Breast Lymphoscintigraphy

Updated
9/8/2024

- **Indication**
  - To localize sentinel lymph nodes in the setting of breast carcinoma.
- **Radiopharmaceutical:**
  - Day of surgery - 500 microCi Tc-99m Lymphoseek (tilmanocept) divided into 2 syringes (each containing 0.1 mL fluid)
  - Afternoon before surgery - 2 mCi Tc-99m Lymphoseek (tilmanocept) divided into 2 syringes (each containing 0.1 mL fluid)
- **Method of Administration:**
  - The Radiologist will inject radionuclide intradermally into the periareolar aspect of breast. 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 - 3-5 mins/image
  - Matrix Size - 256 x 256
  - Zoom - none
  - Patient Positioning - supine with the patient's arm on the cancer side over the patient's head
- **Images/Views:**
  - 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.
  - Begin anterior imaging of the chest at 15-30 mins after radionuclide administration and continue imaging until lymph nodes are visualized.
  - Obtain 45° anterior oblique and lateral static images of the chest towards the side the cancer is located once nodes are visualized.
  - 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.
  - Axillary sentinel lymph node biopsy is now preferred to axillary lymph node dissection in most clinical scenarios.
  - Patients with negative axillary sentinel lymph node biopsy by routine histopathological evaluation do not require axillary lymph node dissection.
  - Superficial radionuclide injection (periareolar, subareolar, subdermal, intradermal) may be preferable to a deep injection for the detection of axillary lymph nodes.
  - Deep radionuclide injection (peritumoral, intratumoral) is recommend if the aim is to stage both axillary and extra-axillary nodal basins.
  - Data suggest fewer than 40 % of those with positive axillary sentinel lymph nodes have metastases in non-sentinel nodes.
  - In approximately 1-2% of patients sentinel lymph nodes will not be detected preoperatively or intraoperatively. Causes of nonvisualization include advanced axillary nodal disease, non UOQ tumors, prior breast/axillary surgery, old age and obesity.