LYMPHOSCINTIGRAPHY - MELANOMA
7.2.2
Radiology Associates of Clearwater

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 melanoma (1-4).

Examination Time

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

Delayed imaging at 1-2 hours may be required.

Patient Instructions / Scheduling

No special prep is required.

If intra-operative localization is also planned, coordinate with the surgery schedule.

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 \( \mu \) filter to remove larger particles (3,7-9).

Dose: 0.5 mCi (37 MBq) in 1.0cc syringe with 27 guage needle, intradermally (1). SCOL is diluted with Lidocaine 1% to a volume of 1cc.
Technique of administration:
1. To prevent skin contamination (which complicates interpretation), drape the area of lesion with a large waterproof drape. Cut a small window to expose the lesion.

2. Make 4 injections of: 0.25 ml, each around the primary lesion or biopsy site at 3, 6, 9, & 12 o'clock:
   * For melanoma of the skin it is essential that the injection is intradermal (producing a wheal) and not subcutaneous (1).
   * For biopsy sites it is important not to inject into a scar. The injection should be 0.5-1.0cm away from the incision site.

3. Place cotton swabs over the puncture site before withdrawing the needle to absorb any excess extruded radiopharmaceutical. Gentle finger massage over the area can be performed to promote lymphatic flow.

Patient Position & Imaging Field

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

 imaging field: Depends on location of the primary tumor. Include all possible drainage pathways (1).
   * For melanoma of the torso: Always include both axillae and both inguinal areas.
   * For melanoma of the head and neck: Drainage is always inferiorly so do not inject below lesion or you may obscure a nearby sentinel node.

Acquisition Protocol (1)

 acquire dynamic images for 5 minutes, 30 seconds per frame. This is followed by a single static image of the injection site for 5 minutes. Acquire static images every 5 minutes following injection of the radiopharmaceutical for 5 minutes, with the field of view including the injection site and expected proximal drainage pattern, as recommended by the Nuclear Medicine Physician. Remain in the room with the patient and observe the persistence scope.

 a. Melanoma of the head and neck can show significant variability in lymphatic drainage. Images must include the entire head in anterior, posterior and oblique positions.

 b. For upper extremity lesions, image the proximal affected arm, the axilla, the chest, including the sternal area and the neck. Once initial nodal pathway is identified, additional views may be acquired of other regions to assess drainage pattern.
c. For melanoma of the trunk, cutaneous drainage patterns can be unpredictable; it is important to look for drainage to the triangular intra-muscular space by including posterior and lateral views of this region (the spaces inferior and lateral to the scapula). Images must include both axillary and both inguinal regions.

d. For a lower extremity lesion after imaging the injection site move the camera to the proximal draining lymph nodes. Generally, for a lesion above the knee, this will include the groin.

Co-57 transmission images of each site must be done.

After the initial 30 minutes of imaging, additional oblique views may be obtained to identify the depth of the lymph nodes. The nodes can be marked with purple ink if the patient is scheduled for surgery.

Data Processing

Expose the digital images so that background counts are just visible.

Create a second copy to accompany the patient to surgery.

If the patient is going to surgery post imaging – have a preliminary form filled out and take 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>
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<tbody>
<tr>
<td>Gamma-2</td>
<td>89.07</td>
<td>140.5</td>
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</tbody>
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Dosimetry - Tc-99m-Antimony Sulfide Colloid (20)

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


Normal Findings


JSM
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This procedure complies with the Society of Nuclear Medicine Procedure Guideline for Lymphoscintigraphy in Melanoma. Version 1.0, June 15, 2002