Overview

The Lymphoscintigraphy study demonstrates the flow of lymph from the site of injection through the draining lymphatics and into the sentinel lymph node(s).

Indications

Identification and localization of draining lymph node groups and sentinel nodes in breast cancer (5,6).

Examination Time

Initially: 30 min for injection of the radiopharmaceutical and imaging.

Delayed images 1-2 hours after injection may be required.

Patient Instructions / Scheduling

Radiotracer injection can be performed with or without image guidance. The standard protocol will be intradermal injection around the biopsy site or areola without image guidance.

Injection Technique:
The referring physician must indicate and mark the site where the injection is to be performed. Do not proceed with injection unless the site is clearly marked.

When requested by the surgeon, patients will be sent to Radiology for intraparenchymal injection under image guidance.

Equipment & Energy Windows

Gamma camera: Large field of view.

Collimator: Low energy, high resolution, parallel hole.

Energy window: 20% window centered at 140 keV.

Matrix 256x256

Radiopharmaceutical, Dose, & Technique of Administration
Tc-99m-sulfur colloid filtered through a 0.22 µ filter to remove larger particles (3,7-9).

**Dose:**

Non-image guided injection: 0.45mCi in a 1cc syringe with 27 gauge needle (SCOL is diluted with Lidocaine 1% to a volume of 1cc).

Image guided injection: 0.45mCi in a 6cc syringe with 27 gauge needle.

**Technique of administration:**

Non-Image guided: Make 4 intradermal injections of equal volume around the areola or the scar/marked site. Place cotton swabs over the puncture site before withdrawing the needle to absorb any excess extruded radiopharmaceutical.

Image guided:

Radiologist will perform intraparenchymal injection of radiotracer using ultrasound or mammography guidance.

**Patient Position & Imaging Field**

Patient position: Same position that is to be used for surgery (1).

Imaging field: Breast and associated axilla. As lymphatic drainage can vary, images should include the sternal area and neck.

**Acquisition Protocol** (1)

Acquire dynamic images for 5 minutes, 30 seconds per frame. This is followed by static images in the anterior, RAO, and right lateral, or anterior, LAO, and left lateral projections depending on which breast was injected.

Images are acquired for 5 minutes.

Co-57 transmission views must be done for each projection.

After imaging, pictures must be reviewed by the Physician to determine if additional views are required.

Mark the sites of the injection and biopsy on the breast diagram of the history sheet.

**Data Processing**

Expose the digital images so that background counts are just visible.
If the patient is going to surgery, have a preliminary report filled out and give to the Nuclear Medicine Physician for a wet read.

**Principle Radiation Emission Data - Tc-99m (19)**

- Physical half-life = 6.01 hours.

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Mean % per disintegration</th>
<th>Mean energy (keV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-2</td>
<td>89.07</td>
<td>140.5</td>
</tr>
</tbody>
</table>

**Dosimetry - Tc-99m-Antimony Sulfide Colloid (20)**

<table>
<thead>
<tr>
<th>Organ</th>
<th>rads/1 mCi</th>
<th>mGy/37 MBq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection site</td>
<td>0.44</td>
<td>4.4</td>
</tr>
<tr>
<td>Regional lymph nodes</td>
<td>0.03</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**References**


Normal Findings