Original Article

Arterial Phase CT for Early Detection of HCC in Cirrhotic Patients

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Abstract

Objective: To know the effectiveness of Early Arterial phase CT in detecting the small focus of HCC in Cirrhotic Patient. **Material and Methods:** 135 patient of Cirrhosis were scanned on a Multislice CT scanner with bolus chase contrast tracking. All the patient had a mass lesion on Ultrasound. Inclusion criterion was a solitary lesion in the liver. The patient were scanned in arterial phase, Portal venous phase and delayed phase CT. The scans were done with an injector using a 100 ml of contrast volume with the flow rate of 3.5ml / sec. **Findings** Total lesions identified on scans were 210 on early arterial phase of the imaging. 145 in portal venous phase and 142 in delayed phase. 43 patient showed multiple lesions – 31.8 %. That is to suggest that ultrasound picked less lesions as compared to CT Maximum number of 210 lesions were appreciated in early arterial phase of the CT. **Conclusion:** Early Arterial phase CT is better for early detection of smaller sized HCC.

INTRODUCTION

Hepatocellular carcinoma (HCC) is the most common primary hepatic tumor and one of the most common cancers worldwide. HCC is a primary malignancy of hepatocellular origin. Cross-sectional imaging with computed tomography (CT) scanning and magnetic resonance imaging (MRI) is most commonly used to detect hepatocellular carcinoma (HCC). CT scanning is frequently the first examination; however, MRI has superior contrast resolution and may better detect lesions less than 1 cm in diameter. Ultrasonography (US) can be sensitive in detecting HCC and, depending on the operator, can detect small lesions. US can evaluate for vascular invasion of the portal and hepatic veins through color Doppler imaging. Nuclear medicine imaging, angiography, and plain films are less useful.

STUDY

Objective – To know the effectiveness of Early Arterial phase CT in detecting the small focus of HCC in Cirrhotic Patient.

MATERIAL AND METHODS

Place of Study – Doctors Plaza Diagnostic Centre, Faisalabad. Duration of the study – One year from December 2010 to December 2011. Convenient sampling was done.

INCLUSION CRITERION

Cirrhotic patient with a solitary mass lesion in liver of any size.

METHODOLOGY

135 patient of Cirrhosis were scanned on a Multislice CT scanner with bolus chase contrast tracking. All the patient had a solitary mass lesion on Ultrasound. The patient were scanned in arterial phase- 20 sec after injection of 100 ml of non ionic contrast, Portal venous phase 60 sec and delayed phase CT 120 sec. The scans were done with an injector using a100 ml of contrast volume with the flow rate of 3.5 ml / sec. Scan were acquired from the dome of diaphragms till the iliac crests.

DATA COLLECTED AND ANALYSED

Findings:

Total lesions identified on scans were 210 on early arterial phase of the imaging. 145 in portal venous phase and 142 in delayed phase.

Modality	Lesions
Ultrasound	135
CT	210

43 patient showed multiple lesions – 31.8 %. That is to suggest that ultrasound picked less lesions as compared to CT. Ultrasound picked 75 less lesions.

Maximum number of lesions were appreciated in early arterial phase of the CT – 210

Contrast Phase	Number of lesions
Early Arterial	210
Portal venous	145
Delayed venous	142

DISCUSSION

Proper technical performance of CT scanning with imaging in the hepatic arterial and portal venous phases, as well as delayed contrast images, is important in detecting hepatocellular carcinoma (HCC). Lesions may be missed if early vascular imaging is not performed. It is important to use high injection rates and appropriate bolus timing. Sensitivity of good-quality dual- or triple-phase CT scanning for the detection of patients with tumors is 60-70%.[2] The CT appearance of HCC varies depending on tumor size and the imaging phase. The most common attenuation pattern is iso-hyper-isoattenuation on prephase, arterial phase, and venous phase, respectively; however, this pattern is shared by other hepatocellular nodules, including regenerative and dysplastic nodules. Unenhanced CT typically reveals an iso-hypodense mass. If the mass is large, central areas of necrosis may be seen. Look for signs of cirrhosis or hemochromatosis. In the hepatic arterial phase (seen in the image below), lesions typically are hyperdense (relative to hepatic parenchyma) as a result of hepatic arterial supply. Larger tumors may have necrotic central regions that are typically hypodense during this imaging phase. Look for neovascularity to indicate the presence of inconspicuous lesions. In the portal venous phase, small lesions may be isodense or hypodense and difficult to see, since the remainder of the liver increases in attenuation. Larger lesions with necrotic regions remain hypodense. In the delayed-postcontrast phase, small lesions may be inconspicuous on late phases. Delayed phase scans may show a tumor capsule, one of the more specific signs indicating HCC. CT can also evaluate complications of HCC, such as portal venous or hepatic venous invasion. In addition, be alert and evaluate for other complications such as bleeding within the tumor and hemoperitoneum. Evaluate underlying disease on CT, which can indicate the etiology of a hepatic mass. Look for signs of cirrhosis and hemochromatosis. Cirrhotic nodules cannot be reliably differentiated from small HCCs. Since success of therapy depends on early HCC detection, the distinction is important; MRI can assist with nodule differentiation. False-negative CT imaging can occur. Even the best CT scanner may have difficulty detecting small lesions, especially if good-quality, triphasic scanning is not performed. Prospective detection rates of tumors and tumor nodules were reported as 59% and 37%, respectively, in a large series with pathologic correlation.[3] In the setting of an abnormal liver with elevated alpha-fetoprotein (AFP), a vascular mass or a large necrotic mass strongly suggests HCC; however, other hepatic lesions, benign or malignant, can mimic hepatocellular carcinoma (HCC) on CT. MRI or nuclear imaging can assist in this differentiation.

CT is better in evaluation of hepatic lesions[4.] Now even target sonographic data is being obtained of those lesions, which were not detected on ultrasound initially and were only detected on CT, MRI[5]. As compared to our study other international studies also document finding similar to our study.[6.] Also now these guidelines are being matched for proper management of early HCC [7.] Early arterial phase CT is also used in following up of patient undergoing ablation therapy for HCC. [8]

Figure- 1

HCC in early arterial phase

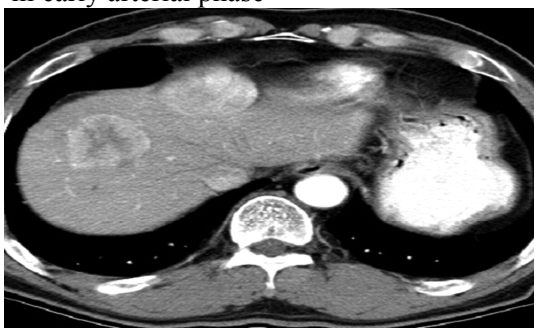
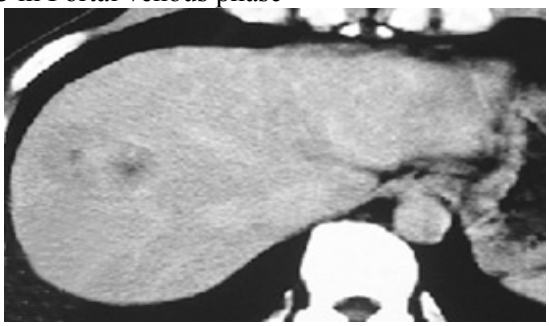


Figure-2
HCC in Portal venous phase



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