

Multi-Slice Computer Tomography Dynamic Enhanced Expression and Clinical Significance of Hepatic Perfusion Abnormalities

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ABSTRACT Objective: To investigate the imaging features and clinical significance of the dynamic enhanced CT perfusion of the liver. **Method:** 112 cases of hepatic perfusion disorders were collected, including 22 cases of hepatocellular carcinoma with tumor thrombus, 12 cases of bile duct carcinoma, 16 cases of cholangitis, 31 cases of hemangioma, 10 cases of liver cirrhosis and liver laceration injury in 5 cases, 16 cases of liver abscess, all cases were surgically or clinically confirmed. All cases were performed with three phase enhanced scanning, and the images were loaded into the PACS system. **Results:** In 26 cases, 76 cases with patchy enhancement around the focus were shown in 10 cases with patchy enhancement. Arterial phase was in 47 cases, 12 cases with high perfusion, and 53 cases with high perfusion. **Conclusion:** Correct understanding of liver perfusion abnormalities in the diagnosis of lesions and reduce the true extent of the lesion is important.

KEYWORDS

Volume tomography
X-ray
Dynamic enhancement
Perfusion abnormality

1. Introduction

Under normal physiological conditions, liver accept double blood supply from hepatic artery and portal vein, these two sets of systems are dependent, between them exist multiple channels of communication, including the hepatic sinus, meridian tube, the peribiliary vein. Liver perfusion abnormalities, also known as a transient liver density difference, refers to a variety of causes of the liver, sub section, and the difference between liver and liver. The cause of abnormal liver perfusion is diverse, the mechanism is complex, and the imaging performance is not characteristic. Familiar with all kinds of imaging features of hepatic perfusion abnormalities, correctly identify the liver physiological and pathological changes, and to improve the level of imaging diagnosis of liver disease, which has a very important clinical significance. When some pathological con-

ditions, these channels are opened, and the liver is caused by local or diffuse hepatic hemodynamic changes. This article reviews the clinical manifestations and significance of 112 cases of abnormal liver perfusion, analysis and explore the clinical manifestation and significance of abnormal perfusion abnormalities in the liver, which is beneficial to the diagnosis of the lesions, and to reduce the accuracy and accuracy of the disease [1].

2. Materials and methods

Collected from 2012 to 2014 in our hospital, 112 cases of patients with abnormal liver perfusion abnormalities were selected. Method: Patients with CT three enhanced scan. CT model: Brilliance PHILIPS 16 row spiral CT. Scan parameters: tube voltage 120 kV, tube current 300 mA, pitch 0.938, layer thickness 6 mm, layer spacing 6 mm. The use of iohexol contrast agent, with high-pressure syringe hand vein at the speed of 3 mL/s injection, the dose of 1.5–2.0 ml/kg calculation. All patients underwent plain scan, hepatic arterial phase, portal phase and balanced phase scanning, and the scan time was 20–30 s, 50–60 s, 120 s, respectively, after injection of contrast medium.

All patients had three image enhancement two senior radiologist in PACS system analysis. The observation contents include the morphology and phase of the abnormal perfusion.

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3. Results

The data relates to liver disease, hepatocellular carcinoma with tumor thrombus (Figure 1) 22 cases, bile duct cancer cells (Figure 2) in 12 cases, cholangitis (Figure 3) 16 cases, hemangioma (Figure 4) 31 cases, cirrhosis (Figure 5) in 10 cases, laceration of the liver (Figure 6) in 5 cases, liver abscess (Figure 7) in 16 cases, all cases were surgery or clinical confirmed.

The author will be divided into the following three types: wedge shaped, irregular scattered around the lesion. On the abnormal perfusion phase is divided into: high arterial perfusion, portal venous phase, high perfusion, arterial phase and portal venous phase were high perfusion (Table 1 and 2). The results show that hepatocellular carcinoma with tumor thrombi in most commonly wedge perfusion abnormalities and cholangitis, cholangiocarcinoma, liver laceration hurt liver abscess is often shown around lesions around the patchy enhancement, liver cirrhosis, liver diffuse perfusion abnormalities. The abnormal perfusion phase and arterial phase with high perfusion and arterial phase and portal venous phase high perfusion. There are few of the high perfusion in the portal vein phase.

4. Discussion

With the popularization of multi row spiral CT, liver dynamic phase three scan is an important method for liver imaging examination. Liver perfusion abnormalities are also gradually being concerned about this phenomenon. There are many reports on.

The causes and mechanisms of abnormal liver perfusion are mainly the following: (1) Portal vein occlusion, including thrombosis, tumor thrombus, tumor invasion, surgical ligation, etc. Because of the reduction or cessation of blood flow of the portal vein, hepatic artery after hepatic sinus, vascular, and the tumor and the bile duct surround-

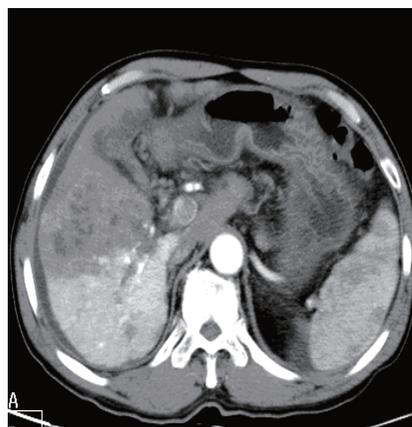


Figure 1. Liver cancer with tumor thrombus, arterial phase showing the right lobe of the right lobe of the wedge of the perfusion abnormalities. Tumor thrombus in the right branch of the portal vein.



Figure 2. Bile duct cell carcinoma, arterial phase showing patchy abnormal perfusion of left lobe lesions.

Table 1. Morphology of 112 cases with abnormal perfusion.

Morphology of perfusion abnormalities	Hepatocellular carcinoma with tumor thrombus	Bile duct cell carcinoma	Cholangitis	Hemangioma	Cirrhosis	Trauma	Liver abscess
Wedge (26/112)	20 (20/22)	2 (2/12)	0	1 (1/31)	1 (1/10)	1 (1/5)	1 (1/16)
Around the lesion was patchy (76/112)	2 (2/22)	10 (10/12)	15 (15/16)	30 (30/31)	0	4 (4/5)	15 (15/16)
Irregular speckle in patchy (10/112)	0	0	1 (1/16)	0	9 (9/10)	0	0

Table 2. 112 cases of abnormal perfusion.

Phase of perfusion abnormalities	Hepatocellular carcinoma with tumor thrombus	Bile duct cell carcinoma	Cholangitis	Hemangioma	Cirrhosis	Trauma	Liver abscess
Arterial phase perfusion (47/112)	12 (12/22)	5 (5/12)	8 (8/16)	10 (10/31)	2 (2/10)	2 (2/5)	8 (8/16)
Portal phase high perfusion (12/112)	2 (2/22)	1 (1/12)	2 (2/16)	2 (2/31)	2 (2/10)	1 (1/5)	2 (2/16)
Two high perfusion (53/112)	8 (8/22)	6 (6/12)	6 (6/16)	19 (19/31)	6 (6/10)	2 (2/5)	6 (6/16)

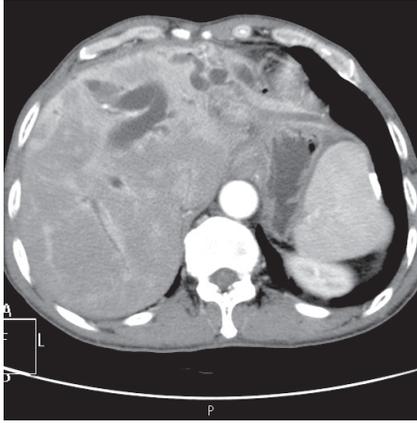


Figure 3. Cholangitis, arterial phase shows along the expansion around the bile duct patchy abnormal perfusion.

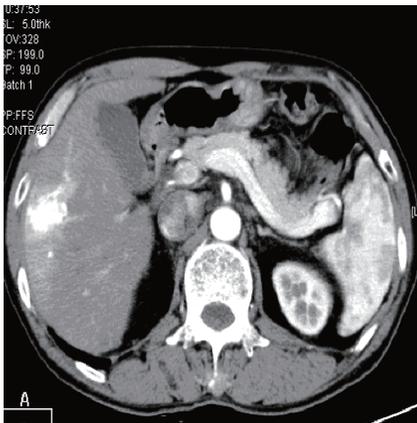


Figure 4. Vascular tumor, arterial phase showing patchy abnormal perfusion of the right lobe of the liver.

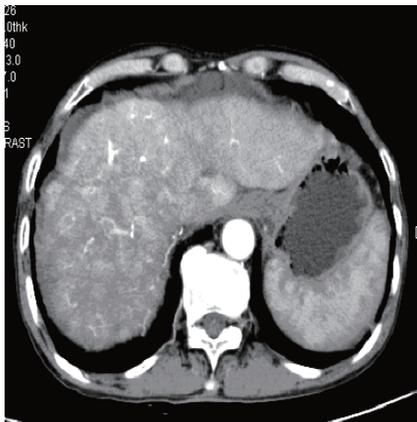


Figure 5. Cirrhosis, arterial phase showing patchy abnormal perfusion in the liver.

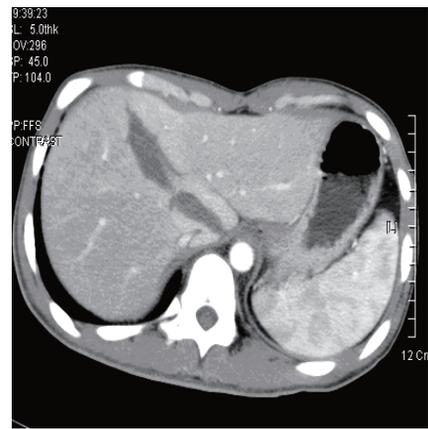


Figure 6. Liver laceration, arterial phase showing patchy abnormal perfusion.

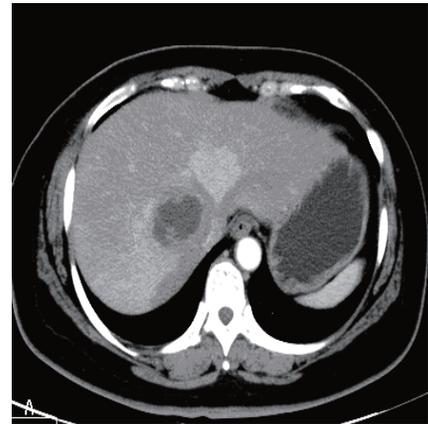


Figure 7. Liver abscess, arterial phase showing patchy abnormal perfusion of the right lobe of the liver.

ing venous plexus and other compensatory increase, so as to achieve the success of the success of the liver artery and portal vein shunt. (2) Hepatic artery portal vein fistula, including liver cancer, hepatic hemangioma, liver injury, interventional therapy, liver cirrhosis, and so on, the per-

formance of the hepatic arterial phase of the portal vein or branch showed early and the corresponding region of high density enhancement. (3) Increase the local blood flow and liver of aberrant blood vessel formation “the third hepatic inflow tract” and the venous drainage containing contrast agent of blood into the liver sinus with portal vein early. The vagus vein beside the common sites for gallbladder fossa Liver in front of the party Sickle ligament and around subcapsular zone. (4) Inflammatory hyperemia, acute cholangitis, liver abscesses can cause hepatic arterial hyperemia or regional portal blood stasis [2]. (5) Phenomenon of the rich blood supply and blood supply of the tumor: blood supply of tumor, such as primary liver cancer, rich blood supply and metastasis tumor, and so often caused by tumor in the liver segment blood supply artery increased, blood supply, and the surrounding liver parenchyma produce “steal” phenomenon, the affected area can show a high or low density change of arterial phase [3].

The study showed that the abnormal morphology of different lesions was different, the liver cancer with tumor thrombus in the form of perfusion abnormalities in the

majority, the distribution tends to follow the liver segments, such as the portal vein, the left lobe of the perfusion abnormalities. Inflammatory lesions perfusion anomalies generally to surround around the lesion, such as cholangitis bile duct by distributed, liver abscess appeared showed a patchy distribution in the perilesional. Hemangioma is a rich blood vessel tumor, it is often expressed as a tumor of peripheral blood. In addition, the author found that there are 8 cases of abnormal thickening of blood vessels around the lesions. The liver laceration showed the abnormal perfusion of the strip in accordance with the liver injury, which was released along the tear. It could be damaged by the hepatic vascular network. Liver cirrhosis patients with diffuse irregular perfusion abnormalities, I believe that this is mainly due to cirrhosis of the liver caused by liver damage, liver vascular imbalance, liver artery blood supply to increase the proportion of the proportion of portal blood flow is reduced, so the performance of the whole liver abnormal perfusion. Wedge shaped perfusion abnormalities in the group A patients with cirrhosis, the author analysis the left branch of the portal vein during the arterial phase early, suggesting the occurrence of the hepatic artery portal vein fistula, so a wedge [4,5].

Perfusion abnormalities in the morphology and the period is different, the arterial phase and portal venous phase appeared abnormal perfusion of the lesions, to observe the balance is conducive to the further distinction for the perfusion abnormalities and parenchymal disease, such as hepatocellular carcinoma, liver metastasis tumor, liver hemangioma, focal nodular hyperplasia and hepatic adenoma and others account for lesions and fatty liver in normal liver island and so on. These lesions showed low density, low or slightly higher density (e.g., hemangioma), and the liver Island plain scan was a high density or slightly higher

density.

Liver perfusion abnormality is a phenomenon often encountered in imaging diagnosis. This phenomenon often indicates that the changes of hemodynamics caused by liver disease, correct understanding of this phenomenon can provide information for the diagnosis of diseases, and avoid the true range of the lesions [6].

This study shows that the abnormal morphology of the perfusion is wedge shaped in 26 cases, which is demonstrated by 76 cases of patchy enhancement around the focus, which is demonstrated in 10 cases with patchy enhancement. Arterial phase was in 47 cases, 12 cases with high perfusion, and 53 cases with high perfusion. It can be seen that the correct understanding of the abnormal liver perfusion abnormalities in the diagnosis of lesions and reduce the true extent of the lesion is important.

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