

Title: Hepatobiliary Iminodiacetic Acid Scanning Detects Previously Unknown Hepatic Metastases from Colorectal Adenocarcinoma

Authors:

(1) Jonathan Chapman, MD

Radiology Resident Physician

Beaumont Health System

Oakland University William Beaumont School of Medicine

(2) Edward Sutherland, MD

Radiology Resident Physician

Beaumont Health System

Oakland University William Beaumont School of Medicine

(3) Jane Palka, MD

Attending Nuclear Medicine Physician

Beaumont Health System

Oakland University William Beaumont School of Medicine

Corresponding and First Author:

Jonathan Chapman, MD

Beaumont Hospital – Royal Oak

Diagnostic Radiology Department, 2 CT

3601 West 13 Mile Road | Royal Oak | MI | 48073

P: 734-620-5069 | Fax: 248-898-2496

Email: jonathan.chapman@beaumont.org

Manuscript Word Count: 747

Short running title: HIDA Colonic Adenocarcinoma

Abstract

A case of previously unknown metastatic colorectal adenocarcinoma presents as focal photopenia on hepatobiliary iminodiacetic acid scintigraphy (HIDA scan). Differential diagnosis of focal photopenia and heterogenous hepatic radiotracer uptake on hepatobiliary scintigraphy is reviewed.

Key Words: Colorectal adenocarcinoma, HIDA scan

Introduction

Colorectal adenocarcinoma is the 3rd most common type of cancer worldwide, with approximately 1.36 million new cases diagnosed each year (1). Approximately 30-50% of patients with colorectal cancer develop liver metastases(2). This report presents a case of metastatic colorectal adenocarcinoma first discovered on HIDA scan, which to our knowledge is not previously described in the literature, and reviews the differential diagnosis of focal photopenia and heterogenous hepatic radiotracer uptake on hepatobiliary scintigraphy.

Case Report

A 50-year-old male with no significant past medical history presented to his primary care physician for one month of worsening aching/burning right upper quadrant (RUQ) and suprapubic pain with associated dysuria, nausea and weight loss. Urinalysis performed in office revealed trace hematuria. The clinician hypothesized the pain to be related to separate etiologies; GERD versus cholelithiasis to explain the RUQ pain and nephrolithiasis causing the suprapubic pain. Abdominal ultrasound and hepatobiliary scan were ordered. In addition, the patient was prescribed famotidine and advised to drink more water.

Hepatobiliary scanning was performed, prior to ultrasound, with 5.35 mCi of ^{99m}Tc-disofenin.

Anterior and left-anterior-oblique images of the abdomen were obtained in the supine position at 45 and 50 minutes post radiotracer administration respectively. At 60 minutes post radiotracer

administration, the patient was injected with 2 mcg Sincalide (CCK) infused over 60 minutes, during which dynamic acquisition was performed for gallbladder ejection fraction calculation, which was normal.

Images obtained at 45 and 50 minutes post ^{99m}Tc -disofenin administration demonstrated heterogenous liver uptake with multiple scattered photopenic areas (Figure 1). Given these findings were suspicious for liver masses, an abdominal ultrasound was recommended. Ultrasound showed multiple echogenic masses throughout the liver (Figure 2). Subsequent labs yielded an elevated CEA of 1738 and LDH of 804. Contrast enhanced CT of the abdomen and pelvis demonstrated hypodense masses throughout the liver, lymphadenopathy, and a primary sigmoid colon mass invading the bladder (Figure 3). CORE liver biopsy revealed metastatic colorectal adenocarcinoma.

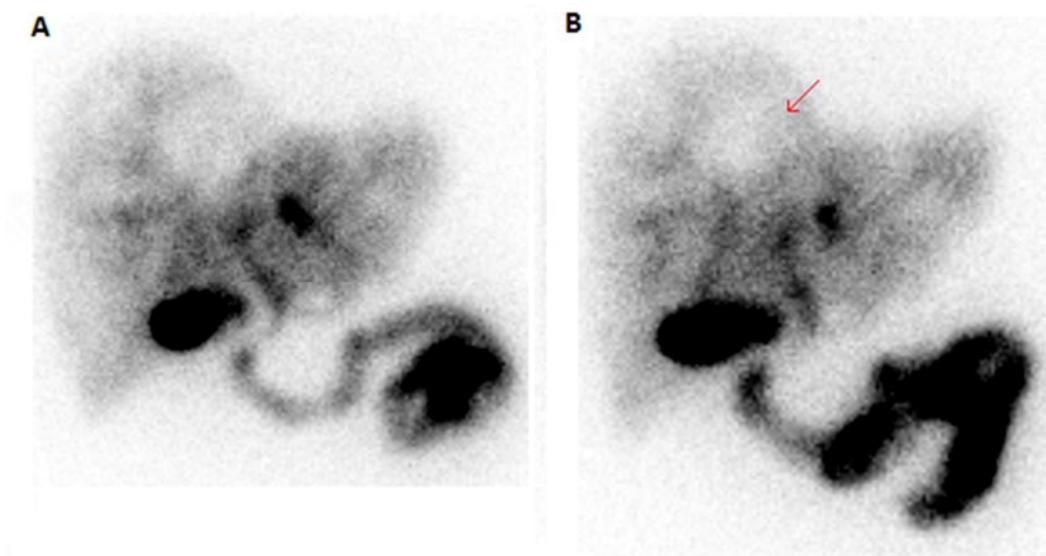


FIGURE 1. Anterior (A) and left anterior oblique (B) spot images obtained 45 and 50 minutes following ^{99m}Tc -disofenin administration show heterogenous distribution of radiotracer activity throughout the liver as well as a large photopenic defect (thin arrow).



FIGURE 2. Sagittal ultrasound of the right hepatic lobe shows numerous echogenic masses.

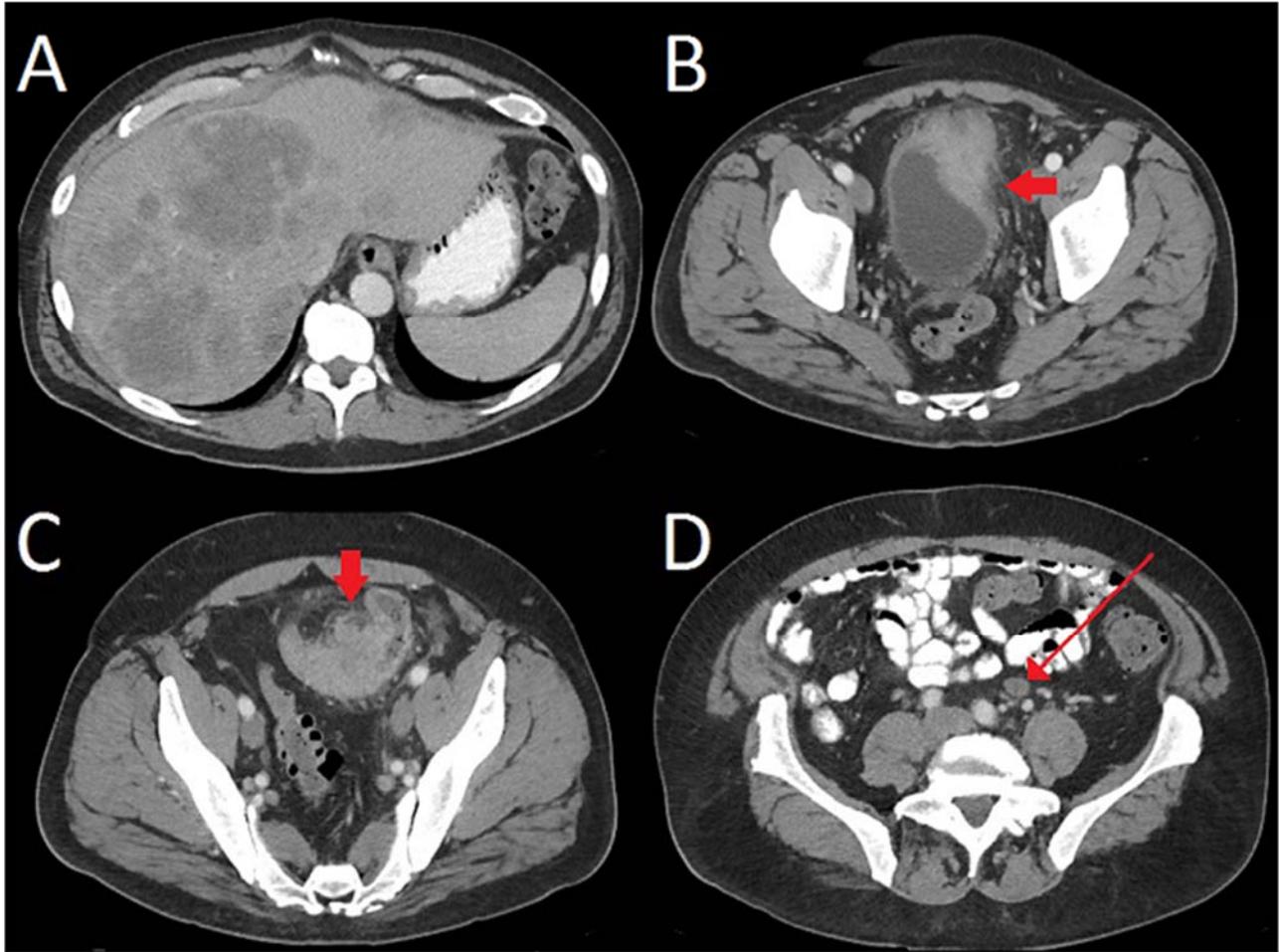


FIGURE 3. Axial portal venous phase contrast-enhanced CT images of the abdomen (A-D) show hypodense masses scattered throughout the liver(A). Also seen is a primary sigmoid colon mass (downward arrow) invading the bladder (leftward arrow) and lymphadenopathy (thin arrow).

Discussion

In the normal liver, hepatocytes demonstrate uptake of iminoiacetic acid leading to homogenous radiotracer distribution. Theoretically, any process which replaces or displaces normal hepatocytes would be expected to cause focal photopenic areas or heterogenous hepatic radiotracer uptake. The potential causes are many but include benign hepatic cysts, metastasis, primary liver masses and less common processes like focal confluent hepatic fibrosis and Caroli disease (3). Focal hepatic fibrosis would demonstrate wedge-shaped areas of decreased radiotracer activity, while hepatic

cysts and metastases are more likely to demonstrate randomly distributed photopenic defects. Caroli disease is known to initially show multiple focal photopenic defects that later fill with radiotracer on subsequent delayed imaging (3). In the setting of cirrhosis, a heterogenous scintigraphic appearance of the liver can be seen due to the replacement of normally functioning hepatocytes with hepatocytes which exhibit either increased or decreased function, such as is seen with regenerative nodules or with the development of poorly differentiated hepatocellular carcinoma (4).

Conclusion

Focal photopenia on HIDA scan is suspicious for metastatic or primary neoplasia. In addition to correlation with patient history and prior imaging, one should consider further evaluation with other imaging modalities.

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