of the left cavernous sinus (Fig. 4A). Blood-pool images of the head (Fig. 4B) showed abnormal tracer accumulation in the left cavernous sinus, with marked dilatation of the ophthalmic vein on the left side. On carotid angiography, a carotid cavernous fistula was found with marked dilatation of the left ophthalmic vein.

Case 5. A 62-year-old man with a history of subarachnoid hemorrhage was admitted for headache and progressive dementia. An unenhanced TCT scan showed only slightly enlarged ventricles. The enhanced study showed contrast in the right posterior temporal region, suggesting a vascular malformation. Radionuclide angiography, posterior view, showed increased vascularity in the right paramedian region (Fig. 5). Tc-99m-labeled red blood cells showed increased vascularity in the right posterior temporal region, near the midline. It also showed an unsuspected vascular abnormality in the midline above the superior sagittal sinus. Contrast angiography revealed a right temporal paramedian arteriovenous malformation supplied by branches of the right middle cerebral artery, and an extracranial arteriovenous malformation in the vertex supplied by branches of both external carotid arteries.

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.

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Marked Congenital Fissure Masquerading as Splenic Laceration: Report of a Case

Richard M. Hansen and Don R. Spiegelhoff

St. Luke's Hospital and The Medical College of Wisconsin, Milwaukee, Wisconsin

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.

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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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For reprints contact: Richard M. Hansen, MD, Milwaukee County Medical Complex, 8700 W. Wisconsin Ave., Milwaukee, WI 53226.

CASE HISTORY

A 26-year-old white woman fell off a 7-ft ladder, striking the left side of her back; this produced immediate back pain radiating into her left abdomen and groin. Examination of the abdomen and back revealed a superficial abrasion over the left flank and left costovertebral angle. There was left upper quadrant tenderness, and no other findings.

Laboratory data at admission showed microscopic hematuria, hematocrit 36%, and normal coagulation data. An intravenous pyelogram showed good function bilaterally without dye extravasation, but the lower pole of the left kidney was poorly visualized, consistent with a contusion. A Tc-99m sulfur colloid liver-spleen scan was obtained. The liver was normal, but the spleen scan showed multiple wedge-shaped defects, the most prominent being

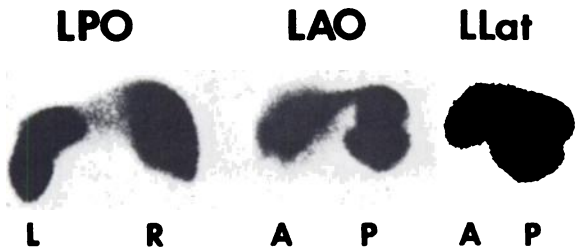

FIG. 1. Three views of spleen, showing defects in mid and inferior portions suggesting splenic laceration.

through the midportion, compatible with a laceration of the spleen. A smaller defect noted inferiorly and anteriorly suggested a second laceration in this area (Fig. 1).

At laparotomy, a large retroperitoneal hematoma was found, extending from the lower pole of the left kidney to the pelvis. It was not evacuated. The spleen had multiple congenital fetal lobulations without evidence of laceration; it was not removed. The patient made a satisfactory recovery and has been well since.

DISCUSSION

Wide variations in the anatomy of the spleen are known to occur (*4,5*). Marked persistent clefting, estimated to affect one in 50 cases (*6*), can give the appearance of lobulation of the spleen. The frequency with which this is observed on splenic scintigrams is unknown.

The current case demonstrates how a marked congenital fissure can masquerade as a splenic laceration in the setting of suspected intra-abdominal trauma. This would be expected to occur more frequently than has been reported, there being only one other case documented in the medical literature (*6*). That case is interesting in that the ultimate site of injury was found to be a renal contusion and retroperitoneal hematoma, just as in our case.

Focal splenic defects have been ascribed to a number of causes, such as infarction, lymphoma, metastatic tumor, inflammatory masses, cysts, and pancreatic pseudocysts (*1,7*). However, differentiating these from splenic trauma can usually be done by history alone. Since two cases have now been described, congenital fissures should be included in the list of causes of spleen scan abnormality that cannot be excluded by history. In the setting of other known intra-abdominal trauma, the possibility of a false-positive spleen scan due to congenital fissure should be entertained and further tests done, such as arteriography (*8*) or computerized tomography (*9*), in an attempt to delineate the splenic architecture.

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