بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

Role of 18 FDG PET/CT Imaging in Assessment of Neoadjuvant Chemotherapy Response in Breast Cancer Patients

Thesis

Submitted for Partial Fulfillment of MD degree in Radiodiagnosis

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قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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List of Abbreviations

Abb.	Full term
CT	Computed tomography
DC	Ductal carcinoma
DCIS	Ductal carcinoma in situ
ER	Estrogen receptors
FDG	Flurodeoxy glucose
FN	False negative
FP	False positive
IDC	Invasive ductal carcinoma
IDC NIS	Invasive ductal carcinoma nospecific type
ILC	Invasive lobular carcinoma
LC	Lobular carcinoma
LICS	Lobular carcinoma in situ
MC	Medullary carcinoma
NAC	Neoadjuvant chemotherapy
NET	Neuro-endocrine tumor
NPV	Negative predictive value
pCR	Pathologic complete response
PERCIST	PET response criteria in solid tumors
PET	Positron emission tomography
PPV	Positive predictive value
PR	Progesterone receptors
RECIST	Response Evaluation Criteria in Solid Tumors
SUVmax	Maximum Standardized uptake value
TN	True negative
TP	True positive

INTRODUCTION

Breast carcinoma is the most frequently diagnosed life-threatening cancer in women and leading cause of cancer death among women. In Western Europe and the United States the incidence is highest in the 40 - 55 age range, and its prevalence is still on rise. It accounts for 40,000 and 14,000 deaths yearly in the US and UK, respectively, and that makes it the second cause of cancer death in women in those countries ***(Yun et al., 2012).***

Positron emission tomography (PET) with 18 fluorine (18f) flurodeoxy glucose (FDG) has an important role in oncology. Its role in management of breast cancer is evolving. These past years, combined PET and computed tomography (CT)(PET\CT) systems have replaced PET alone in most nuclear medicine departments. The CT portion of PET\CT provides the anatomic information useful for accurate interpretation of PET signal. It also provides a map used for attenuation correction of PET images ***(Groheux et al., 2013).***

Imaging of metabolic pathways serves as an alternative way for visualizing the treatment effects; furthermore, metabolic reduction within the tumor precedes the anatomic response to therapy. PET with 18 F- FDG has been used to evaluate the clinical response to NAC in patient with breast cancer. Metabolic reduction often occurs early in the course of therapy and precedes reduction in size of the tumor, because morphologic changes of the tumor occur much later than the metabolic response. The 18F-FDG uptake, expressed semiquantitatively by standardized uptake value (SUV), in interim PET studies has been reported as a strong predictor of clinical and pathologic response. Metabolic reduction detected between base line and early phase of NAC can provide early information on potential tumor response ***(Tateishi et al., 2012).***