ANGIOGRAPHIC FINDINGS OF HEPATOCELLULAR CARCINOMA IN SIRIRAJ HOSPITAL

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ABSTRACT

Five years collection of 126 cases of celiac and hepatic angiography of hepatocellular carcinoma were done and analysed in the aspects of sex, age and angiographic findings, such as, neovascularity, vascular distortion, etc. The most common finding was neovascularity(88%), the least findings were avascularity(5%), and normal angiographic finding(5%). Comparison between eighteen cases of pathological diagnosis with the other study was also performed.

INTRODUCTION

Hepatocellular carcinoma is the most common primary malignant tumor of liver, responsible for at least one million death per annum world-wide.[1] It is common in Africa and South East Asia but relatively uncommon in United States and Europe. In United states, hepatocellular carcinoma constituting only 1-2.5 % of all cancer.[2]

In Thailand, liver cancer is the most frequent cancer in males and the third in females.[3] The geographic distribution of liver cancer closely related to viral hepatitis, mycotoxin, cirrhosis.

There are many radiological methods for detecting hepatocellular carcinoma such as ultrasonography, CT scan, CT arterial portography ,CT with lipiodol and angiography. However, the main role of arteriography in modern radiological practice is for planning and performing the treatment of hepatocellular carcinoma : this modality is in fact important in assessing the surgical resectibility, providing the vascular road map for surgery and chemoembolization, when the surguery is not indicated.[4]

We had analyzed patients who were diagnosed to have liver carcinoma by using angiographic method and compared all of the results with surgical and pathological diagnosis.

MATERIALS AND METHODS

We have retrospectively reviewed 126 cases of known case of hepatocellular carcinoma who were refered to department of diagnostic radiology for angiographic studies in five years. All patients were evaluated by both celiac and superior mesenteric angiography to search for abnormality such as neovascularity, vascular distortion, vascular encasement, irregularity of vascular margin, arterio-venous shunting and portal vein invasion or portal vein thrombosis. All of angiographic films were reviewed by two experienced radiologists without knowing the final diagnosis.

Finally, in all patients, the diagnoses were confirmed by using peritoneoscopy, surgical biopsy, laboratory studies or pathological evidence. After collection of all data, they were analyzed by statistical methods.

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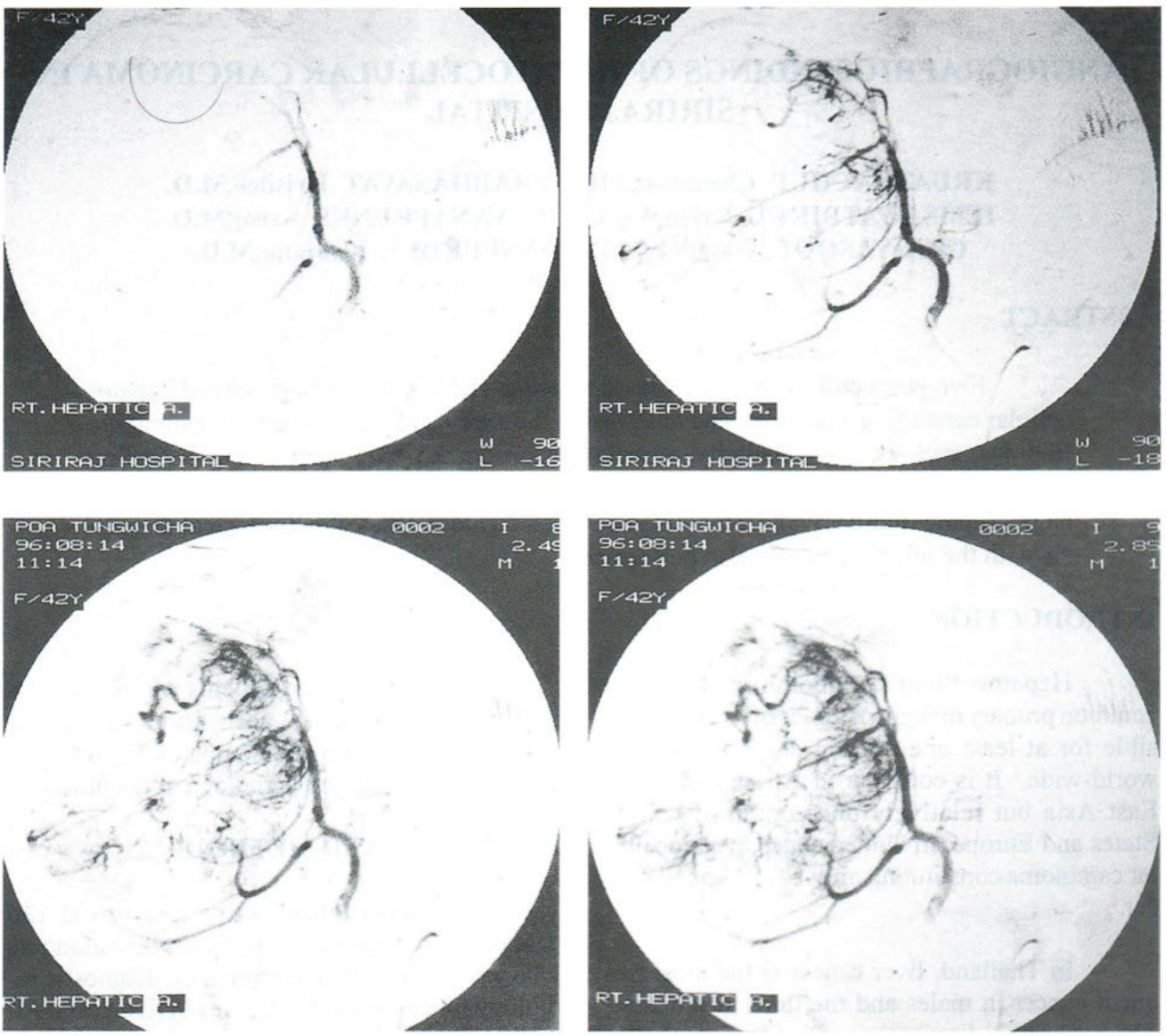


Fig 1 The hepatic angiograms show displacement of hepatic artery branches encircle the large intrahepatic tumor mass, there are also demonstration of neovascularity in the mass regions.

RESULT

In all of 126 cases, the incidences of sex, age and angiographic findings were demonstrated in the tables below :

Table 1. sex incidence

Sex	Number
Male	84
Female	42

Table 2. age incidence

Age range	Number
1 - 10	0
11 - 20	0
21 - 30	21
31 - 40	28
41 - 50	35
51 - 60	35
61 - 70	7
71 - 80	0

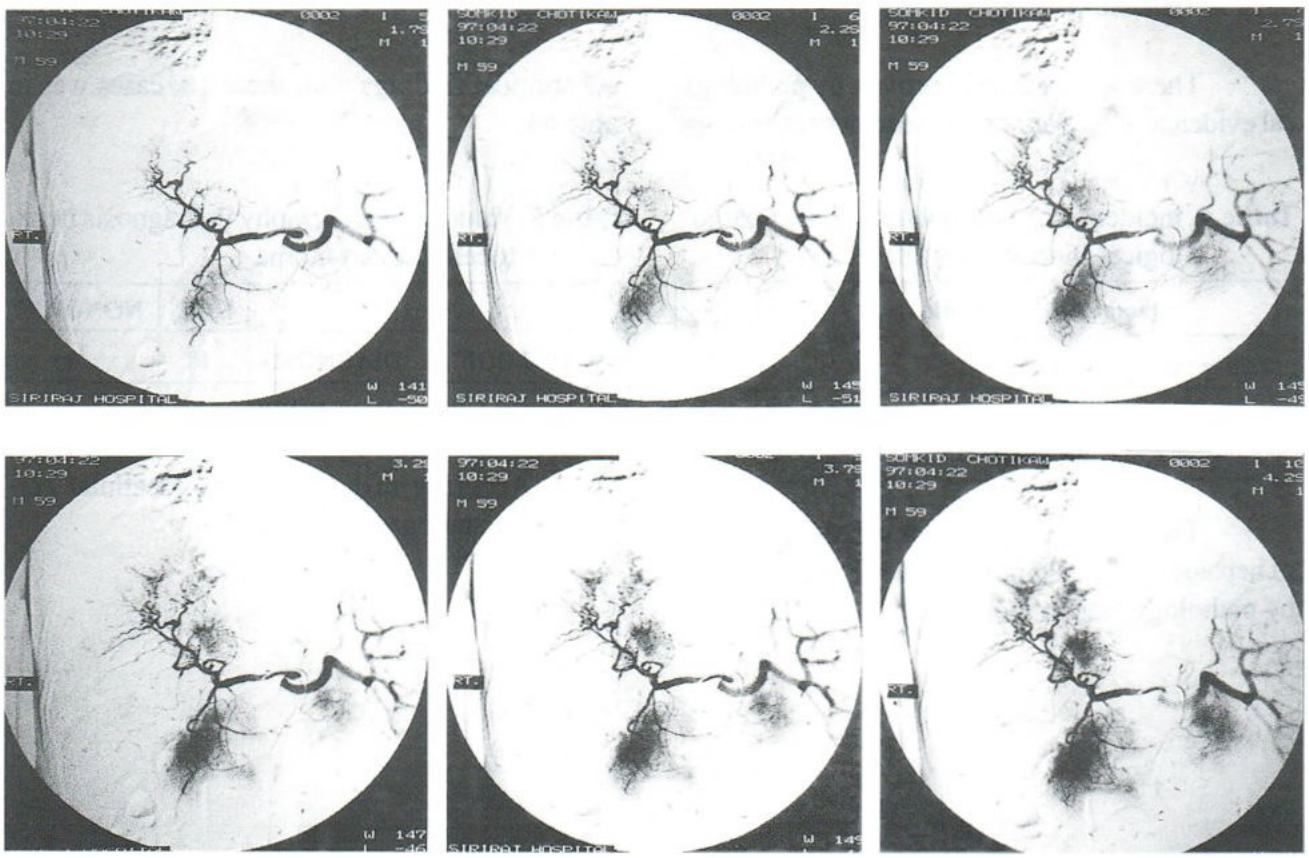


Fig 2 Celiac angiography shows multiple areas of abnormal staining in both lobes of the liver.

Table 3. angiographic finding (N= 18)

FINDING	NUMBER
neovascularity	112 (88%)
vascular distortion	105 (83%)
vascular pooling	72 (66%)
vascular encasement	35 (27%)
irregular margin	56 (44%)
AV shunting	42 (33%)
portal vein thrombosis	7 (5%)
avascularity	7 (5%)
normal finding (No abnormality detected)	7 (5%)

There were 18 cases proven by pathological evidence. Comparison between peritoneoscopy and surgical findings with these 18 cases was in table #4.

Table 4 incidence of peritoneoscopy and patho logical biopsy (N= 18)

methods of diagnosis	Number
positive peritoneoscopy	6
positive surgical finding	7
not proven by peritoneoscopy or surgery	5

The value of angiography in the diagnosis of hepatocellular carcinoma in the 18 cases, proven by pathology was in the Table #5.

Table 5 Value of angiography in diagnosis hepatocellular carcinoma

	HCC	NON-HCC
PATHOLOGICAL DIAGNOSIS	18	0
ANGIOGRAPHIC DIAGNOSIS	17	1

Accuracy in diagnosis hepatocellular carcinoma by angiography is 94 %

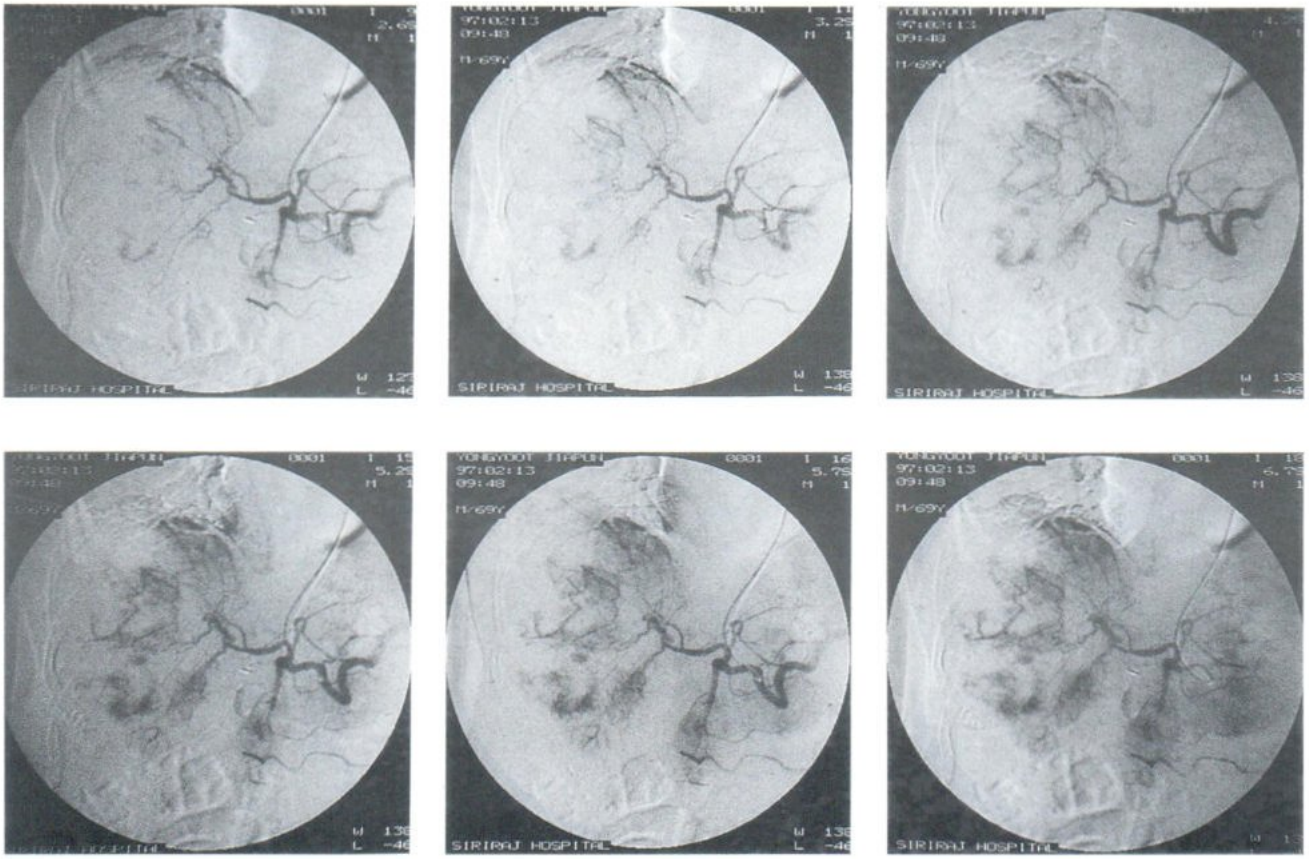


Fig 3 Celiac angiography shows multiple areas of abnormal vascular staining in right lobe of liver. There is also demonstrable of hepatic artery branches encircle the right lobe tumor mass.

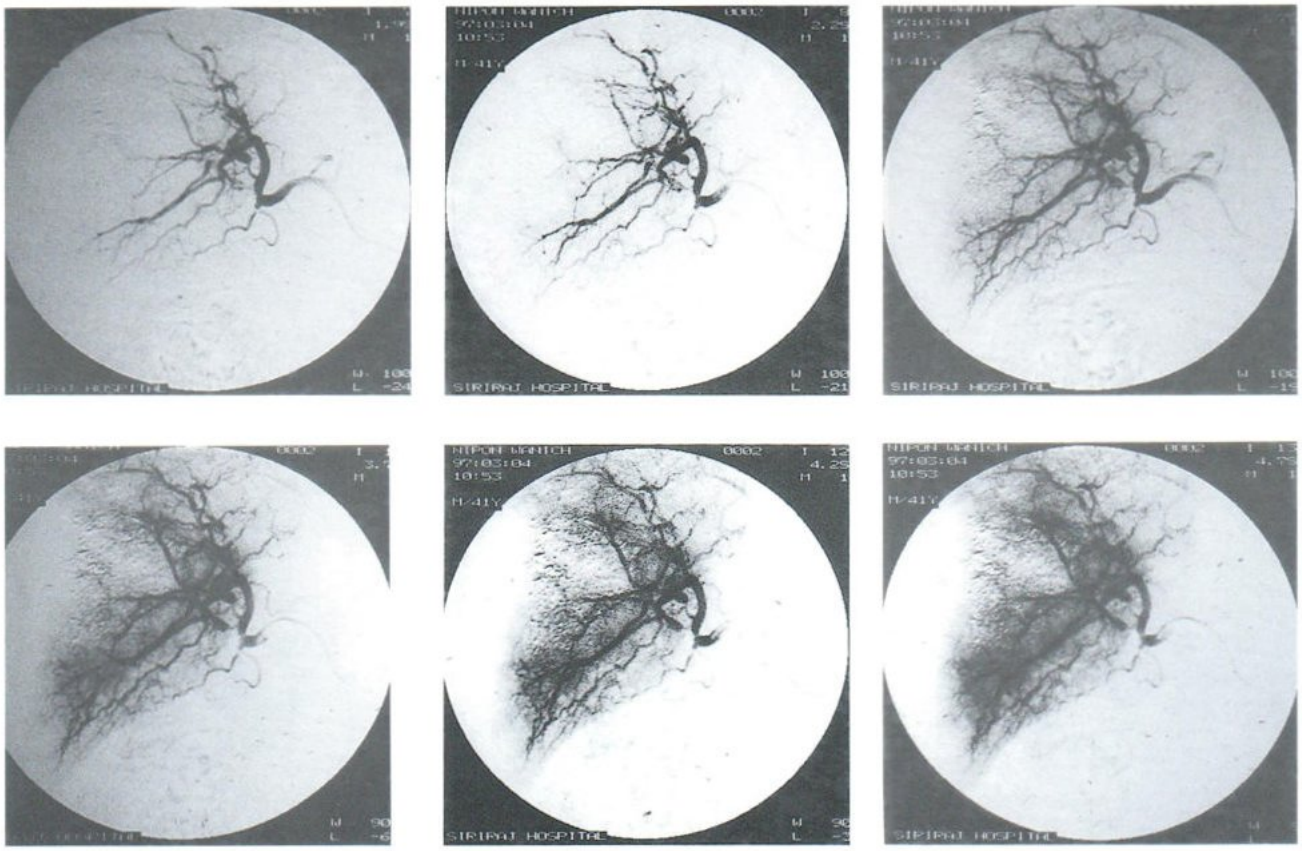


Fig 4 Hepatic angiography shows straightening of hepatic artery branches because of tumor mass effect.

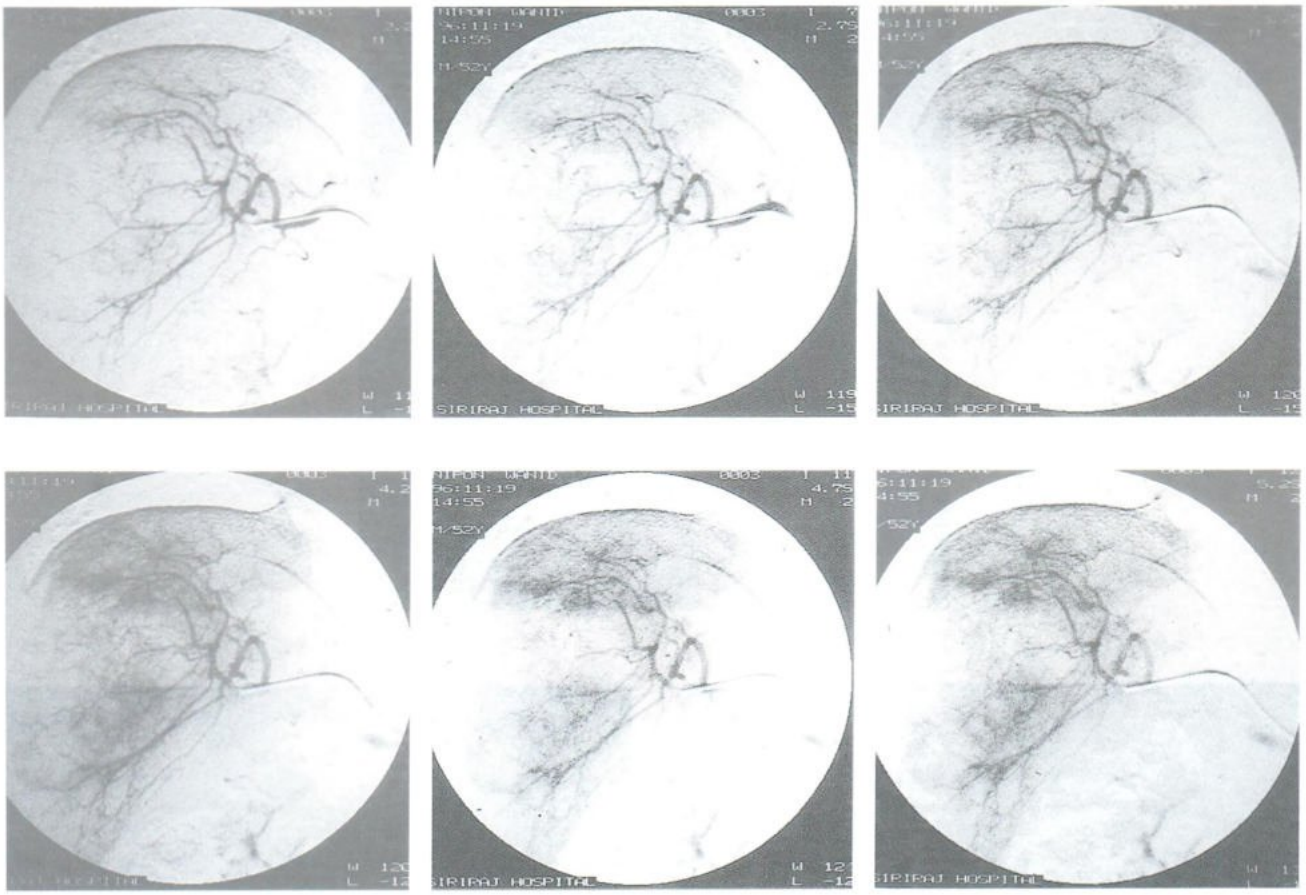
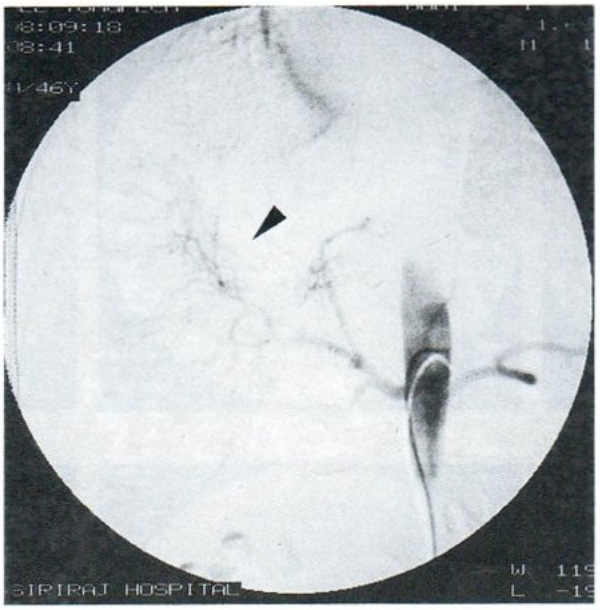


Fig. 5 Hepatic angiography shows large tumor mass at right lobe of liver displace the hepatic artery branches. There is also abnormal tumor staining at the region close to right dome of diaphragm.



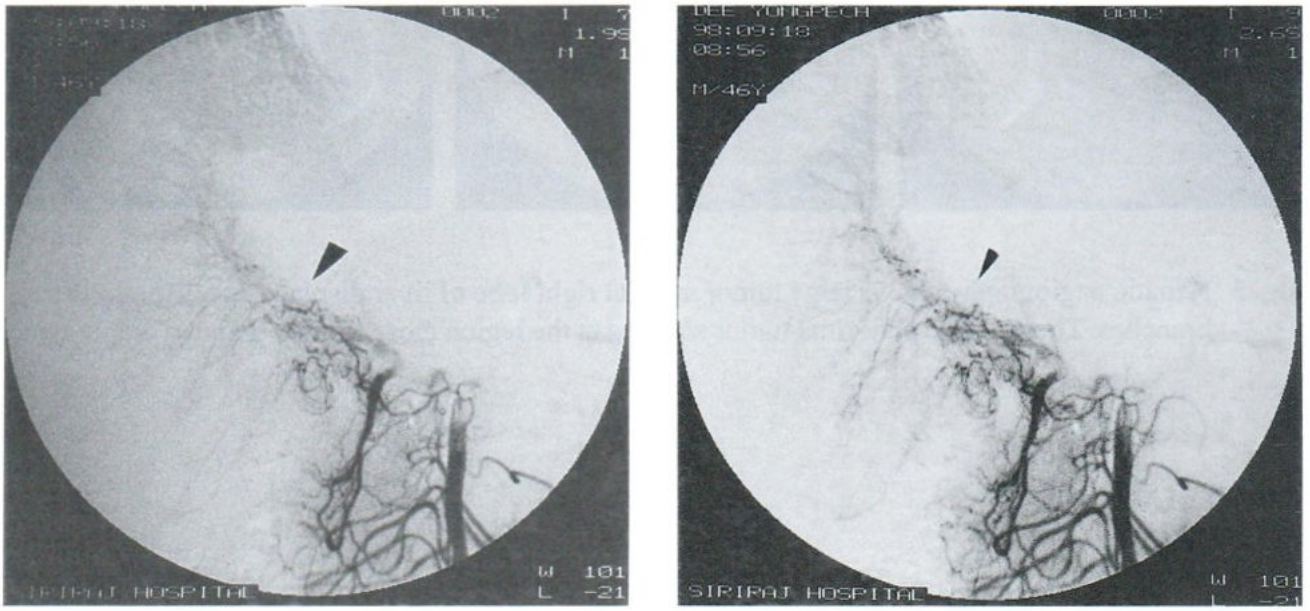


Fig. 6,7 These figures show multiple liver vascular channels from hepatic and superior mesenteric arteries (arrow heads) coursing along portal venous radical suggesting portal venous involvement.

DISCUSSION

Hepatocellular carcinoma, also known as hepatoma, is one of the most important neoplasm in the human population. It's true incidence is not known but the tumor is estimated to cause at least a quarter of a million death world wide in each year.[5] It is common in sub-saharan Africa and in much of the South East Asia (SEA), Far East, but relatively uncommon in North America. In Thailand, hepatocellular carcinoma is the most frequent cancer in males and the third in females.[2]

Table 6 Geographic incidence of hepatocellular carcinoma[6]

COUNTRY	INCIDENCE (PER 100,000)	
	MALE	FEMALE
UK	1.4	0.4
CANADA	1.3	0.3
USA		
WHITE	2.4	0.6
BLACK	8	1.8
JAPAN	12	2.9
CHINA	32	9.1
SOUTH AFRICA		
BLACK	28	
WHITE	1.4	
TAIWAN[9]	1158	
THAILAND[7]	36	14

In most of all population hepatocellular carcinoma is more common in the males than the females. Male to female ratio of 4:1 are common in Africa and Southeast Asia, whereas a ratio of 2.4 males to 1 females has been reported for United States. In our study, the result ratio of 2:1, is found.

Age incidences are slightly different in geographic location. In South Africa, common age range is between 30-50 years old. In North America and Asia common age range is between 60-80 and 40-60 years old respectively. In our study, common age range is between 40-60 years old which correlating with other previous studies.[5]

Table 7 Age incidence of hepatocellular carcinoma[6]

COUNTRY	COMMON AGE RANGE (year)
AFRICA	30 - 50
ASIA	40 - 60
NORTH AMERICA	60 - 80

There are many methods for evaluating hepatocellular carcinoma. Angiography is one of the most useful methods. It is mandatory in the staging of hepatocullualr carcinoma despite its relative higher mobidity compare to the other technique. It allows detection of the vascular tumors as small as 0.5 cm and 2.0 cm if the tumor is hypovascular. The vast majority of hepatocellualr carcinoma are hypervascular tumors, characterized by AV shunting and increased capillary blush in the hepatogram (late venous) phase.As with other imaging techniques, the main objective is to distinguish between unifocal and multifocal disease. Additionally, the presence of venous invasion, both into hepatic vein and segmental portal vein may be assessed.[2]

In our study,spectrum of angiographic finding in hepatoma range from avascular to hypervascular. The most angiographic finding is neovascularity 88% (112/126). Other findings include vascular distortion 83%(105/126), vascular pooling 66%(72/126), vascular encasement 27%(35/126), irregular margin 44%(56/126), AV shunt 33%(42/126), portal vein thrombosis 5%(7/126), avascularity 5%(7/126) no abnormal angiography detected 5 %(7/126). These findings agree with typical angiographic picture of HCC.

Compared with previous study of Tonkin et al 1998, some angiographic findings are similar but some are different as described in table 8.

Table 8 Comparison between study of Tonkin et al 1988 and Siriraj (18 cases with pathological diagnosis).

	FINDINGS TONKIN et al (n = 26) 1988	SIRIRAJ (n = 18)
neovascularity	26 (10%)	16 (89%)
vascular pooling	22 (85%)	15 (83%)
vascular distortion	5 (19%)	12 (67%)
vascular encasement	20 (77%)	5 (28%)
irregular margin	18 (69%)	8 (44%)

Accuracy in the diagnosis of HCC by angiography remain in doubt. Lack of typical angiographic modification in small HCC suggests that the neovasculature has not yet developed fully or that vascular changes are already present but angiography is not sensitive enough to demonstrate them.[4] It is possible for the 5% of our cases, whose angiography show no abnormality, the HCC-tumor size is too small lesion to be demonstrated by hepatic angiography. And in our studies with color Doppler ultrasonography (Krisdee Prabhasavat 1997), we find that the small HCC is supplied by the portal circulation, so we cannot find any abnormality in the hepatic angiography study in the case of the small HCC (size less than 1-2 cm).

We could correctly diagnosed HCC in 94% of case(17/18) but because of too small sample size we used and no non HCC group in this study, the value of angiography should be carefully interpreted. Most of our cases show no surgical or laparoscopic diagnosis. It is possible that the proved cases trend to have true hepatocellular carcinoma than non-proved case (not included in this study), so, there may be some populational bias for the diagnosis of HCC.

In summary, although in our study show correctly diagnosed of HCC in 94% of cases, more strictly design of study is needed for interpretation with more confidence. However, other than diagnostic role of angiography, angiography play role in staging, identification of multiplicity and evaluation for further possible chemoembolization.

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