Splenic Incidentalomas

Sameer Ahmed[a], Karen M. Horton, MD[b,*], Elliot K. Fishman, MD[c]

KEYWORDS

• Spleen • Incidentalomas • Computed tomography

The spleen is often referred to as the forgotten organ. This claim may be because the spleen is not necessary for survival, although it certainly plays an important role in immunity. Its exact functions are still a mystery. Compared with other intraabdominal organs such as the liver and pancreas, there is a significant paucity of scientific investigation involving the spleen. This situation is especially true in the radiology literature, in which little has been published regarding the detection and characterization of splenic disease conditions.

Splenic lesions are common in a busy radiology practice. Technical advancements in computed tomography (CT) now allow unprecedented temporal and spatial resolution; unexpected splenic lesions are commonly detected on CT examinations of the abdomen and chest and often pose a diagnostic challenge to both the radiologist and clinician. This article discusses incidental splenic lesions detected on CT and explores potential management strategies.

INCIDENTAL SPLENIC LESIONS

Data on the prevalence of splenic incidentalomas are limited. Two studies conducted at level I trauma centers have reported the prevalence of incidental splenic lesions detected on CT.

In a study of 3113 patients at a level I trauma center, Ekeh and colleagues[1] reported on the prevalence of various incidentally detected lesions on abdominal CT. Scanning was performed on a GE Hi-Speed 4-Slice scanner with intravenous (IV) contrast. The prevalence of splenic granuloma and accessory spleen was 1.38% and 0.1%, respectively. The detection rates of splenic cyst and splenic hemangioma were each less than 0.08%. All incidentally detected splenic lesions in this study were benign.[1] Another recent study at a level I trauma center reported only 10 cases of incidental splenic findings on high-definition spiral CT from a total of 991 patients.[2] This study included cases of splenic cyst (4), splenomegaly (4), splenic hemangioma (one), and splenic abscess (one), with a total prevalence of only 1.0%. All reported lesions were considered clinically benign.

These 2 studies are relevant because lesions detected in the spleen were truly incidental, because these were patients being scanned for trauma. In clinical practice, when splenic lesions are detected, it is sometimes difficult to be sure that they are incidental findings, especially in patients being scanned for vague abdominal symptoms.

CT IMAGING OF THE SPLEEN

Before discussing individual splenic lesions, it is important to briefly discuss the normal appearance of the spleen on CT as well as technical issues related to CT imaging of the spleen.

The spleen is an intraperitoneal organ with a smooth serosal surface. Splenic clefts are common as a result of incomplete fusion of the embryonic splenic buds, and should not be

[a] Johns Hopkins School of Medicine, 1620 McElderry Street, Baltimore, MD 21205, USA
[b] Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins Medical Institutions, JHOC 3253, 601 North Caroline Street, Baltimore, MD 21287, USA
[c] Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins Medical Institutions, JHOC 3254, 601 North Caroline Street, Baltimore, MD 21287-0801, USA
* Corresponding author.
E-mail address: kmhorton@jhmi.edu

Radiol Clin N Am 49 (2011) 323–347
doi:10.1016/j.rcl.2010.11.001

interpreted as laceration or previous infarcts (Fig. 1).[3] Similarly, spenules (unfused splenic buds) are common and have been reported to occur in 10% of the population (Fig. 2).[4] These accessory spleens should not be mistaken for adenopathy, implants, or masses in adjacent organs such as the pancreas or left adrenal gland.[5]

In addition, because of the presence of white pulp and red pulp, there are variable circulatory routes through the spleen. This situation results in heterogeneous perfusion of the spleen after IV contrast administration.[6] This pattern often seems serpentine or chordlike (Fig. 3). It is more common early after rapid contrast administration and is exaggerated in patients with portal hypertension, splenic vein occlusion, or heart failure. This early enhancement pattern can obscure an underlying splenic mass or laceration. Alternatively, the heterogeneous appearance can simulate the presence of focal splenic masses.

The best time to image the spleen after IV contrast administration has not been well established. However, if a CT is being performed to characterize a known or suspected splenic lesion, there are some guidelines. It is probably reasonable to obtain a noncontrast scan to better define the presence of calcifications or hemorrhage and to obtain a baseline density of the lesion. After IV contrast administration (3–5 mL/s), an arterial scan at 30 s is useful to better define vascularity and enhancement as well as to visualize the splenic artery. The parenchyma of the spleen may not be well imaged at this time. A later phase scan at 60 to 70 s is helpful to show homogeneous parenchymal enhancement and to allow more accurate detection of small lesions. Delayed scans may be of value in select cases.

The role of three-dimensional imaging for evaluation and characterization of splenic lesions has not been well studied. However, the ability to visualize the spleen and splenic diseases in more than one plane has been useful in our clinical practice (Fig. 4).

CLINICAL CORRELATION

The CT appearances of a variety of splenic lesions overlap considerably. When a splenic lesion is detected on CT, it often cannot be characterized completely without basic clinical correlation. For example, is it truly an incidental lesion in an asymptomatic patient? Does the patient have pain that could be related to the spleen? Does the patient have a fever? Is the patient immunocompromised? Does the patient have an underlying malignancy? Does the patient have a history of trauma? Is there an isolated splenic lesion or multiple splenic lesions? Is there any other associated abdominal condition, such as liver lesions or adenopathy? This information is critical when evaluating splenic disease. The appearances of splenic lesions on CT are typically not pathognomonic and often cannot be characterized based on the CT appearance alone.

PATIENT SCENARIOS

This section presents a series of clinical scenarios involving splenic lesions detected on CT. Each scenario includes a discussion of the relevant

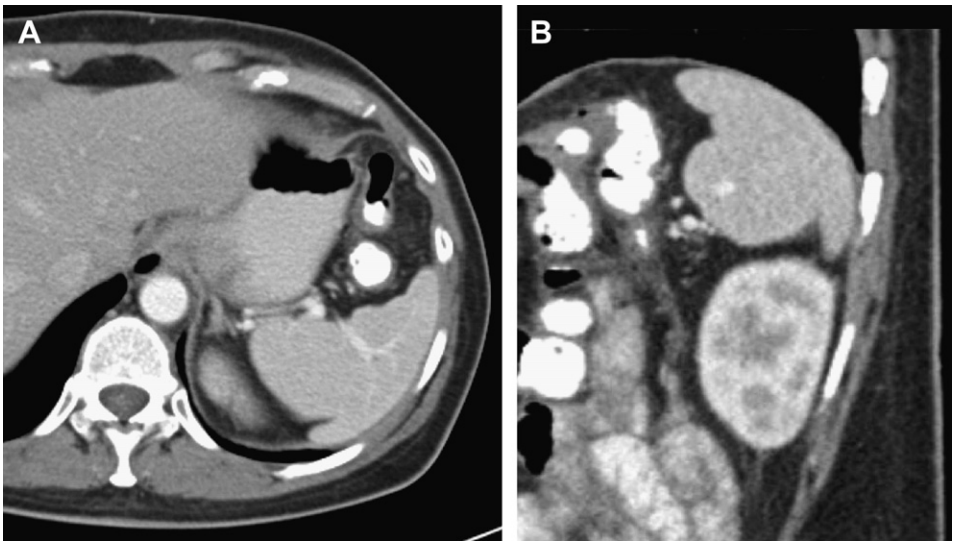

Fig. 1. (*A*) Axial and (*B*) coronal contrast-enhanced CT shows a splenic cleft along the posterior and inferior margin.