CT

[1]

. . . . .

: multi-detector row helical CT(MDCT)

.

: MDCT(LightSpeed Qx/i, GE medical system, Milwaukee, Wis)
41 ,
103 .
150 ml 4 ml/sec bolus tracking method
, . 2.5
mm, 1.25 mm, 15 mm/rotation ,
5 mm, 5 mm, 15 mm/rotation .
. ,

.

: , , 1 81%, 77%,
55%, 2 83%, 81%, 68% ,
($p > 0.05$). 16 ,
, 5 .

($p < 0.05$).
34.5, 51.5 ,
($p > 0.05$).
: MDCT ,
.

(hepatocelluar carcinoma) (hyper- , (1).
vascular) , CT(multi-detector row helical CT, MDCT)
(1, 2). , CT(single-detector row
, , CT, MR helical CT) 3 7
, CT CT ,
(2). (1),
CT(helical CT) (arterial phase), .
(portal phase), (delayed phase) CT
(1). , (triple
phase) .

(2).

(chronic liver disease)

CT 41 (33 , 8 , 57
) . 103 (1.8 cm)
103 2 cm 30 ,
2 cm 73 (1.8 cm). 1
, 54
iodized oil CT . 58 , ,
(AFP)
CT .
CT CT(multi- detector row
helical CT, LightSpeed QX/i, GE medical system, Milwaukee,
Wis) . Ultravist
300(Iopromide, Schering, Korea) 4 ml 150 ml
.

, , .
bolus tracking method(Smartprep, GE
medical system)
100HU (high
speed mode) (slice thickness) 2.5 mm,

: CT

(table speed) 15 mm/rotation, (pitch) 6
. 2.8
(parameter)
. 100
(high quality mode) 5
mm, 15 mm/rotation, 3
. ,
,
,
, (
1 1)
.

(liver parenchyma)

,
.

.

,
. , ,
2 cm
. (Paired samples test)

.

Table 1-1. Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images (all tumor)

	EAP	LAP	PVP	Total
Reader 1	83/103 (81%)	81/103 (77%)	57/103 (55%)	100/103 (97%)
Reader 2	85/103 (83%)	83/103 (81%)	70/103 (68%)	94/103 (91%)

EAP: early arterial phase   Paired Samples Test: $p > 0.05$
LAP: late arterial phase
PVP: portal venous phase

Table 1-2. Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images (> 2 cm in size)

	EAP	LAP	PVP	Total
Reader 1	24/30 (80%)	25/30 (83%)	15/30 (50%)	29/30 (97%)
Reader 2	25/30 (83%)	24/30 (80%)	16/30 (53%)	27/30 (90%)

Table 1-3. Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images (< 2 cm in size)

	EAP	LAP	PVP	Total
Reader 1	59/73 (81%)	56/73 (77%)	42/73 (58%)	71/73 (97%)
Reader 2	60/73 (82%)	59/73 (81%)	54/73 (74%)	67/73 (92%)

Table 2-1. Detection Rates of Hepatocelluar Carcinoma on Early and Late Arterial Phase Images(all tumor)

	EAP/LAP			
	+/+	+/-	-/+	-/-
Reader 1	67/103 (65%)	16/103 (15%)	14/103 (14%)	3/103 (2%)
Reader 2	78/103 (76%)	7/103 (7%)	5/103 (5%)	4/103 (4%)

Table 2-2. Detection Rates of Hepatocelluar Carcinoma on Early and Late Arterial Phase Images (> 2 cm in size)

	EAP/LAP			
	+/+	+/-	-/+	-/-
Reader 1	20/30 (67%)	5/30 (17%)	4/30 (13%)	0/30 (0%)
Reader 2	21/30 (70%)	2/30 (7%)	1/30 (3%)	3/30 (10%)

Table 2-3. Detection Rates of Hepatocelluar Carcinoma on Early and Late Arterial Phase Images(< 2 cm in size)

	EAP/LAP			
	+/+	+/-	-/+	-/-
Reader 1	47/73 (64%)	11/73 (15%)	10/73 (14%)	3/73 (4%)
Reader 2	57/73 (78%)	5/73 (7%)	4/73 (6%)	1/73 (1%)

(conspicuity) ,

(Paired sample test)

(Table 2). , ,

, 1 97%,

, 2 cm 2 91% .

. , 1 83%, 2 86%

. . ,

1 82%, 2 84% .

1 2

, 1 2

80%, 83%, 77%, 80%,

55%, 68% ,

1 97%, 2 91% .

1 2

(Paired samples test, $p > 0.05$) (Table 1).

/

(Fig. 1), / (Fig. 2), / (Fig. 3), /

(Fig. 4) 1 65%,

15%, 14%, 2% , 2 76%, 7%, 5%

4%

(Paired samples test, $p < 0.05$) (Table 3).

34.5(2 cm : 33, 2

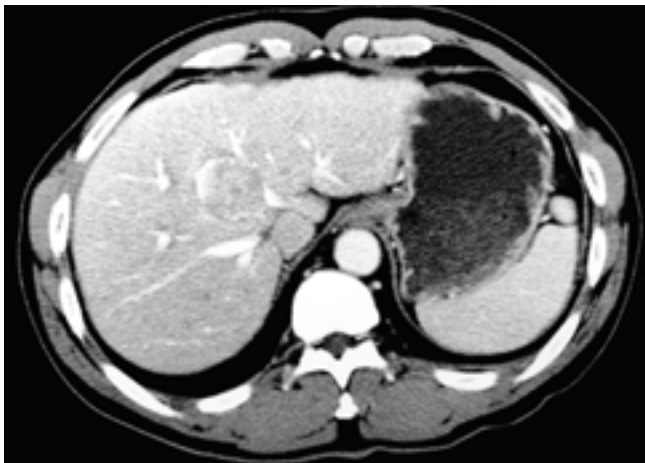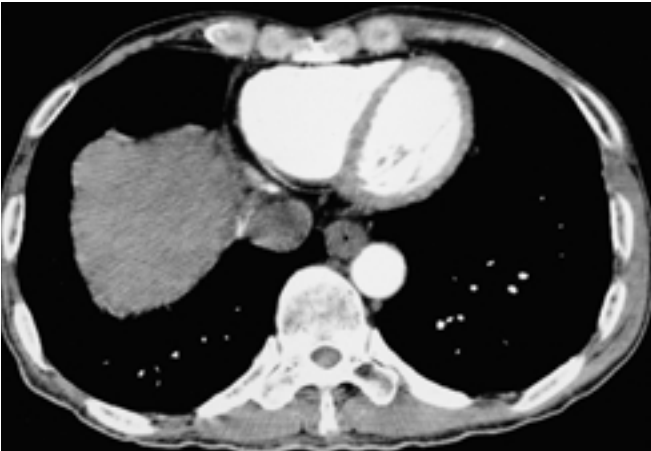cm : 36) 51.5 (2cm : 48, 2 cm

: 55)

(Paired samples test, $p > 0.05$).

,

CT

Fig. 1. Triple phase images of liver in 52-year-old male patient with hepatocelluar carcinoma. Hepatocelluar carcinoma is seen at segment 8 of liver on all early arterial phase (**A**), late arterial phase (**B**) and portal venous phase (**C**) images.

:   CT

(4- 7). CT   (CT during arterial portography, CTAP), CT   (CT during hepatic arteriography, CTHA)   iodized oil CT

CT

(4, 8).   CT   20

,
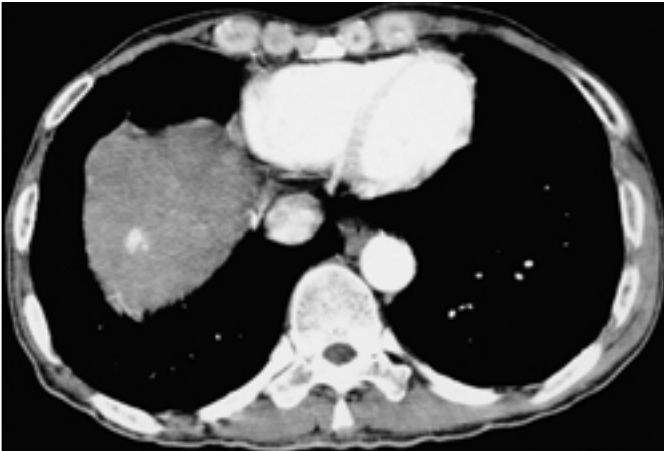
.

,   (9-
12).   CT   (13)

,   CT

Table 3-2. Comparison of the Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images

	EAP+LAP+PVP	EAP+PVP	LAP+PVP
Reader 1	29/30 (97%)	25/30 (83%)	24/30 (80%)
Reader 2	27/30 (90%)	26/30 (87%)	25/30 (83%)
Average	94%	85%	82%

Table 3-1. Comparison of the Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images

	EAP+LAP+PVP	EAP+PVP	LAP+PVP
Reader 1	100/103 (97%)	86/103 (83%)	84/103 (82%)
Reader 2	94/103 (91%)	89/103 (86%)	87/103 (84%)
Average	94%	85%	83%

Paired Samples Test: $p < 0.05$

Table 3-3. Comparison of the Detection Rates of Hepatocelluar Carcinoma on Triple Phase Images

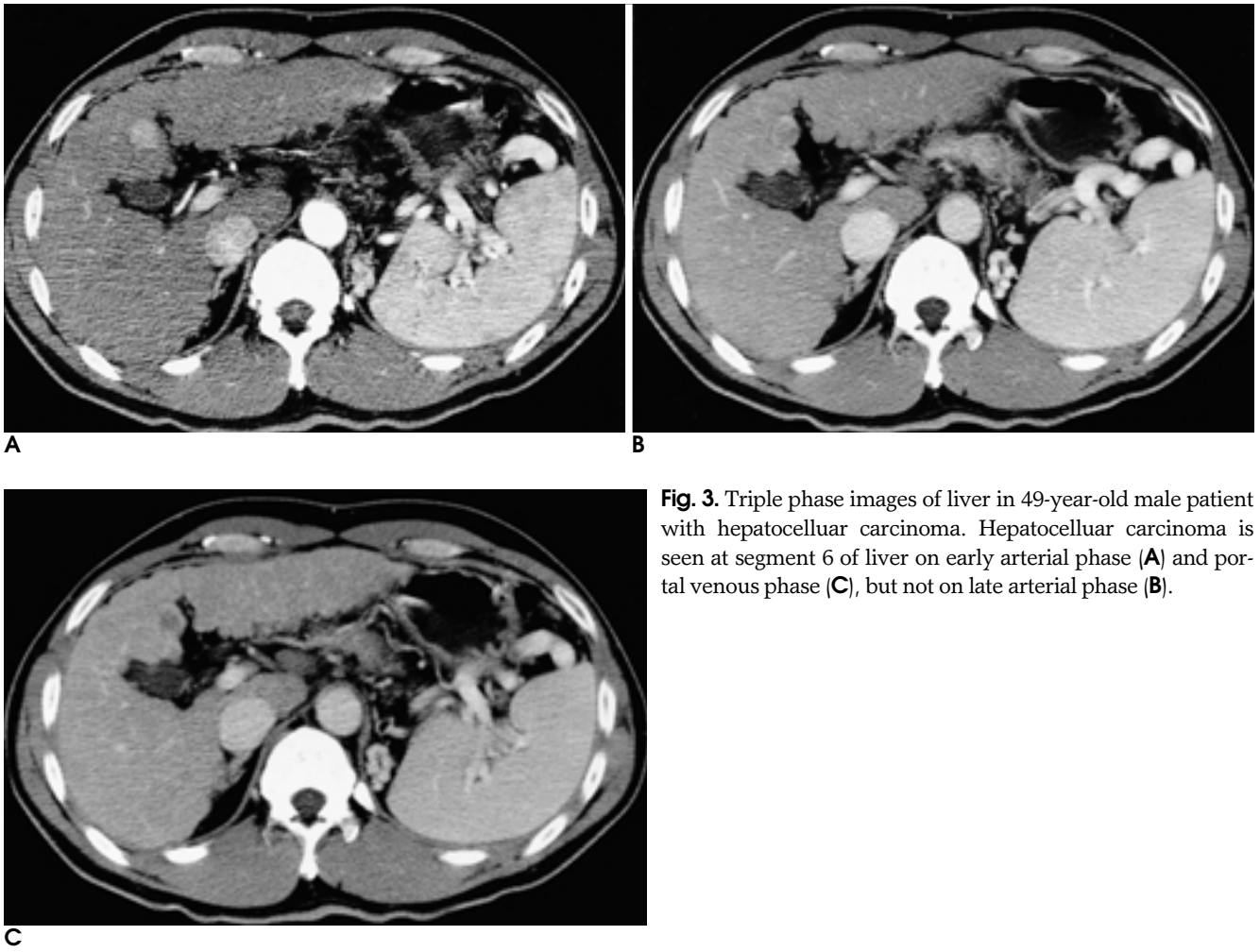|	EAP+LAP+PVP	EAP+PVP	LAP+PVP
Reader 1	71/73 (97%)	61/73 (84%)	60/73 (82%)
Reader 2	67/73 (92%)	63/73 (86%)	62/73 (85%)
Average	95%	85%	84%

Fig. 2. Triple phase images of liver in 65-year-old male patient with hepatocelluar carcinoma. Hepatocelluar carcinoma is seen at segment 8 of liver on late arterial phase (**B**) and portal venous phase (**C**), but not on early arterial phase (**A**).
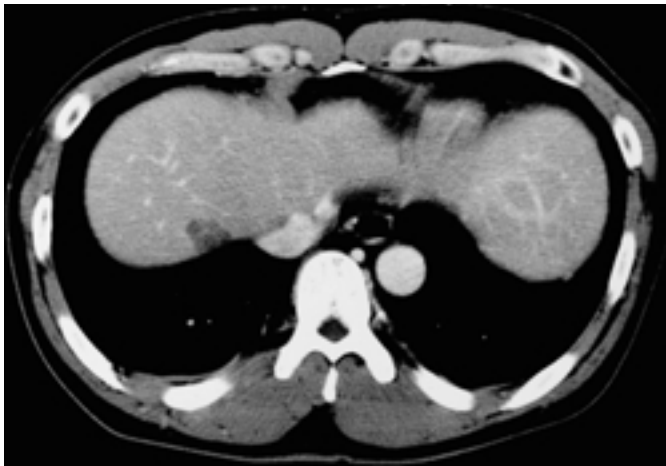
200

Fig. 3. Triple phase images of liver in 49-year-old male patient with hepatocelluar carcinoma. Hepatocelluar carcinoma is seen at segment 6 of liver on early arterial phase (**A**) and portal venous phase (**C**), but not on late arterial phase (**B**).

(4- 7, 14, 15).

,

.

(4, 16).

(1, 19). Murakami (1)

20   30   (12, 13, 17).

54%, 85%,   78%, 83%

.

CT

(13, 18).

86%, 92%   .

.

(13, 18).

,   ,   (variability)   (vas-

20- 30   CT   cularity)   .

CT

,   ,   ,

(1).   CT   CT   3-   ,

7   .

10

(1).   (p> 0.05).

Fig. 4. Triple phase images of liver in 50-year-old male patient with hepatocelluar carcinoma. Hepatocelluar carcinoma is seen at segment 8 of liver on portal venous phase (**C**), but not on early arterial phase (**A**) and late arterial phase (**B**).

$(p > 0.05)$.

80%

.

(17).

(1).

,

, $(p < 0.05)$.

Murakimi   (1)

,

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CT

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CT

,   ,

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Detection of Hepatocelluar Carcinoma on Triple-Phase Images of Liver Using Multi-Detector Row Helical CT[1]

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Purpose: To determine whether triple-phase multi-detector-row helical CT images of the liver improves the detection rate of hepatocellular carcinoma (HCC).

Materials and Methods: Forty-one patients with 103 HCCs underwent triple-phase multi-detector-row helical CT imaging of the entire liver after contrast administration. Early and late arterial phase images were obtained serially during a single breath-hold, and portal venous-phase images were then obtained. Each image set was independently assessed for the presence of HCC by two radiologists unaware of the possible presence of tumors, and for each phase the detection rate was determined. For each arterial-phase image, lesion conspicuity (attenuation of a tumor compared with that of its parenchyma) was calculated.

Results: For reader 1, the detection rates for the early arterial, late arterial, and portal venous phase were 81%, 77%, and 55%, respectively, and for reader 2 were 83%, 81%, and 68%, respectively ($p>0.05$). When triple-phase imaging findings were combined, the detection rate was significantly higher than when only those of the early or late arterial, and portal venous, phase were used ($p<0.05$). Mean lesion conspicuity for the late arterial phase was higher than for the early arterial phase, but the difference was statistically insignificant ($p>0.05$).

Conclusion: Triple-phase imaging of the liver, involving the early arterial, late arterial, and portal venous phase, and using multi-detector-row helical CT, increases the detection rate of HCC.

Index words : Liver neoplasms, diagnosis
Liver, CT

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