

THE ROLE OF PET/CT IN BREAST CANCER IMAGING AND PATIENT MANAGEMENT

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Nuclear medicine has had a role in the management of patients with breast carcinoma since the introduction of the Strontium-85 bone scan about more than four decades ago. The recent development of lymphoscintigraphic sentinel node localization as well as SPECT and PET/CT studies has broadened the spectrum of role of nuclear medicine in assisting breast cancer management decisions.

Despite the limitations of the radiographic mammography, i.e., the majority of breast biopsies yield benign lesions; it remains the primary screening procedure for breast cancer. In few areas of mammographic uncertainty, scintimammography with Tc-99m sestamibi or F-18 FDG may be of value especially when dedicated scanners, positron emission mammography (PEM) is used. However, ultrasound and MRI in such cases are preferred and Dr. Laurie L. Fajardo will review their utilizations in this meeting.

FDG PET/CT has been extensively used for detection and defining the extent of recurrent or metastatic breast cancer and for monitoring the therapy response in the management of the breast cancer patients. FDG PET/CT might determine the patients' response to chemotherapy, possibly earlier than conventional methods. Although its accuracy in detection of the primary tumor and axil-

lary staging is fairly accurate, because of the potential presence of undetectable micro metastases and its inability to accurately detect sclerotic bone lesions, FDG PET/CT should not be considered a substitute for conventional staging studies, including CT and bone scintigraphy. Its most frequent utilization is in staging / restaging, by detecting the extent of possible disease recurrence, and both local and distant metastasis. Since the lytic metastatic bone lesions in particular may exhibit increased glucose metabolism, F-18 FDG (and Fluorine-18) PET/CT studies can easily detect such lesions and augment the Tc-99m MDP bone scan when the conventional bone scan may be less revealing.

The FDG uptake in the primary tumor carries prognostic information. It has been suggested that high FDG uptake (pretherapy SUV > 4.0) in the primary tumor may be a marker of tumor cell resistance to apoptosis, the process that underlies tumor response to therapy. The future applications of PET/CT, which will include newer tracers, will help us to better characterize tumor biology and more effectively measure patients' response to therapy. Thus, tailored therapy to individual patient; measurement and prediction of the early response to therapy; and early identification of the drug resistance factors - therapy failures- would be possible, which all will improve patient outcome and prevent unnecessary therapies.

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