Role Of PET/CT In Follow Up Of Post Therapeutic Colorectal Cancer

Thesis

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List of Abbreviations

µ maps	: Attenuation map
18F-FDG	: ^{18}F- FluoroDeoxyGlucose
AC/AL	: Attenuation correction/Alignment
ACFs	: Attenuation correction factors
CECT	: Contrast enhanced computed tomography
CR	: Complete Response
CRu	: unconfirmed complete response
CT	: Computed Tomography
ESR	: Erythrocyte sedimentation rate
F 18	: Fluorine 18
FDG	: FluoroDeoxyGlucose
GLUT	: Glucose Transporters
GSO	: Gadolinium Silicate
GTD	: Greatest transverse diameter
H+	: Hydrogen ion
H2 (F-18)	: Hydrogen fluoride
IV	: Intravenous
IWC	: International Workshop Criteria
KeV	: Kilo electron Volt
KV	: Kilo Volt
LDH	: Lactate dehydrogenase
LSO	: Lutetium Oxyorthosilicate
MCi	: Micro Curies
MeV	: Mega electron Volt
Mo	: Months
MRI	: Magnetic Resonance Imaging
N	: Neutron,
P	: Proton
PD	: Progressive disease
PERCIST	: PET Response Criteria in Solid Tumors
PET	: Positron Emission Tomography
PET/CT	: Positron Emission Tomography/ Computed Tomography
PFS	: Progression Free Survival
PMTs	: Photomultiplier tubes
PR	: Partial Response
RECIST	: Response Evaluation Criteria in Solid Tumors
SD	: Stable disease

✍List of Abbreviations

SLL	: Small-cell lymphocytic lymphoma
SPD	: Sum Of The Products Of The Greatest Diameters
ß-	: Electron
ß+	: Positron
SUV	: Standardized Uptake Value
SUVavg	: Average Standardized Uptake Value
SUVmax	: Maximum Standardized Uptake Value
US	: Ultrasound
WBC	: White blood cells
WHO	: World Health Organization
Wt	: Weight
XRT	: Radiotherapy
γ	: Photon

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Abstract

Background: Colorectal cancer (CRC) is one of the most common malignancies worldwide and is a major health problem in developed countries with local and distant recurrences develops in 30-50% of patients during follow-up after primary surgery. ***Aim of the Work:*** The present study is aiming at emphasizing the role of PET/CT in follow up of patients with colorectal carcinoma after treatment, as well as detection of local recurrence and distant metastasis. ***Methods:*** the study included 25 patients with past history of colorectal cancer, they underwent PET/CT examination with the following protocol: patients were fasting for at least 6 hrs before undergoing scanning. A standard dose of 1-1.5 mCi/kg of F-FDG was intravenously injected 45-60 mins before imaging then initially low dose CT was performed for attenuation correction. After that PET emission scanning was performed immediately after the CT. this was followed by diagnostic CT using IV contrast administration and hyperosmolar oral contrast (diluted mannitol solution) to achieve bowel distension. All data acquired a combined PET/CT in-line system. ***Results:*** The study showed that there is significant paired differences between the number of local lesions as well as metastatic deposition detected in the initial and follow up PET/CT. ***Conclusion:*** FDG PET/CT is extremely useful for therapy response assessment due to its capacity to help distinguish between residual metabolically active tumor and areas of nectrosis and fibrosis, thus identifying which of these patients have achieved satisfactory functional remission and which one of them needs further treatment.

Keywords: CRC: Colorectal cancer; PET: Positron emission tomography; CEA; Carcino embryonic antigen

INTRODUCTION

Colorectal cancer (CRC) is one of the most common malignancies worldwide and is a major health problem in developed countries with local and distant recurrences develops in 30–50% of patients during follow-up after primary surgery. ***(Wichmann et al., 2015)***

Colorectal imaging advances with magnetic resonance (MR), CT colonography (CTC), and positron emission tomography (PET) over the past year or so have been substantial. ***(Perry, 2015)***

18F-fluorodeoxyglucose (FDG) PET/CT is well established as a diagnostic tool in the evaluation of patients with rising Carcino embryonic antigen (CEA) and suspected recurrence of colorectal cancer. ***(Lu, et al., 2013)***

The early detection of recurrence is vital because surgery, radiotherapy and chemotherapy (either separately or as part of a multidisciplinary approach) may improve patient survival and quality of life. Although only 20–30% of patients with recurrent metastatic disease are suitable candidates for curative resection, the five-year survival rate in this group is 30–40%. ***(Elias et al., 2014)***.