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: 91 6   98 12

29   (: 57.8 (36-74) ,

= 21:8)   .

± 2SD

(n= 16)   ,

(n= 13)   .   3

, 3   .

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: 29   16   ,   12

(75%),   4 (25%)   ,   13   ,   5 (38.5%),

8 (61.5%)

$(p < 0.05)$.   16   1 (6.3%),

13   7 (53.8%)

$(p < 0.005)$.

$(p < 0.05)$.

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10-20%   (1-5).   .

(5, 6).

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(4, 7, 8).

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,   1991   6   1998   12

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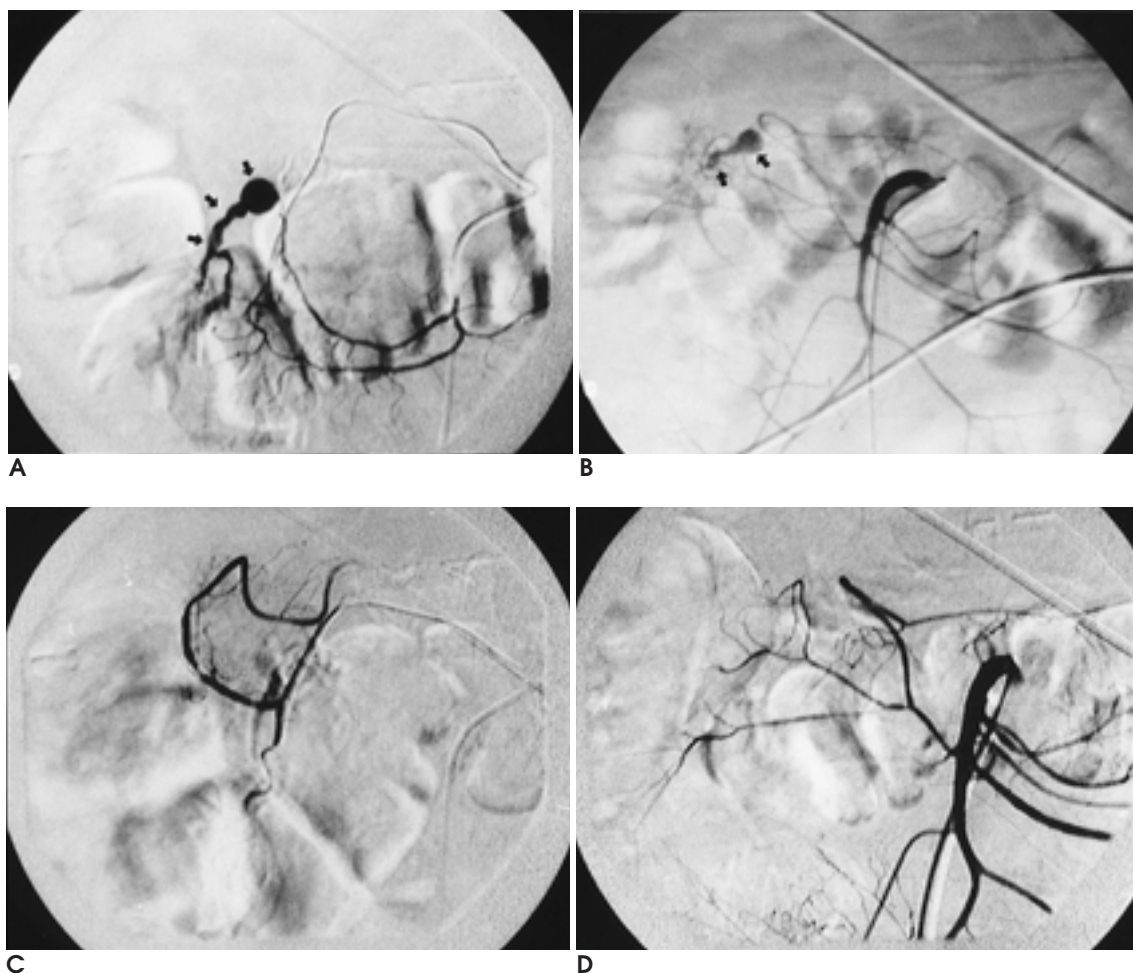29   29   .   21 ,   8

36-74 (57.8) .

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(Fig. 1) 12   , 6   .

,   (,   ,   ) 5 ,   Seldinger
3 ,   (stress induced gastri-   , 4 F   5 F
tis)   3 ,   (Fig. 2) 2 ,   (celiac trunk),   (superior mesenteric
,   , Mallory- Weiss   artery),   (inferior mesenteric artery)
(Fig. 3),   (angiodysplasia)   1
(Table 1, 2).   ,   ,   ,   ,
(Prothrombin
Time,   PT),   (activated   .   (coaxial technique)   3 F S- P
Partial Thromplastin Time,   aPTT)   (Terumo Corporation, Japan), Tracker (Target
± 2.5 SD   ,   Therapeutics, San Jose, U.S.A.)
PT   23   , aPTT   40   .
(n= 13),   (n= 16)
.
13   10   .
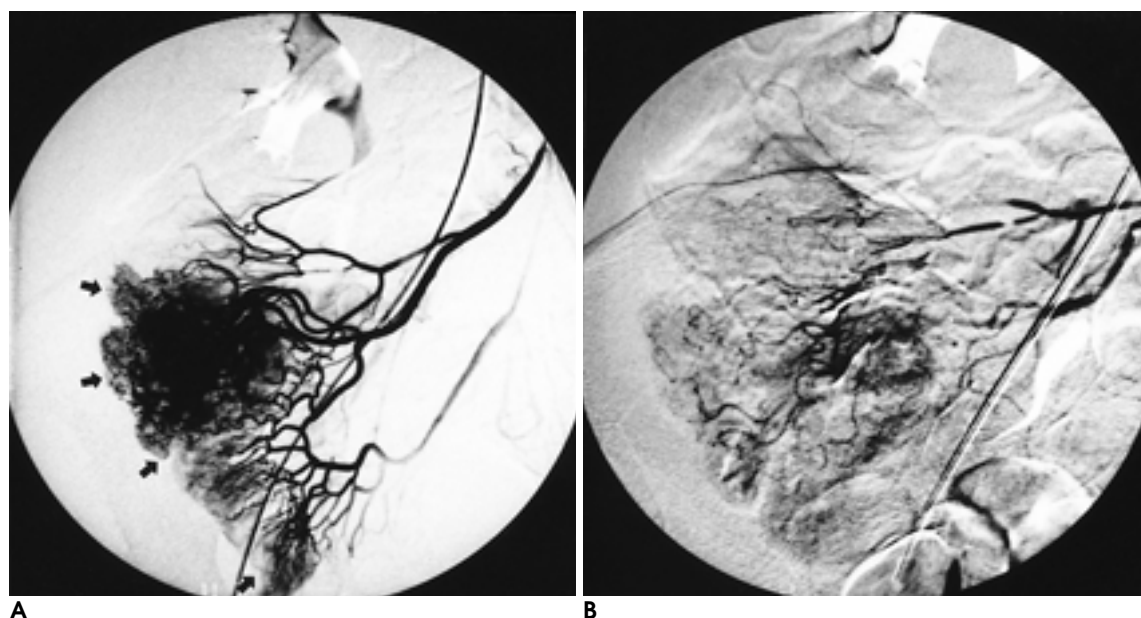, 7   ,

Fig. 1. A duodenal ulcer bleeding in 58-year-old man with failure of endoscopic therapy. The patient had coagulopathy and was transfused total 26 units of packed red blood cells, but bleeding was controlled by embolization effectively (Case 9 of Table 2).
A, B. The extravasation (arrows) is noted on the posterior pancreaticoduodenal artery from gastroduodenal artery of celiac trunk, and same branch from superior mesenteric artery.
C, D. Using microcathter with gelfoam pledgets, the bleeding vessel was embolized effectively through celiac trunk and superior mesenteric artery.

Table 1. Cases and Data of the Patients without Coagulopathy Who Were Treated with Embolotherapy

Case	Age/Sex	PT/PTT	BP	Shock	Underlying disease	Diagnosis	Total units of transfusion	Results of embolization	Outcome	Embolized artery
1	72/M	21.0/29.5	90/60	+	AGC	Cancer bleeding	21	Success		Lt. gastric
2	71/M	22.1/34.6	110/70	-	Hypertensive ICH	Stress induced gastritis	5	Success		Lt. gastric
3	70/M	24.8/32.4	100/60	-	Duodenal ulcer perforation	Postop. bleeding	14	Success		Pancreaticoduodenal Gastroduodenal, SMA
4	63/F	20.7/39.1	110/70	-	Intestinal obstruction	Postop. bleeding	10	Fail	Operation Recovery	Lt.gastric
5	62/M	22.1/38.2	100/80	-	AGC	Postop. bleeding	12	Fail	Operation Recovery	Lt. gastric
6	61/M	19.5/28.7	100/60	-	Cerebral contusion	UGI bleeding by trauma	2	Success		Gastroduodenal
7	60/F	22.2/37.6	80/60	+	GB ca.	Duodenal ulcer	11	Fail	Operation Recovery	Gastroduodenal
8	58/M	10.9/23.1	80/50	+	Esophageal ca. Chemotherapy	Gastric ulcer	21	Success		Lt. & Rt. gastric
9	56/M	19.2/27.4	100/60	-	Aangiodysplasia	Lower GI bleeding	14	Success		Ileal branch of SMA
10	56/M	11.5/26.8	110/70	-		Duodenal ulcer	7	Success		Gastroduodenal
11	55/F	10.0/25.1	80/50	+	LC, AGC	Cancer bleeding	33	Fail	Operation Expire	Lt. gastric
12	53/M	22.3/28.5	110/70	-	AGC	Cancer bleeding	10	Success		Lt. gastric
13	46/F	18.8/26.4	100/60	-	Colon cancer	Cancer bleeding	2	Success		SMA, ileocecal
14	40/M	21.2/26.4	110/70			Jejunal bleeding Inflammation	4	Success		SMA
15	37/M	18.7/27.9	100/70	-		Mallory-Weiss syndrome	3	Success		Lt. gastric
16	36/M	20.4/38.0	120/70	-		Duodenal ulcer	3	Success		Gastroduodenal

*M = Male, F = Female, PT = Prothrombin time, aPTT = Activated partial thromboplastin time, BP = Blood pressure, AGC = Advanced gastric cancer, ICH = Intracerebral hemorrhage, LC = Liver cirrhosis, + = Presence, - = Absence, ca. = Cancer, op. = Operation, Rt. = Right, Lt. = Left, SMA = Superior mesenteric artery.

Fig. 2. A tuberculous enterocolitis in 44-year-old woman with hematochezia. The patient had coagulopathy and was transfused total 24 units of packed red blood cells. this patient had undergone cecumectomy for rebleeding at last (Case 11 of Table 2).
A. The hypertrophic vasa recta with dense staining (arrows) of mucosa are noted on early arterial phase.
B. Angiogram obtained after embolization with gelfoam pledgets. There are seen a few vasa recta, which prevents bowel ischemia.

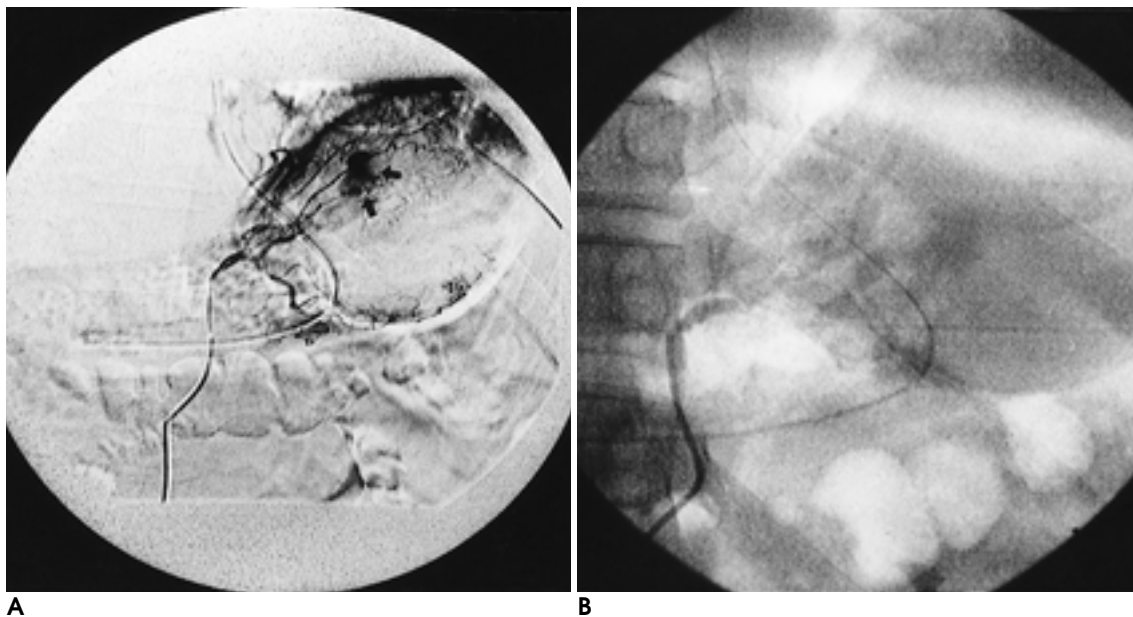**Table 2.** Cases and Data of the Patients with Coagulopathy Who Were Treated with Embolotherapy

Case	Age/Sex	PT/PTT	BP	Shock	Underlying disease	Diagnosis	Total units of transfusion	Results of embolization	Outcome	Embolized artery
1	74/F	24.5/50.0	70/50	+		Gastric ulcer	31	Fail	Expire	Lt. gastric
2	73/M	24.7/40.7	100/80	-	Colon ca.	Stress induced gastritis	33	Success		Lt. gastric
3	71/M	24.5/40.2	110/70	-	ICH	Stress induced gastritis	22	Fail	Expire	Lt. gastric
4	70/M	24.7/45.7	80/50	+		Duodenal ulcer	40	Fail	Expire	Pancreaticoduodenal Gastroduodenal, SMA
5	67/M	24.2/46.0	80/50	+	LC	Duodenal ulcer	34	Fail	Expire	Pancreaticoduodenal Gastroduodenal, SMA
6	65/M	33.5/52.2	100/80	-	RCC,LC	UGI bleeding	17	Fail	Expire	Lt. gastric
7	60/F	24.5/42.9	80/60	+	LC	Duodenal ulcer	49	Fail	Expire	Pancreaticoduodenal Gastroduodenal, SMA
8	58/M	24.8/41.6	80/60	+	LC	Duodenal ulcer	36	Fail	Expire	Pancreaticoduodenal Gastroduodenal, SMA
9	58/M	24.0/41.6	80/60	+	LC	Duodenal ulcer	26	Success		Pancreaticoduodenal Gastroduodenal, SMA
10	56/M	24.2/40.2	100/70	-		Gastric ulcer	20	Success		Lt. gastric
11	44/F	24.0/57.0	110/70	-		Tuberculous colitis	24	Fail	Operation Recovery	Ileocolic of SMA
12	44/M	24.5/42.9	100/70	-	Cholangioca.	Duodenal ulcer	16	Success		Gastroduodenal
13	42/F	24.7/47.7	110/70	-		Sarcomatous mass	28	Success		Rectosigmoid of IMA

* M = Male, F = Female, PT = Prothrombin time, aPTT = Activated partial thromboplastin time, BP = Blood pressure, ICH = Intracerebral hemorrhage, LC = Liver cirrhosis, RCC = Renal cell carcinoma, + = Presence, - = Absence, ca. = Cancer, Rt. = Right, Lt. = Left, SMA = Superior mesenteric artery, IMA = Inferior mesenteric artery.

A   **B**

Fig. 3. A Mallory-Weiss syndrome in a 37-year-old man with hematemesis. The patient did not have coagulopathy and was transfused only 3 units of packed red blood cells. Bleeding vessel was controlled with embolization (Case 15 of Table 1).
A. Left gastric angiogram shows extravasation (arrows) of the contrast material into stomach.
B. After embolization with gelfoam pledgets, left gastric artery was embolized effectively.

Table 3. Results of Embolotherapy in Gastrointestinal Bleeding with or without Coagulopathy

	Success	Failed	Total
	Case (%)	Case (%)	
Gastrointestinal bleeding			
with coagulopathy	5 (38.5)	8 (61.5)*	13
without coagulopathy	12 (75.0)	4 (25.0)	16
	17	12	

* $p < 0.05$

Table 4. Factors that May Produce Coagulopathy

	Coagulopathy	Control	Total
	Case (%)	Case (%)	
Gastrointestinal bleeding			
with underlying disease (liver cirrhosis, cancer)	7 (50%)	7 (50%)	14
with chemotherapy		1	1
with shock	6 (60%)*	4 (40%)	10
with massive transfusion	13 (59%)*	9 (41%)	22

* $p < 0.05$

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                                        (Table
1, 2).

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                            .

                                29   17
(58.6%)   12
(41.4%)   .
        29   13   (44.8%)   .
        16   12   (75%),   4   (25%)
        ,   13   5   (38.5%),

8   (61.5%)
                                                ($p <$
0.05) (Table 3).
                                            29   8
                13   7   (53.8%),   16
    1   (6.3%)

            ($p <$ 0.005).

        ,
    28.9   ,   10.6
                                                    (p
< 0.05),

        ($p < 0.05$) (Table 4).

                                                (transcatheter
embolization)
                            .
                    (collateral circulation)
                        (irreversible ischemia)
                                    (colonic infarction)
        20%   (5, 10- 12).

                ,   ,

                    ,

                                            (perfusion
pressure)   (6).

                                            .
                            ,   .

                    .

                                                    ,
        ,   (7).
                            3
                            .

                                                (13).

75%,

(7).

58.6%

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75%

(6, 7, 12),   38.5%

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(9, 14).

                                                  29

22   ,   13   .

13   7   ,

6

.   13   24   16-

49

Wilson   (15)

.   ,

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11   29   ,

12.7

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Faringer   (16)   24   10

70%

. Locker   (17)

(DIC)   (thrombogenic cell

debritus)

, PT, aPTT   .

PT, aPTT   ± 2SD

28.9

10.6

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.   29   8   13

.   7   (53.8%),   16   1   (6.3%)

.   , DIC,

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The Effect of Embolotherapy for Acute Gastrointestinal Bleeding in Patient with Coagulopathy[1]

Suk-Bin Seo, M.D., Byeong-Ho Park, M.D., Jae-Ick Kim, M.D.,
Bong-Sik Koo, M.D., Ki-Nam Lee, M.D., Kyung-Jin Nam, M.D., Yung-Il Lee, M.D.

[1]*Department of Diagnostic Radiology, College of Medicine, Dong-A University*

Purpose: To analyse the causes of coagulopathy and determine the effect of embolotherapy on acute gastrointestinal (GI) bleeding coexisting with coagulopathy.

Materials and Methods: Between June 1991 and December 1998, 29 patients with acute GI bleeding (M:F = 21:8, mean age, 57.8 years) underwent percutaneous embolotherapy and immediate cessation of bleeding was confirmed. The patients were divided into two groups: control (n = 16) and those with coagulopathy (n = 13), group membership being determined according to the criteria of $> \pm$ 2SD of normal prothrombin time (PT) and activated partial thromboplastin time (aPTT) (PT $>$ 23 seconds, aPTT $>$ 40 seconds) at the time at which embolization was requested. Embolotherapy was, defined as clinically successful, if the patient was stable for at least three days, without bleeding, after technically successful embolization. The clinical success rate of embolization and the mortality rate were compared between the two groups, and the causes of coagulopathy statistically analysed.

Results: The clinical success rate of embolization was 75% (n = 12) in the control group, compared with 38.5% (n = 5) in the coagulopathic group ($p < 0.05$), while the mortality rate for the two groups was 6.3% (n = 1) and 53.8% (n = 7), respectively ($p < 0.005$). Statistically, massive transfusion and sustained shock before embolization were the causes of coagulopathy ($p < 0.05$).

Conclusion: In coagulopathic patients with acute GI bleeding, embolotherapy induces transient bleeding control, but is unlikely to save lives.

Index words : Gastrointestinal tract, hemorrhage
Arteries, therapeutic embolization

Address reprint requests to : Byeong-Ho Park, M.D., Department of Diagnostic Radiology, Dong-A University of College of Medicine
1, 3-Ga Dongdaeshin-Dong, Seo-Ku, Pusan 602-715, Korea.
Tel. 82-51-240-5368   Fax. 82-51-253-4931

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