In-111-Labeled Leukocyte Imaging: False-Positive Study Due to Acute Gastrointestinal Bleeding

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A case is reported in which In-111-labeled leukocytes accumulated in the left colon on a 24-hr delayed image. This was found to be secondary to an upper gastrointestinal bleed in progress at the time of injection of the radiolabeled leukocytes.

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Scintigraphy with In-111-labeled leukocytes (In-111 WBC) is being used more frequently for abscess location in patients with fever of unknown origin. The technique is particularly useful in the postoperative patient since, unlike gallium-67 citrate, there is no significant uptake in normal bowel. Recently we observed a patient with intense focal abdominal accumulation of In-111 WBC activity, due to gastrointestinal (GI) bleeding.

CASE REPORT

A 69-yr-old man developed sepsis after surgery for multiple injuries suffered in an automobile accident. The injuries included a tear in the thoracic aorta requiring repair, and a fracture of the L-5 vertebral body resulting in paraplegia. An In-111 WBC study was performed in search of a focus of infection. Autologous WBCs were labeled with In-111 oxine by the method of McDougall and associates (*1*). Radioactive dose was 1 mCi. Images were obtained 24 hr after injection, using an Anger camera with medium-energy collimator and energy windows set for the 171- and 245-keV full-energy peaks of In-111. The initial image was obtained over the liver and spleen, preset for 700,000 counts. All subsequent images were set for the initial time.

A large abnormal accumulation of In-111 was identified in what appeared to be the region of the left and sigmoid colon (Fig. 1). At the approximate time of the intravenous injection of the In-111 WBCs the patient had a documented upper GI bleed followed by melena. He was transfused with two units of packed RBCs before the hematocrit became stable. From this information we concluded that the most likely cause for the increased intestinal activity was the patient's GI bleed. For confirmation we hoped to image the patient at 48 hr to look for a change in distribution of the intestinal activity. Unfortunately the patient's condition deteriorated and no additional images could be obtained.

Four days later an autopsy was performed, confirming the

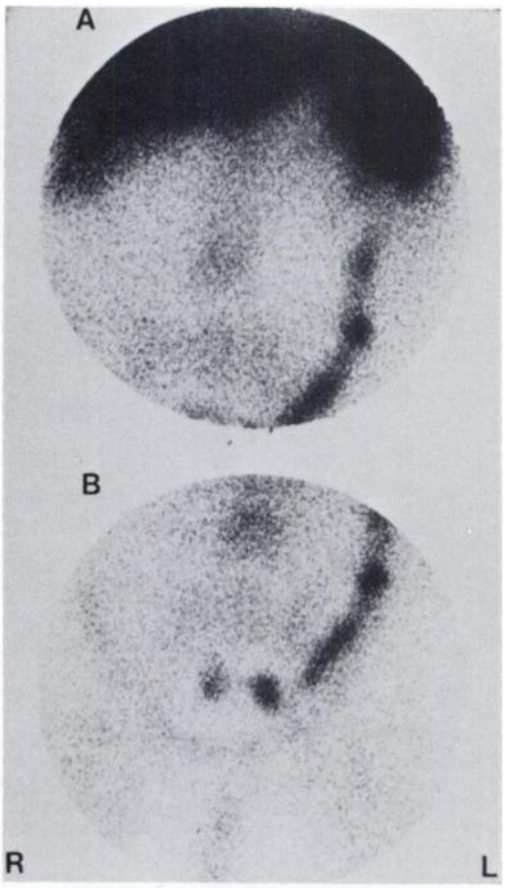

FIG. 1. Anterior images of upper (A) and lower (B) abdomen 24 hr after intravenous injection of autologous indium-111 WBCs. Abnormal activity present in left colon. Less intense activity seen in region of L-5 vertebral body. At autopsy there was severe fracture-dislocation of L-5, without evidence of superimposed infection.

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presence of a hemorrhagic gastritis. The left colon was intact, with no evidence of ischemia or necrosis.

DISCUSSION

Reports have appeared recently describing intestinal visualization from noninfectious causes during In-111 WBC studies (*2,3*). Gray described In-111 WBC accumulation in an area of small-bowel infarction mimicking a paracolic abscess. Coleman and Welch have described a case of increased colonic activity felt to be secondary to inflammation from multiple enemas (*3*). They also mentioned intestinal accumulation due to ischemic bowel and an ulcerating colitis secondary to a vasculitis (*3*).

Visualization of GI bleeding with In-111 WBCs should not be considered surprising. In-111 WBCs behave like Tc-99m sulfur colloid in that the most avid uptake is in the liver and spleen and to a lesser extent in the bone marrow (*4*). Like sulfur colloid, extravasation may occur if there is bleeding at the time of radiotracer injection. Unlike sulfur colloid, however, blood clearance of In-111 WBCs is slower, and as much as 4.6% of radioactivity remains in the blood at 22 hr after injection (*4*). Conceivably GI bleeding occurring within 24 hr of injection of the In-111 WBCs could show significant gut activity and lead to an erroneous diagnosis.

This case demonstrates yet another noninfectious cause of intestinal activity visualized by In-111 WBC imaging.

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