

Role of nuclear medicine in breast cancer

Scintimammography :

Scintimammography in nuclear medicine, which utilizes a wide range of instrumentation applications. Especially in recent years, conventional planar scintimammography has been enhanced by single-photon emission computed tomography (SPECT) and hybrid SPECT/CT. While in hybrid SPECT/CT adds clinical value by co-registering physiologic with anatomical data to support non-palpable lesion biopsies, radiotherapy planning and then treatment follow-up. The devices like Breast-specific gamma imaging which dedicated to small field of view (FOV) and also have emerged internationally. For both the BSGI, and scintimammography, planar orientations (anterior, lateral, oblique) are obtained within 5-15 min post-injection. Oblique and lateral images are acquired as the patient lies in prone position with pendent breasts while supine positioning is supported for oblique, anterior and SPECT tomography acquisitions. In both positions image acquisitions are preferred. Prone positioning better separates breast tissue from high pharmaceutical uptake in the myocardium and liver improving visualization of breast activity by reducing scattering of photon and improving contrast of image. Additionally, advantages of prone position which is enhanced evaluation of the chest wall, better outline of the breast contour and improved spatial resolution. While in supine position improves visualization of primary lesion and internal mammary. BSGI obtains 210 mini images in the craniocaudal and mediolateral oblique orientations per breast. For great importance to diagnosis and prognosis of patient is breast lesion size and palpability as small non-palpable lesions which indicates early disease. Characterising mammographically non-palpable benign lesions as metabolically benign could obviate the need for a difficult biopsy procedure and instead support clinical observation. The high specificity of scintimammography, a positive scintigraphic finding would support recommending an invasive evaluation. While multiple studies suggested that dedicated combined with breast positioning during BSGI provided better detection of sub-centimeter and non palpable lesions, this is compared to scintimammography, overall sensitivity and specificity was 82% and 85% respectively and also showing no improvement over SPECT, which was 86 and 87 percentages respectively. Indeed, the dedicated camera design of BSGI is highly sensitive for detecting local disease, but is limited in the broader clinical setting compared to planar, SPECT, and SPECT/CT cameras that can investigate regional, axial and global disease.