Tc-99m RBC Imaging for Demonstrating Intermittent Intestinal Bleeding

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Received for publication December 25, 1989

Summary: A case of intestinal bleeding caused by multiple ulcerations near the terminal ileum is presented. Abdominal scanning with Tc-99m tagged red blood cells (Tc-99m RBC) demonstrated the intermittent bleeding in short intervals. Selective angiography did not demonstrate the bleeding site. Exploratory laparotomy showed 3 ulcers on the ileum at a site near the terminal ileum, with bleeding from one site. Tc-99m RBC abdominal scanning was very useful in this case for localization of the site of gastrointestinal bleeding before laparotomy.

Key words: intermittent intestinal bleeding — Tc-99m RBC imaging — ileum ulcer — emergency examination — non specific inflammation

Introduction

Tc-99m tagged red blood cell (Tc-99m RBC) abdominal scanning is quite useful for the detection of gastrointestinal bleeding, especially from small intestinal lesions. The present study describes a patient with intermittent bleeding at short intervals caused by multiple ulcerations near the terminal ileum.

Case Report

A 50-year-old man was brought into the critical care center by ambulance with melena and hemorrhagic shock. The patient began feeling abdominal peri-umbilical pain, general fatigue and chills with a low fever, 25 days previously. After a high fever with shaking chills for 5 days, he consulted his family physician who prescribed an antipyretic and an antibiotic. Melena and hematochezia began abruptly, 2 days later, and he was admitted to a local hospital. Endoscopic examination of the esophagus, stomach, duodenum to the 2nd portion and rectum to the ascending colon revealed no abnormal findings, but the melena persisted. Profuse melena of about 2000 ml began abruptly on the morning of admission.

A routine hematological study on admission showed a red blood cell number of $226 \times 10^4$, a hemoglobin of 7.3 g/dl, a hematocrit of 23%, and a white blood cell count of 4700. Selective angiography was performed a few hours after admission, but there were no abnormal findings in the area of the superior and inferior mesenteric arteries. Emergency abdominal imaging with Tc-99m RBC was performed about 11 hours after admission. The image, 10 min after administration, showed an area of abnormal activity in the ileocecocal region. Furthermore, this area of abnormal activity moved to the descending colon after 45 min. Next, the bleeding
occurred again in the coecum after 90 min. Thus, these images represent intermittent bleeding (Fig. 1a, b, c). The patient received a total of 1200ml of blood by transfusion before the laparotomy, although the blood transfusion did not improve the hematocrit, and the melana began again.

An exploratory laparotomy was performed about 18 hours after admission and it demonstrated 3 ulcers about 20–30cm orally from the terminal ileum (Fig. 2). The size of these ulcers were 1.5×1.5cm, 4.0×4.5cm and 3.0×3.0cm in order from the oral side. The largest one with a clot was the bleeding region. About 20cm of

Fig. 1. Tc-99m RBC gastrointestinal bleeding image. The first image at 10 min. shows linear focal activity at the ileocolic region (a). This activity was transferred to the descending colon at 45 min (b) and the sigmoid colon at 60 min (c). In the ileocolic region, new activity developed at 45 min and 60 min. Non-sequential activity shows intermittent intestinal bleeding.

Fig. 2. A photograph of the resected region of the ileum demonstrated 3 ulcerative lesions (arrows). The bleeding occurred at the large central lesion.
bowel between 15 and 35 cm from the terminal ileum was resected. A pathological specimen of the resected ulcer lesion and lymph nodes showed inflammatory changes. The origin of the inflammatory lesion could not be demonstrated by stool culture or various serologic tests for microorganisms associated with intestinal bleeding.

**Discussion**

Tc-99m RBC abdominal scanning is very useful for the detection of gastrointestinal bleeding (McKusick et al. 1981). This imaging is especially helpful for lesions in the small intestine, because endoscopic examinations are difficult to perform in this region and angiography does not always demonstrate the bleeding site.

Smith et al. (1987) suggested that the ideal time to perform scintigraphy is during or immediately after (≤24 hr) the patient receives at least two units (500 ml) of blood by transfusion.

In this case, the patient received a 900 ml blood transfusion before the abdominal scintigraphy. Selective angiography did not demonstrate the bleeding site, although the patient was in hemorrhagic shock from the profuse melena. Tc-99m RBC abdominal imaging, performed within 24 hr after a large amount of melena, illustrated the low volume intermittent bleeding for a brief time.

**References**
