
Scintigraphic Detection of Occult Hemorrhage in a Patient Receiving Anticoagulants

Richard C. Rosenbaum, Gerald S. Johnston, and Nancy O. Whitley

Department of Diagnostic Radiology, University of Maryland Hospital, Baltimore, Maryland

The exact location of hemorrhage complicating anticoagulant therapy is sometimes difficult to establish. We present a case in which imaging with ^{99m}Tc-labeled red cells had a significant role in the diagnosis of soft-tissue bleeding in a paraplegic patient receiving long-term anticoagulation.

J Nucl Med 27:223-225, 1986

Spontaneous bleeding may complicate anticoagulant therapy with either heparin or the coumarin derivatives. Patients with bleeding secondary to anticoagulation most commonly present with ecchymoses, epistaxis, gastrointestinal hemorrhage, or hematuria. The bleeding may also cause intramuscular, intramural intestinal, or retroperitoneal hematomas.

Anticoagulated patients with evidence of acute blood loss without an apparent source can present a difficult diagnostic problem. Blood loss into the retroperitoneum or bulky soft-tissues of a clinically significant magnitude may be masked until acute symptoms occur. Confirmation and localization of suspected hemorrhage is difficult with conventional radiographs, however, computed tomography has proven useful for detection and definition of the extent of retroperitoneal and musculoskeletal hematomas (1).

Technetium-99m-labeled red blood cells are normally restricted to the intravascular space and remain so for a prolonged period, allowing for serial imaging to detect active bleeding which is frequently intermittent. They are used extensively in nuclear cardiology and for the evaluation of gastrointestinal bleeding. There has also been an expanding use of this technique for the detection of pulmonary hemorrhage (2) and for the evaluation of vascular abnormalities of the brain (3) and liver (4,5). Its application for the diagnosis and management of occult hemorrhage in an anticoagulated patient is demonstrated by this case.

CASE REPORT

A 29-yr-old man was readmitted because of an acute hypotensive episode associated with a sudden significant drop in hematocrit and hemoglobin (19.8/6.6 from 35.2/11.7 2 days earlier). He had recently been discharged to a rehabilitation hospital after a 3½ mo hospital stay following a gunshot wound to the neck which had caused T₂ motor/T₄ sensory paraplegia. The initial hospitalization was complicated by deep venous thrombosis with pulmonary embolism for which he was receiving coumarin anticoagulation. Other medication included ibuprofen and macrodantin.

On admission, the PT was 22/11 and the PTT was 80/35 sec. The platelet count was 342,000. Physical examination did not reveal a site of bleeding. Tests of urine, stool, and nasogastric aspirate were negative for blood. Radiographs of the abdomen and chest were unremarkable. A retroperitoneal hemorrhage was suspected. After stabilization with multiple blood, plasma, and platelet transfusions, a computed tomographic (CT) scan of the abdomen and pelvis was obtained and showed no intra-abdominal or retroperitoneal hematomas. A technetium-99m-labeled red cell study was begun. Anterior images showed extravascular tracer accumulations in the iliac regions bilaterally (Fig. 1A). Lateral views were obtained which placed the activity posteriorly, in the buttocks (Fig. 1B), indicating hemorrhage into the gluteal musculature. Review of the CT scans (Fig. 2) confirmed bilateral intragluteal hematomas which were clinically unsuspected and were not appreciated on the initial evaluation of the CT images.

The patient became hypotensive and tachycardic a second time and a follow-up labeled red cell image (Fig. 3) showed further tracer accumulation in the gluteal regions as well as extension into the right thigh musculature. Following additional transfusions of fresh frozen plasma and platelets as well as vitamin K administration, his condition improved and he subsequently remained hemodynamically stable.

Received June 18, 1985; revision accepted Sept. 18, 1985.

For reprints contact: Richard C. Rosenbaum, MD, University of Maryland Hospital, Div. of Nuclear Medicine, 22 S. Greene St., Baltimore, MD 21201.

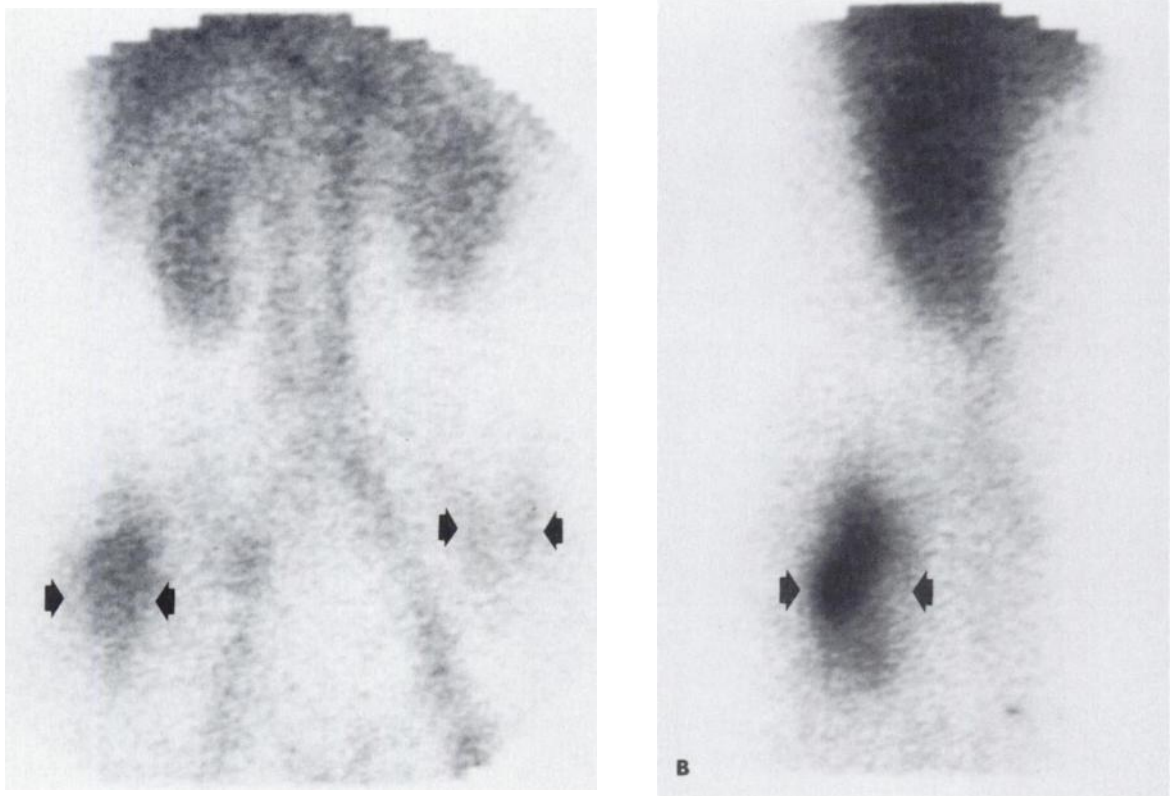


FIGURE 1

Technetium-99m-labeled red blood cell study. A: Anterior image shows bilateral iliac foci of extravascular activity (arrows). B: Right lateral view shows activity located posteriorly in buttocks (arrows)

DISCUSSION

Hemorrhage is the most frequent complication of anticoagulant therapy. Fatalities have been reported and moderate bleeding (not requiring transfusion) such as hematuria, ecchymosis, epistaxis, and melena occurs in 10–35% of patients (6). Paraplegics are at a higher

risk for bleeding associated with antithrombotic therapy, even when prolongation of prothrombin time is within the therapeutic range, as in this case. Hull et al. reported hemorrhagic complications in seven of 33 patients treated with oral anticoagulants for a 3-mo period, including two paraplegics who developed extensive

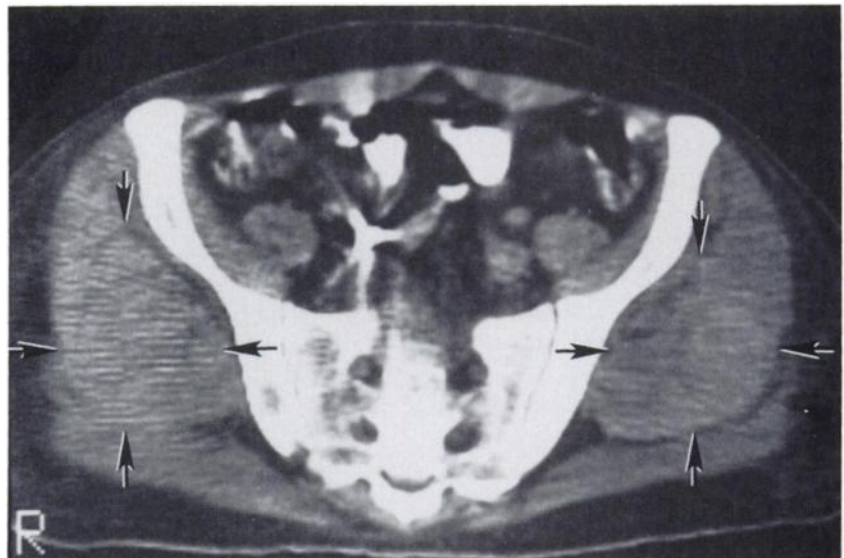


FIGURE 2
Axial CT scan of pelvis (with oral and IV contrast) shows partially organized bilateral intragluteal hematomas (arrows)



FIGURE 3
Technetium-99m-labeled red blood cell study. Anterior image at 24 hr shows further hemorrhage extending into right thigh (arrows)

hematomas of the thigh, presumably as a result of trauma to insensitive limbs (7). Aspirin and nonsteroidal anti-inflammatory drugs such as ibuprofen should be avoided in patients receiving anticoagulants since the additional hemostatic impairment that results from inhibition of platelet function may provoke hemorrhage (8).

Technetium-99m-labeled red blood cells allow the potential for whole-body imaging in the initial documentation of bleeding. In addition, the capability for serial imaging facilitates the detection of further hemorrhage or extension of hematomas which is helpful in evaluating for possible interventional radiological or surgical procedures. CT has been used effectively for early detection of retroperitoneal hemorrhage and in follow-up of patients treated conservatively by transfu-

sion (9) Although CT provides excellent morphological characterization of the hematoma, it is rarely able to determine whether active bleeding persists. Furthermore, bleeding into the musculature of the trunk or extremities may sometimes elude detection by CT if the hematomas are symmetrical and of isodensity with the surrounding muscles.

The potential for falsely identifying a gluteal hematoma as gastrointestinal bleeding during red-cell labeled scintigraphy has been stressed in a previous case report (10). The lateral location of the activity on anterior views mitigates against an intra-abdominal hemorrhage and a lateral view will clearly localize the activity posteriorly, in the buttocks.

REFERENCES

1. Chuang V, Fried A, Chung-Quan C: Computed tomographic evaluation of para-aortic hematoma following translumbar aortography. *Radiology* 130:711-712, 1979
2. Winzelberg G, Laman D, Sachs M, et al: Detection of pulmonary hemorrhage with technetium-labeled red cells. *J Nucl Med* 22: 884-885, 1981
3. Front D, Israel O: Technetium-99m-labeled blood cells in evaluation of vascular abnormalities. *J Nucl Med* 22:149-151, 1981
4. Engel M, Marks D, Sandler M, et al: Differentiation of focal intrahepatic lesions with technetium-99m-red blood cell imaging. *Radiology* 146:777-782, 1983
5. Front D, Royal H, Israel O, et al: Scintigraphy of Hepatic Hemangiomas: The value of technetium-99m-labeled red blood cells: Concise communication. *J Nucl Med* 22:684-687, 1981
6. Harvey A: *The Principles and Practice of Medicine*, Norwalk, Connecticut, Appleton Century Crofts, 1984, p 520
7. Hull R, Delmore T, Genton E, et al: Warfarin sodium versus low-dose heparin in the long-term treatment of venous thrombosis. *N Engl J Med* 301:855-858, 1979
8. Wintrobe M: *Clinical Hematology*, Philadelphia, Lea and Febiger, 1981, pp 1259-1260
9. Lee J, Sagel S, Stanley R: *Computed Body Tomography*, New York, Raven Press, 1983, pp 480-481
10. Fink-Bennett D, Johnson J: Gluteal hematoma: A potential cause for a false-positive Tc-99m RBC gastrointestinal bleeding study. *Clin Nucl Med* 9:414, 1984