

**FALSE-POSITIVE LIVER SCAN DUE TO LUNG ABSCESS**

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With the introduction of the scintillation camera (1,2) and the availability of short-lived radiocolloids such as  $^{99m}\text{Tc}$  (3), the routine use of liver scanning as an expedient, reliable, and safe means for detecting and evaluating liver abscesses has gained universal acceptance. This report describes an unusual cause of factitious liver abscess and lends insight into the process of misinterpretation.

**CASE REPORT**

The patient, a 31-year-old male, was admitted because of progressive dysphagia, nausea, and abdominal pain. He had a previous history of intractable gastric ulcers and regional enteritis involving the ileum. He had had multiple surgical procedures including vagotomy and pyloroplasty in 1964, partial gastrectomy and gastrojejunostomy in 1965, lysis of adhesions and an entero-enterostomy in 1969, and a total gastrectomy and esophagojejunostomy in October of 1970. A liver scan at the time of hospitalization in October of 1970 revealed hepatomegaly with no evidence of subphrenic abscess or intrahepatic lesion.

At the time of admission on March 3, 1971, the patient was emaciated, dehydrated, and had a fever of 101°F. The pulse was 90 and the blood pressure was 100/50. The remainder of the physical examination was unremarkable. Except for a moderate leukocytosis of 13,000 with 90% polys, elevated alkaline phosphatase, and depressed albumin levels, laboratory tests were not remarkable. The chest film on admission was normal. Subsequent chest films, however, revealed a progressive infiltrate in the right lower lobe which consolidated and eventually excavated, resulting in a large multiloculated basilar abscess cavity (Fig. 1A). A liver scan was performed after 2 weeks of hospitalization and showed a large defect in the superior, postero-medial aspect of the right lobe of the liver which was interpreted as a liver abscess (Fig. 1B).

A laparotomy was performed to drain the apparent liver abscess. At the time of surgery, adhesions were present between the superior aspect of the liver and the dome of the diaphragm. Visualization and/or palpation of the entire liver following lysis of these adhesions demonstrated no evidence of induration, pus, or liver abscess, although a large fluctuant mass representing a lung abscess could be felt pressing down from above the diaphragm. Needle aspirations of the liver showed normal hepatic architecture.

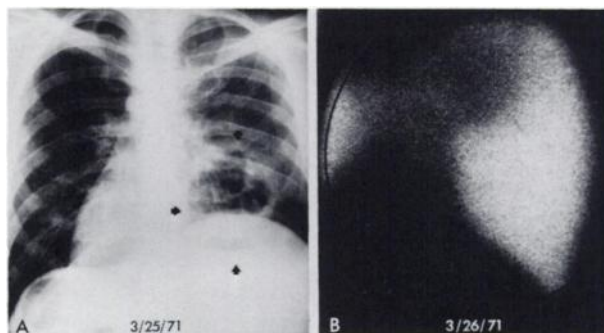
Postoperatively, the patient was maintained on broad-spectrum antibiotics and the temperature remained normal. He gained weight and his strength returned to normal. Followup chest films demonstrated continued resolution of the right lower lobe abscess cavity (Fig. 2A) and subsequent liver scans demonstrated continued resolution of the apparent liver mass (Fig. 2B).

**DISCUSSION**

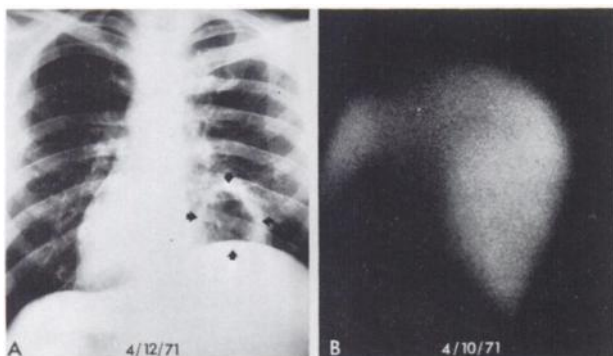
The liver scan is an accurate and relatively sensitive test for detecting space-occupying lesions in the

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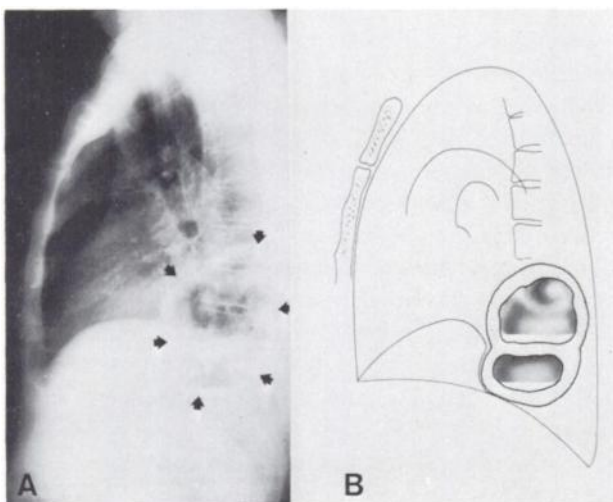
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**FIG. 1.** (A) large multiloculated abscess cavity is demonstrated in right lower lobe part of which projects below dome of diaphragm. (B) posterior camera view of liver one day later shows large defect in superior, postero-medial aspect of liver.



**FIG. 2.** (A) right basilar lung abscess has decreased considerably over 3-week period. (B) posterior camera view 2 days earlier shows significant decrease in size of previously demonstrated defect.



**FIG. 3.** Lateral view of chest (A) and accompanying diagram (B) demonstrate considerable overlap between lung abscess and dome of liver as well as compression of liver margin by basilar abscess.

liver (4-8). False-positives are rarely encountered with the newer scanning techniques (6,9). Occasionally extrinsic compression by an enlarged gall bladder, metastatic tumor, enlarged lymph nodes, or normal anatomic structures such as rib cage and kidney may lead to misinterpretation (6).

In several large series (10,11), the accuracy in the diagnosis of liver abscess by liver scan was 86-98%. The scan has been helpful not only in early detection, but also in the selection of a proper surgical approach (12). It is not surprising, therefore, that clinicians have become increasingly dependent upon radionuclide studies for initial diagnosis or confirmation of suspected liver abscesses.

This case is an example of an unusual cause of a lesion simulating liver abscess. It is apparent in retrospect that the large defect in the superior, posteromedial aspect of the liver was due to compression

from above the diaphragm by the multiloculated excavated infiltrate in the right lower lobe. As emphasized by Lachman (13) and demonstrated in the diagram (Fig. 3A and B), the posterior sulcus of the right pleural cavity is quite deep, extending to the level of the first or second lumbar vertebra and accounting for considerable overlap between the dome of the liver and the lung base. It is not surprising, therefore, that a large pulmonary lesion in the lung base may produce a defect in the superior aspect of the liver on the posterior camera view. It is also apparent that the rapid disappearance, in 3 weeks, of the defect is inconsistent with a healing hepatic abscess, since such abscesses normally require 2-4 months of intensive antibiotic therapy for resolution (14).

When one encounters a mass defect during a radionuclide study of the liver, a host of potential false-positive etiologies must be considered, including pathological processes in adjacent structures. This case is the first reported of a false-positive liver scan due to an abscess in the lung base.

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