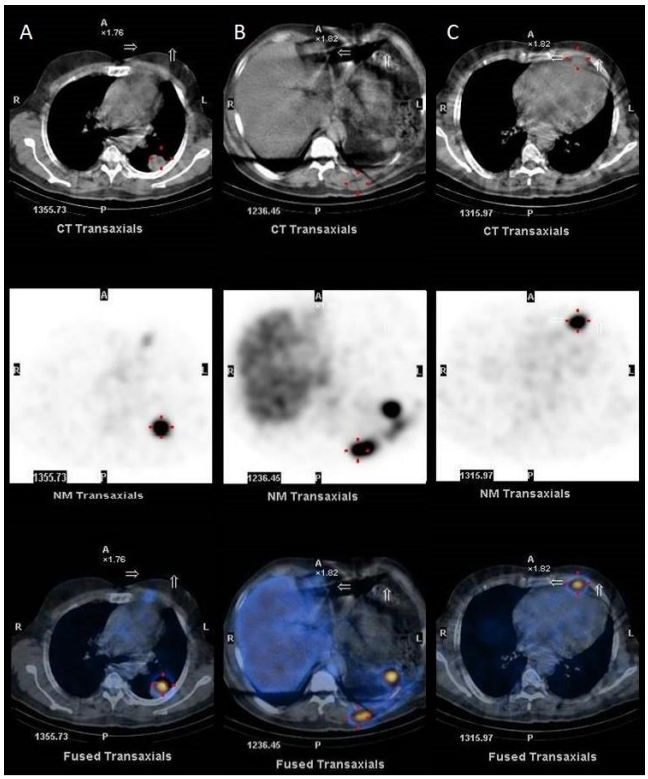


***Figure 3:*** *Activity consistent with splenosis foci were observed in CT, SPECT, and hybrid SPECT/CT images in the left upper lobe apicoposterior segment level* ***(a)****, in the spleen lodge, between the muscle planes of the left posterolateral wall of the thorax* ***(b)****, and in the anterior parapericardial fatty tissue* ***(c)***

Scintigraphic imaging with indium-111 labeled platelets, denatured erythrocytes, or sulfur colloid marked with Tc-99 m can be used to identify ectopic splenic foci such as splenosis and accessory spleen. Splenic scintigraphy performed with Tc-99-m-labeled denatured erythrocytes is frequently preferred due to its relatively easy access compared to In-111. After the radiopharmaceutical injection, the differential diagnosis can be made with high accuracy and specificity while avoiding unnecessary interventional methods by sequestering Tc-99 m-labeled denatured erythrocytes in the splenic tissue. With SPECT (single-photon emission computerized tomography) or hybrid SPECT/CT imaging applied in addition to planar images, the activity in planar imaging can be minimized, the superposition can be minimized, and the cross-sectional localization of the foci can be achieved. In F-18 FDG PET/CT imaging, ectopic splenic foci often show low-level FDG uptake; thus, it can be possible to differentiate them from malignant pathologies (6).

There is no consensus on the management of TS yet, but it is accepted that removal of the lesions is not indicated unless symptoms occur (3). In splenectomized patients, prompt antibody production against newly encountered bacteria is impaired, and it is well known that post-splenectomy infection is a serious disease with high morbidity and mortality. Ectopic spleen tissues can reduce the risk of these infections, which is why surgical removal was not considered since the lesions did not cause compression or related symptoms.

## CONCLUSION

In cases with a history of trauma and spleen or diaphragmatic injury secondary to trauma, TS should be considered before an invasive diagnostic test or surgical exploration. TS can be diagnosed by selective spleen scintigraphy without the need for invasive intervention.

## CONFLICTS OF INTEREST

None declared.

## AUTHOR CONTRIBUTIONS

Concept - H.Y, F.T., A.Ç., A.A., U.Ç.; Planning and Design - H.Y, F.T., A.Ç., A.A., U.Ç.; Supervision - H.Y, F.T., A.Ç., A.A., U.Ç.; Funding -; Materials -; Data Collection and/or Processing - H.Y, F.T., A.Ç.; Analysis and/or Interpretation - H.Y, F.T.; Literature Review - H.Y, F.T., A.Ç.; Writing - H.Y, F.T., A.Ç., U.Ç.; Critical Review - H.Y, U.Ç.

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