The Role of FDG-PET/CT in Staging of Breast Cancer

A Thesis

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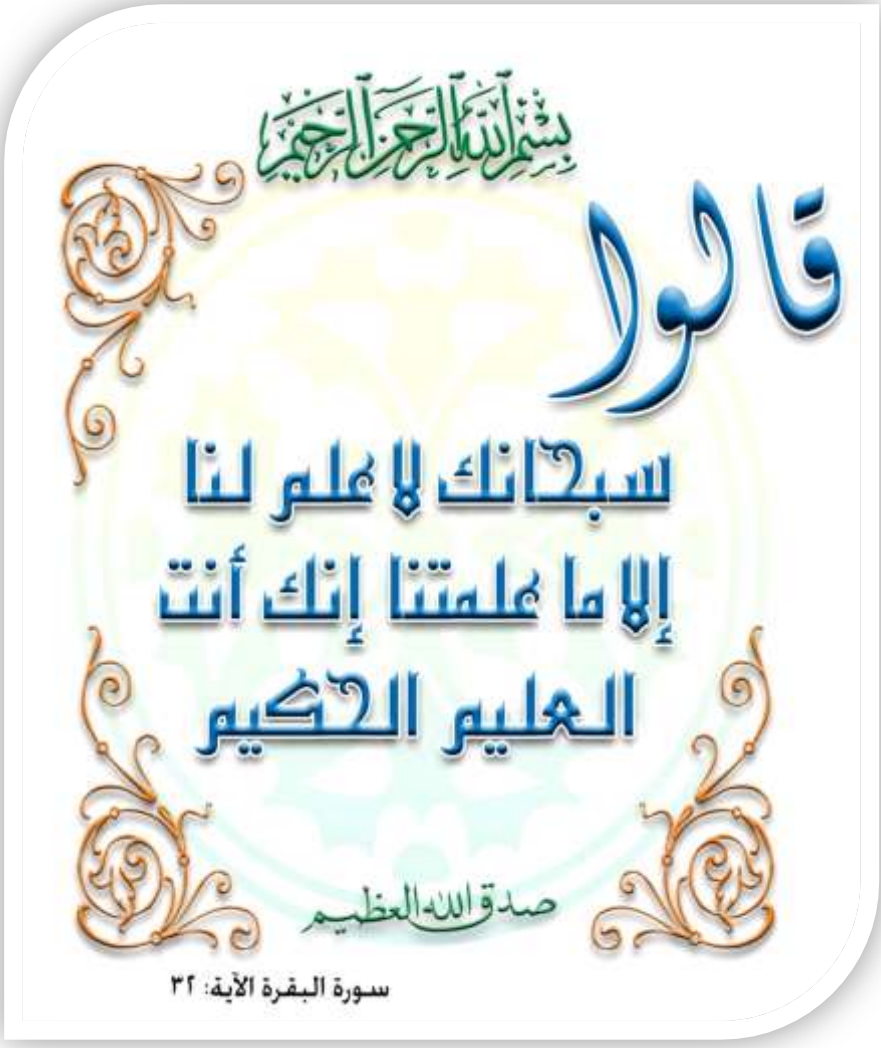
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Ahmed Mohamed Hasaan Ali Elnaggar

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List of Abbreviations

Abbr.	Full-term
AJCC	**:** American Joint Committee on Cancer
DCIS	**:** Ductal carcinoma in situ
FDG	**:** Fluorodeoxyglucose
IDC	**:** Invasive ductal carcinoma
ILC	**:** Invasive lobular carcinoma
LCIS	**:** Lobular carcinoma in situ
MC	**:** Medullary carcinoma
NET	**:** Neuroendocrine tumor
NOS	**:** Not otherwise specified
NST	**:** No special type”
PET	**:** Positron emission tomography
SD	**:** Standard deviation
SPSS	**:** Statistical package for social science
TDLU	**:** Terminal duct lobular unit
TNM	**:** Tumor, nodes, and metastases
UICC	**:** International Union for Cancer Control
18F	**:** Fluorine 18

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Abstract

Background: Breast cancer is the most common non-skin cancer and the second leading cause of cancer related death in women. Breast cancer strikes women of all ages, races, ethnicities, socioeconomic strata, and geographic locales. Once breast cancer is diagnosed, the tumor stage has to be accurately determined before therapy chosen and the prognosis known. **Aim of the Work:** to highlight the role of PET-CT imaging in staging of patients with breast cancer. **Patients and Methods:** This study was carried out on a total of 51 female patients biopsy-proved to have cancer breast coming to perform PET/CT scans for staging, pre-operative or pre-therapeutic assessment with ages ranging from 27 to 78 years, in specialized private center in Cairo using combined PET-CT machine (Phillips Ingenuity TF PET/CT 128 Slice) from October 2017 to June 2019. **Results:** Combined PET/CT staged 3 patients as stage IA, 10 patients as stage IIA, 6 patients as stage IIB, 2 patients as stage IIIA, 3 patients as stage IIIB, 2 patients as stage IIIC and 25 patients as stage IV. Out of 51 patients, combined PET/CT upgraded the staging of 13 patients compared to initial CT staging. **Conclusion:** PET/CT is the technique of choice and indispensable tool for evaluation of the patients with breast cancer.

Key words: FDG-PET/CT, breast cancer staging

Introduction

Breast cancer is the most frequent cancer entity affecting women, and poses a major challenge for oncological research. Breast cancer is responsible for approximately 15% of all female cancer deaths, representing the second leading cause of cancer-related female death, and affecting not only elderly but many younger patients ***(Riegger et al., 2012).***

Breast cancer tumor stage at initial diagnosis determines prognosis and directs treatment planning. Current staging guidelines recommend clinical examination and multimodality imaging, which includes conventional mammography, ultrasound of the breast and ultrasound of the axillary fossae for local staging. Chest X-ray or chest computed tomography, bone scan and ultrasound of the liver to evaluate for distant metastases should be considered in patients with intermediate or high risk breast cancer. The availability of combined 18 F-2-Fluoro-2-deoxy-Dglucose (18 F-FDG) positron emission tomography and computed tomography (PET/CT) as a whole body imaging method is increasing, as is its role in oncologic imaging, treatment, and management ***(Krammer et al., 2015).***

Whole-body staging protocols using F18-FDG PET/CT including a fully diagnostic, full-dose CT scan with intravenously and per-orally administered contrast agent are used for a wide variety of cancer entities. Improved diagnostic accuracy has been documented for whole-body