Skin Lymphoscintigraphy

Updated 9/8/2024

- **Indications**
  - To localize sentinel lymph nodes in the setting of melanoma, Merkel cell carcinoma and squamous cell carcinoma.
- **Radiopharmaceutical:**
  - Day of surgery - 500 microCi Tc-99m Lymphoseek (tilmanocept) divided into 4 syringes (each containing 0.1 mL fluid)
  - Afternoon before surgery = 2 mCi Tc-99m Lymphoseek (tilmanocept) divided into 4 syringes (each containing 0.1 mL fluid)
- **Method of Administration:**
  - The Radiologist will inject radionuclide intradermally around the 12, 3, 6 and 9 o'clock positions within 1 cm of skin lesion. The injection sites will then be massaged for a few minutes to stimulate lymphatic flow.
- **Patient Preparation:**
  - No specific preparation prior to radionuclide administration.
- **Conflicting Examinations/Medications:**
  - No Nuclear Medicine exams within the previous 24 hrs.
- **Pregnancy/Lactation:**
  - Pregnancy status does not need to be assessed due to short $t_{1/2}$, low administered activity and extremely low radiation risks.
  - Breast feeding mothers should discard breast milk for 24 hrs following Tc-99m Lymphoseek / sulfur colloid administration.
- **Imaging Technique:**
  - Collimator - LEHR or LEAP
  - Photopeak - 140 keV 20% window for Tc-99m
  - Image Preset Counts
    - Dynamic - 60 secs/image for 20 mins (20 images)
    - Static - 3-5 mins/image
    - SPECT - 64 stops, 25 secs/stop
  - Matrix Size - 128×128 (dynamic), 256 x 256 (static), 128 x 128 (SPECT)
  - Zoom - none
- **Images/Views:**
  - Dynamic Images (Only if Requested)
    - Begin imaging immediately after radionuclide administration. Image for 20 mins.
    - Obtain anterior images of the area around the injection sites with the patient supine or prone depending of the location of the skin lesion.
    - For hand/forearm lesions follow any lymphatic channels superiorly to identify any epitrochlear nodes.
    - For feet/foreleg lesions follow any lymphatic channels superiorly to identify any popliteal nodes.
  - Static Images (Always Obtained)
    - A Co-57 sheet flood source should be placed under the patient to outline his/her anatomy.
    - Place shielding over the injection sites to decrease scatter artifact.
    - Image the patient supine with his/her arms by the sides for neck images and overhead for other images.
    - Begin imaging 15-30 mins after radionuclide administration.
    - Head and neck lesions
      - ✓ Obtain anterior and lateral images of the face and neck until lymph nodes are visualized.
    - Trunk lesions
      - ✓ Obtain anterior images of the cervical, supraclavicular, axillary & pelvic regions. Image all these areas even if nodes are visualized elsewhere (sentinel nodes can be located in multiple locations in a patient).
      - ✓ Add 45° anterior oblique and lateral images if nodes are visualized in either axilla.
      - ✓ Add lateral images if nodes are visualized in the neck.

- Arm lesions
  - ✓ Obtain anterior images of the axilla, supraclavicular and neck regions.
  - ✓ Add elbow images for hand/forearm lesions.
  - ✓ Add 45° anterior oblique and lateral images if nodes are visualized in either axilla.
  - ✓ Add lateral images if nodes are visualized in the neck.
- Leg lesions
  - ✓ Obtain anterior images of the pelvis/groin.
  - ✓ Add knee images for feet/foreleg lesions.

➢ SPECT Images - can be obtained as requested by the Radiologist or Surgeon.

➢ Have the Radiologist / Radiologist Assistant mark any node(s) with a permanent marker if the exam is ordered with imaging.

- **Notes:**
  - ➢ Lymphoseek targets dextran-mannose receptors on the surface of macrophages / dendritic cells in lymph nodes.
  - ➢ The first lymph node to appear is the sentinel lymph node and is often the hottest node and is usually the node closest to the injection site.
  - ➢ Sentinel lymph nodes may also be present between the primary lesion and the nodal basin (so-called in-transit or interval sentinel lymph nodes).
  - ➢ A skin cancer may drain directly to multiple lymph nodes in one or more nodal basins (e.g. chest lesions draining to both the axilla and the groin).
  - ➢ Second-echelon nodes may be misinterpreted as sentinel lymph nodes if dynamic or early static imaging is not obtained.
  - ➢ Patients with thick melanoma have a risk of lymph node metastases >40 %.
  - ➢ Patients with thin melanoma have a risk of lymph node metastases <5 %.
  - ➢ Causes of sentinel lymph node nonvisualization include existing nodal disease, previously performed wide local excision of the skin lesion and prior surgery/trauma to the expected nodal basin.