

The role of Nuclear Medicine in breast cancer management

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Breast cancer is the most common malignant tumour in females. Nuclear Medicine and molecular imaging plays an important role in diagnosis, staging, surveillance and management of disease. Moreover, these images also provide a unique tool for guiding individualized cancer therapy by assessing therapeutic targets, evaluating early response to treatment, and identifying residual cancer tissue after therapy. In particular, in the era of personalized medicine, the goal of molecular imaging is to be a biomarker which can be predictive as well as a prognostic factor.

Management of breast cancer consists of locoregional and systemic therapy, which is largely based on disease staging. Surgery with curative intent is the best option in early stages, whereas in advanced stages, in which tumor has spread outside the axillary basin, surgery is rarely curable. Therefore, detection of metastases and proper staging is of the utmost importance for choosing the best treatment. Nuclear Medicine with SPECT/CT imaging is an useful modality for skeletal and nodal staging in early-stage cases with important impact on therapy. Nevertheless, FDG PET/CT is of value in the initial staging of high-risk patients, and it should be the first whole-body imaging examination for restaging breast cancer patients with known or suspected recurrence; moreover, FDG PET/CT is emerging as a promising tool for early monitoring of the effectiveness of neoadjuvant chemotherapy.