

*Short communications***The “water-ida”¹: A simple means to separate duodenal from gallbladder activity on cholescintigraphic studies****Richard L. Wahl**

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Abstract. In some ^{99m}Tc -iminodiacetic acid studies, separation of the gallbladder from the duodenum can be difficult, despite multiple views. When faced with this problem, we have had the patient ingest 250 cc of tap water. This ingestion clears the duodenum of activity and has allowed us to see the residual activity in the gallbladder. This “water-ida” view may be a useful addition in difficult to interpret hepatobiliary studies.

^{99m}Tc -iminodiacetic acid cholescintigraphy for acute cholecystitis has been shown to be sensitive and specific (Weissman et al. 1979; Freitas and Gulati 1980). One problem that can cause difficulty in interpreting these studies is the presence of radioactivity in the duodenum, which can overlap the gallbladder activity. This problem is generally solvable by obtaining additional views, such as right lateral, or left or right anterior oblique view (Freitas 1982). Occasionally these views are not definitive and ultrasound has been suggested to better define the anatomy (Weissman et al. 1981).

To address the problem of gallbladder overlap with the duodenum when it arises, we have added an additional view to our study: having the patient, who is not “n.p.o.,” ingest 250 cc of tap water at 60 min or more into the study when the gallbladder is not separable from the duodenum, then obtaining delayed views. An illustrative case follows.

Case Report

A 15-year-old white female was admitted with a 1.5-day history of upper abdominal pain and nausea. Her past history included exploratory surgery 10 years prior to admission for pancreatic and mesenteric contusions post-trauma. Admitting laboratory data was remarkable because of slightly elevated serum amylase at 195 Somogyi units/100 ml (nl 23–100), an increased white blood cell (WBC) count ($17,000/\text{mm}^3$) with a left shift, normal serum bilirubin at 0.5 mg/100 ml and a normal alkaline phosphatase 73 IU/l. An ultrasound examination, after overnight fast, showed a slightly dilated gallbladder without stones, a common hepatic duct of 6–7 mm in caliber, as well as prominent left and right hepatic ducts. The question of acute cholecystitis remained and she was referred to nuclear medicine for hepatobiliary imaging.

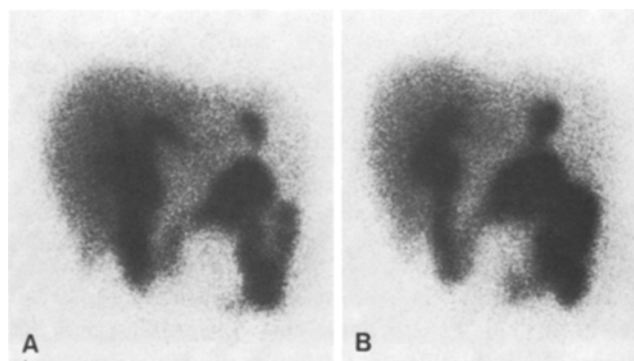


Fig. 1. **A** Anterior view 60 min into study: RUQ activity cannot be separated into discrete gallbladder and duodenum. **B** LAO view 65 min into study: RUQ activity cannot be separated into discrete gallbladder and duodenum

The fasting patient was injected with 4 mCi of ^{99m}Tc disofenin¹, and sequential images of the liver and abdomen were taken with a scintillation camera with a large field of view that was fitted with a low-energy all-purpose collimator. Each image contained 1 million counts, with new images being begun every 5 min. Although the small bowel was clearly seen by 35 min into the study, by 1.5 h it was not apparent, even with right anterior oblique and left anterior oblique views, if the gallbladder was filled, or if duodenal activity was present and overlapping (Fig. 1 A, B). A right lateral view (Fig. 2 A) was also obtained and did not clearly show if the gallbladder was filled or if the duodenum and bowel overlying the gallbladder accounted for the right upper abdominal activity. Since surgery was not planned immediately, the patient was given 250 cc of tap water and asked to lie in the right lateral decubitus position. A right lateral image obtained 5 min after the water was given (Fig. 2 B) clearly shows that the gallbladder is filled with Tc-Disida and that the bowel activity previously surrounding it has been washed away.

The patient was managed medically and did well, with her WBC and amylase quickly dropping into the normal range. At discharge, she was felt to have probably had a viral syndrome, possibly with mild pancreatitis.

¹ Hepatolite (New England Nuclear)

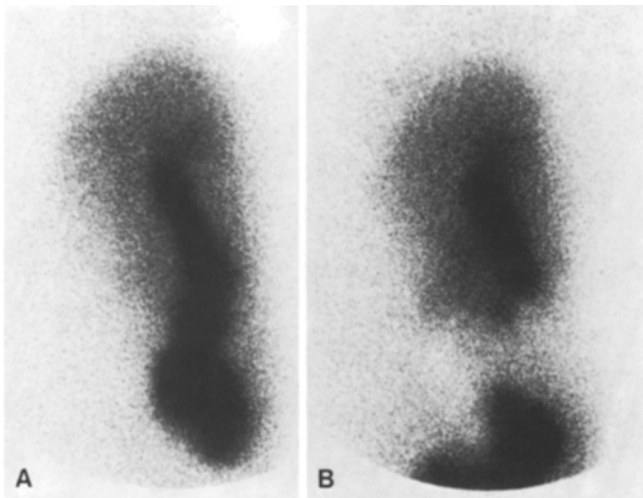


Fig. 2. **A** Right lateral view 90 min into study: showing much activity in the upper abdomen, not easily separable into discrete gallbladder and bowel. **B** Right lateral view 105 min into study; 5 min after the patient ingested 250 cc of water by mouth shows clear activity in the anteriorly situated gallbladder, with activity washed away from the duodenum and proximal small bowel

Discussion

Despite the high sensitivity and specificity for the diagnosis of acute cholecystitis reported by several investigators (Weissman et al. 1979; Freitas and Gulati 1980) and the general ease in interpreting the study, difficulty sometimes arises in separating excreted ^{99m}Tc -IDA activity in the duodenum from that in the gallbladder. Although multiple views will generally resolve the problem, this case illustrates that occasionally these are not successful. Ultrasonography has been recommended when this overlap occurs (Weiss-

man et al. 1981). We have shown in this case that the ingestion by the patient of simple tap water can aid in making this separation. This simple maneuver should be performed only if the referring physician agrees, as the patient will then not be totally "n.p.o." We have chosen a relatively small volume (250 cc), as larger volumes might cause excessive gastric distension which could release cholecystokinin (CCK) and cause gallbladder contraction (Snodgrass 1977). In addition, water was chosen over substances containing fat or high protein to avoid their known high stimulating potential for CCK release (Jaffe 1979). In selected patients, the use of the "water-IDA" is suggested to provide clear gallbladder delineation from bowel activity, thus improving diagnostic information.

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