

# Splenic infarction as a pitfall on labeled red blood cell imaging

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## ABSTRACT

Patient with a history of overt gastrointestinal bleeding, diabetes mellitus, hypertension, polycythemia vera, and choledocojejunostomy was hospitalized because of hematemesis and melena. An area of Technetium-99m labeled red blood cells accumulation at the splenic flexure similar to an overt bleeding area, was observed on gastrointestinal bleeding scintigraphy (GIBS). In case of underlying malignancy, abdominal computed tomography was performed and demonstrated the infarction area placed laterally in spleen, appearing as a cold region on scintigraphic image, separating the inferomedial and upper part of splenic uptake. Splenic variants and pathologies can complicate interpretation of GIBS.

**Keywords:** Gastrointestinal bleeding scintigraphy, labeled red blood cells, splenic infarction

A 76-year-old woman with a history of diabetes mellitus, hypertension, polycythemia vera (PV), and previous choledocojejunostomy was hospitalized because of hematemesis and melena. The endoscopic evaluation revealed giant ulceration on the region of choledocojejunostomy anastomosis. Epinephrine infusion was performed to the determined artery on the site of anastomosis. Because of recurrent hematemesis, computed tomography (CT) angiography was performed, but a focus of active bleeding could not be determined. The operation was considered and in case of underlying malignancy CT of the abdomen was performed at same day with gastrointestinal bleeding scintigraphy (GIBS) to determine the site of bleeding. An area of Technetium-99m labeled red blood cells (<sup>99m</sup>Tc-RBCs) accumulation at the splenic flexure, inferomedial site of spleen, similar to a bleeding area was observed [Figure 1a-d] at the early anterior (a), posterior (b) and late anterior (c), posterior (d) scintigraphic images. But the activity accumulation was not moving antegrade or retrograde along the gastrointestinal tract. In correlation with CT images, the accumulation nearby splenic flexure determined as inferomedial part of the enlarged spleen. And the cold region on the scintigraphic image was corresponding to infarction area [Figure 2a and b].

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GIBS is a noninvasive study that is performed with <sup>99m</sup>Tc-RBCs to determine whether the bleeding is active, to localize the bleeding site and to approximate the bleeding volume. The diagnostic criteria for scintigraphic gastrointestinal bleeding are the appearance of activity outside the expected anatomic blood pool structures, a change in the intensity of activity on consecutive images and movement of activity in a pattern consistent with bowel.<sup>[1]</sup> But higher bleeding rates are associated with the early appearance of blood in the area and activity can be as intense as or greater than the liver.<sup>[2]</sup>

False positive results because of increased Tc-99m-RBCs activity due to other causes in literature are; penile blood pool mistaken for rectal bleeding, variable uterine activity during the ovulatory cycle, uterine leiomyoma, renal activity especially from an unexpected location such as a pelvic or ectopic kidney, horseshoe kidney, or a renal transplant and pooling of urine activity.<sup>[3-7]</sup>

Vascular causes of abnormal RBC distribution on GIBS can include aneurysms of the abdominal aorta, gastroduodenal artery, iliac artery, and other arterial vessels. Vascular grafts and arterial leaks can also mimic gastrointestinal bleeding. In addition, aortoduodenal fistula rupture, hemangiomas in the

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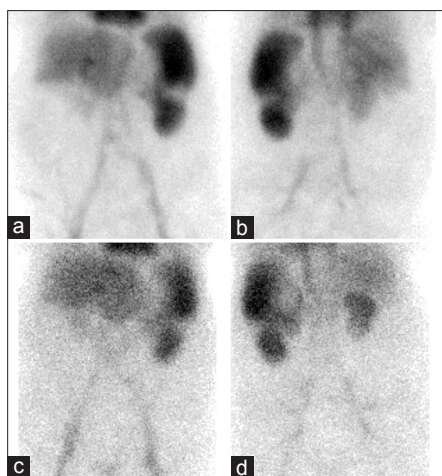
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**Figure 1:** An area of Technetium-99m labeled red blood cells accumulation at the splenic flexure, inferomedial site of spleen, similar to a bleeding area was observed (a-d) at the early anterior (a) posterior (b) and late anterior (c) posterior (d) scintigraphic images

liver or small bowel, and abdominal varices are other causes of false positive GIBS.<sup>[1,7,8]</sup>

Splenic variants and pathology can also cause fixed activity in the form of accessory spleens and splenosis.<sup>[9]</sup> Retroperitoneal bleeding can show focal uptake that grows in intensity but is not expected to move in a luminal pattern.<sup>[10]</sup> We represented a case with splenic infarction causing abnormal RBC distribution. The area of activity accumulation was seen on the early imaging in accordance with the patient's history of overt gastrointestinal bleeding. But it was neither moving like gastrointestinal bleeding, nor growing in intensity like retroperitoneal bleeding. Splenic infarction is associated with benign conditions such as hypercoagulable states, sickle hemoglobinopathies, and malign hematological disorders, also diabetes mellitus. Splenic infarction may be rare but the first evidence of thrombosis in PV.<sup>[11]</sup> The patient in this case represented with PV, diabetes mellitus, hypertension, choledocojejunostomy, and overt gastrointestinal bleeding. An area of Tc-99m-RBCs accumulation at the splenic flexure was determined as inferomedial part of the enlarged spleen in correlation with CT images. And the cold region on the scintigraphic image was corresponding to infarction area on CT.

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Nil.



**Figure 2:** (a and b) Coronal and axial contrast-enhanced computed tomography scan shows an enlarged spleen with splenic infarction, classically described as, peripheral wedge-shaped and low in density region in the middle portion of the spleen

#### Conflicts of interest

There are no conflicts of interest.

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