

HEPATIC BLOOD POOL IMAGING

Primary Indications: Diagnosis of cavernous hemangioma of the liver.

Rationale: “Cold” areas seen on Liver/Spleen images are non-specific and may be either benign or malignant. The most common benign tumor is a hepatic hemangioma which consists of dilated blood vessels and requires no treatment once diagnosed. Most hemangiomas are present at birth and are the most common vascular tumor of the liver. They are usually cavernous in nature, containing large vascular spaces which may be partially or completely filled with blood. Most occur singly, can be large, are often asymptomatic and can be incidentally diagnosed during surgery, autopsy or during other diagnostic tests for an unrelated problem. Increased blood-pool activity is seen in cavernous hemangiomas by comparison with normal hepatic parenchyma. Other hepatic mass lesions have blood-pool activity equal to or less than that of normal hepatic parenchyma. To biopsy a hemangioma could lead to a significant internal hemorrhage.

TECHNIQUE

A sulfa colloid liver scan is usually obtained prior to the labeled RBC study.

Radiopharmaceuticals: Tc99m *in vitro* labeled red cells or Tc99m modified *in vivo* (no centrifugation) labeled red cells; *in vitro* labeling is preferred.

Adult Dose: 20 mCi (*in vitro* labeling) using UltraTag
25 mCi (modified *in vivo* labeling)

Pediatric Dose: 280 uCi/kg with a minimum dose of 2.5 mCi (*in vitro labeling*)
360 uCi/kg with a minimum dose of 2.5 mCi (modified *in vivo*)

Route of Administration: Intravenous injection (bolus injection, if radionuclide angiography is requested by physician)

Patient Preparation: None

Equipment Setup: Gamma camera: Dual-headed SPECT preferred.
Collimator:
Planar imaging: LEAP or LEHR
SPECT imaging: LEHR
Energy window: 140 keV with a 20 % window

Patient Positioning: Supine with 1-2 pillows under knees to minimize low back discomfort and to straighten lumbar lordosis. Check with the physician for proper positioning of patient for radionuclide angiography (if requested).

Procedure: The routine examination consists of 1 hour delayed SPECT imaging only.
 At the discretion of the nuclear medicine physician, the examination may also include an initial radionuclide angiogram in the projection most likely to demonstrate the lesion (to be determined by the physician based on CT, MRI, or sonographic findings) and early static images in several projections.

| View | Digital Acquisition | Film Display (If Applicable) |
|---|--|---|
| OPTIONAL- Radionuclide Angiogram and Immediate Static Image | 60 x 1-sec images (64 x 64 matrix, word-mode) followed by 2-min static image (256 x 256 matrix, word-mode) | 15 x 4-sec images followed by 2-min immediate static image |
| OPTIONAL- Early static view | 256 x 256 matrix, word-mode | Anterior view for 2 million counts or 300 seconds, whichever is first. Right Lateral, RPO, and Posterior views for same time as anterior view. |
| SPECT Acquisition | Specific acquisition protocol dependent on camera. No magnification | |
| SPECT Reconstruction | Reconstruct entire volume No attenuation correction Ramp filter on acquisition computer | |

Items Required For Complete Study:

1. Films of OPTIONAL radionuclide angiogram and early static views (if obtained).
2. SPECT study: Reconstruction, filtering, and volume rendering of digital data.
3. Transfer of all digital images to the workstation.
4. The SPECT images must be reviewed by a nuclear physician before the patient leaves the department.

Reviewed: 11/06, 3/24/10