

T2- 가 (MRC) (TSE)

MRC T2- 가 49 (

:27 , :22 , 12-72 , :51) , 1 .

34 , 7 , T 7 , (RARE, 31)

MRC 가 , TSE (18) (MIP)

MRC , TSE T2- 가

37 33 ,

3 , 가 1 , 12

7 , 3 , 2 . 49 47 ,

37 가 12 10 (96%). TSE T2-

가 ,

49 10 (20.4%) MRC

가 9 , 7 2 , 1

MRC T2- -

MRC

가가 .

Cholangiography, MRC)

(Endoscopic Retrograde Cholangiography, ERC)

(Percutaneous transhepatic Cholangiography, PTC)

1990 . MRC

가 38-70% (4, 5).

(1-

3). 가 MRC

(Magnetic Resonance 가 .

1
2

: T2- 가
 , ERC PTC TR/TEeff 45000/900 msec,
 4 mm, 256 x 256, 28 cm
 20 - 25 40 - 50
 TR/TEef 10000/950 msec,
 40 mm, 256 x 256, 24 - 26 cm,
 MRC NEX 0.5 HASTE
 (8 2 16
 TSE) T2- 가 T2- Gyroscan ACS - NT TSE
 TR/TE 1800/100, 18, 8 mm,
 2 mm, 256 x 256, 375 mm, NEX
 4 , 20 2 , GE
 Signa SS - FSE TR/TEeff 30000/ 100 msec,
 6 mm, 1 mm, 256 x 256,
 5 MRC 가 T2- 34 cm 20 30
 , 가
 49 (antiperistaltic agent)
 , 27 , 22
 12 - 72 (, 51) ,
 34 , 7 , T 7 ,
 1
 MRC 1.5T
 , Gyroscan ACS - NT (Philips Medical Systems, Best,
 The Netherlands) 29 half -
 Fourier Acquisition Single Shot Turbo Spin Echo (
 HASTE)
 18 (TSE)
 (Maximum Intensity Projection, MIP)
 . 2 GE Signa (GE,
 Milwaukee, Wis., U.S.A.) torso array coil
 (Single Shot Fast Spin Echo, SS - FSE)
 MRC
 (definite,
 HASTE MRC TR/TE), (probable,
 1800/650 msec, 0.8 mm,
 256 x 256, 375 mm, 128,), 가 (possible, 가
 2 SPIR
 TR/TE 8000/500, 128,) 3 3 1
 25 mm, 375 mm, 256 x 256 , T2- 가
 10 - 15 5 , Wilcoxon signed rank test
 , 30 3 8
 , 8
 TSE MRC
 TR/TE 1800/650 msec, 2 mm, - 1 mm,
 256 x 256, 400 cm, 128, 49 37 , 33 ,
 2 SPIR , 120 3 20 12 3 , 가 1 ,
 , 120 3 20 (workstation) MIP 3 , 2 . 7 ,
 15 180 49 37 12 10
 GE Signa SS - FSE MRC , 1 , 2 1

100%, 96.0%, T2-가
 MRC 가
 가 23 가 2 () 21
 14 , 1 (가) 1 0
 MRC 가 3
 T2WI 가 7 가 (CT)
 2 8 5 , 1 3 0
 (Table 1).
 T2-가가
 49 10 (20.4%) 7 (Fig. 1),
 3 (Fig. 2),
 ($p < 0.05$) (Table 2). 10 MRC
 가 T2WI
 가 9 (7 , 2)
 T2-가 가
 2 가 2 Klatskin
 1 , 1 가 7 2 ,
 4 , 1
 1 , MRC
 T2-
 (Fig. 3).
 49 39 , 34 (Fig. 4) 5

96.0%, T-2 가가 5
 가 2 , 2 , 1
 가 .
 T2WI) 15
 MRC 가 3
 (CT)
 3

Table 1. Diagnostic Confidence Levels in 49 Patients

	Benign (n=37)		Malignancy (n=12)	
	MRCP	MRCP+T2WI	MRCP	MRCP+T2WI
Definite (3)	21	23	1	7
Probable (2)	15	14	8	5
Possible (1)	1	0	3	0

Note : Data are numbers of patients.
 The number in parenthesis is score.

Table 2. Diagnostic Value of Adding Axial T2WI to MRC

	Helpful	Not helpful	Total
Benign	3 (8.1%)	34 (91.9%)	37
Malignancy	7 (58.3%)*	5 (41.7%)	12
Total	10 (20.4%)	39 (79.6%)	49

Note : Data are numbers of patients.
 * : $p < 0.05$

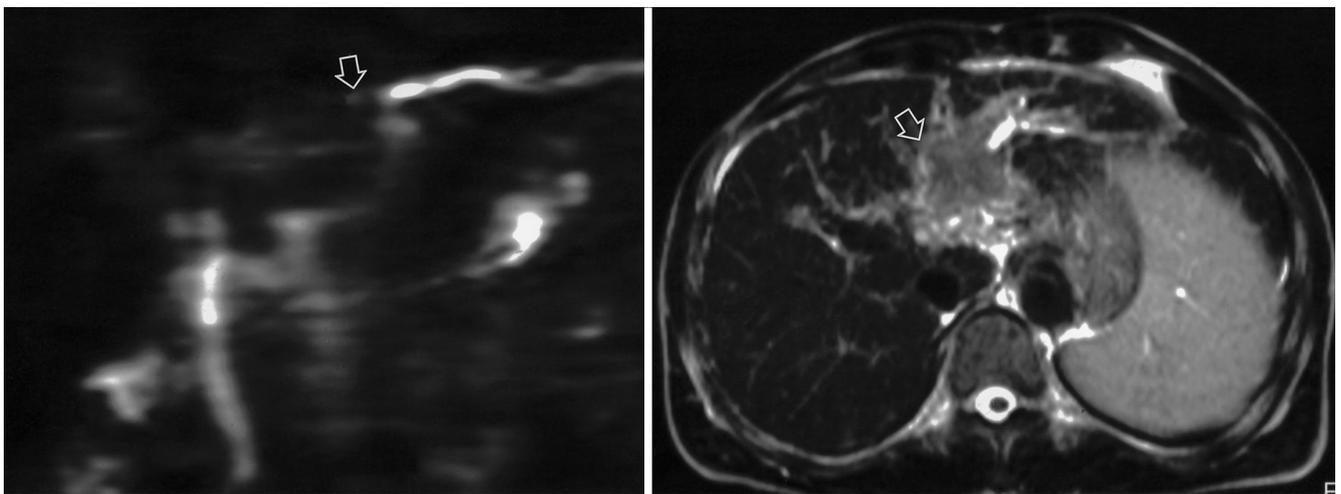


Fig. 1. Cholangiocarcinoma in left lateral segment in a 48-year-old man.
 A. HASTE projection cholangiogram shows abrupt cut-off appearance (arrow) in dilated left intrahepatic ducts suggestive of malignant stricture, although it is not definite.
 B. T2-weighted axial image shows irregular mass (arrow) surrounding left intrahepatic duct confidently. Also, direct invasion to main portal vein is clearly seen.

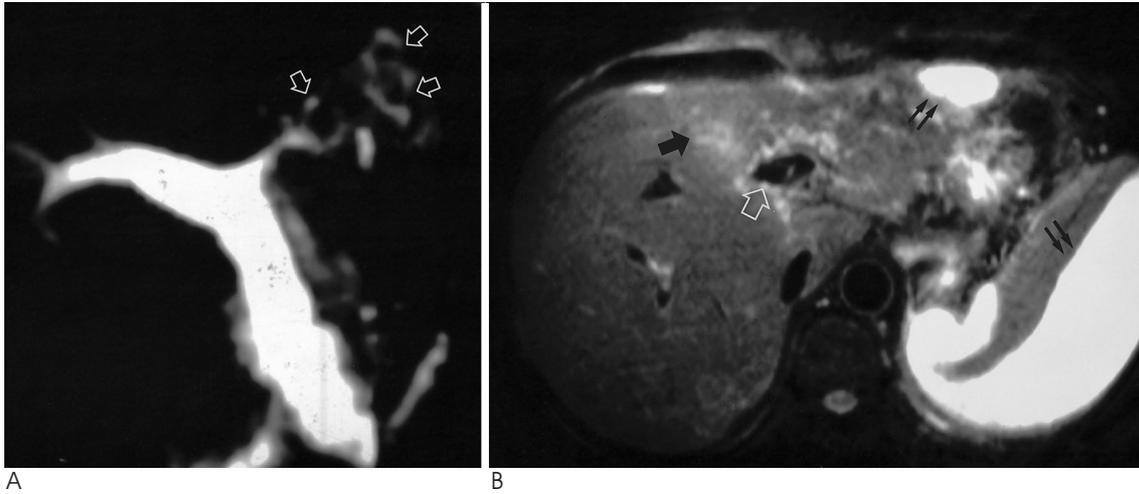


Fig. 2. Hepatolithiasis with intra- & extra-hepatic abscesses in a 56-year-old woman.
 A. MIP reconstruction image shows multiple stones (arrows) within dilated left intrahepatic ducts.
 B. T2-weighted axial image reveals hepatitis (solid arrow), biliary stone (open arrow), abnormal fluid collections (double arrows) in left lateral segment of the liver and subcapsular portion of the spleen.

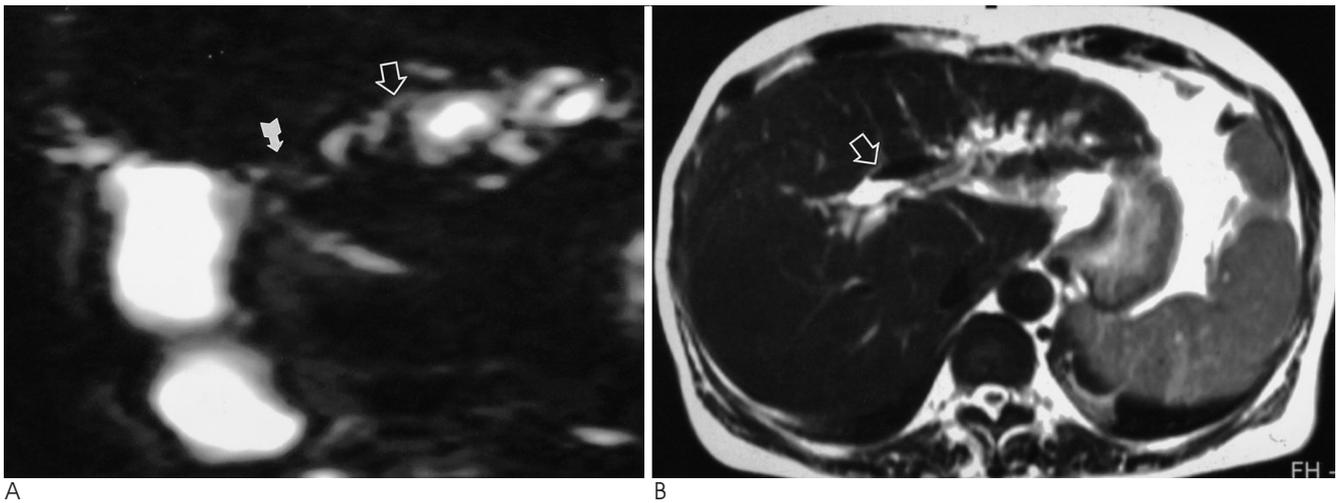
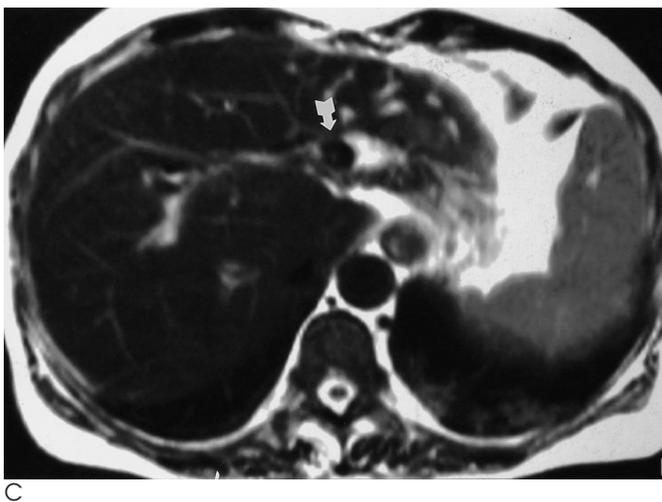


Fig. 3. Hepatolithiasis with air-biliarygram in a 63-year-old woman.
 A. HASTE projection image shows multiple stones (open arrow) in dilated left intrahepatic duct. The signal void (solid arrow) at proximal portion of the lesion is also noted.
 B, C. T2-weighted images show air-biliarygram (open arrow in B) as well as biliary stone (solid arrow in C).



(19, 20). T2- TE
 T2- MRC
 T2- (19). MIP
 T2- (6).
 T-2 MRC 가
 T2- 가 49
 10 가 39
 가 (33
 3)
 1 32 T2- 33
 9 24
 T2- 4
 가 , 2
 가
 T2- 가가
 5 2 ,
 1 MRC 가 2
 MRC 가
 가
 MRC 가 T2- 가

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Usefulness of Magnetic Resonance Cholangiography and Additional T2-Weighted Axial Image in Evaluating Focal Intrahepatic Ductal Dilatation¹

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Purpose: To evaluate the value of MR cholangiography (MRC) and MRC with additional T2-weighted axial imaging for evaluating the cause and determining the therapeutic plan in patients with a focal dilatation of the intrahepatic bile ducts(IHBD).

Materials and Methods: Forty nine patients (male, 27; female, 22; age range, 12 - 72 (mean, 51) years) with a focal intrahepatic ductal dilatation confirmed surgically and pathologically (lobectomy, 34; biopsy, 7; surgical finding and T-tube cholangiography, 7; percutaneous transhepatic biliary drainage with bile cytology, 1) underwent MRC and T2-weighted axial imaging. The MRC were obtained in one of two ways (a single slab or multi-slice acquisition under chemical fat saturation) using RARE (31 patients, source images and single slice images), or TSE (18 patients, source images and MIP reconstruction images). Two radiologists reviewed the MRC images alone, and the MRC images with the T2-weighted axial images. A diagnosis was determined by consensus.

Results: In 37 out of 49 patients, the causes of a bile duct dilation were benign diseases (IHBD stones in 33 cases, liver abscesses with IHBD stones in three cases, one inflammatory pseudotumor). Twelve patients had cholangiocarcinomas (mass-forming type in seven cases, intraductal type in three cases, and periductal infiltrating type in two cases). A correct diagnosis was confirmed in 47 out of 49 cases(96.0%), i.e. all the 37 benign lesions and 10 out of 12 malignant lesions. The addition of the T2-weighted axial image to the MRC did not alter the diagnosis of the causes of the focal intrahepatic ductal dilatation, but was helpful in 10 cases (20.4%). Nine cases (7 cholangiocarcinomas and 2 abscesses), in which MRC showed masses, were visualized more definitely on the additional T2-weighted axial images to the MRC than on the MRC alone. The remaining cases were hepatolithiasis, where stones could be easily differentiated from air by the air-fluid level on the axial images.

Conclusion: MRC is a good diagnostic modality for evaluating a focal dilatation of IHBD, and the addition of T2-weighted axial image to MRC is helpful.

Index words : Bile ducts, MR
Bile ducts, calculi
Bile ducts, stenosis or obstruction

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