IMAGING CORNER

Clinical significance of dermal backflow on lymphoscintigraphy in patients with lower limb edema

Areej Aijaz, Tanzil Sajid, Aamna Hassan
Department of Nuclear Medicine, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore
Correspondence: Aamna Hassan. e-mail: aamnah@skm.org.pk
ORCID ID. 0000-0003-0026-0729

Abstract

Chronic blockage of the lymphatic system due to functional or anatomical causes results in lymphoedema which results in swelling due to accumulation of lymphatic fluid in the soft tissue. Lymphoedema commonly affects the upper and lower limbs but may be seen in the neck, chest wall, abdomen and genitalia. Lymphoscintigraphy is non-invasive and maps the lymphatic channels thereby indicating location of blockage along the lymphatic pathways. Blockage of lymphatic channels may lead to back pressure resulting in dermal backflow. We present a case of dermal backflow in bilateral lymphoedema.

Keywords: lymphoscintigraphy, dermal backflow, lymphedema

DOI: https://doi.org/10.47391/JPMA.23-97

A 43-year-old, female patient with no relevant comorbidity, presented with complaint of long standing bilateral lower limb swelling; more prominent on the left side. Doppler ultrasound of lower extremity revealed a soft thrombus in right posterior

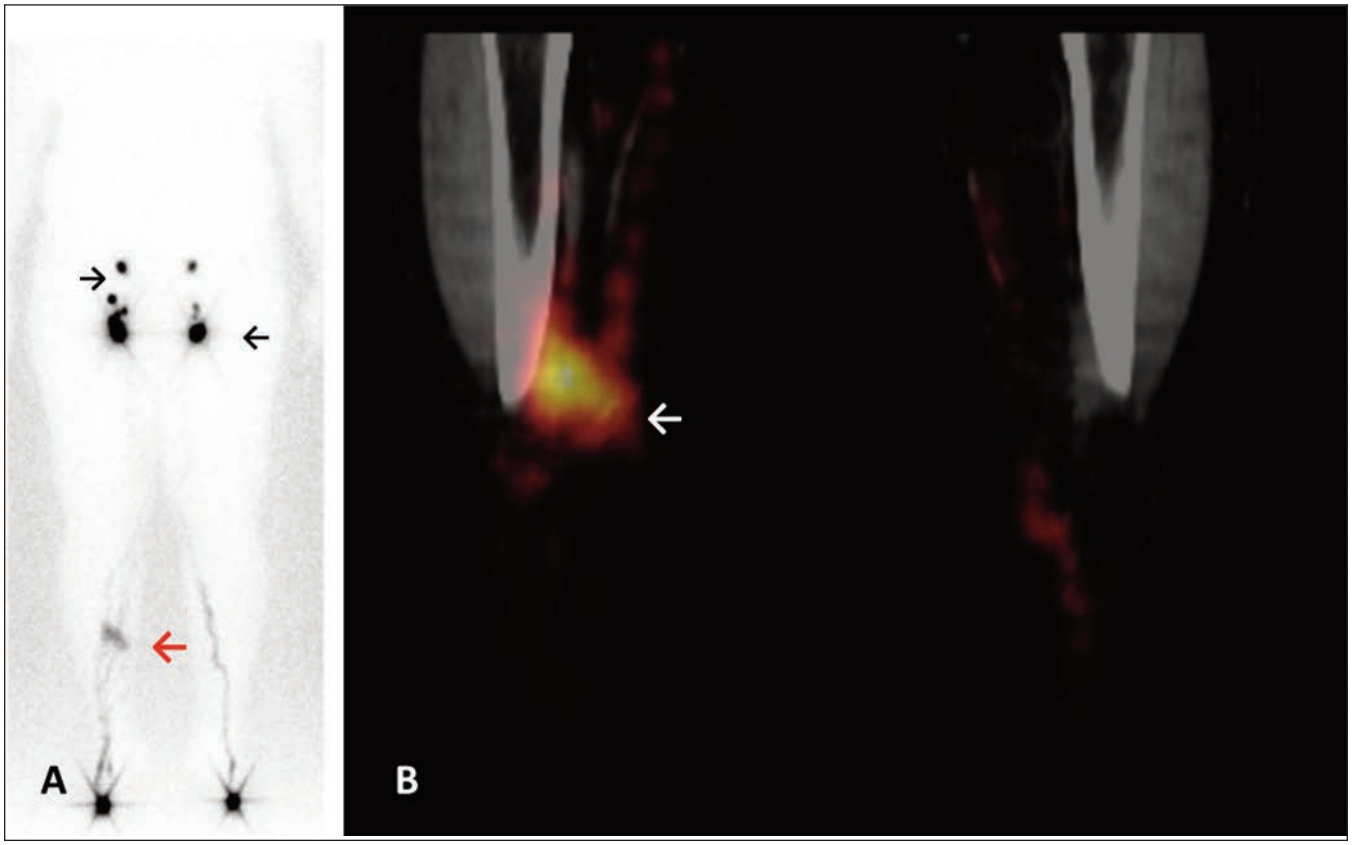

Figure: A) Anterior planar images of lower limbs obtained at 40mins after radiotracer injection show normal ascent of the tracer with visualization of lymphatic tract as well as both side inguinal and pelvic sidewall nodes (black arrows). Few fine collateral channels and pooling of tracer is seen in right proximal calf suggesting dermal backflow (orange arrow). B) On correlative SPECT-CT image, this tracer accumulation is localised in the subcutaneous plane. No underlying morphologic abnormality is appreciable (white arrow). This likely represents dermal backflow.

tibial vein. Following appropriate treatment, repeat Doppler scan after two years showed normal venous duplex and arterial flow in both legs. Lymphoscintigraphy performed after intradermal injection of 38 MBq ^{99m}Tc-Human serum Albumin (HSA) in the first web space of feet. Static images revealed normal ascent of tracer in lymphatics along with dermal backflow (Figure A). SPECT/CT of bilateral lower limbs did not demonstrate any morphologic correlate underlying the dermal backflow (Figure B).

Lymphoedema is a chronic progressive disease resulting from obstruction of lymphatic system which can be anatomical or functional. It can be either primary due to lymphatic malformation or secondary due to lymphatic obstruction from trauma, surgery, cancer, radiation therapy or infections.[1] Lymphoscintigraphy is a non-invasive method where a subcutaneous radionuclide labeled colloid injection in the web space of feet, taken up by the lymphatics gives analysis of lymphatic vessel as well as lymph node, dermal backflow and transit time.[2]

Lymphoscintigraphy is indicated when patient has clinical suspicion of lymphoedema and venous malformation has been ruled out.[3] Lymphoscintigraphy is a readily available, simple method for evaluation of limb lymphoedema of unknown cause. Dermal backflow is not seen commonly, especially on initial phase of imaging. However, evidence of dermal backflow and visualization of popliteal nodes are indicator of long standing and more severe disease.[3]

References

1. Karaçavuş S, Yılmaz YK, Ekim H. Clinical Significance of Lymphoscintigraphy Findings in the Evaluation of Lower Extremity Lymphedema. Mol Imaging Radionucl Ther. 2015;24:80-4. doi: 10.4274/mirt.58077. PMID: 26316473; PMCID: PMC4563174.
2. Moshiri M, Katz DS, Boris M, Yung E. Using lymphoscintigraphy to evaluate suspected lymphedema of the extremities. AJR Am J Roentgenol. 2002;178:405-12.. doi: 10.2214/ajr.178.2.1780405. PMID: 11804905.
3. Kalawat TC, Chittoria RK, Reddy PK, Suneetha B, Narayan R, Ravi P. Role of lymphoscintigraphy in diagnosis and management of patients with leg swelling of unclear etiology. Indian J Nucl Med. 2012t;27:226-30.. doi: 10.4103/0972-3919.115392. PMID: 24019651; PMCID: PMC3759082.