Effect of Narcotic Premedication on Scintigraphic Evaluation of Gallbladder Perforation


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A case of gallbladder perforation is presented in which a small bile leak was demonstrated by cholescintigraphy while the patient was receiving meperidine, but not after meperidine was discontinued. The scintigrams obtained during meperidine therapy also showed a pattern of bile-duct obstruction. It is suggested that increased biliary pressure secondary to meperidine administration permitted visualization of the leak. Use of narcotic drugs may be a useful pharmacologic intervention in cases of peritonitis due to small or obscure bile leaks.


Hepatobiliary imaging with Tc-99m-labeled iminodiacetic acid derivatives has proved to be a sensitive technique for the detection of bile leaks following abdominal trauma or surgery (1,2). Many patients, at the time that bile leak is suspected, are being treated with narcotic analgesics that are known to cause spasm of the sphincter of Oddi (3-5). This case report presents a patient in whom meperidine given for pain relief during attempted liver biopsy may have helped to demonstrate iatrogenic perforation of the gallbladder.

CASE REPORT

A 41-yr-old asymptomatic man was found to have elevation of liver enzymes following a routine physical examination. A transmission computed tomographic image of the abdomen was normal. During attempted percutaneous liver biopsy, dark biliary fluid was obtained. The patient subsequently developed severe abdominal pain, referred to the right shoulder, and signs of peritonitis. The procedure was discontinued without obtaining liver tissue. The patient was given meperidine, 50 mg i.m., every 4 hr for pain. Within 2 hr following the attempted biopsy, a hepatobiliary study was begun for suspected gallbladder perforation.

The study was performed with 5 mCi (185 MBq) of Tc-99m-2,6-di-isopropyliminodiacetic acid (DISIDA). Images were obtained at 5-min intervals for 60 min, at 90 min, and again at 18 hr.

The scintigrams showed a pattern consistent with obstruction of the common bile duct. There was rapid visualization of the liver, intrahepatic bile ducts, gallbladder, and common bile duct. No activity was visible in the intestine at any of the time intervals studied. However, images at 90 min revealed an accumulation of radiotracer lateral, inferior, and posterior to the gallbladder. The scintigram obtained at 18 hr showed extravasated activity in the right paracolic gutter (Fig. 1).

To differentiate potential obstruction of the common bile duct from functional obstruction secondary to narcotics, pain medication was withheld for 12 hr, and imaging was repeated, again using 5 mCi of DISIDA. This second hepatobiliary study showed prompt visualization of both the intra- and extrahepatic biliary tree and the gallbladder. There was free passage of activity into the small bowel. The previously identified bile leak could not be seen (Fig. 2). A cholecystectomy was performed and a small perforation of the gallbladder was identified, without evidence of continuing bile leakage.

DISCUSSION

Opiate derivatives are known to cause spasm of the sphincter of Oddi (3-5). Economou and Ward-McQuaid evaluated the relative effects of various narcotic agents on biliary pressure by means of direct manometry.
FIGURE 1
Cholescintigrams during meperidine therapy. Images obtained at 10 min (A), 30 min (B), 90 min (RAO projection, C), and 18 hr (D). Extravasated bile is seen at 90 min and 18 hr, indicated by closed arrows. Common bile duct is indicated by open arrows. No activity is seen in intestine.

FIGURE 2
Cholescintigrams after withdrawal of meperidine. Images obtained at 10 min (A), 30 min (B), and 90 min (C). There is rapid movement of bile into intestine. No extravasated bile is visualized.
Morphine, pethidine, and phenazocine were shown to cause significant elevation of biliary pressure (4). Chessick and co-workers have also implicated fentanyl citrate in causing biliary hypertension; they reported six cases in which operative cholangiography suggested bile-duct obstruction despite normal common-duct explorations (6).

More recently, opioid drugs have been shown to result in hepatobiliary scintigrams that simulate bile-duct obstruction. Taylor and co-workers reported that patients with abdominal pain treated with meperidine or morphine gave images suggesting obstruction of the common bile duct in the absence of biliary-tract disease (7). Subsequently, Joehl and co-workers confirmed the effect of opioid drugs on hepatobiliary scans in 13 healthy volunteer subjects (8).

Our patient, with a small gallbladder perforation, also had a scintigraphic pattern suggesting common-duct obstruction, presumably due to spasm of the sphincter of Oddi induced by meperidine. This image also demonstrated a small bile leak. When meperidine was discontinued, the image reverted to normal and no leak could be demonstrated. We suggest that the increased biliary pressure resulting from meperidine administration promoted leakage of bile through the small perforation, allowing its visualization in the initial scan. The leak may not have been visualized in the second scan because biliary pressures had returned to normal after meperidine withdrawal, although we cannot exclude the possibility that the leak sealed spontaneously.

Administration of meperidine or morphine may be a useful pharmacologic intervention in detecting small or intermittent bile leaks. Recently, morphine administration has been found useful in promoting rapid filling of the gallbladder during scintiscanning, correctly excluding the diagnosis of acute cholecystitis in the presence of chronic cholecystitis, cholelithiasis, or other conditions that usually delay or prevent gallbladder visualization (9). These investigators also suggest that this effect resulted from increased biliary pressure induced by morphine.

Certainly, promoting biliary leakage is not without consequence. However, in the patient who already has signs of peritonitis, demonstration of the presence and location of an occult bile leak may be important to the therapeutic course of action. Naloxone provides rapid reversal of the effects of narcotic medication on the choledochoduodenal sphincter (3), and can be administered once the bile leak is documented.

REFERENCES