

Diagnosis of Clinically Unsuspected Gallbladder Perforation in an Obese Patient, by Tc-99m IDA Cholescintigraphy

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A male Pickwickian syndrome patient was admitted to the hospital with sudden onset of abdominal pain. Physical examination was equivocal. Due to patient's ileus and morbid obesity (weight 450 lb), neither TCT scan nor ultrasound was possible. A Tc-99m PIPIDA hepatobiliary imaging study revealed intraperitoneal leakage of radioactive bile with collection of the activity in both abdominal gutters, indicating gallbladder rupture. Prompt surgery confirmed the diagnosis.

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Tc-99m IDA cholescintigraphy is primarily used for the diagnosis of acute cholecystitis, less often in other biliary abnormalities (1-4). We describe a case of clinically unsuspected gallbladder rupture in an obese patient in whom cholescintigraphy was the only modality that could be used to document the diagnosis, which lead to appropriate immediate therapy.

CASE REPORT

A 42-yr-old obese (450 lb) male patient with Pickwickian syndrome, who required intubation and ventilation assistance on a prior admission, returned to the hospital for exacerbation of his respiratory symptoms and sudden onset of abdominal pain. The pain was described as constant and not associated with fever, chills, nausea, or vomiting. Physical examination of the abdomen was difficult due to morbid obesity, but there was right upper quadrant tenderness to deep palpation. There was no rebound tenderness. Bowel sounds were not apparent. Rectal examination was unremarkable. The laboratory data showed bilirubin 1.4 mg% (normal 1 mg%), alkaline phosphatase 108 IU/l (35-105), LDH 291 IU/l (132-240) SGOT 70 IU/l (9-34) and elevation of WBC to 29,900 with a marked left shift (PMNs 72%, bands 23%). Due to the patient's pain and morbid obesity, neither TCT scanning nor ultrasound was possible. Because of the right upper quadrant pain and elevated liver-function tests, the clinician requested an hepatobiliary imaging study to exclude acute cholecystitis. A technetium-99m IDA cholescintigraphic series was performed with an LFOV gamma camera, after intravenous injection of 5 mCi of Tc-99m *p*-isopropyl-IDA (PIPIDA). Images were taken at 10, 20, 30, 45, 60, 75, 90, 110, and 180 min after injection. Intraperitoneal leakage of bile (Fig. 1), with pooling of activity in the vicinity of the gallbladder and in both abdominal gutters, indicated gallbladder rupture. The patient was promptly operated on, which

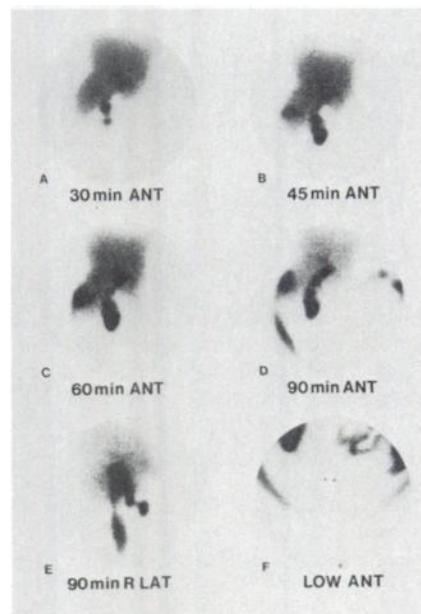


FIG. 1. Early Tc-99m IDA imaging shows liver and gallbladder (A) and pooling of radioactivity close to liver (B,C). Radioactivity appears in both gutters simultaneously at 90 min (D) but does not follow usual course of ascending, transverse, and descending colon. Both gutters are seen, without appearance of transverse colon at any time. Right lateral (E) and low anterior abdominal images (F) show activity moving downwards along both gutters (+++ locates umbilicus).

confirmed rupture of the gallbladder at the fundus. Bile and multiple gallstones were found in the peritoneal cavity.

DISCUSSION AND CONCLUSION

The prognosis in a case of gallbladder rupture and bile peritonitis depends primarily upon the time lapse between perforation and surgery. The overall mortality in rupture is as high as 50%, attributed primarily to delayed diagnosis and treatment (5,6). The gallbladder may rupture and leak bile freely into the peritoneal

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cavity, or the bile leak may be localized between the gallbladder and the surrounding inflammatory adhesions (5).

The localized form of perforation occurs in about 12% of the cases of acute cholecystitis (7). The most common site of perforation is in the relatively hypovascular fundus (8). The perforation is seen more often in acute cholecystitis associated with calculi, but it may occur, less frequently, in acalculous acute cholecystitis (9-10). The symptoms of perforation sometimes can be inconspicuous and completely misleading, as happened in this patient. Occasionally the patient may have a transient relief of symptoms if the leak is well confined.

Gallbladder rupture has been detected using I-131 rose bengal and Tc-99m-labeled iminodiacetic acid derivatives (10-15). It is possible to misinterpret the collection of the radioactive bile in the right peritoneal gutter as due to a fistula between gallbladder and ascending colon. The gallbladder-colon fistula constitutes only about 20% of all gallbladder fistulas. Serial imaging would help to differentiate gallbladder-colon fistula from rupture. The demonstration of radioactivity in both abdominal gutters simultaneously would favor rupture (Fig. 1F).

In conclusion, in this patient the Tc-99m PIPIDA cholescintigrams helped to diagnose gallbladder rupture, and led to immediate surgery with a good outcome. The nuclear medicine physician should be aware of this occasional complication, when interpreting hepatobiliary imaging studies of patients with suspected acute cholecystitis.

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