

CO₂

1

2

2

: TIPS CO₂

가 .

: TIPS

8

가 1

CO₂CO₂

50cc

CO₂

. 3

Ring s

5F

wedge

5

transjugular access set

9F

wedge

5F

CO₂

:

TIPS

.

8

7

(87.5%)

. 5F

wedge

3

2

1

. 9F

wedge

5F

1

5 4

20.5

: CO₂

TIPS

(Transjugular Intrahepatic

Portosystemic Shunt, TIPS)

TIPS

CO₂

(1, 2). , TIPS

가

(3-5),

1

(4), iodine

wedge

(5),

TIPS

8

bilical)

(6),

(paraum-

38

61

(46)

,

7

(complete

Doppler

(7),

situs inversus)

1

(8)

, TIPS

iodine

가

가

가

가

가가

iodine

가

CO₂CO₂CO₂50cc CO₂

5F

wedge

가 3

, Ring s transjugular access set(COOK, Bloom-

¹가²가

1998 12 29

1999 8 13

ington, IN U.S.A.) 9 F wedge (1, 2). TIPS

5 F wedge CO₂ (5).

가 5 (DSA)

Philips BV 3000(Philips, Einthoven, Netherlands), 3 CO₂ (im-

age stacking)

14 G modified Ro sch needle(COOK, Bloomington, IN U.S.A.)

가 (2, 5).

가 iodine

가 가

가 가 CO₂

가 (5, 9).

(

) (10) 가

(11). CO₂

가

(10-13). iodine 가가

, CO₂

가 (11-13). CO₂ iodine

가 iodine

(11-13). Iodine 가

, CO₂ iodine

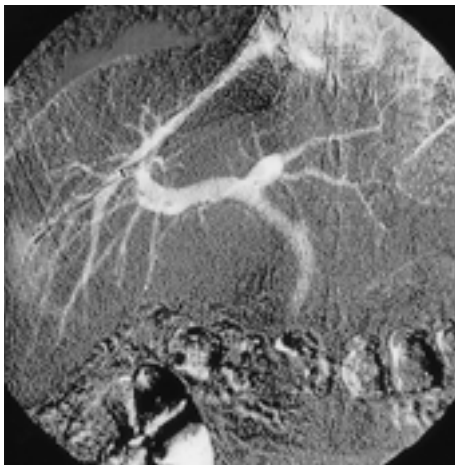
(12-14). (sinusoid)

가 (13-15).

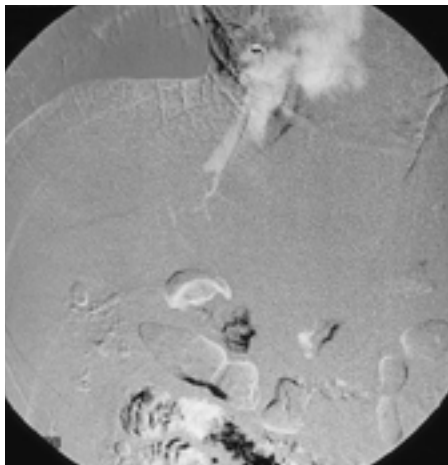
CO₂

TIPS (13, 14). CO₂

iodine



1



2

Fig. 1. A 57-year-old male patient with variceal bleeding and ascites. CO₂ indirect portal venogram with wedging of 9 F sheath and 5 F catheter provides excellent visualization of the portal venous system including the main portal vein.

Fig. 2. A 47-year-old male patient presented with variceal bleeding. CO₂ indirect portal venogram with a 5 F catheter wedging provides non visualization of the portal venous system.

CO₂ wedge CO₂가 (13), wedge CO₂가 wedge 9 F wedge 5 F wedge 3 2 가 , 1 가 9 F wedge 5 4 가 가 CO₂ 가 100% (16), 가 가 가 9 F wedge CO₂ 가 80% 가 82- 86% CO₂ 9 F 가 20.5 Ring (1) (transhepatic portal vein puncture) 163 ± 23 121 ± 29 Longo (8) Doppler 40-105 7 (flash artifact) 가 Roizental (5) 20 , 10 127.5 , 110 가 10-20 CO₂ 가 (11-13). 가 (DSA) (12, 13), CO₂ 가

- (16). , CO₂ 10mm (11, 13, 17). TIPS CO₂ 가
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The Usefulness of CO₂ Indirect Portography in Transjugular Intrahepatic Portosystemic Shunt(TIPS)¹

Hae Jum Yang, M.D., Hae Giu Lee, M.D., Je Ryung Yoo, M.D.,
Kyung Joo Lee, M.D., Myung Hee Chung, M.D., Won Jong Yu, M.D., Yeo Dong Yoon, M.D.,
Seog Hee Park, M.D., Young Sok Lee, M.D.², Nam Ik Han, M.D.²

¹Department of Radiology and ²Internal Medicine1, Holy Family Hospital, The Catholic University of Korea.

Purpose : To determine the usefulness of carbon dioxide(CO₂) indirect portography during TIPS procedure.

Materials and Methods : We evaluated eight patients who had undergone TIPS due to variceal hemorrhage or ascites caused by portal hypertension. All patients but one with complete situs inversus underwent wedged right hepatic venography for visualization of the portal vein using CO₂. For CO₂ indirect portal venography, 50cc of CO₂ was injected by hand without prior injection of a small amount of CO₂. In three patients a 5-F angiographic catheter was wedged into the right hepatic vein, and in the other five a 9-F sheath from a Ring's transjugular access set was adjunctively wedged into the right hepatic vein over the 5-F catheter. The time required for portal vein puncture was defined as the time between the indirect portal venography procedure and the first procedure after successful portal vein puncture.

Results : All patients successfully underwent TIPS without any immediate complication. The portal vein was visualized by CO₂ in 7 of 8 patients (87.5 %). Two of three patients who underwent indirect portography with only a 5-F catheter wedging demonstrated opacification of the right portal vein; in the remaining patient the portal venous system was not visualized. Of the five patients who underwent indirect portography with an adjunctive 9-F sheath wedged in the right hepatic vein, four showed opacification from the peripheral to the main portal vein, and in the other, the only right peripheral portal vein was opacified. The mean time for portal vein puncture was 20.5 minutes.

Conclusion : For visualization of the portal venous system during TIPS procedure, the use of CO₂ indirect portography is feasible.

Index words : Shunts, portosystemic

Portography

Liver, cirrhosis

Esophagus, varices

Carbon dioxide

Address reprint requests to : Hae Giu Lee, M.D., Department of Radiology, Holy Family Hospital, The Catholic University of Korea
#2, Sosa-dong, Wonmi-gu, Pucheon-city, Kyunggi-do, 420-717, Korea.
Tel. 82-32-340-2188 Fax. 82-32-340-2187