Annals of Nuclear Medicine Vol. 11, No. 2, 163–166, 1997

Inferior mesenteric varix demonstrated by ^{99m}Tc-red blood cell gastrointestinal bleeding study

Tomonori YOSHIKAI,*,**** Yu YOKOMIZO,* Ikuko IWASHITA,* Yasuhiro OKADA,**
Hirofumi KOGA*,*** and Sho KUDO****

*Departments of *Radiology, and **Internal Medicine, Fukuoka Red Cross Hospital*
*******Department of Radiology, National Hospital Kyushu Medical Center*
*****Department of Radiology, Saga Medical School*

Reported here is a case of an inferior mesenteric varix demonstrated by ^{99m}Tc-red blood cell (RBC) scintigraphy performed for gastrointestinal bleeding in a 47-year-old man. It was shaped like a question mark ranging from the left upper abdomen to the pelvis. This is the first report of scintigraphic recognition of an inferior mesenteric varix.

Key words: inferior mesenteric varix, gastrointestinal bleeding, scintigraphy, ^{99m}Tc-RBC

INTRODUCTION

SCINTIGRAPHY with ^{99m}Tc-RBC or ^{99m}Tc-sulfur colloid has been frequently used in cases of gastrointestinal bleeding.[1–4] It can detect minor or intermittent bleeding which may not be demonstrated by angiography.[1,3] It can also reveal vascular abnormalities such as aneurysms, angiodysplasia, hemangiomas, and varices, which are visualized as a blood pool.[5] Although there are a few reports on scintigraphic demonstrations of superior mesenteric varices,[4,5] scintigrams of inferior mesenteric varices have not been reported. We present a case of inferior mesenteric varix demonstrated in a ^{99m}Tc-RBC gastrointestinal bleeding study.

CASE REPORT

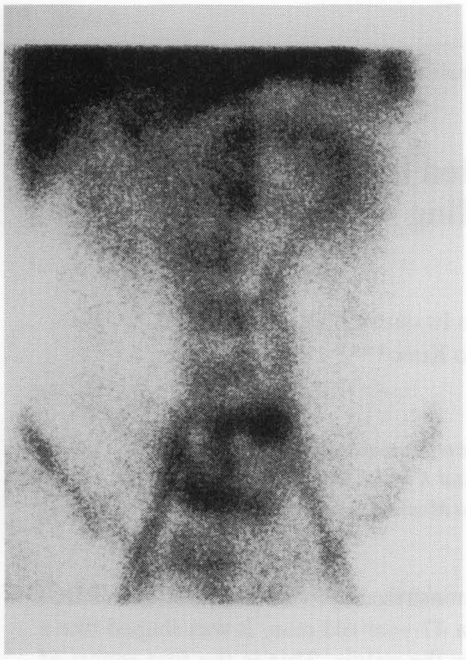
A 47-year-old man was admitted to our hospital with massive melena, fatigue, and dizziness. The melena had continued for one week prior to admission. He had severe anemia manifested by a hemoglobin level of 6.4 g/d*l* and hematocrit of 18.2%. His platelet count was 18.5×10^4/mm^3, and his liver function was within normal limits. Physical examination revealed anemic conjunctiva palpebra and varicosities in both lower extremities. He had a history of hemorrhoids since infancy and of surgery for varices of the right lower extremity in childhood. Colonoscopy did not detect any bleeding site. For the ^{99m}Tc-RBC gastrointestinal bleeding study the patient was intravenously injected with 1 mg of stannous pyrophosphate followed by an injection of 740 MBq of ^{99m}Tc-pertechnetate after 20 minutes. Scintigrams were obtained at 0, 5, 10, 20, 30 and 45 minutes after the injection of the tracer with a preset time of 3 minutes. An abnormal vascular structure resembling a question mark was demonstrated on each image (Fig. 1). Superior mesenteric angiography revealed a markedly dilated inferior mesenteric vein, which drained hepatofugally (Fig. 2a). Marked stenosis of the portal vein was revealed by celiac angiography (Fig. 2b). Contrast-enhanced CT showed a dilated tortuous vascular structure, a mesenteric varix, in the true pelvis (Fig. 3a). A dilated right internal iliac vein was also seen (Fig. 3b). A CT slice at the mid-abdomen demonstrated a dilated inferior vena cava (Fig. 3c). These indicated the existence of a portosystemic shunt. The patient was treated conservatively, and a follow-up colonoscopy revealed marked teleangiectasia and varices in the sigmoid colon, rupture of which was thought to be the cause of the previous gastrointestinal bleeding.

Received January 23, 1997, revision accepted March 13, 1997.

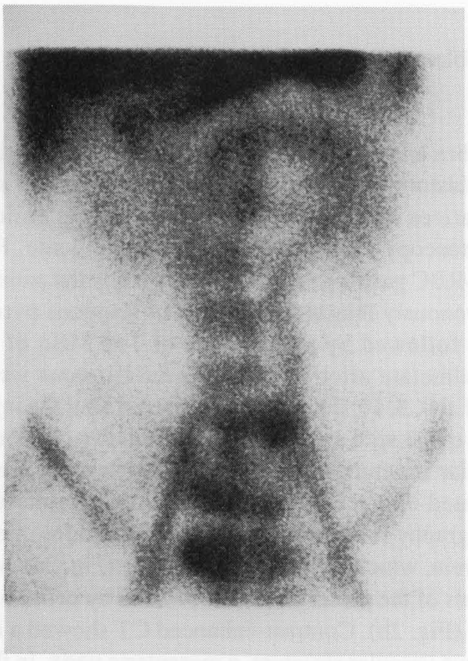
For reprint contact: Tomonori Yoshikai, M.D., Department of Radiology, Saga Medical School, 5–1–1 Nabeshima, Saga 849, JAPAN.

DISCUSSION

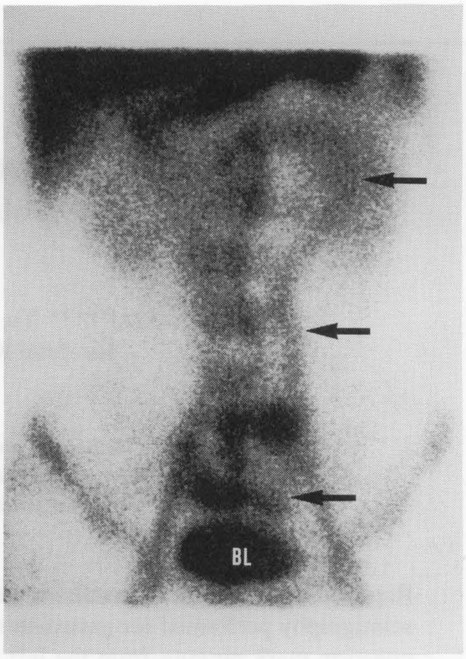
Scintigraphy with ^{99m}Tc-RBC or sulfur colloid has proven useful for detecting gastrointestinal bleeding sites.[1–4]



a



b



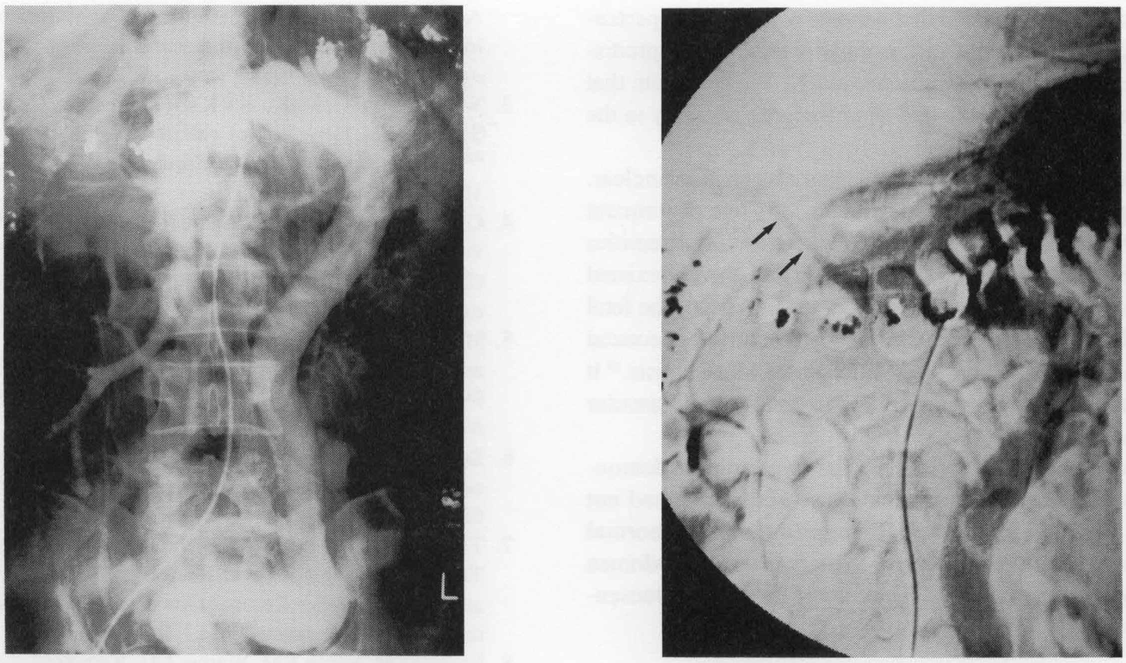
c

Fig. 1 Anterior abdominal images in the ^{99m}Tc-RBC study obtained at 0 (a), 10 (b), and 45 (c) minutes after injection of 740 MBq of ^{99m}Tc-pertechnetate show a persistent abnormal vascular structure in the shape of a question mark in the left abdomen and pelvis (arrows). BL: urinary bladder

When intraluminal radioactivity is positive and it migrates to the anal side by peristaltic transport, a diagnosis of gastrointestinal bleeding can be made. In the present case, abnormal radioactivity ranging from the left upper abdomen to the true pelvis was shown immediately after the administration of the tracer and it remained unchanged in shape throughout the study. The radioactivity seen suggested a blood pool in the vascular structures, which was confirmed by angiography. We could not detect actual bleeding in the scintigraphic or angiographic studies. Mountz et al. stressed the importance of delayed images to differentiate acute gastrointestinal bleeding from abnormal vascular structures.[5] Visualization of the stomach and the duodenum in the scintigrams was attributable to free unbound ^{99m}Tc-pertechnetate which resulted from an *in vivo* method we used for labeling RBC with technetium-99m. While this labeling method has clinical simplicity, its labeling efficiency is relatively low, ranging from 60 to 90%.[6]

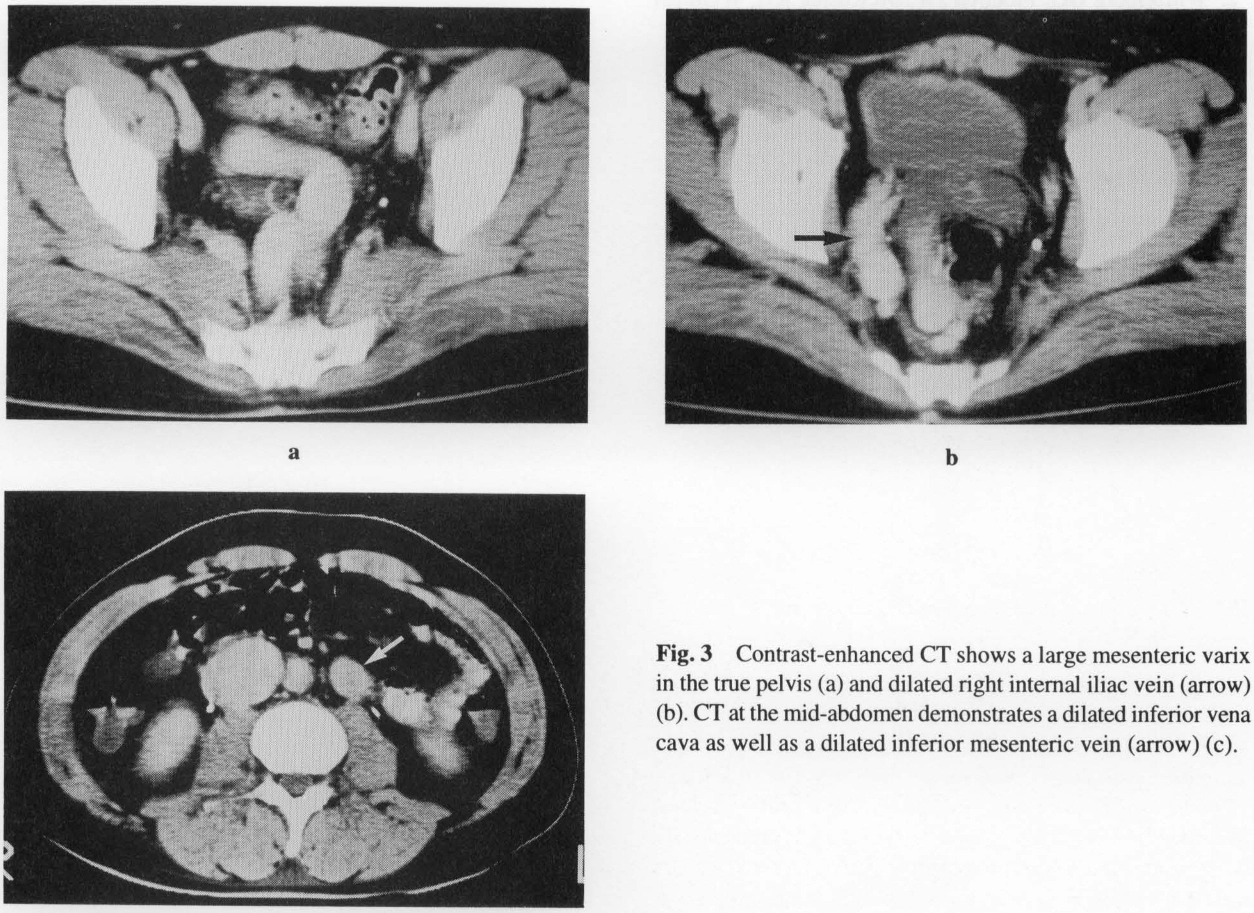
The inferior mesenteric varix in our case had a characteristic configuration like a question mark. Takano et al. reported a similar shape in an inferior mesenteric varix demonstrated by angiography.[7] Scintigraphic recognition of this shape may contribute to the diagnosis of the inferior mesenteric varix.

Inferior mesenteric varix is a rare condition in portal hypertension.[4,8,9] Gudjonsson et al. reviewed 69 cases of colonic varices reported world-wide in the literature.[4] According to their report, two-thirds of the varices were located in the inferior mesenteric vein. Portal hypertension was present in three-fourths of all cases. In our case, it seemed likely initially that an increase in portal venous pressure due to portal vein stenosis gave rise to hepatofugal flow in the inferior mesenteric vein and resulted in the varix formation. Our patient, however, did not have splenomegaly, esophagocardial varices, or any other collateral vessel such as a spontaneous splenorenal shunt, all of which are ordinary responses to portal hypertension.



a b

Fig. 2 (a) Portal phase of the superior mesenteric angiography demonstrates a markedly dilated inferior mesenteric vein with hepatofugal flow. (b) Portal phase of celiac angiography shows a marked stenosis of the portal vein (arrows).



a b

c

Fig. 3 Contrast-enhanced CT shows a large mesenteric varix in the true pelvis (a) and dilated right internal iliac vein (arrow) (b). CT at the mid-abdomen demonstrates a dilated inferior vena cava as well as a dilated inferior mesenteric vein (arrow) (c).

Lopata et al. postulated that patients with portal hypertension develop colonic varices only if they have a predisposing congenital vascular anomaly.[9] We speculate that our patient might have had an underlying anomaly in the inferior mesenteric vein.

The cause of the portal vein stenosis remains unclear. This patient's long history from an early age of frequent melena, hemorrhoids and varices of the lower extremities suggests that the portal vein stenosis had already existed in infancy. Excessive obliteration mechanism of the fetal umbilical vein and the ductus venosus at birth or neonatal omphalitis might have caused the portal vein stenosis.[10] It remains a possibility that it is due simply to a vascular anomaly.

In conclusion, we presented the scintigraphic demonstration of an inferior mesenteric varix, which had not been previously reported. Recognition of an abnormal vascular structure like a question mark in the left abdomen and pelvis may help the diagnosis of the inferior mesenteric varix.

REFERENCES

1. Alavi A, Ring EJ. Localization of gastrointestinal bleeding: superiority of ^{99m}Tc sulfur colloid compared with angiography. *Am J Roentgenol* 137: 741–748, 1981.
2. Winzelberg GG, Froelich JW, McKusick KA, Waltman AC, Greenfield AJ, Athanasoulis CA, et al. Radionuclide localization of lower gastrointestinal hemorrhage. *Radiology* 139: 465–469, 1981.
3. Winzelberg GG, McKusick KA, Froelich JW, Callahan RJ, Strauss HW. Detection of gastrointestinal bleeding with ^{99m}Tc-labeled red blood cells. *Semin Nucl Med* 12: 139–146, 1982.
4. Gudjonsson H, Zeiler D, Gamelli RL, Kaye MD. Colonic varices: report of an unusual case diagnosed by radionuclide scanning, with review of the literature. *Gastroenterology* 91: 1543–1547, 1986.
5. Mountz JM, Ripley SD, Gross MD, Richmond B. The appearance of a large mesenteric varix on a technetium-99m red blood cell gastrointestinal bleeding study. *Clin Nucl Med* 11: 229–232, 1986.
6. Srivastava SC, Chervu LR. Radionuclide-labeled red blood cells: current status and future projects. *Semin Nucl Med* 14: 68–82, 1984.
7. Takano H, Yoshikawa T, Takahashi S, Oyamada H, Takemura T, Sugino S, et al. Rectosigmoid colonic varices: an often unrecognized cause of lower gastrointestinal bleeding. *Jpn J Gastroenterol* 86: 1310–1315, 1989.
8. Feldman M, Smith VM, Warner CG. Varices of the colon: report of three cases. *JAMA* 179: 729–730, 1962.
9. Lopata HI, Berlin L. Colon varices: a rare cause of lower gastrointestinal bleeding. *Radiology* 87: 1048–1050, 1966.
10. Marks C. Developmental basis of the portal venous system. *Am J Surg* 117: 671–681, 1969.