

Clinical Imaging with Indium-111 Leukocytes: Uptake in Bowel Infarction

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Leukocytes labeled with indium-111 accumulated in an area of small-bowel infarction, mimicking a paracolic abscess. Evidence of subacute bowel obstruction should alert the nuclear medicine physician to the former possibility.

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Whole-body scintigraphy following injection of autologous In-111 leukocytes is now established as a valuable clinical tool for detection of occult abscess formation (1-5). Several pitfalls of the technique have emerged recently (3,8). We describe a patient with an abnormal intra-abdominal collection of indium who did not have an abscess but a length of infarcted small bowel.

CASE REPORT

Four weeks after elective cholecystectomy, a 55-year-old man was readmitted with constant anorexia, central abdominal pain, nausea, and vomiting. On physical examination there was no fever, he had dullness to percussion and crepitations at the right base, diffuse abdominal tenderness was present, and weight loss of 14 pounds was noted. Laboratory data included a white-cell count of 30,000/cu mm, a chest radiograph that showed right middle- and lower-lobe consolidation, a scout film of the abdomen that revealed some fluid levels, and a normal ultrasound of abdomen. Indium-111 leukocyte scintigraphy at 24 hr was performed 6 days after admission and showed a focal collection of indium in the left iliac fossa (Fig. 1).

At laparotomy, a 75-cm length of infarcted small bowel was found in the left iliac fossa. The bowel was black in areas and was twisted on an axis, with attachment to the site of the previous gallbladder excision. There was a granular peritonitis throughout the lower abdominal cavity but no collection of pus or fluid. Side-to-side jejunio-ileal anastomosis was performed.

Microscopy of the surgical specimen showed mucosal necrosis in the black areas, with intense polymorph infiltration of the mucosa and submucosa. The opportunity to measure the indium content of the resected specimen was lost.

After convalescence, the patient was discharged well.

DISCUSSION

Scintigraphy with In-111 leukocytes is a sensitive and relatively specific clinical test for detecting localized infection (1-4). The

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physiological homing function of the polymorph (5) results in a net flux of labeled cells into the abscess, with higher abscess-to-tissue ratios than are possible with gallium (6). Also important are the lack of normal colonic activity (7) or uptake in tumors (9), both of which occur with gallium.

Polymorphs will also accumulate in the inflammatory response to tissue infarction. Workers have demonstrated positive imaging of canine myocardial infarction (10) and ischemic canine bowel infarction (11) with labeled leukocytes, but apart from the reported uptake of In-111 leukocytes in a cerebral infarction (8), the technique has been of no value in human series to date (3). Without verification by *in vitro* counting of the resected specimen, evidence

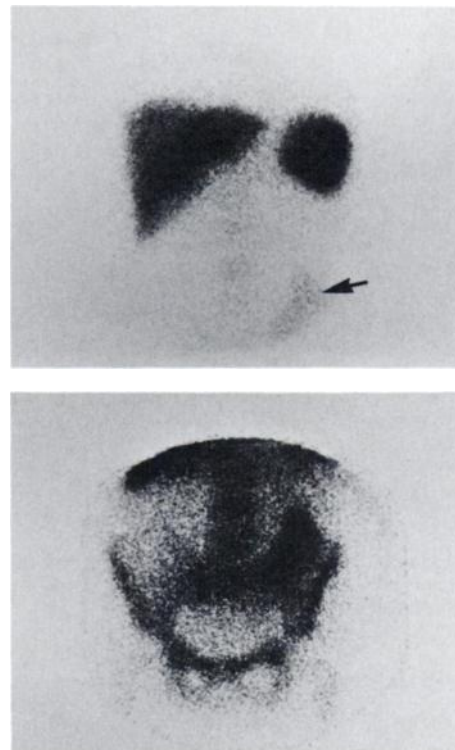


FIG. 1. Indium-111 leukocytes in bowel infarction: upper and lower abdominal images showing abnormal uptake in left iliac fossa.

that labeled leukocytes accumulated in the infarcted bowel is provided by the identical position of the affected bowel and scintigraphic abnormality and the exclusion at laparotomy of a focal collection of pus or fluid. By contrast, diffuse bowel uptake has been reported after multiple enemata, in the presence of vasculitis, and in ischemic bowel without infarction (8), but differentiation from a focal lesion can usually be made.

In conclusion, accumulation of labeled leukocytes in bowel infarction illustrates the nonspecificity of the inflammatory response. Since the diagnosis must not be delayed, we suggest that laboratory data indicating a degree of subacute intestinal obstruction should alert the nuclear medicine physician to the possibility of infarction rather than abscess.

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