شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

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HANAA ALY

Diagnostic role of PET CT in hepatocellular carcinoma compaired with triphasic CT imaging

Thesis

Submitted in Partial Fulfillment for the Master Degree in Radiology

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Yasmine Emad

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List of Abbreviations

Abb.	Full term
^{18}F-FDG	^{18}F-fludeoxyglucose
AASLD	American Association for the Study of Liver Diseases
AFP	Alpha feto -protein
AUC	Area under curve
BCLC	Barcelona clinic liver cancer
CA	Contrast agent
CBD	Common bile duct
CHA	Common hepatic artery
CHD	Common hepatic duct
CM	Contrast media
CT	Computed tomography
GB	Gall bladder
GDA	Gastro-duodenal artery
HAP	Hepatic artery proper
HCC	Hepatocellular carcinoma
HFL	hepatic focal lesion
HV	Hepatic vein
IVC	Inferior vena cava
LHA	Left hepatic artery
LHV	Left hepatic vein
LN	lymph node
LOR	Line of response
LPV	Left portal vein
MHV	Middle hepatic vein
MPV	Main portal vein

List of Abbreviations Cont...

Abb.	Full term
MRI	Magnetic resonance imaging
NPV	Negative predictive value
PET	Positron emission tomography
PPV	Positive predictive value
PV	Portal vein
RHA	Right hepatic artery
RHV	Right hepatic vein
ROC	Receiver operating characteristic curve
RPV	Right portal vein
SMV	Superior mesenteric vein
SUV	Standardized uptake value
SV	Splenic vein
US	Ultrasound

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INTRODUCTION

Hepatocellular carcinoma (HCC) is the most common primary malignancy of the liver. It ranks as the fifth most common tumor in the world and the third most common cause of cancer-related death. In recent decades, HCC age-adjusted incidence rates have doubled. This is largely due to an increasing prevalence of ailments that predispose to hepatic cirrhosis, such as chronic viral hepatitis, obesity, and alcohol abuse ***(Gomaa, 2020).***

Prognosis of patients with HCC is usually poor, and predicting life expectancy is difficult because of variable factors such as portal vein (PV) thrombosis, tumor stage, and high recurrence rate of the tumor. Accurate staging of HCC is crucial because only patients with small tumors (<5 cm) without distant metastasis would benefit from liver resection or liver transplantation as a curative treatment ***(Cho et al., 2017).***

Imaging techniques are a key tool for clinical decision. The development of ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI) has allowed the detection and diagnosis of liver tumors at an asymptomatic stage, and this has modified their diagnostic approach and treatment. Indeed, some of the effective therapies are image guided. Further more, evaluation of treatment and follow-up are done through imaging. Hence, understanding of the information provided by imaging techniques is critical for the clinician in charge of liver cancer patients (Bruix&Sherman***., 2010).***

Residual, recurrent, and metastatic lesions of HCC are not detected well by traditional imaging such as MRI or CT because these modalities detect morphologic changes, which can occur quite slowly in HCC. A more effective modality seems to be positron emission tomography (PET/CT) using the exogenous contrast agent (CA) ^{18}F-fludeoxyglucose (^{18}F-FDG) can scan the whole body ***(Liao et al., 2018).***

PET/CT is an imaging modality using positron-emitting markers. The most commonly used marker in evaluating cancer patients is ^{18}F-FDG, an analogue of glucose, used in processes of glucose metabolism. Glucose metabolism increases rapidly in dividing and growing cells causing an increased uptake of ^{18}F-FDG ***(Croteau et al., 2016).***

In some cancers, ^{18}F-FDG scanning especially when merged with CT, is highly sensitive in the staging of the malignancies, and can be used in management of individual patients. This modality has been established as a diagnostic tool of various cancers` ***(Guo et al., 2007).***

PET/CT is useful to detect distant metastasis. Evidence supports a relationship between PET/CT imaging and degree of tumor differentiation. PET/CT emerged as a highly effective nuclear imaging tool for diagnostic setup**,** treatment allocation, and assessment of post-interventional tumor response in medical and surgical oncology ***(Kornberg and Freiss, 2019).***