

CT

1

: CT(CTHA)

: 3

CT(CTAP)

CTHA

CTHA

66

. CTHA

15-50ml

0.6-2.0ml/s

1mm

5-8

. CTAP

, .

, ,

,

,

가

,

. CTHA

Child

,

, Child

.

:

66

18

16

,

13

,

가 8

,

2

,

2

14

48

,

,

27,

7, 14

,

(p=0.001).

18

Child

A

C가

14

4

48

Child A, B, C가

32,

13, 3

. Child

가

.

50)ml

32(20-35)ml

,

34(15-

가

:

CT

CTHA

(27%),

.

THA)
CTAP)

CT(CT during hepatic arteriography,

C-

(arteriportal shunt)

CT(CT during arteriportography,

가

(5, 6). CTAP

,

가

.

CTHA

(1-4). CTHA CTAP

,

(gastroepiploic artery),

(right gastric

(cavernous transformation of portal vein)

artery)

CTHA

가

2.0ml

35-47

11

44-120ml

2.0ml

20-65

CTHA

CTAP

가

CTHA

3 CTHA CTAP

(celiac angiography)

CTHA

66 49:17

36 75 56

가 58

3

58 12

36

가

CTHA CTAP

Child

CTHA

CTHA

Child

4

1

3

CT (Somatom Plus S, Siemens, Erlangen, Germany)

10mm/sec

10mm

CTHA 66 50 35ml

1.5ml

5

11

20-29ml

1.5-1.7ml

30 38ml

1.5 1.7ml

3

15ml 0.6ml, 40ml 1.4ml, 50ml

2ml

5-

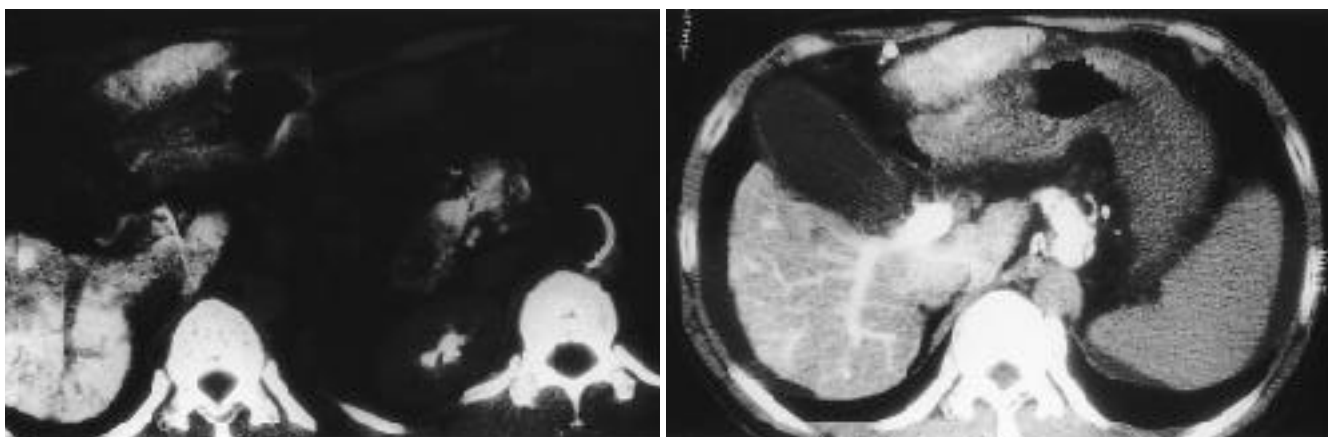
8 CTAP 66 58 100ml

Mantel-Haenszel chi-square test

Table 1. Relationship between Opacified Normal PV and Enhancement of Organs

	Opacified PV*	Nonopacified PV*
Grade	2	27
Grade	2	7
Grade	14	14

*PV = portal vein



A

B

Fig. 1. 35-year-old male patient with small hepatocellular carcinoma in segment V.

A. CTHA shows nonopacified portal vein and well-enhancing nodule in segment V. Stomach is hypodensely enhanced comparing with hepatic artery (left). Duodenum and pancreatic head are also hypodensely enhanced on lower level (right).

B. CTAP shows well opacified portal venous system.

Child

t-test

(Table 1)

가 29 27 (Fig. 1),
9 2 (Fig. 2).

66 18 CTHA 18 ,
13 , 가 8 , 2 .

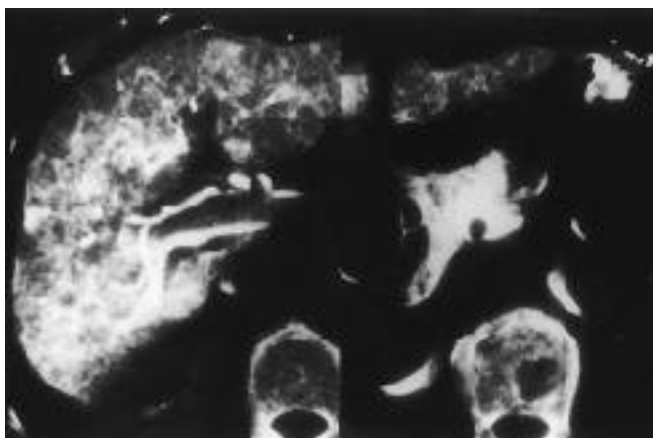
가 6 가 ,
5 , 4

가 ,
가 1 .

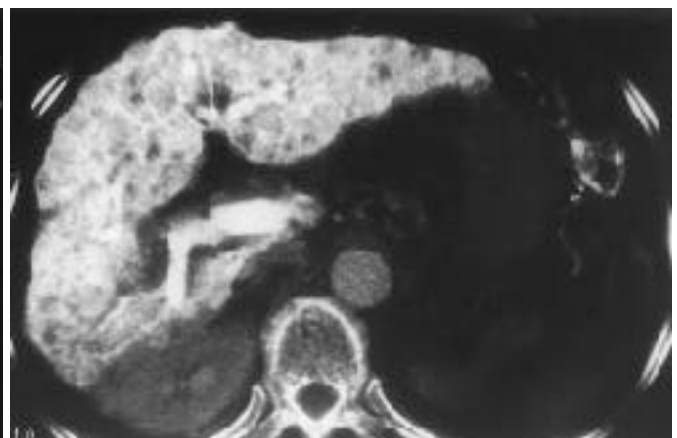
Table 2. Relationship between Opacified normal PV and Child Classification

	Opacified PV*	Nonopacified PV*
Child A	14	32
Child B	0	13
Child C	4	3

*PV= portal vein



A

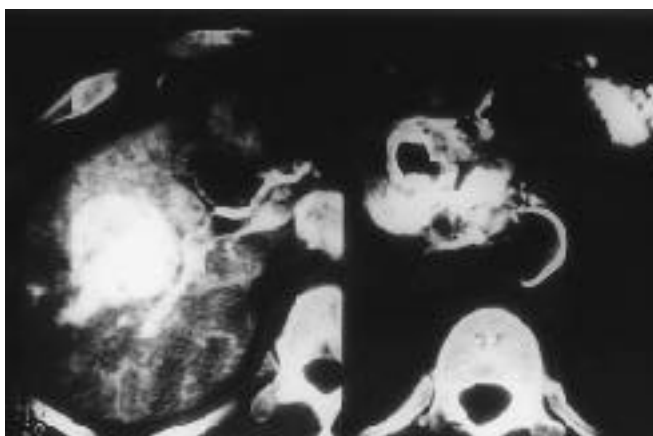


B

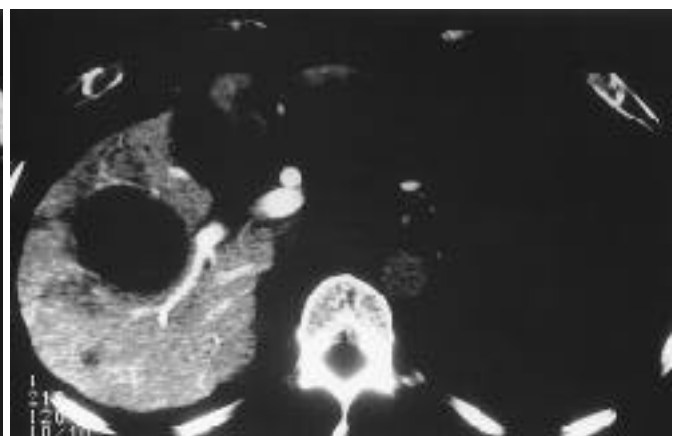
Fig. 2. 71-year-old female patient with advanced liver cirrhosis and small hepatocellular carcinoma in segment 7.

A. CTHA shows opacified main portal vein, right portal vein, and the posterior branch of right portal vein. Layering of contrast material in main portal vein is noted (left). Pancreatic head is isodensely enhanced comparing with hepatic artery, whereas other organs are enhanced hypodensely (right).

B. CTAP shows normal portal venous system.



A



B

Fig. 3. 43-year-old male patient with large hepatocellular carcinoma in right lobe.

A. CTHA shows large well enhancing mass in right lobe and opacified main portal vein, some portion of right portal vein, and the posterior branch of right portal vein (left). Stomach, duodenum, and pancreatic head are all isodensely enhanced comparing with hepatic artery (right).

B. CTAP shows the tumor mass as a perfusion defect and well opacified portal venous system.

가 28 CTHA

(Fig. 3).

(p = 0.001).

18 Child A CTHA

C가 14 4 48 Child A, B, 5-8 Murakami (20)

C가 32, 13, 3 Child 5-8 Takayasu (21)

(Table 2), Child CTHA 1-2 Irie (22) 10-15

가

(p> 0.05). CTHA

32(20-35)ml , CT CTHA

34(15-50)ml ,

(p>0.05).

CTHA CTAP

15), CTHA

ing) (Fig. 2)

가
CTHA

가
CTHA

가
(local circulation circuit)

CTHA 가 가

(19).

CTHA

CTHA

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Opacification of Portal Vein on CT during Hepatic Arteriography Via Normal Vascular Flow¹

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Purpose : To evaluate the frequency, distribution, and associated factors of the opacified normal portal vein as seen on CT, during hepatic arteriography(CTHA).

Materials and Methods : One hundred and eighty-nine patients who underwent both CTHA and CT during arteriography (CTAP) during a three-year period were reviewed. Of these, 66 patients without anomalous hepatic arterial supply and arteriportal (AP) shunt on celiac angiography were analyzed. Comparing CTHA with CTAP, we determined whether or not the portal vein(PV) is opacified within the second-order branch. The degree of contrast enhancement in the stomach, duodenum, and pancreas was graded as follows : grade I, all three organs were hypodensely enhanced; grade II, some organ were isodensely enhanced, but others hypodensely ; grade III, all three organs were isodensely enhanced relative to the CHA. The relationship between opacified portal vein (OPV) and the degree of enhancement of the three organs, amount of contrast media, and Child classification was statistically examined.

Results : The PV was opacified in 18 of the 66 patients (27%) ; This was the main PV in 16, right PV in 13, and left PV in two. Of the single branches, the right post posterior branch was most commonly opacified. Among 18 patients with OPV, the degree of three organs (stomach, duodenum, and pancreas) was grade I in two, grade II in two, and grade III in 14 while among 48 patients with nonopacified PV, the findings were grade I in 27, grade II in seven, and grade III in 14. The relationship between OPV and degree of enhancement of the three organs was statistically significant ($p=0.001$). There was however, no statistically significant difference between OPV and Child classification and the amount of contrast media.

Conclusion : PV opacification during CTHA is not rare and this finding should not therefore be regarded as indicator of a pathologic conditions such as AP shunt.

Index words : Liver, CT.

Liver, angiography.

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