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Indium-111-chloride scintigraphy visualized gastric involvement in a case of adult T-cell leukemia

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We report a case of adult T-cell leukemia (ATL) with gastric involvement visualized by ^{111}In-chloride scintigraphy. A 55-year-old male patient presented with upper abdominal pain and appetite loss. His barium gastric series showed multiple ulcerating polypoid tumors due to gastric involvement of ATL. These lesions accumulated ^{111}In-chloride and were also avid for ^{67}Ga-citrate. Although the mechanism of ^{111}In-chloride accumulation is unknown, ^{111}In-chloride scintigraphy may be useful in evaluating patients with ATL.

Key words: ^{111}In-chloride bone marrow scintigraphy, ^{67}Ga-citrate, adult T-cell leukemia

INTRODUCTION

^{111}In-chloride has been used frequently as a bone marrow imaging agent.[1,2] This agent was also reported as a potential agent for the detection of tumors.[3–7] We report a case of adult T-cell leukemia (ATL), caused by human T-lymphotropic virus type I (HTLV-I), with gastric involvement visualized by ^{111}In-chloride scintigraphy.

CASE REPORT

A 55-year-old male patient presented with upper abdominal pain and appetite loss. In the laboratory findings, pancytopenia (white blood cell count, 1900/mm^3 with 7% atypical lymphocytes; red blood cell count, 2.0×10^6/mm^3; hemoglobin, 7.5 g/d*l*; platelet count, 60000/mm^3) and a high serum level of lactate dehydrogenase (800 IU/L: normal range 200–430) were observed. His stool contained occult blood. No superficial lymph nodes were palpable. Bone marrow aspiration obtained from the left iliac crest demonstrated the presence of atypical lymphocyte infiltration (2.0%). His barium gastric series showed multiple ulcerating polypoid tumors (Fig. 1).

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Biopsy specimens of these lesions were initially diagnosed as malignant lymphoma. Because anti-HTLV-I-antibodies in his serum were positive and monoclonal proviral DNA integration in tumor cells was demonstrated, a diagnosis of ATL with gastric involvement was made. Barium studies of the small bowel and colon showed no evidence of infiltration of tumor cells. Computed tomography of the abdomen showed irregularly thickened gastric walls, but no swollen lymph nodes were found. Bone marrow scintigraphy was performed to evaluate the active bone marrow 48 hr after intravenous injection of 74 MBq of ^{111}In-chloride. It showed a peripheral expansion of bone marrow uptake and abnormal uptake in the upper abdomen and pelvis (Fig. 2). Two of these lesions were consistent with the gastric masses seen in the barium gastric series and were also visualized by ^{67}Ga-citrate scintigraphy, which had been performed 48 hr after intravenous injection of 148 MBq of ^{67}Ga-citrate 10 days before ^{111}In-chloride administration (Fig. 3). The others were regarded as bowel activity.

DISCUSSION

ATL, which was first described by Takatsuki et al., has many clinical features including lymphadenopathy, hepatomegaly, splenomegaly, skin lesions and hypercalcemia.[8] Cases of infiltration of ATL into the gastrointestinal tract have been reported.[9–18] Sakata et al. reported that 23 of 76 patients (30.3%) with ATL who underwent an endoscopic examination had gastric involvement.[18]

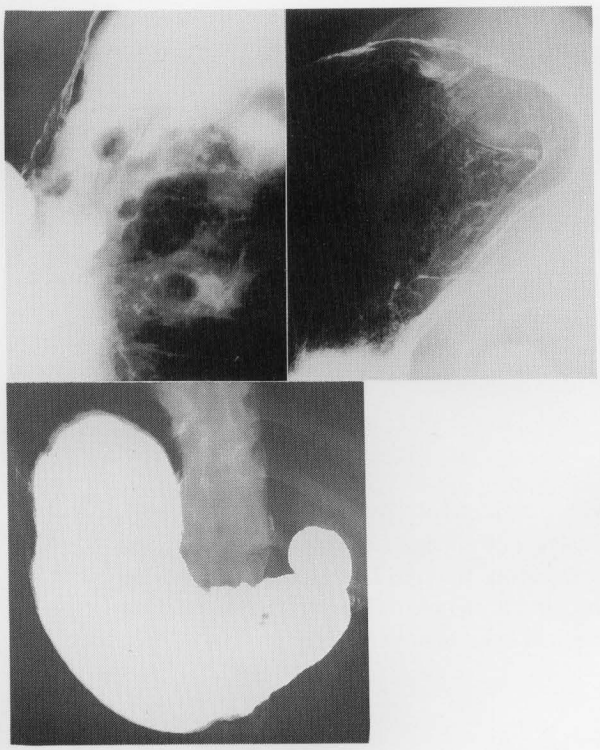

Fig. 1 Gastric barium series. Multiple ulcerating polypoid tumors are seen in the fundus, the antrum and the body of the stomach.

Fig. 2 In-111 chloride scintigraphy. Peripheral expansion of bone marrow uptake in both tibial shafts and both humeral shafts is shown. Central bone marrow uptake is not reduced. Two sites of abnormal uptake are observed in the mid-upper abdomen and the left-upper waist consistent with gastric lesions shown on gastric barium series (arrows). Intestinal activities are also seen.

Some authors reported that ^{111}In-chloride was a potential agent for the detection of tumors.[3–7] Goodwin et al. reported that localization of tumors was possible in seven of ten patients with a variety of head and neck tumors, including squamous cell carcinoma, Hodgkin's disease, lymphosarcoma, reticulum-cell sarcoma, metastatic prostatic carcinoma and carcinoma of the floor of the mouth.[3] Although the mechanism of uptake in tumors is unknown, a passive concentration mechanism due to abnormalities in capillary permeability was suggested.[3]

Wochner et al. reported that about 4% of the dose of indium administered was excreted in feces within 10 days.[19] But no bowel activity is known to be seen in ^{111}In-chloride scintigraphy,[3] and the bowel activity in our patient was thought to be an abnormal finding. This phenomenon might be due to bleeding from the ulcerative lesions in the stomach, or to inflammatory exudation.

The usefulness of ^{67}Ga-citrate scintigraphy is reported in patients with ATL.[20,21] Hoshi et al. reported that 17 of 25 patients had positive scans and 10 malignant lesions were detected in 9 of 17 patients by ^{67}Ga-citrate scintigraphy.[20] ^{67}Ga-citrate was also accumulated in the gastric lesions in this case. Therefore ^{67}Ga-citrate may be useful for the detection of gastric involvement in ATL, but ^{111}In-chloride may play a supplementary role in the evaluation of gastric involvement in ATL, because ^{67}Ga-citrate accumulation in the stomach is also described as a frequent

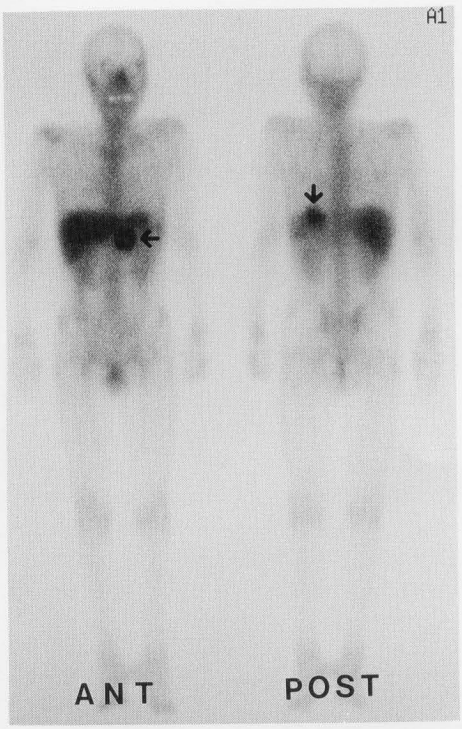

Fig. 3 Ga-67 citrate scintigraphy shows two sites of abnormal uptake in the mid-upper abdomen and the left-upper waist (arrows).

incidental finding.[22] Further studies are needed to evaluate the usefulness of ^{111}In-chloride scintigraphy in the detection of ATL lesions.

CONCLUSION

We report a case of ATL with gastric involvement visualized by ^{111}In-chloride scintigraphy. Even if the mechanism of uptake in gastric lesions is unknown, ^{111}In-chloride scintigraphy may be useful in evaluating patients with ATL.

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