The Role of Multidetector Computed Tomography Liver Perfusion and Tumor Tissue in Assessment of Hepatocellular Carcinoma

Essay

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List of Contents

Anatomy of the Liver

Pathology of Hepatocellular Carcinoma

CT Liver Techniques

CT Perfusion Liver and Tumor Tissue Findings in Hepatocellular Carcinoma

List of Figures

List of Figures (Cont.)

List of Figures (Cont.)

List of Tables

List of Abbreviations

3Dangiogram……Three-dimensional angiogram

AFP……Alfa feto protein

AJCC……American Joint Committee on Cancer

BF……Blodo flow

BV……Blood volume

CECT……Contrast enhancement CT scan

CHA……Commun hepatic artery

CHD ……Common hepatic duct

CLIP……Cancer of the liver Italian program

CT……Computed tomography

FNH……Focal nodular hyperplasia

GN……Gall bladder

HAP……Hepatic artery phase

HBF……Hepatic blood flow

HCC……Hepatocellular carcinoma

HCT……Helical computed tomography

HCV……Hepatitis C virus

HPI……Hepatic perfusion index

HU ……Field unit

IVC……Inferior vena cava

List of Abbreviations (Cont.)

LHA ·····Left hepatic artery

MDCT·····Multi-detector computed tomography

MIP ·····Maximum intensity projection

MTT ·····Mean transit time

NCECT·····Non-contrast enhancement CT scan

Ps ·····Permeability-surface area product

PV ·····Portal vein

PVP·····Portal vein phase

RHA·····Right hepatic artery

ROI ·····Region of interest

TAC·····Time attenuation curves

TDC ·····Time-density curve

UICC ·····Union International Contre le Cancer

VEGF ·····Vasculr endothelial growth factor

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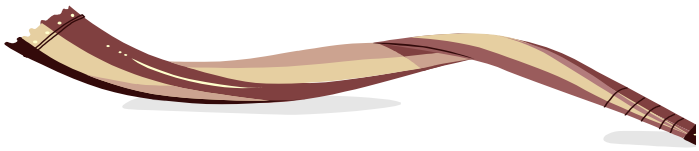

Ahmed Mohamed Mohamed Hamad

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ
الْحَكِيمُ

صدق الله العظيم

سورة البقرة الآية

(32)

Introduction

Hepatocellular carcinoma (HCC) is the fifth most common malignancy worldwide and is responsible for more than 500 000 deaths every year globally. HCCs are highly vascular and derive neovasculature through the process of angiogenesis. Tumor angiogenesis is a complex process mediated by several angiogenic and antiangiogenic factors and is critical for tumor growth and metastasis. Therefore, quantifying tumor angiogenesis is important for risk stratification, evaluation of disease progression, and monitoring response to therapy ***(Miles et al., 2000).***

Currently, tissue sampling for the evaluation of tumor microvessel density is considered the most accurate direct marker of angiogenesis. However, tissue sampling is invasive and therefore impractical for longitudinal patient monitoring. Consequently, an accurate noninvasive method to quantify tumor angiogenesis would be highly desirable ***(Miles et al.,2000).***

Computer tomographic (CT) perfusion is a technology that allows quantitative assessment of various parameters, such as tumor blood flow (BF), blood volume (BV), mean transit time (MTT), and permeability–surface area product (PS). Results suggest that CT perfusion is a feasible and, from the limited data, reproducible technique for quantifying tumor vascularity and angiogenesis in advanced HCC ***(Miles et al., 2000).***