

1

2

3

가 가

2001 2 2004 7

115 97 17-88

(, 58.5) 가 73 , 가 24 31 ,

23 , Mallory - Weiss 3 , 3 , 가 가 3 ,

2 , 2 , 2 , 2 , 1 ,

25 3 , 41 , 38 , 15

100% 67% (65/97)

32 14 14

가 81% (79/97) 18

12 , 5 , 1

79 6

19% (18/97)

1972 Rosch (1) (1, 9, 10).

가 가

가 (11, 12).

(2-8). 가

가 1975

1
2
3

115
97 , 58.5) 73 , 24 17 - 88 (48
49 , 31 , 23 , Mallory -
Weiss 3 , 3 , 가
가 3 , 2 , 2 , 2 ,
2 , 1 , 25
(/) 104
mmHg/66 mmHg 6.9 g/dL , 97
88 가 1 unit 48 units
97 66
가 가 . 97
49 CT
17 CT
31 11 12
CT 8 3
5 가 CT
Multistar T.O.P (Siemens, Erlangen,
Germany) Advantx LCA LP+ (GE Medical Systems,
Milwaukee, WI, U.S.A.)
Seldinger 6 Fr 5
Fr Yashiro catheter (Terumo, Tokyo, Japan)

CT
가
가
3 Fr Microferret catheter (Cook, Bloomington,
IN, U.S.A.)
Coil - Hilal embolization microcoil (Cook, Bloomington, IN,
U.S.A.), Tornado embolization microcoil (Cook, Bloomington,
IN, U.S.A.), Vortx (Boston Scientific, Natick, MA, U.S.A.)
(Upjohn, Kalamazoo, IN, U.S.A.)

Table 1. Embolized Arteries of Gastrointestinal Bleeding in 97 Patients

Embolized Arteries	Number
Gastroduodenal	21
Ileocolic	18
Left gastric	15
Jejunal	10
Ileal	9
Pancreaticoduodenal	4
Right gastric	3
Esophageal	3
Mid-colic	4
Superior rectal	3
Others (left colic, right colic, sigmoid colic, right hepatic, splenic, common hepatic and right superior hemorrhoidal artery)	7
Total	97

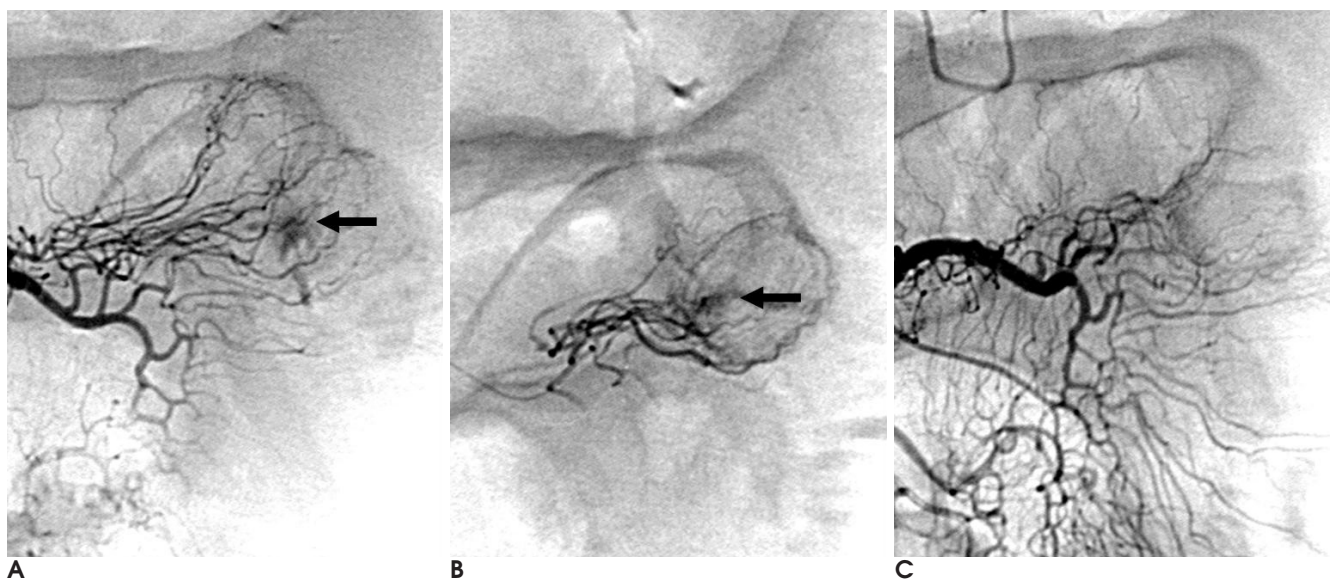
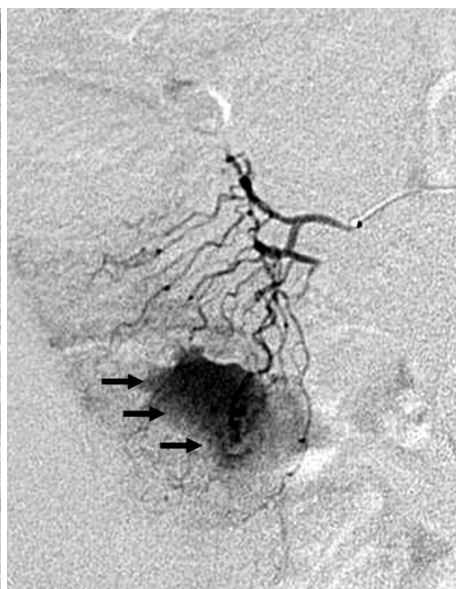


Fig. 1. 44-year-old man with jejunal bleeding (unknown origin). Superior mesenteric artery angiogram (A) and superselective jejunal artery angiogram (B) shows active extravasation of contrast media from 1st branch of jejunal artery (arrow). (C) Follow up angiogram obtained after superselective transarterial embolization of vasa recta of 1st jejunal branch with gelfoam demonstrates cessation of extravasation.

가 1 (Table 1). 가 43 , 가
15 가 가 39
(100%) 가
21 , 18 , (, 3-102 , 19)
15 , (Fig. 1) 10 , (Fig. 2) 9 , 97 65
4 , 3 , 3 , 가
4 , 3 , , S 67% (65/97) .
(Fig. 3) 32 14 , 9



A



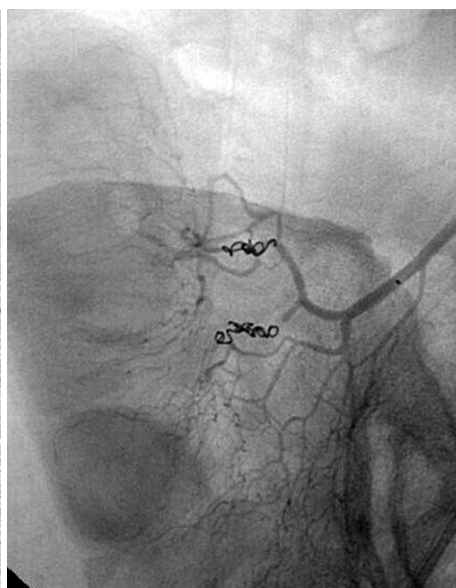
B

Fig. 2. 62-year-old woman with ileal ulcer bleeding. Superior mesenteric artery angiogram (A) and superselective ileal artery angiogram (B) shows active extravasation of contrast media through the ileal artery (arrows).

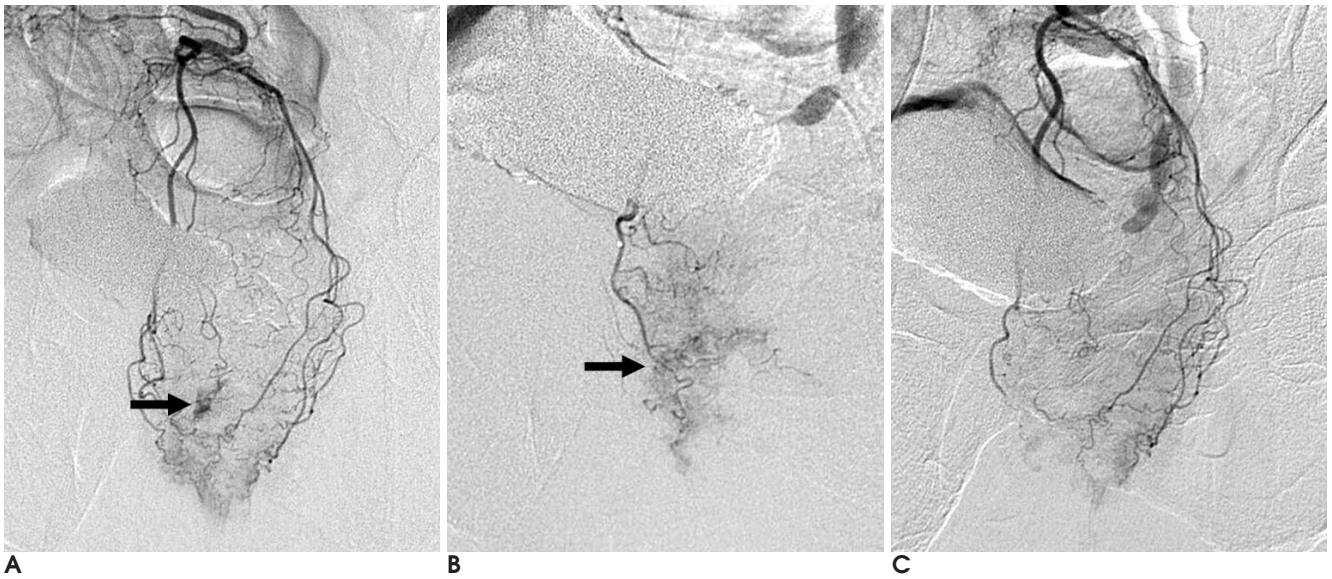
C, D. Follow up angiogram obtained after superselective transarterial embolization of two vasa recta of ileal artery with five micocoils demonstrates cessation of extravasation.



C



D



가 .

가 , 가 (5, 13). 17 - 43%

가 (5, 14).

가

가

104 mmHg/66 mmHg 124 mmHg/78 mmHg , 6.9 g/dL 81% (79/97)

18 (3), 12 (4) , 5

가 15 - 30%

(12, 15, 16).

19% (18/97)

가

가

82.5%) (11, 17, 18).

81%

가 Treitz

가

. Bell (13)

가

가 .

가

(19, 20).

(11,

12, 21 - 23).

.

가

,

가 ,

,

,

,

.

가 , PVA

(polyvinyl alcohol, Ivalon), isobutyl - 2 - cyanoacrylate, 가

1975

(1, 9, 10).

(24).

가 , PVA 가

가

.

(22).

Okazaki (12)

가 ,

(segmental branch vasa recta)

가 가 (arcade)

가 가

.

(11, 12).

Schenker (25)

1. Rosch J, Dotter CT, Brown MJ. Selective arterial embolization: a new method for control of acute gastrointestinal bleeding. *Radiology* 1972;102:303-306
2. Dempsey DT, Burke DR, Reilly RS, McLean GK, Rosato EF. Angiography in poor-risk patients with massive nonvariceal upper gastrointestinal bleeding. *Am J Surg* 1990;159:282-286
3. Gomes AS, Lois JF, McCoy RD. Angiographic treatment of gastrointestinal hemorrhage: comparison of vasopressin infusion and embolization. *AJR Am J Roentgenol* 1986;146:1031-1037
4. Lang EK. Transcatheter embolization in management of hemorrhage from duodenal ulcer: long-term results and complications. *Radiology* 1992;182:703-707
5. Toyoda H, Nakano S, Takeda I, Kumada T, Sugiyama K, Osada T, et al. Transcatheter arterial embolization for massive bleeding from duodenal ulcers not controlled by endoscopic hemostasis. *Endoscopy* 1995;27:304-307
6. Emcamacion CE, Kadir S, Beam CA, Payne CS. Gastronitestinal bleeding: treatment with gastrointestinal arterial embolization. *Radiology* 1992;183:505-508
7. Kramer SC, Gorich J, Rilinger N, Siech M, Aschoff AJ, Vogel J, et al. Embolizatin for gastrointestinal hemorrhages. *Eur Radiol* 2000;10:802-805
8. Defreyne L, Vanlangenhove P, De Vos M, Pattyn P, Van Maele G, Decruyenaere J, et al. Embolization as a first approach with endoscopically unmanageable acute nonvariceal gastrointestinal hemorrhage. *Radiology* 2001;218:739-748
9. Bookstein JJ, Cholesta EM, Foley D, Walter JF. Transcatheter

:

- 가

Superselective Transarterial Embolization for the Management of Acute Gastrointestinal Bleeding¹

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Purpose: We wanted to evaluate the safety and effectiveness of superselective transarterial embolization for the management of gastrointestinal bleeding.

Materials and Methods: We evaluated 97 of 115 patients who had undergone diagnostic angiography and transarterial embolization for gastrointestinal bleeding from February 2001 to July 2004, and they subsequently underwent superselective transarterial embolization. Their ages ranged from 17 to 88 years (mean age: 58.5 years), and 73 were men and 24 were women. The etiologies were a postoperative condition ($n=31$), ulcer ($n=23$), Mallory-Weiss syndrome ($n=3$), trauma ($n=3$), pseudoaneurysm from pancreatitis ($n=3$), diverticula ($n=2$), inflammatory bowel disease ($n=2$), tumor ($n=2$), Behcet's disease ($n=2$), hemobilia ($n=1$), and unknown origin ($n=25$). The regions of bleeding were the esophagus ($n=3$), stomach and duodenum ($n=41$), small bowel ($n=38$) and colon ($n=15$). All the patients underwent superselective transarterial embolization using microcoils, gelfoam or a combination of microcoils and gelfoam. Technical success was defined as devascularization of targeted vascular lesion or the disappearance of extravasation of the contrast media, as noted on the angiography after embolization. Clinical success was defined as the disappearance of clinical symptoms and the reestablishment of normal cardiovascular hemodynamics after transarterial embolization without any operation or endoscopic management.

Results: The technical success rate was 100%. The primary clinical success rate was 67% (65 of 97 patients). Of the 32 primary failures, fourteen patients underwent repeat embolization; of these, clinical success was achieved in all the patients and so the secondary clinical success rate was 81% (79 of 97 patients). Of the 18 patients with primary failures, five patients underwent operation, one patient underwent endoscopic management and the others died during the observation period due to disseminated coagulopathy or complications of their underlying diseases. During the follow up period, six patients of the 79 clinically successful patients died due to disseminated coagulopathy or complications of their underlying diseases, and so the total mortality rate was 19% (18 of 97 patients). Postembolization complications such as bowel ischemia or infarction did not occur during the observation period.

Conclusion: Superselective transarterial embolization is an effective therapy for treating acute gastrointestinal hemorrhage, and it has a high technical rate and clinical success rate, and a low complication rate.

Index words : Gastrointestinal tract, hemorrhage
Gastrointestinal tract, angiography
Arteries, embolism

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