

1

2 2

: (TIPS) BRTO (BRTO)
 : 2004 1 2006 3 BRTO 1
 8 BRTO . BRTO TIPS 2000
 1 2006 3 TIPS 1 13 TIPS
 . 1 Child - Pugh
 가 , , ,
 가 가 ,
 : BRTO 가, Child - Pugh ,
 TIPS . BRTO 7 가
 , 6 가
 . TIPS 4 , 6 , 5 , 2 가
 .
 : BRTO , 가 ,
 TIPS BRTO 가 ,

. (Balloon occluded retrograde
 transvenous obliteration, BRTO) (6).
 TIPS
 , 가
 가 (1 - 3).
 (7, 8).
 (Transjugular intrahepatic portosystemic
 shunt, TIPS) BRTO ,
 50% ,
 가 BRTO
 (4, 5). TIPS BRTO

1

2

. 8
 (Fig. 1A, B). 3
 2 histoacryl
 1 . 1
 2004 1 2006 3
 BRTO 15 . 1
 7 8 BRTO
 6 BRTO
 TIPS
 (hypovolemic shock)
 BRTO 가 5 3
 56.6 (45 - 67) 3
 , 1 HBV, 2 HCV, 1 가 HBV
 가 , 가 1 . 6
 가 4 가
 가 6 가
 (computed tomography, CT)
 (Fig. 1C, D).
 2000 1 2006 3
 TIPS 16
 TIPS
 BRTO 2 BRTO
 13 BRTO TIPS 1

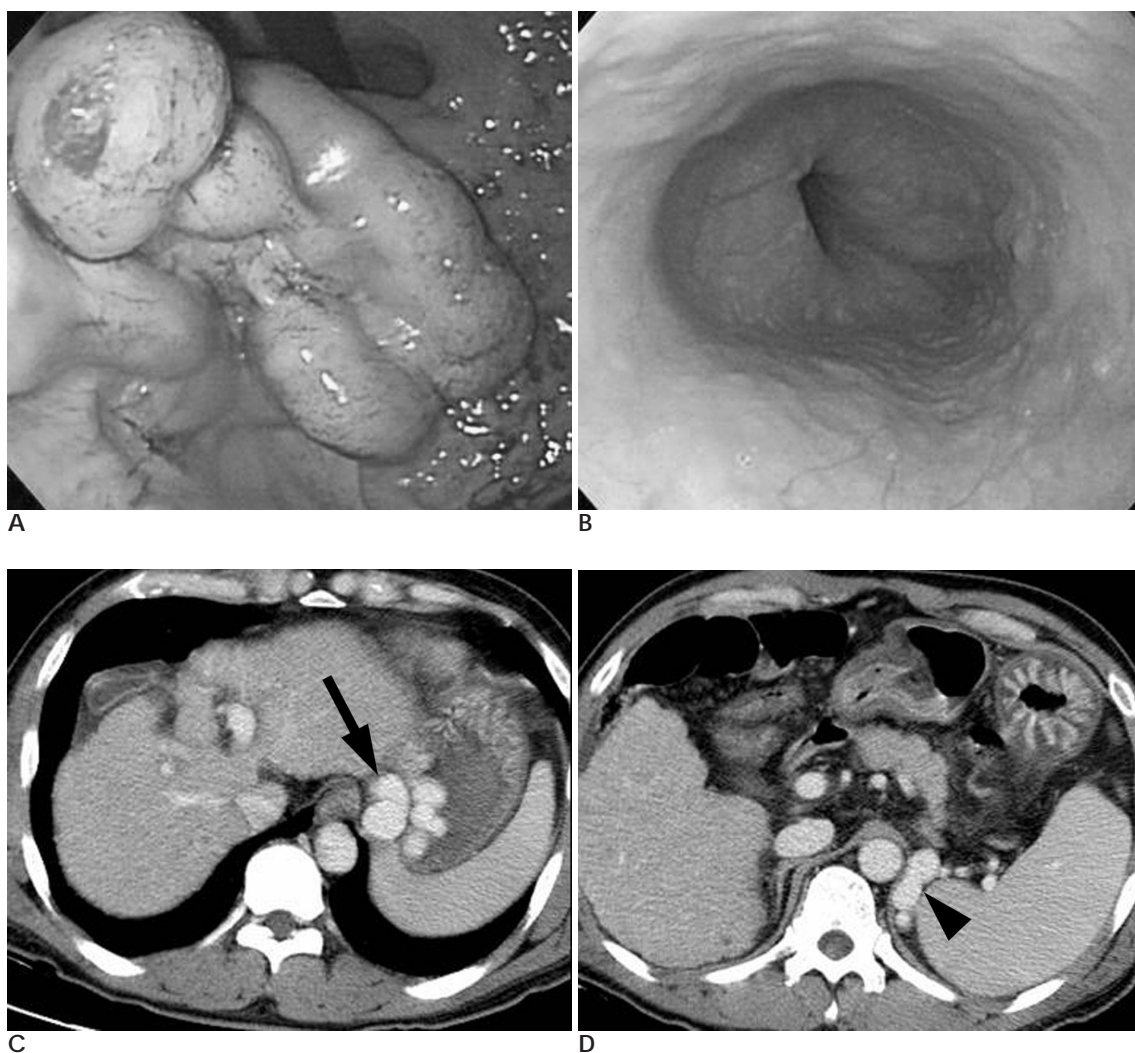


Fig. 1. A 57-year-old man with gastric variceal bleeding.
 A, B. Initial endoscopy shows large gastric varices, but there is no varices in the esophagus.
 C, D. Contrast-enhanced CT images show large gastric fundal varices (arrow) and gastrorenal shunt (arrowhead).

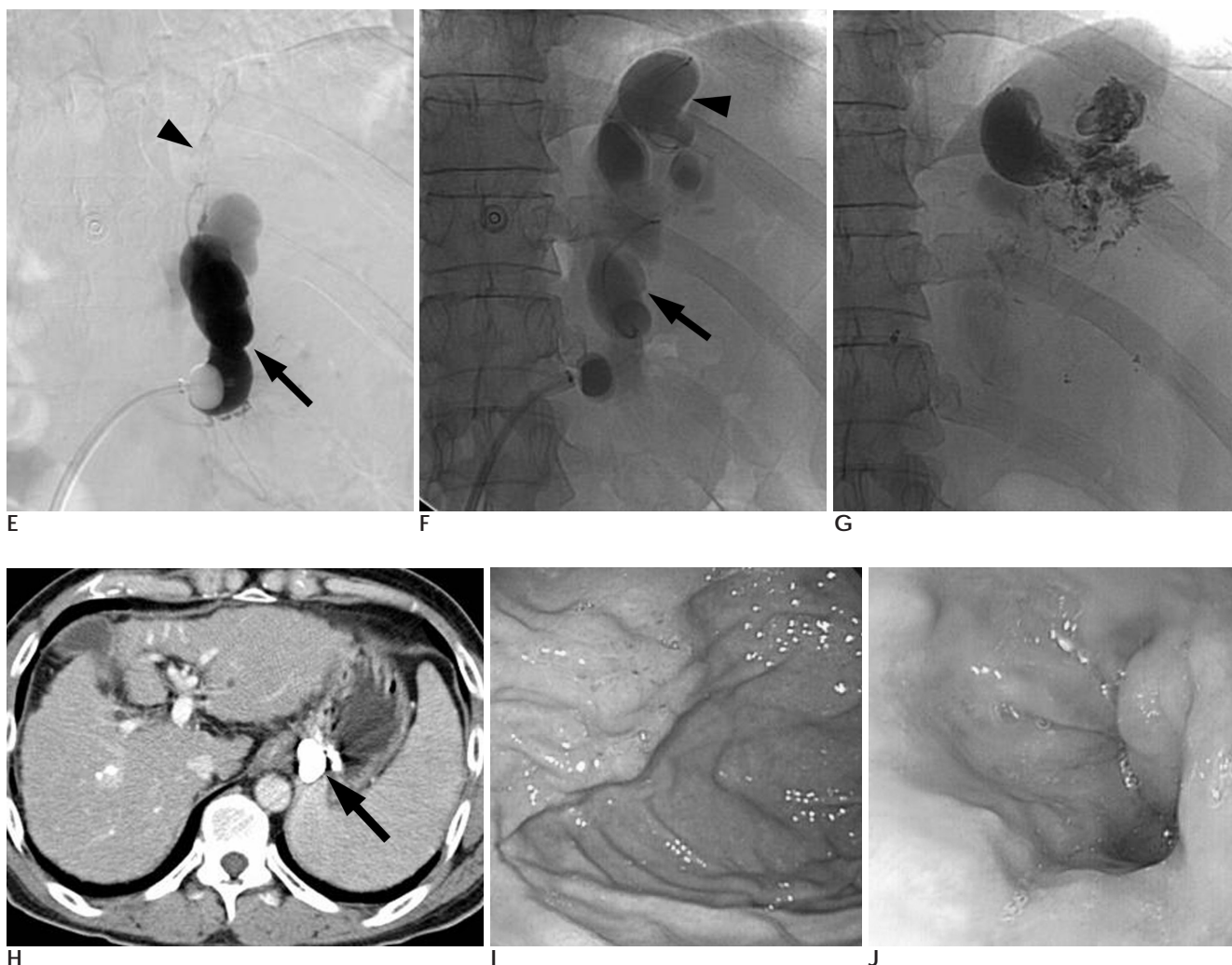


Fig. 1. E. Balloon-occluded left renal venogram demonstrates gastroduodenal shunt (arrow) and fine collaterals (arrowhead). F. After sclerotherapy of collaterals, angiogram in gastric varices using a microcatheter shows large gastric varices (arrowhead) and gastroduodenal shunt (arrow). G. Immediate follow-up angiogram after the injection of ethanolamine oleate into the varices for two hours demonstrates the gastric varices occluded. H. Follow-up enhanced CT scan obtained 6 months after the procedure shows occluded gastric varices by clot formation (arrow). I, J. Follow-up endoscopy 6 months after the procedure shows marked improvement of gastric fundal varices, but esophageal varices had developed.

가 10 , 가 3 , 50.2 BRTD
(35 - 64) . 4 HAV, 8 (renal venogram)
HBV, 가 1 . 4 , (occlusion)
balloon catheter)
. 8
,
. 4
,
3
1
TIPS 8 CT 가 , 5
CT .
ethanolamine oleate - lipiodol , 2
(Fig. 1F).
5% ethanolamine
lipiodol 5:1
ethanolamine
oleate 40 mL . 1 30

| | | | | | | | | | |
|-------------------------------|--|---------------|--|--------|--|------------|--|------------------------|--|
| , INR | | 가 | | 가 | | 가 | | , 1 | |
| TIPS | | , ALP가 | | BRT0 | | TIPS | | (Fig. 1J). 85.7% (6/7) | |
| , ALP | | 가 | | , 2 | | , 2 | | | |
| 가 | | 가 | | , TIPS | | (Table 2). | | | |
| . Child - Pugh | | 8.2 | | 8.9 | | TIPS | | 6 | |
| BRT0 | | 1 | | 4 | | (Table 2). | | | |
| BRT0 | | 1 | | 가 | | , TIPS | | | |
| TIPS | | 2 | | 가 | | 가 | | | |
| 4 | | (Table 2). | | 3 | | | | | |
| , 1 | | 가 1 | | , 8 | | TIPS | | | |
| 가 1 | | , 30 | | | | | | | |
| 1 Sengstaken - Blakemore tube | | . 7 | | | | | | | |
| 1 가 | | , TIPS | | | | | | | |
| BRT0 | | 7 | | 가 | | | | | |
| , CT | | 6 | | | | | | | |
| 가 | | lipiodol | | | | | | | |
| 1 | | (Fig. 1H, I). | | | | | | | |
| lipiodol | | CT | | | | | | | |
| , BRT0 | | 87.5% (7/8) | | | | | | | |
| TIPS | | 9 | | 2 | | | | | |
| 가 | | , 5 | | 가 | | | | | |
| (Table 2). | | | | | | | | | |
| BRT0 | | 7 | | 6 | | | | | |

Table 2. Comparison of Complications after BRT0 or TIPS Procedures

| | BRT0 | | TIPS | | p-value |
|--------------------|------|-------|------|-------|---------|
| | No. | % | No. | % | |
| Rebleeding | | | | | 0.344 |
| Absent | 7 | 87.5% | 9 | 69.2% | |
| Present | 1 | 12.5% | 4 | 30.8% | |
| Encephalopathy | | | | | 0.032 |
| Absent | 8 | 100% | 7 | 53.8% | |
| Present | 0 | 0% | 6 | 46.2% | |
| Esophageal varices | | | | | 0.028 |
| Decrease | 0 | 0% | 2 | 22.2% | |
| No interval | 1 | 14.3% | 5 | 55.6% | |
| Increase | 6 | 85.7% | 2 | 22.2% | |
| Gastric varices | | | | | 0.006 |
| Decrease | 7 | 87.5% | 2 | 22.2% | |
| No interval | 1 | 12.5% | 2 | 22.2% | |
| Increase | 0 | 0% | 5 | 55.6% | |
| Ascites | | | | | 0.90 |
| Decrease | 0 | 0% | 1 | 14.3% | |
| No interval | 6 | 85.7% | 4 | 57.1% | |
| Increase | 1 | 14.3% | 2 | 28.6% | |

Table 1. Laboratory Data at Baseline and after Procedures

| | Before BRT0 | 2 month after BRT0 | p-value | Before TIPS | 2 month after TIPS | p-value |
|---------------------------|-------------|--------------------|---------|-------------|--------------------|---------|
| AST (IU/L) | 63.5 | 47.6 | 0.204 | 74.8 | 69 | 0.807 |
| ALT (IU/L) | 43.1 | 37.8 | 0.208 | 76.4 | 45.9 | 0.753 |
| ALP (IU/L) | 257.6 | 257.4 | 0.889 | 189.9 | 382.5 | 0.007 |
| LDH (IU/L) | 512.6 | 472 | 0.575 | 534.1 | 632.2 | 0.208 |
| Total bilirubin (mg/dl) | 1.51 | 1.12 | 0.123 | 2.11 | 6.35 | 0.016 |
| Direct bilirubin (mg/dl) | 0.52 | 0.33 | 0.123 | 0.75 | 3.54 | 0.009 |
| Total protein (mg/dl) | 5.85 | 6.76 | 0.159 | 4.84 | 6.05 | 0.050 |
| Albumin (mg/dl) | 2.89 | 3.39 | 0.034 | 2.61 | 2.42 | 0.700 |
| Total cholesterol (mg/dl) | 116.3 | 137.3 | 0.05 | 91.8 | 103.5 | 0.162 |
| Ammonia (ug/dl) | 77 | 54.8 | 0.043 | 108 | 75.4 | 0.213 |
| BUN (mg/dl) | 15.7 | 13.4 | 0.398 | 19.9 | 21.6 | 0.505 |
| Creatinine (mg/dl) | 0.84 | 0.83 | 0.863 | 0.96 | 1.84 | 0.248 |
| Hemoglobin (g/dl) | 9.78 | 9.7 | 0.726 | 9.02 | 9.85 | 0.184 |
| WBC count (10 E3/ul) | 5.071 | 3.554 | 0.123 | 6.986 | 5.469 | 0.055 |
| Platelet count (10 E3/ul) | 109 | 93.8 | 0.326 | 58.2 | 59.9 | 0.698 |
| PT time (sec) | 16.3 | 15.3 | 0.150 | 18.9 | 18.8 | 0.944 |
| PT INR | 1.34 | 1.24 | 0.292 | 1.66 | 1.67 | 0.972 |
| Child-Pugh score | 7 | 6.1 | 0.020 | 8.2 | 8.9 | 0.163 |

가 (Table 2). (15, 16). BRTO 8 7
BRTO , TIPS 3 (87.5%) 가 CT
, 2 , 1 7 6 가
1 1 가 , BRTO TIPS
TIPS 가 9 2 (22.2%)
가 가 5 (55.6%) , TIPS
13 3 23% , TIPS
BRTO가
TIPS 가 ,
(4, 17).
, TIPS
30% , 가
55% (10, 11). TIPS
TIPS
(short gastric vein) (posterior TIPS (18). BRTO TIPS
gastric vein) 가 가
(16). Choi (13) Fukuda (16)
BRTO Child - Pugh 가 , Miyamoto
(19) indocyanine green (intrinsic
clearance) BRTO 가 , BRTO
(13, 16, 19).
BRTO Child - Pugh 가 ,
가 가
(12). TIPS가 TIPS
, 가 가
(4, 13, 14). ,
TIPS BRTO I, II, VII, IX, X
. BRTO 1996 Kanagawa(6) INR
BRTO
가 TIPS
BRTO 가 ,
TIPS , INR, Child -
Pugh
TIPS (20).
가 50 - 63% 1
(4). BRTO 57 , BRTO 68 , TIPS
. BRTO 87 - 100% 1 BRTO
, 0 - 10%

(16, 21).

BROTO 가 . , CT 가 , CT 가 5 - 35% , TIPS 가 165 , TIPS 220 , BROTO TIPS 가 , BROTO TIPS , TIPS , BROTO CT 가 . TIPS 가 BROTO 8 1 BROTO 7 , histoacryl , BROTO TIPS 10 - 63% 7 6 가 8 , 4 , (85.7%) , 1 , (15, 16, 24). BROTO 가 BROTO BROTO (15, 16). TIPS BROTO 가 , BROTO 11 가 , 3 BROTO 가 BROTO TIPS 가 . , TIPS CT 6 가

BROTO ethanolamine oleate (disseminated intravascular coagulation) ethanolamine oleate 8 - 40 mL , ethanolamine oleate 40 mL (26). 가 BROTO TIPS 가 8 , 13 가 , 1

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The Clinical Results of Balloon-Occluded Retrograde Transvenous Obliteration in Treatment of Gastric Varices Compared with Transjugular Intrahepatic Portosystemic Shunt¹

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Purpose: To compare the clinical results of BRTO in the gastric varices with those of TIPS.

Materials and Methods: From January 2004 to March 2006, eight patients who had been followed up for more than 1 month after BRTO were enrolled in this study. This study compared the clinical efficacy of BRTO with that of TIPS in 13 patients who had undergone TIPS from January 2000 to March 2006. The change in laboratory parameters before and after each procedure and the incidence of rebleeding, encephalopathy, ascites and varices were analyzed after each procedure.

Results: In the BRTO group, the level of albumin increased, and the levels of ammonia and the Child-Pugh score decreased. The TIPS group showed no improvement in the liver function. In the BRTO group, the gastric varices were eradicated in 7 patients. Gastric variceal rebleeding and encephalopathy did not occur. However, the esophageal varices worsened in 6 patients. In the TIPS group, rebleeding ($n=4$), encephalopathy ($n=7$) and a worsening of the gastric ($n=5$) or esophageal varices ($n=2$) occurred.

Conclusion: BRTO improves the metabolic activity of the liver and has a lower incidence of encephalopathy. Hence, BRTO is a good alternative to TIPS in the gastric varices accompanied by a gastroduodenal shunt although a treatment for a worsening of the esophageal varices may be needed after BRTO.

Index words : Stomach, varices

Stomach, interventional procedures

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