

RADIONUCLIDE SCINTIGRAPHY: A DIAGNOSTIC AID IN DELAYED TRAUMATIC SPLENIC RUPTURE: CASE REPORT

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The use of ^{99m}Tc -sulfur colloid scintigraphy in the diagnosis of a delayed traumatic splenic rupture 10 days after injury is described. Splenic scintigraphy of patients falling in this category may help the clinician in the early detection of splenic rupture.

It is generally accepted that the symptoms of non-penetrating splenic rupture are primarily derived from acute internal bleeding and peritoneal irritation. Usually, these symptoms could be easily recognized and then effectively treated by an immediate splenectomy. However, about 20% of patients have symptoms and signs that become manifest after a delay of 2–3 days and occasionally after 30 days following a traumatic injury (1). This group of patients may be very difficult to diagnose. The diagnosis of this group may be aided by plain skiagram of the abdomen which may show such suggestive signs as fractures of the left lower ribs and/or displacement of the stomach or colon. However, even these features may be indefinite. In these cases, therefore, it may be necessary to perform an angiography or a laparotomy on an ill patient. In this context it is shown that radionuclide scintigraphy may be an easy and rapid procedure that sometimes provides instantaneous and more precise information.

CASE REPORT

A 49-year-old housewife was admitted to the hospital after an injury to her left lower chest in a fall. Findings of the physical examination were normal except for mild tenderness over the left lower chest area. The hemogram was normal and remained so for the next 5 days. Roentgenogram of chest was reported negative. Scintigraphic examination during the first admission was not done. The patient was discharged on the fifth hospital day in good condition. She was sent back to the hospital after 4 days,

however, because of the onset of abdominal pain and pallor. At examination she was conscious with tenderness over the left upper quadrant of the abdomen. The hemoglobin value was 9 gm/100 ml and the hematocrit reading, 27%. The ^{99m}Tc -sulfur colloid study showed a normal liver. There was a radial pattern of decreased radioactivity in the upper portion of the spleen, however, seen on the posterior and left lateral views, indicative of rupture of the spleen (Fig. 1). At laparotomy, the liver was found normal. The spleen revealed a "Y"-shaped tear, 5 cm in length on its superior lateral surface, and sub-capsular hematoma, 2 × 3 cm, on its superior border (Fig. 2A). Splenectomy was performed. About 300 ml of clotted blood was removed from the peritoneal cavity. Grossly, the removed spleen was 150 gm in weight, and 10 × 7 × 3 cm in size. Cut surfaces showed irregular intrasplenic hematomas in the upper portion of the spleen (Fig. 2B).

DISCUSSION

Failure to diagnose a delayed splenic rupture soon after an accident remains an important factor contributing to high mortality (2–4). Peritoneal lavage (5) and angiography (6–9) may be used as diagnostic procedures in delayed splenic rupture. However, angiography is usually hazardous to patients. Olsen (10) suggested that peritoneal lavage is certainly a simple and safe technique that could detect even a small amount of intraperitoneal bleeding. However, it cannot be used to ascertain the source of intraperitoneal hemorrhage. In recent years, the use of radionuclide imaging has been increasingly employed (11–13) in the study of splenic trauma using ^{99m}Tc -sulfur colloid. The procedure is simple,

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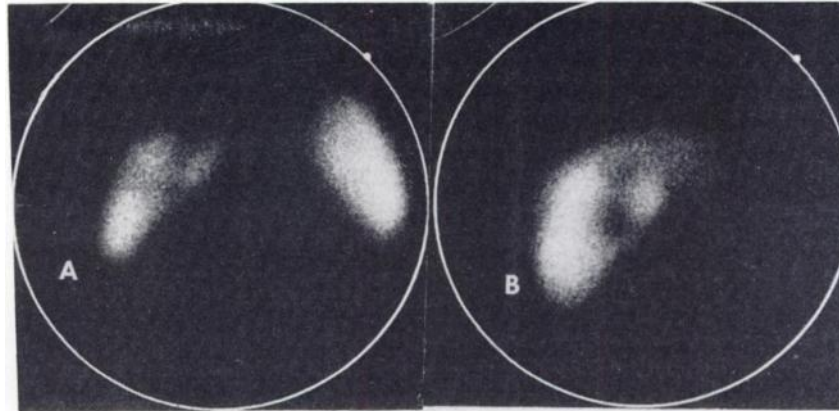


FIG. 1. Technetium-99m-sulfur colloid spleen scintiphotos. Posterior view (A) showing radial pattern of decreased radioactivity. Left lateral view (B) showing a bandlike decreased-to-absent radioactivity in posterolateral aspect of spleen.

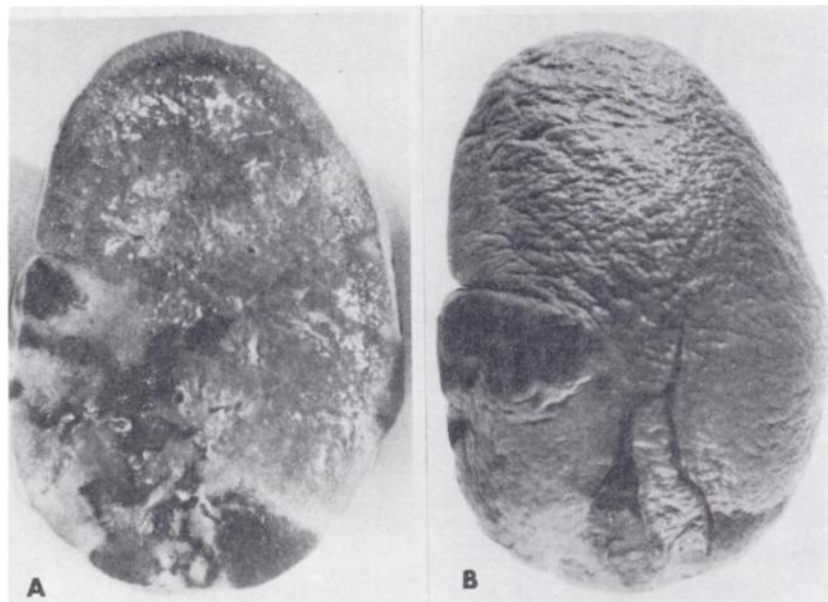


FIG. 2. (A) Gross appearance of spleen showing subcapsular hematomas and "Y"-shaped tear on superolateral surface. (B) Cut surface of spleen showing intrasplenic and subcapsular hematomas.

safe, and rapid. In addition, it helps in differentiating hepatic injury from splenic injury in patients with only evidence of intraperitoneal bleeding.

Evans, et al (12) and O'Mara, et al (13) reported a number of cases of splenic and hepatic traumas as diagnosed by scintigraphy. All these reported cases were later confirmed at surgery. Recently, Slavin, et al (14) reported a case of progression of delayed splenic rupture. The initial spleen scan revealed only decreased activity in the lower pole and the second study 2 days later showed separation of functional splenic tissue. The same might be true in this patient although it could not be proved because of the lack of an initial splenic scan. Apparently, there was a latent period for about 10 days after the injury. Slavin, et al (14) suggested that the pathogenesis of delayed rupture is probably due to a small tear in the spleen into which bleeding occurs followed by massive bleeding. The course of delayed clinical manifestations might be due to a continuation of intrasplenic hemorrhage that subsequently

increased the tension of the organ and size of laceration.

Abscess, tumor, cyst, and infarction of the spleen may give a similar image as hematoma on the scintigraphy (15-17). However, a previous traumatic history might give a clue for differentiation. An early determination in the presence of the splenic parenchymal injury and subcapsular hematomas could avoid a long period of clinical observation. Scintigraphy is a very useful diagnostic aid in detecting an occult traumatic lesion of the spleen.

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