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POSITIVE INTESTINAL SCAN CAUSED BY CARCINOID TUMOR

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The first case of a positive gastrointestinal scan caused by a carcinoid tumor of the ileum is reported. The precise reason for the concentration of activity of the ^{99m}Tc-pertechnetate is unclear. Repeat imaging 14 days postoperatively was normal.

Technetium-99m-pertechnetate gastrointestinal imaging has become an important part of the diagnostic workup at many centers, such as our own, in patients with gastrointestinal bleeding in whom more conventional examination, including barium and endoscopy studies, does not disclose a likely source of bleeding (*1,2*). This report is of a patient with a positive gastrointestinal scan caused by a carcinoid tumor of the ileum.

CASE REPORT

A 47-year-old woman was admitted to the Bethesda Lutheran Hospital for evaluation of lightheadedness and malaise. Physical examination was unremarkable except for moderate pallor. She had a microcytic, hypochromic anemia with a hemoglobin of 9.5 gm%; her stools were dark and tested strongly positive with guaiac. Barium examination of the entire bowel was normal. Endoscopic examination of the esophagus, stomach and duodenum, as well as distal colon, was normal. A gastrointestinal scan was performed with sequential imaging beginning at 30 min following the intravenous injection of 10 mCi of ^{99m}Tc-pertechnetate. Imaging was done with the patient in the supine position using a Nuclear-Chicago (Pho/Gamma III) scintillation camera with a low-energy diverging collimator. Imaging revealed an area of increased activity midway between the umbilicus and pubic symphysis present on the initial 30-min scintiphoto and persisting on subsequent imaging at 1, 2, and 4 hr (Fig. 1).

A presumptive diagnosis of a gastric mucosal containing Meckel's diverticulum was made. At laparotomy no diverticulum was found but a 1.5-cm carcinoid tumor of the ileum 26 in. from the ileocecal valve was resected. This was not associated with an intussusception and there was no evidence of any other lesion. There was evidence of recent bleeding found in the tumor margins (Fig. 2).

The patient did well postoperatively. Repeat imaging 14 days later showed no abnormality (Fig. 3). A 6-month followup examination has thus far disclosed no evidence of recurrent bleeding; the stools remain guaiac negative. Her hemoglobin is normal.

DISCUSSION

Technetium-99m-pertechnetate gastrointestinal imaging is frequently performed in patients with gastrointestinal bleeding when more conventional methods such as barium and endoscopic examination fail to reveal the source of bleeding. Positive scans have been obtained in patients with gastric mucosal containing Meckel's diverticulum, the radionuclide being concentrated by the parietal cells of the gastric mucosa (*1,2*). Positive scans have also been noted in patients with small-bowel intussusception and obstruction, presumably secondary to vascular stasis and congestion (*1*).

Positive scans might be obtained theoretically in large hemangiomas and peptic ulceration of the small intestine (*3*). So-called false-positive images may be seen in partial obstruction of the urinary collecting system, abdominal aneurysms, and probably most often in accumulation of the radionuclide in small-bowel loops simply by progression of gastric contents

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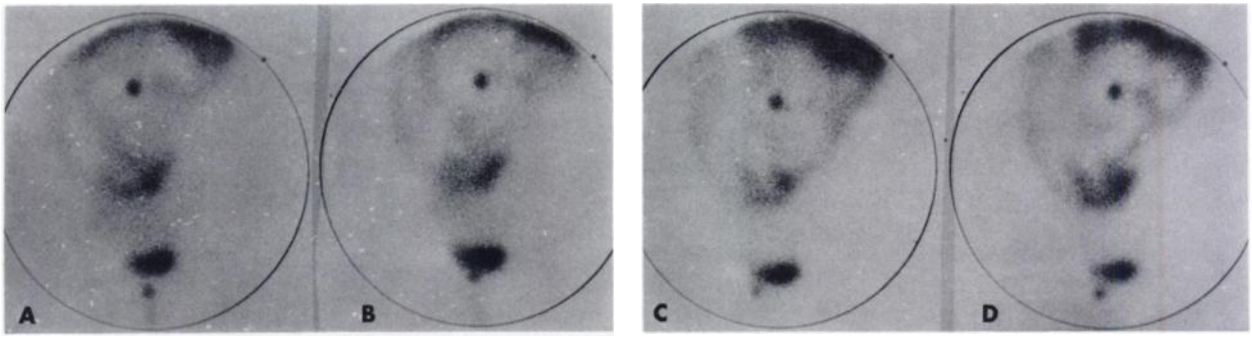

FIG. 1. Technetium-99m-pertechnetate scintigrams at (A) 30 min, (B) 1 hr, (C) 2 hr, and (D) 4 hr demonstrate area of increased activity midway between umbilicus and pubic symphysis (marked with ^{57}Co).

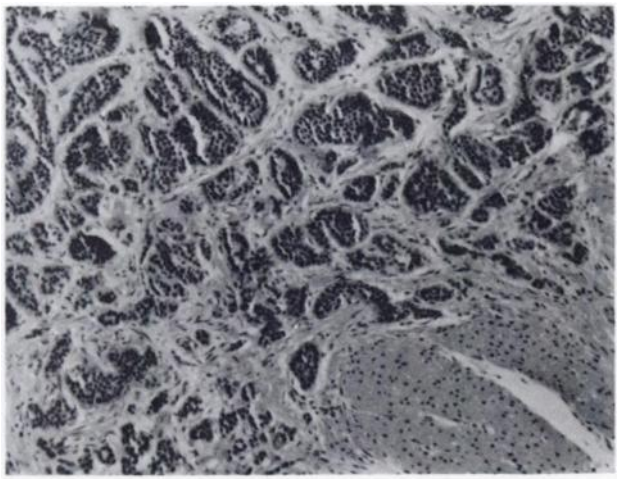

FIG. 2. Histologic section of specimen demonstrating typical carcinoid tumor cells.

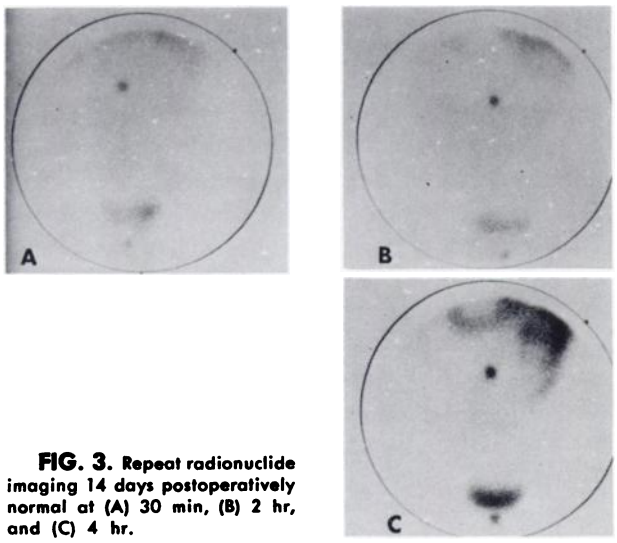

FIG. 3. Repeat radionuclide imaging 14 days postoperatively normal at (A) 30 min, (B) 2 hr, and (C) 4 hr.

along the gastrointestinal tract lumen (*2,3*). Our method of performing the imaging with placement of a nasogastric tube seems to minimize this last possibility.

Bleeding can be a presenting symptom of a gastrointestinal carcinoid tumor and in our reported case it seems likely that the carcinoid was indeed the source of bleeding (*4*). Mucosal ulceration and evidence of recent bleeding were noted in the histologic specimen. The patient has had no evidence of recurrent bleeding.

The reason for the positive image is not entirely clear. The size and vascularity of the tumor would seem insufficient to account for this. One might speculate that the carcinoid cells might actively secrete the pertechnetate. Weichert postulates a common stem cell for the carcinoid and other tumors with multipotential precursor cells begetting all peptide-secreting cells arising from the embryonic foregut (*5*).

The carcinoid tumor should be added to the list of possible causes of positive scans and, in instances where carcinoids are clinically suspected, the scan may prove of value in confirming their presence. We anticipate, moreover, that this report will stimulate further observation and thought about the possible mechanisms of production of the positive scintigrams in these patients.

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