an ERPF value greater than or equal to 557 ml/min. In our computer program this reduces itself to a single statement [IF (X.GT.120) ERPF = 557]. Since this yields an essentially normal ERPF, there is negligible diagnostic error generated by the limit.

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False-Positive Liver Scan Due to Spine Deformity

Liver scintigraphy is well established for the diagnosis of many hepatic diseases. However, various false-negative and false-positive studies have been reported. With regard to false positives, previous literature (1-10) describes many causes of scan abnormalities. This letter reports a false-positive liver scan resulting from marked kyphoscoliosis.

A 60-year-old man, with proven squamous cell carcinoma of the lung and suspected hepatic metastasis, was referred to our department for a liver scan. He had a 40-yr history of cigarette smoking and had recently noticed loss of weight and a productive cough. On examination, he appeared to be cachectic, with marked kyphoscoliosis. There were audible carotid bruits and poor respiratory excursion. Left cervical and bilateral femoral lymphadenopathy were noted. The liver extended 9 cm below the right costal margin. The chest radiograph showed a mass measuring 8×8 cm, which was located in the left lung, and also showed evidence of kyphoscoliosis. The ECG showed left-ventricular hypertrophy and nonspecific ST-T abnormality. The liver scan (Fig. 1) showed a defect along the posterior margin of the right hepatic lobe. The subsequent bone scan showed marked scoliosis.

There are multiple causes of false-positive liver scan: residual barium in the colon (1), dextrogastria (2), hypernephroma (3,4,7), gallbladder impression (4,6,8,9), the inferior vena cava fossa (6),



FIG. 1. Liver scintiphotos. (Tc-99m sulfur colloid) Top: anterior view, normal appearance. Bottom left: right lateral view, showing distorted appearance with a concave area of photon deficiency in posterior aspect of liver. Bottom right: posterior view, normal appearance of liver and spleen.

pancreatic mass, splenic enlargement, rib indentation, adrenal and lymph-node metastasis, subphrenic fluid collections (4), localized hepatic thinning, retroperitoneal neuroblastoma (7), and cardiac impression at the superior border of the left hepatic lobe (10).

There have also been reports of vertebral pressure defects in the



FIG. 2. (left) Bone scan (Tc-99m medronate sodium) of the thoracic and lumbar spine, right lateral view. Radioactivity in lumbar spine corresponds to area of photon deficiency seen in right lateral view of liver (Fig. 1, bottom left).

FIG. 3. (right) Bone scan of thoracic and lumbar spine, posterior view: marked lateral thoraco-lumbar scoliosis.

midline due to lordosis (6). Our patient had marked kyphoscoliosis to the right as seen on the bone scan; consequently, the liver scan showed an abnormality along the margin of the right hepatic lobe. This might be explained either by indentation of the liver or by photon absorption due to the deformed spine. We think the latter more likely in this case. This is felt to be so because the defect is seen only in the right lateral position and not on the others. The subsequent bone scan (Fig. 2) also confirmed that the exact area of the liver scan abnormality corresponds to the spinal anomaly.

Whenever doubt exists regarding the interpretation of the liver scan, extra studies should be done to elucidate the diagnostic problem. These may include 1-131 rose bengal studies for gallbladder fossa (4,6,8,9), the recently developed Tc-99m iminodiacetic acid (HIDA), Tc-99m pyridoxylideneglutamate,or renal scans for retroperitoneal masses, or rapid sequential cardiac images to define the impression of the superior border of the left lobe (10). Most important, however, is careful physical examination, which should be performed on every patient who is referred to a nuclear medicine department.

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Tc-99m Glucoheptonate Renal Imaging: Congenital Mesoblastic Nephroma

The mesoblastic nephroma is the most common renal neoplasm seen during the first few weeks of life (1). The tumor is also referred to as leiomyomatous hamartoma, fetal mesenchymal hamartoma, and fetal renal hamartoma. It must be distinguished from the congenital and potentially malignant Wilms' tumor (2).

Clinically, the most common presenting feature of a mesoblastic nephroma is a large asymptomatic flank mass, as was noted in our newborn patient. Our evaluation consisted of a standard radiograph of the abdomen, which showed a large mass without calcification, and an ultrasound examination, which confirmed a solid left renal mass. A Tc-99m glucoheptonate (2 mCi) renal scan demonstrated two functioning kidneys with marked discrepancy in size. No focal defects were noted (Fig. 1). At surgery a large left renal tumor was removed. The sections indicated that the tumor was a mesoblastic nephroma.

In general, renal tumors in children—such as Wilms' tumor, mesoblastic nephroma, hypernephroma, and angiomyolipoma produce focal renal defects with radionuclide imaging. The patient illustrated is an exception. The histopathology of the tumor explained the scintigraphic appearance. The kidney was infiltrated by a mass composed of fibrous and mesenchymal stroma that isolated and surrounded islands of normal glomeruli and tubules, but with preservation of complete nephrons. The tracer was con-



FIG. 1. Tc-99m glucoheptonate renal images, posterior view. Note two functioning kidneys. Arrow marks kidney with large mesoblastic nephroma.