



CT  
28 3  
(M:F=29:2, 34-71 51.3 ).  
CT 8 CT  
(kappa 0.550, p < .001).  
(n=14),  
(n=14). 28 9  
(32.1%). 28 6  
(n=4). CT 가 (n=2), 2cm 가  
(62.5%). 8 5  
가  
CT가  
(Hepatocellular carcinoma, HCC)  
40% (1), (n = 28) (n = 3)  
CT 31 34 71  
( : 51.3 ) , 29:2 9  
(2). 2 - (n = 9),  
3.6% (3, 4). (percutaneous ethanol injection therapy, PEIT)(n  
= 1), (n = 3)  
(hemobilia) (4, 5). 29  
(n = 18), 가  
(1, 4), (computed HBsAg HCV Ab , alpha fetoprotein(AFP)  
(6), CT 200ng/ml ,  
(n = 11)(7, 8), 2 , 1  
(right anterior segmentectomy)  
1  
CT  
CT  
1994 1 1999 5 가 ,  
(n = 10)  
(n = 4) 가 ,  
(polypoid filling defect)  
1999 9 13 2000 1 14  
649

(n = 14)(1, 2, 4, 9),  
가  
(abrupt cut off)  
(n = 3),  
CT, CT, Somatom Plus S,  
Somatom Plus 4 (Siemens Medical Systems, Erlangen,  
Germany) Hi-Speed Advantage System(GE Medical System,  
Milwaukee, U.S.A.) 100 - 120ml  
(Ultravist 370, Schering AG, Germany)  
2.5mL 3, 5, 6, 7,  
8, 10mm 1:1 1:2  
30, bolus track-  
ing 100  
HU(Hounsfield Unit) 11  
65  
28  
10 60 ( 21.2 ) CT  
8, CT  
CT  
CT  
가  
(diffuse), (mas-  
sive)

Table 1. Hepatocellular Carcinoma with Bile Duct Invasion :  
Enhancement Pattern of Parenchymal and Intraductal Mass  
on Two Phase Spiral CT

		Intraductal mass*					Total
		H-H	H-I	H-L	I-L	L-L	
Parenchymal Mass*	H-H			1	1		2
	H-I	1	3				4
	H-L		2	5	1	2	10
	I-L				3		3
	L-L				1	6	7
	Not evident †				1	1	2
Total		1	5	7	7	8	28

kappa 0.550 p < .001

\* Enhancement pattern of parenchymal and intraductal mass  
H-H : high / high attenuation on two phase(arteria/portal phase)  
H-I : high / iso attenuation  
H-L : high / low attenuation  
I-L : iso / low attenuation  
L-L : low / low attenuation

† Parenchymal mass was not evident in CT.

:  
( , , ),  
(cleft)  
,  
CT  
(compact) ;  
(partial) ;  
(faint or none) ;  
CT 90%  
3  
2 CT  
가 CT  
Mann Whitney U  
test  
28 가  
26 4.1 cm( , 0.8 - 9cm)  
20 , 5 ,



Fig. 1. Small parenchymal tumor with extensive intraductal growth in 68-year-old female who had been treated with transarterial chemoembolization(TACE) once and percutaneous ethanol injection therapy(PEIT) twice. Contrast-enhanced CT scan shows a hepatic mass with compact lipiodol uptake (black arrow) in the right hepatic lobe. Peripheral intrahepatic bile ducts(double arrows) are dilated in the liver. There is an intraductal mass(open arrow) filling the common bile duct(CBD). Curvilinear ductal lumen(arrow-heads) is seen between the wall of CBD and the mass. Surgical resection for both parenchymal and intraductal mass revealed hepatocellular carcinoma.

1  
가 2cm  
PEIT  
2  
Table 1  
(Fig. 1).  
가 26  
가 16 61.5%  
2cm(1 - 3cm)  
14 14  
가  
12  
(Figs. 2, 3).  
가  
9  
4  
(cau-  
date lobe)  
1  
가 2  
가 16  
가 7  
가 3

(cleft)  
가 9 (9/28, 32.1%) (Fig. 1).

Table 1

Table 2. Lipiodol Uptake vs Enhancement Pattern & Size of ID Mass

		Intraductal mass*		
		Compact(n= 2)	Partial(n= 3)	Faint(n= 3)
Parenchymal mass*	Compact	2	1	1
	Partial		2	0
	Faint			2
Enhancement of Intraductal mass†	H/I	1		
	H/L	1		
	I/L		2	1
	L/L		1	1

\* Lipiodol uptake on intraductal mass or parenchymal mass

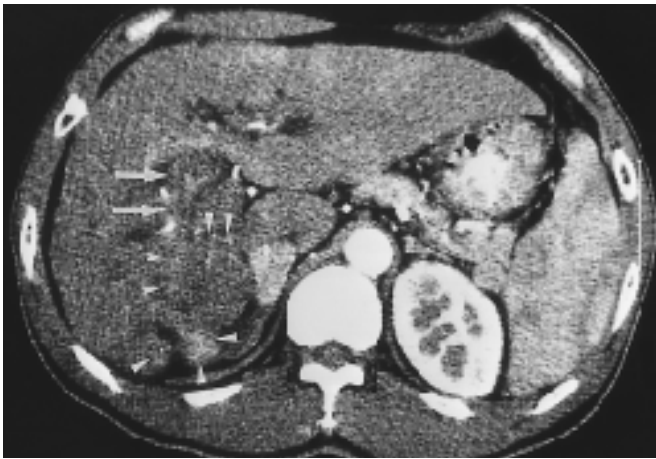
† Enhancement pattern of intraductal mass on spiral CT before TACE

H-I : high / iso attenuation on two phase (arterial/ portal phase)

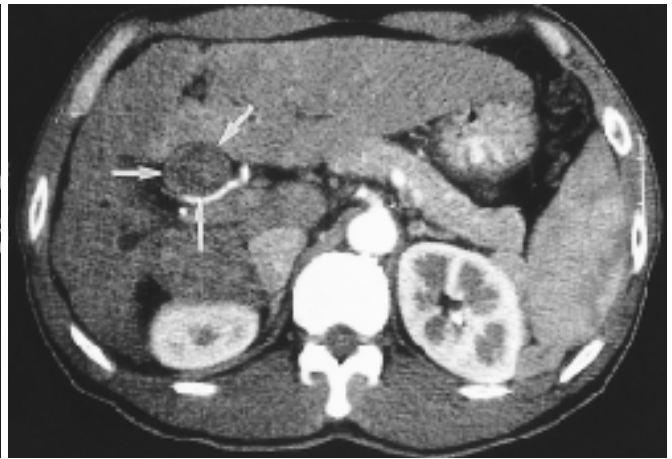
H-L : high / low attenuation

I-L : iso / low attenuation

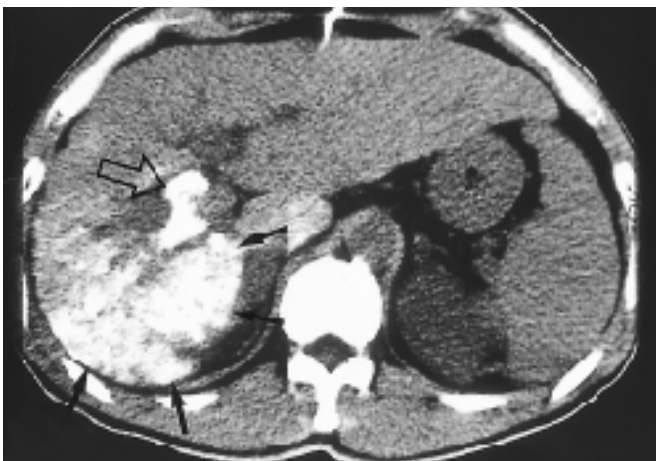
L-L : low / low attenuation



A



B



C

Fig. 2. Hepatocellular carcinoma(HCC) growing into the CBD in a 50-year-old male.

A. Contrast-enhanced CT scan obtained on arterial phase shows poorly enhancing ill-defined mass in right hepatic lobe(arrow-heads) as well as a mass in the CBD(arrows).

B. Contrast-enhanced CT scan obtained at more caudal level than (A) shows dilated CBD filled with poorly enhancing mass(arrows).

C. On noncontrast CT scan obtained 14 days after TACE, both hepatic parenchymal(arrows) and intraductal masses(open arrow) show compact lipiodol uptake.

(46.4%),  
( kappa 0.550, p < .001).

(3.5 ± 2.7 cm vs 4.3 ± 2.4 cm, p = .403).

가 28 13  
가 4 , 2  
2 , 가  
2 , 3 , 3 ,  
가 8 5  
(62.5%)(Fig. 2).

CT Table 2 ,  
2 가

3  
3 2 2cm  
가 , 8 4  
, 3 2 1  
(portocaval)  
가 1 , 가 1 , 가 1  
(Fig. 4).  
1 /  
2

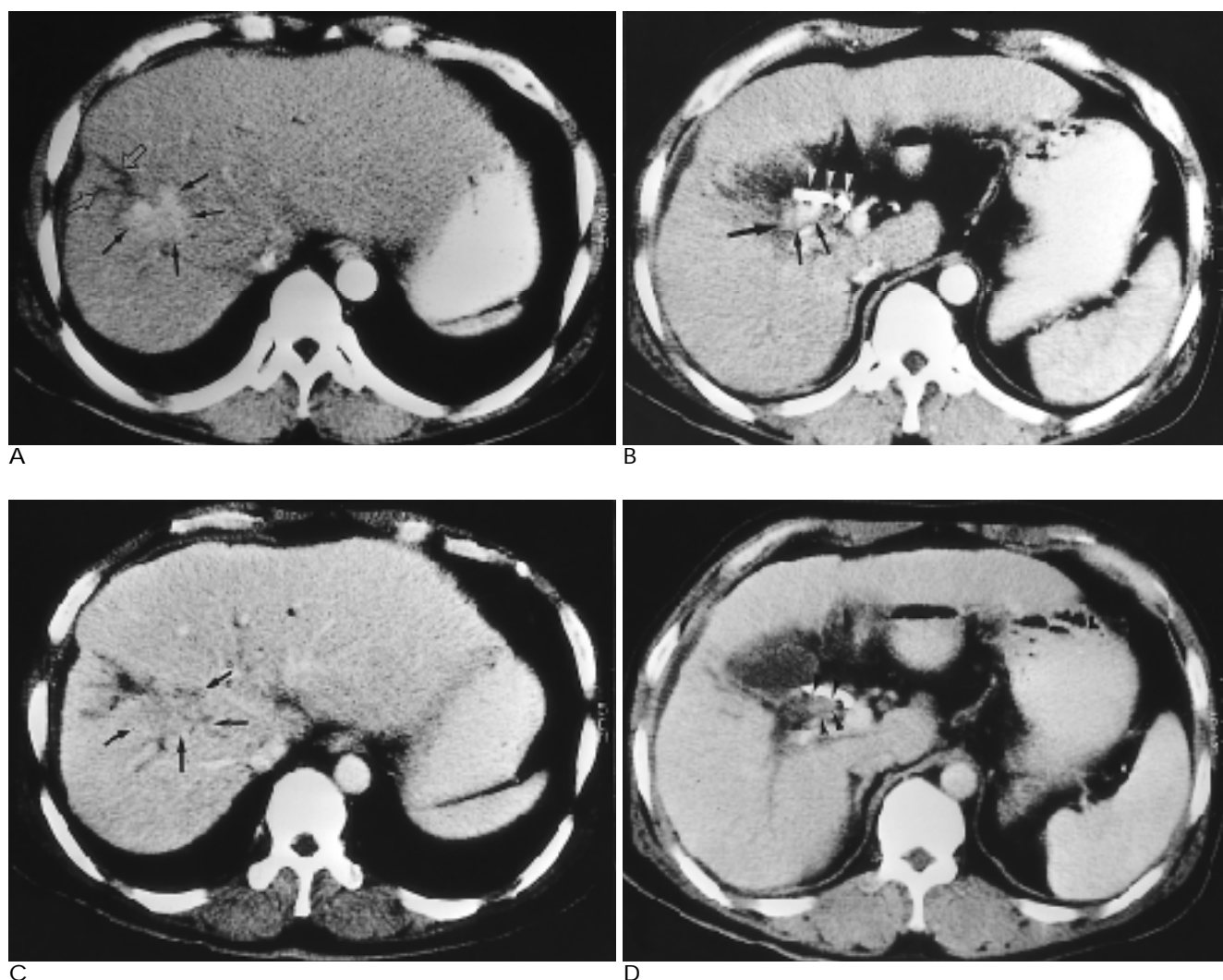


Fig. 3. HCC growing into the CBD in 48-year-old male, confirmed by hilar dissection and S5,8 subsegmentectomy.  
A. Contrast-enhanced CT scan obtained on arterial phase shows a well-enhancing mass in the right hepatic lobe (arrows) along with dilated bile ducts(open arrows) peripheral to the mass.  
B. Contrast-enhanced CT scan at more caudal level than (A) shows a well enhancing mass (arrows) within the CBD. An internal drainage tube is seen in the CBD(arrowheads).  
C, D. Contrast-enhanced CT scan obtained at portal phase shows the same enhancement pattern between parenchymal(arrows) and intraductal(arrowheads) masses.

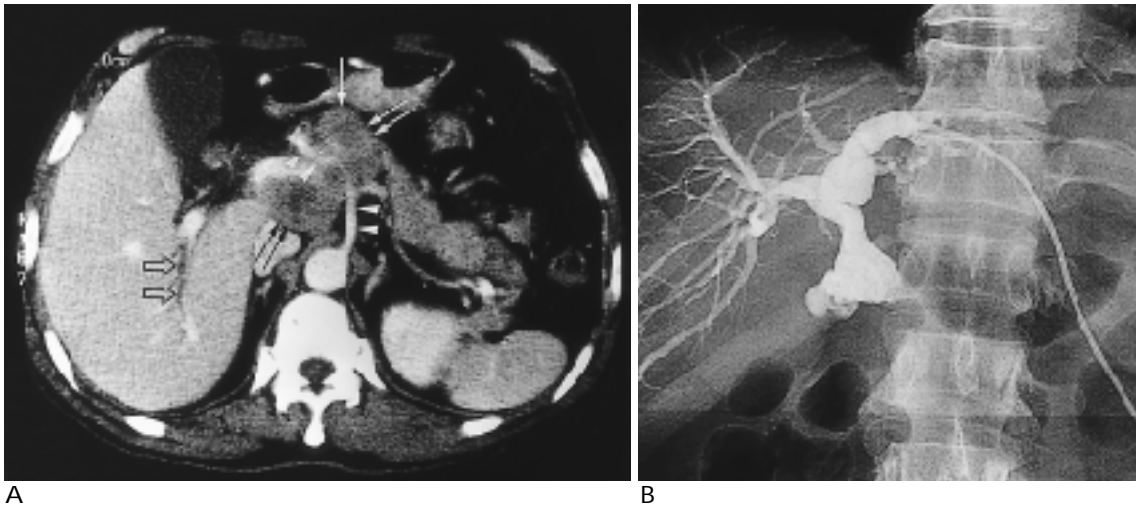


Fig. 4. Metastatic hilar lymph node from hepatocellular carcinoma with bile duct compression in 60-year-old male.  
A. Contrast-enhanced CT scan shows conglomerate enlarged nodes (arrows) surrounding the branches of celiac axis (arrowheads) as well as evidence of intrahepatic bile duct dilatation (open arrows).  
B. Cholangiogram shows dilatation of the extrahepatic and left hepatic bile ducts along with evidence of extrinsic compression upon the common hepatic duct. At the obstruction site, CBD is displaced medially by the compression of surrounding enlarged nodes.

[illegible]

(13-16),  
가  
가 가  
,  
가 (14, 15).  
가 2  
가 , 가  
가 가  
(n = 2),  
가 2cm (n = 4),  
PEIT  
가 (4/6, 67%).  
가  
CT  
가 ,  
가

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. . . . . 1989; 25: 573-576
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## Hepatocellular Carcinoma with Bile Duct Involvement : Computed Tomographic (CT) Findings<sup>1</sup>

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**Purpose :** To describe the radiologic features of computed tomography(CT) in hepatocellular carcinoma(HCC) with bile duct involvement.

**Materials and Methods :** We retrospectively analyzed the two phase spiral CT findings of 31 patients in whom HCC with bile duct invasion (n= 28) or compression (n= 3), was diagnosed. Eight of these underwent follow-up CT after transarterial chemoembolization. We analyzed the size, type, location, enhancement pattern, and lipiodol retention of parenchymal and intraductal masses, as well as their and lymphadenopathy.

**Results :** In all patients with bile duct invasion, single or multiple masses were demonstrated in the bile ducts. Intraductal masses showed the same enhancement characteristics as the parenchymal mass ( $\kappa$  0.550,  $p < .001$ ), and were contiguous to this mass. In 14 of 28 patients, intraductal masses filled the peripheral intrahepatic bile ducts and extended to the common bile ducts. In the other 14, the parenchymal mass extended to the area of the porta hepatis and then directly invaded the large ducts. In nine of the 28 patients, there was a hypoattenuated cleft between the intraductal mass and ductal wall. In six, a parenchymal mass was not apparent (n = 2), or was smaller than 2cm (n = 4). In five of eight patients (62.5%), follow-up CT after transarterial chemoembolization showed compact or partial lipiodol retention within the intraductal mass. In patients with bile duct compression, perihilar lymph nodes were noted along with the dilated intrahepatic duct but no intraductal mass was demonstrated in the duct.

**Conclusion :** Hepatocellular carcinomas cause bile duct dilatation either by direct invasion or by extrinsic compression of the bile duct with surrounding enlarged nodes. For the diagnosis of this condition, CT is helpful.

**Index words :** Liver, CT  
Liver neoplasms, CT  
Bile ducts, neoplasms

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