

# Persistent Bowel Activity of Gallium-67-Citrate Simulating Cholecystitis: A Case Report

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**Objective:** A 34-year-old woman with a history of non-Hodgkin's lymphoma developed fever and abdominal tenderness, and a  $^{67}\text{Ga}$  scan was obtained to exclude a source of infection.

**Methods:** Whole-body planar images and a SPECT study of the abdomen were obtained using  $^{67}\text{Ga}$  citrate.

**Results:** The planar images at 48 hr after injection showed a focus of intense activity which appeared to be in the gallbladder fossa, raising the possibility of cholecystitis or a subhepatic abscess. A SPECT study of the abdomen was inconclusive in distinguishing the focus from bowel activity. However, delayed images at 72 hr after injection demonstrated movement of activity in the bowel and clearance of the suspicious focus.

**Conclusion:** Bowel activity of  $^{67}\text{Ga}$  citrate imposes severe limitations on the diagnosis of abdominal infection. Delayed imaging is the best way to differentiate abscess or other infections from localized bowel accumulation.

**Key Words:** lymphoma; infection; gallium-67; gallbladder fossa; bowel

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## CASE REPORT

A 34-year old woman with a history of non-Hodgkin's lymphoma received an autologous bone marrow transplant. She subsequently developed fever and abdominal tenderness, and a  $^{67}\text{Ga}$  scan was obtained to exclude a source of infection.

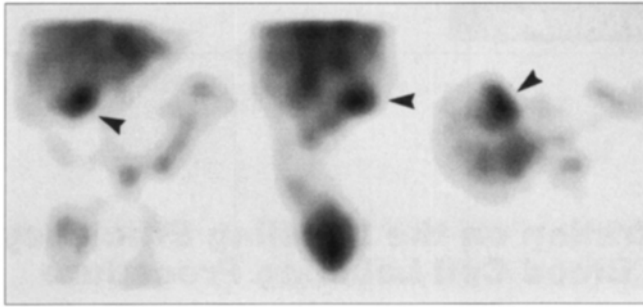
A planar anterior view of the whole body (Fig. 1), performed after bowel cleansing, demonstrated a focus of increased  $^{67}\text{Ga}$  activity which seemed to be in the gallbladder fossa. Representative coronal, sagittal and transaxial images of a SPECT study of the abdomen (Fig. 2, from left to right) confirmed the location of the focus (arrow) which has no distinct association

with adjacent bowel activity. A 72-hour delayed anterior view of the abdomen (Fig. 3) showed clearance of activity from the hepatic flexure of the colon and disappearance of the suspicious focus.



**FIGURE 1.** Planar anterior view of the whole body shows a focus of increased  $^{67}\text{Ga}$  activity in the gallbladder fossa.

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**FIGURE 2.** Representative coronal, sagittal and transaxial images of a SPECT study of the abdomen (left to right) confirm the location of the focus (arrow) which has no distinct association with adjacent bowel activity.

### DISCUSSION

Gallium-67 citrate is excreted through the kidneys in the first 12 to 24 hr. After that time the intestinal mucosa becomes the



**FIGURE 3.** A 72-hour delayed anterior view of the abdomen shows clearance of activity from the hepatic flexure of the colon and disappearance of the suspicious focus.

major route of elimination, imposing severe limitations on the diagnosis of abdominal infection.

Meticulous bowel preparation is advised prior to imaging. Although enemas may produce at least partial evacuation of the descending colon, they may not be successful in cleansing the ascending and transverse colon. Repeat imaging on successive days is usually more helpful. Gallium-67 uptake in the abdomen has been reported in acute cholecystitis, amebic abscess, hepatoma, necrotic liver metastases, pyogenic abscess, perinephric abscess and inflammatory bowel disease (1-6).

Indium-111-labeled autologous WBC scintigraphy has the advantage of low background activity, no uptake or excretion by the normal bowel and usually no uptake in tumors. Thus, it may be more prudent to use the latter imaging modality for evaluation of an abdominal source of infection.

Our case illustrates the utmost significance of delayed abdominal imaging with  $^{67}\text{Ga}$ . The physiologic movement of bowel activity over time is the best way to differentiate abscess or other infections from localized bowel accumulation.

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