

GALLIUM GALLBLADDER SCANNING IN CHOLECYSTITIS

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Gallium has been shown to accumulate in metabolically active tissue including sites of infection. The purpose of this study was to evaluate gallium scanning in cholecystitis. Ten patients with cholecystitis were studied using conventional gallium scanning techniques. Five patients with acute cholecystitis showed intense gallium accumulation in the gallbladder area. One of five patients with chronic cholecystitis showed significant accumulation in the gallbladder. The limitations of this method are mainly the need for serial scanning to rule out gallium accumulation in the hepatic flexure of the colon and also the failure to detect consistently a chronically diseased fibrotic gallbladder. We conclude that gallium scanning of the gallbladder is an important adjunctive study in the evaluation of cholecystitis.

Gallium accumulation within inflammatory tissue has been well documented (1-3). Gallium accumulation in empyema of the gallbladder has also been demonstrated (4). The diagnosis of cholecystitis with or without empyema is often difficult especially in patients with fever but without localizing features and in those with vague symptomatology and equivocal radiographic studies. This study indicates a possible role for gallium in the evaluation of such patients.

METHODS

Ten cases of suspected gallbladder disease were studied. When possible, oral cholecystogram, intra-

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TABLE 1. GALLIUM SCANNING IN CHOLECYSTITIS

Pa-tient	Gallium scan	White cell count	Oral cholecystogram	Intravenous cholangiogram	Alkaline phosphatase (normal 1-3)	Bilirubin (total/direct)	Diagnosis
RO	+++	22,900	Not done	Not visualized	2.2	4.5/0.1	Acute cholecystitis
NG	++++	21,700	Not visualized double dose	Not visualized	9.1	0.7/13	Acute cholecystitis
ML	++++	19,000	Not visualized double dose	Not visualized	6.2	0.3/0.1	Acute cholecystitis
VQ	++++	16,000	Not done	Not visualized	5.6	3.3/2.4	Chronic cholecystitis
MN	++++	14,300	Not visualized double dose	Not done	5.6	0.5/1.	Acute cholecystitis
MD	—	9,300	Good function	Not done	1.8	0.7/0.2	Chronic cholecystitis
EP	—	7,700	Not done	Not visualized	2.2	0.8/0.1	Chronic cholecystitis
ED	++	6,800	Not visualized double dose	Not visualized	5.6	0.9/0.2	Acute cholecystitis
AM	—	6,400	Not visualized double dose	Poor visualization with stones	2.3	0.6/0.1	Chronic cholecystitis
MM	—	5,800	Not visualized double dose	Not visualized	2.0	0.5/0.1	Chronic cholecystitis

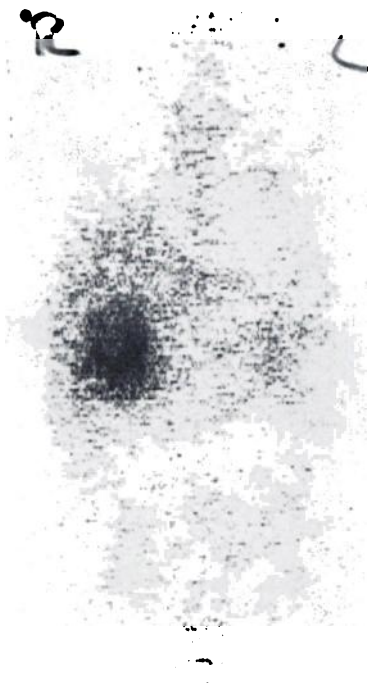


FIG. 1. ^{67}Ga -citrate scan of patient with acute cholecystitis.

venous cholangiogram, colloid liver scan, and appropriate blood studies were done. Gallium-67-citrate torso scans were done in all cases. The liver scans were performed with Anger cameras or rectilinear scanners following administration of 5 mCi of $^{99\text{m}}\text{Tc}$ -sulfur colloid. Gallium torso scans were performed on a dual-headed scanner using 5 mCi of ^{67}Ga -citrate and a 184-keV photopeak setting. The time following injection was 4–48 hr with serial studies done when possible. Diagnosis was established by surgery in eight cases. Two patients (RO and MM) were suspected of cholecystitis based on clinical course as well as on laboratory and radiologic findings.

RESULTS

The results are summarized in Table 1.

Figure 1 is a surgically proven case of acute cholecystitis with an enlarged edematous gallbladder found at surgery. No empyema was present. Adhesions to the omentum and bowel were noted. The oral cholecystogram and intravenous cholecystogram showed nonvisualization.

Figure 2 shows intensive uptake in the gallbladder in a 30-year-old Oriental woman with fever of unknown etiology. Surgery showed the gallbladder to be edematous and inflamed. The pathologic diagnosis was acute cholecystitis.

Figure 3 is a surgically proven case of chronic cholecystitis with acute changes. An amebic abscess

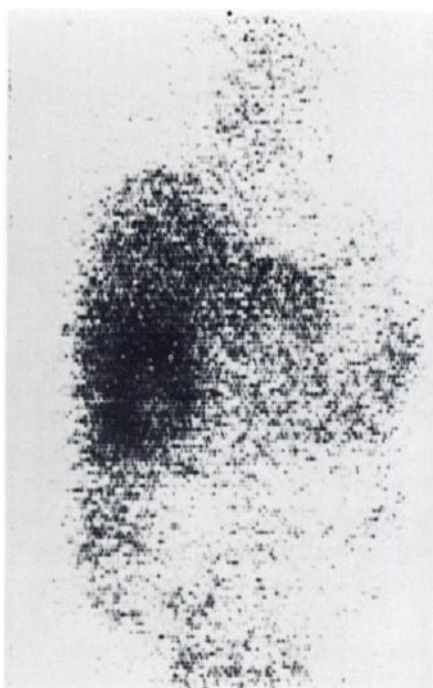


FIG. 2. ^{67}Ga -citrate scan of patient with clinically unsuspected cholecystitis admitted with fever of unknown etiology.

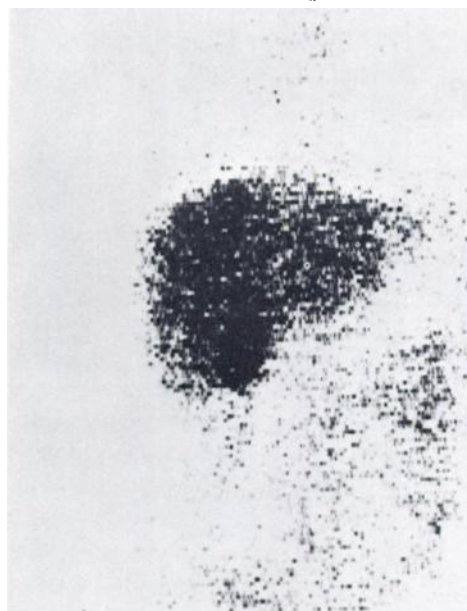


FIG. 3. ^{67}Ga -citrate scan of patient with surgically proven chronic cholecystitis. Admitting diagnosis was amebic abscess. Colloid liver scan was normal.

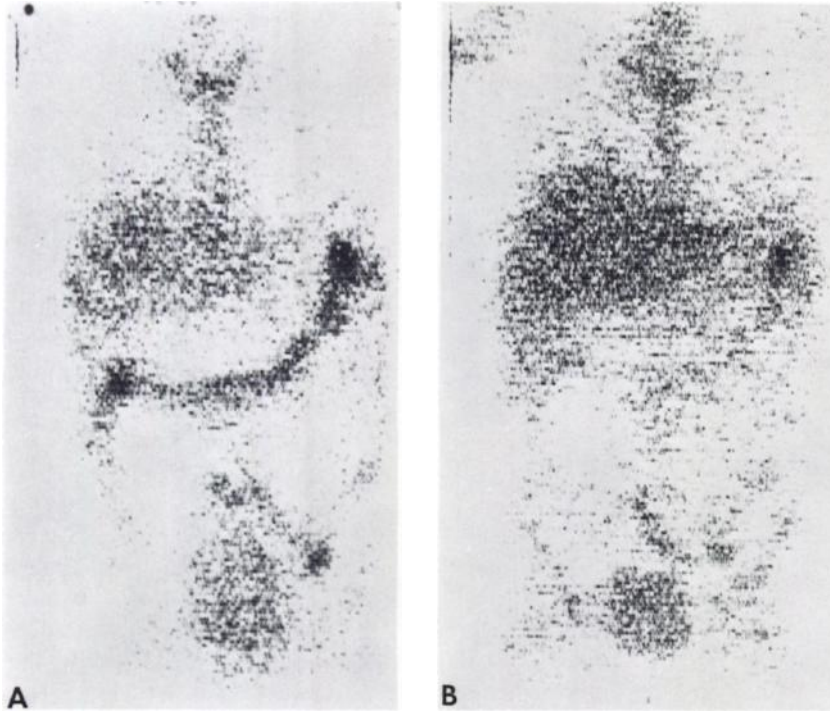


FIG. 4. ^{67}Ga -citrate scan of patient with surgically proven chronic cholecystitis (A) 24 hr, (B) 48 hr. Note uptake in hepatic flexure that tends to preclude accurate assessment of gallbladder region.

was suspected; however, the colloid liver scan was normal.

Figure 4 illustrates a problem in the use of gallium for abdominal scanning. The accumulation of gallium in the transverse colon with occasional sequestration in the hepatic flexure necessitates serial scans. This may occasionally preclude the use of this method for early diagnosis. At surgery the patient was found to have a fibrotic, contracted gallbladder.

DISCUSSION

The use of ^{67}Ga -citrate to evaluate inflammatory disease of the gallbladder is most useful in the acute stages of cholecystitis or in chronic disease with acute exacerbations. A chronic disease process with a fibrotic, small gallbladder may show no detectable gallium accumulation. The current study indicates a spectrum of ^{67}Ga accumulation with a markedly inflamed edematous gallbladder showing maximum uptake while decreasing accumulation is noted as chronicity and fibrosis increase.

The major problems encountered in this study

were: (A) The occasional need for serial scanning, often preventing a rapid definitive diagnosis, and (B) The failure of significant gallium accumulation in a fibrotic contracted gallbladder.

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