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Scintigraphy with Tc-99m-labeled red blood cells was used to evaluate five patients with suspected vascular abnormalities. The technique was useful for the imaging of large areas of the body and in obtaining multiple views. Conventional radionuclide angiography is of limited usefulness in such cases.


Technetium-99m-labeled red blood cells are limited to the intravascular space. They are used extensively in nuclear cardiology and recently for evaluation of gastrointestinal bleeding. This report presents five cases in which Tc-99m-labeled red blood cells were used to evaluate patients with vascular abnormalities.

METHODS

In Cases 1, 2, and 3, red blood cells were labeled in vitro (1) using a commercial kit and 15 mCi of Tc-99m as pertechnetate. Whole-body images were obtained using a scanning table and a gamma camera. In Cases 4 and 5, red blood cells were labeled in vivo (2). Radionuclide angiography was performed with 15 mCi of pertechnetate 30 min after an injection from a commercial kit. At the completion of dynamic angiography, static studies of the head were done in the anterior, posterior, and both lateral views, collecting 400,000 counts for each view.

CASE REPORTS

Case 1. A 15-month-old boy presented with a growing mass on the lateral aspect of his right thigh. The mass had a soft, "lipoid" consistency, was not pulsating, and the skin overlying it was of normal appearance and temperature. An hemangiomatous mass was also found on the left shoulder. The relationship of the two lesions, their vascular nature, and the possible presence of occult lesions were uncertain. Whole-body scintigraphy with Tc-99m-labeled red blood cells showed both lesions to be highly vascular and did not reveal other abnormalities (Fig. 1). Contrast angiography showed a typical hemangioma.

Case 2. A 58-year-old woman was admitted with a history of progressive anemia, epistaxis, hemoptysis, and right upper quadrant pain. Physical examination revealed multiple cutaneous telangiectasia and hepatosplenomegaly. Chest radiographs showed a dense shadow in the upper right lung field. Admission diagnosis was hereditary hemorrhagic telangiectasia—the Sutton-Rendu-Osler-Weber syndrome. As multiple vascular abnormalities are found in this disease, whole-body scintigraphy with Tc-99m-labeled red blood cells was performed.

FIG. 1. (Left, Case 1.) Whole-body scintigraphy with Tc-99m-labeled red blood cells. Abnormal vascularity is evident in right shoulder and left thigh (arrows).

FIG. 2. (Right, Case 2.) Whole-body scintigraphy with Tc-99m-labeled red blood cells showing highly vascularized lesion in upper right lung (arrow). Note the huge spleen.

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It revealed the highly vascular nature of the lung lesion (Fig. 2), which on contrast angiography was proved to be a vascular malformation. No lesions were detected elsewhere in the body.

Case 3. A 22-year-old man was admitted for headache, fever, and swelling of both legs. Examination was remarkable for chronic edema of the lower extremities, dilated veins of the abdominal wall, and papilledema. Ulcerations of the mucous membranes of the mouth and the skin of the scrotum and a positive intradermal saline injection test suggested Behcet's disease. After the injection of Tc-99m-labeled red blood cells into an arm vein, whole-body scintigraphy was done in search of venous occlusions common in this disease. It revealed alternative pathways of venous flow (Fig. 3A) suggesting occlusion of the inferior vena cava. Images of the head showed occlusion of the superior sagittal sinus (Fig. 3B). The scintigraphic findings were confirmed by venography of the inferior vena cava and cranial contrast angiography.

Case 4. A 19-year-old woman was hospitalized for progressive left exophthalmus 1 yr after a craniocerebral injury. Physical examination was remarkable for a 6-mm left exophthalmus and a murmur over the left eye. Radionuclide angiography in the anterior view showed early visualization of a vascular lesion in the region
Marked Congenital Fissure Masquerading as Splenic Laceration: Report of a Case

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A 26-year-old white woman fell from a ladder striking her back. Clinical evaluation indicated a left renal contusion with microscopic hematuria, and a liver-spleen scan suggested a splenic laceration. The patient was initially stable but evidence of ongoing blood loss forced exploratory laparotomy on the third hospital day. A large, retroperitoneal perirenal hematoma was found but the spleen was intact, with multiple marked congenital fissures. The problem of congenital fissures as a cause of abnormal spleen scan is discussed.


The role of radionuclide imaging in suspected splenic trauma has been well documented (1–3). The spleen scintigram can be easily and quickly performed on a critically ill patient, and in the clinical setting of trauma the presence of splenic scan defects has a high correlation with splenic lacerations (1–3).

We report here a case of suspected intra-abdominal trauma where the liver-spleen scan strongly suggested splenic laceration. At exploratory laparotomy, however, marked congenital lobulation of the spleen was the only splenic abnormality identified.

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DISCUSSION

Intravenous radionuclide angiography, while being a useful method for detection of vascular abnormalities, could not be used in the cases presented here. There were lesions well separated from each other, occult lesions were suspected, or multiple views were necessary to show the whole extent of the condition and its nature. Both arterial lesions showing hypervascularity, and venous lesions showing vascular obstruction, could be demonstrated. When using in vivo labeling, radionuclide angiography with bolus injection could be combined with multiple static views for evaluation of vascular abnormalities of the brain.

REFERENCES