

Hemoclip Treatment for Post-endoscopic Sphincterotomy Bleeding

Lien-Fu Lin
Chuan-Pau Siau
Ka-Sic Ho
Jai-Nien Tung

Division of Gastroenterology, Department of Internal Medicine, Wuchi Tung's Taichung Metroharbor Hospital, Taichung, Taiwan, R.O.C.

Key Words

bleeding;
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Background. The incidence of bleeding after endoscopic sphincterotomy (EST) ranges from 2%-12.1%. Endoscopic treatments include injection and thermal therapy, which can have recurrent bleeding and potential complications of chemical and thermal injuries. There is only 1 case report of post-EST bleeding managed by hemoclipping in the literature. Treatment of post-EST bleeding with hemoclip is reported in this study.

Methods. From March 1999 to May 2003, a retrospective analysis of 162 cases of EST was made. Nine cases (5.5%) of post EST bleeding, 7 male and 2 female patients, with a mean age of 58 ± 16 (37-82) years, were treated with hemoclipping. Four cases of recurrent bleeding were treated with secondary clipping when previous local epinephrine injection was ineffective, and the remaining 5 cases were managed with primary hemoclipping.

Results. Six cases were of major bleeding; 3 needed blood transfusion (mean: 7.3 units: 6-8 units) and 3 had a reduction of hemoglobin > 2 g/dL but without blood transfusion. The location of bleeder was 5 on the left side, 2 on the right side and 1 in both flaps of post-EST papilla. The median clips used were 2 (1-7), and the median missed clips were 0.5 (0-3). The success rate hemostasis was 88.8%, including 4 recurrent major bleeding after previous local epinephrine injection. Some technical difficulties were encountered. The failed case that underwent operation was due to total inability to get a visual field because of massive bleeding. There were no complications related to hemoclipping.

Conclusions. Hemoclipping can be an alternative method for hemostasis in post-EST bleeding.

The reported incidence¹⁻⁵ of bleeding after endoscopic sphincterotomy (EST) is 2%-12.1% from the literature. Endoscopic treatments include injection and thermal therapy. Injection agents consist of epinephrine, alcohol, polidocanol and fibrin,^{2,3,6,7} and thermal therapy includes electrocoagulation⁸ and argon plasma coagulation (APC).^{9,10} Hemostasis by local epinephrine injection can have a recurrence of bleeding, whereas sclerosing agent injection and thermal applications have potential complications of chemical and thermal injuries. There is only a single case report of post-EST bleeding managed by hemoclipping in the literature.¹¹ Thereby we report our experience of hemoclip placement for hemostasis in post-EST bleeding, including cases of recurrent post-EST bleeding that were treated with local epinephrine injection previously.

METHODS

From March 1999 to May 2003, a retrospective analysis of 162 cases of EST was made. Nine cases (5.5%) of post-EST bleeding, 7 male and 2 female patients, with a mean age of 58 ± 16 (37-82) years, were treated with hemoclipping. There were 8 cases of immediate bleeding which were defined as active bleeding at the time of EST and 1 delayed bleeding recognized 12 hours later presenting as bloody stool. Six cases were major bleeding, which were defined as a reduction of hemoglobin > 2 g/dL, or blood transfusion of $> 1,000$ mL, or needing surgery. Of nine cases, secondary clipping was performed in 4 cases of recurrent bleeding that were treated previously with local epinephrine injection. Primary clipping was performed in subsequent 5 cases: 4 of immediate bleeding at

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Correspondence to: Lien-Fu Lin, MD, 11th Floor, No. 8, Lane 168, Sec. 2, Mei Tsun Road, Taichung 402, Taiwan.

Tel:+886-4-2260-6161; Fax:+886-4-2260-6161; E-mail: lienfu42@ms10.hinet.net

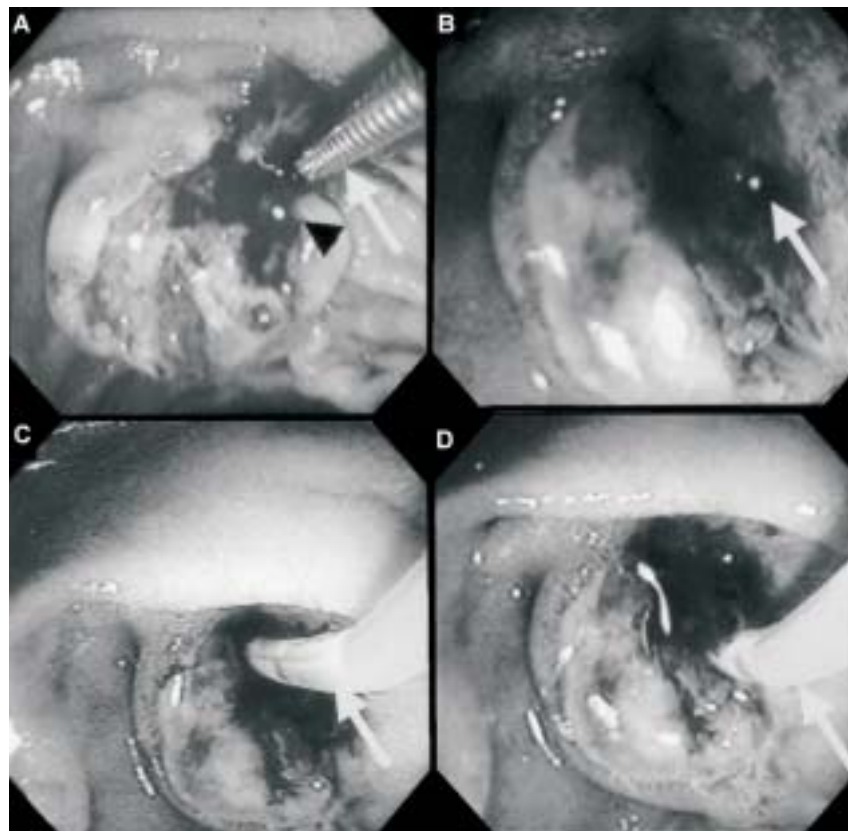


Fig. 1. (A) Active bleeding with visible vessel (arrow head) at the time of EST, which was treated with local epinephrine injection (arrow); (B) Recurrent bleeding after 2 days, with a visible vessel (arrow); (C) Catheter pointing in the direction of the common bile duct; (D) Catheter pointing in the direction of the pancreatic duct.



Fig. 2. Clipping (arrow) for the visible vessel near the edge of the flap of the previous case shown in Fig. 1.

the same time of endoscopic sphincterotomy when there was persistent active bleeding or visible vessel after local

epinephrine injection and 1 delayed bleeding. Primary clipping was defined as clipping at first endoscopic hemostasis procedure. Endoscopic hemostasis was performed with duodenoscope (TJF 240, Olympus Optical Co., Ltd., Tokyo, Japan) and hemoclip device (Olympus HX-5QR-1, MD-850, MD-859 clip). The procedures of hemoclipping were as follows: local epinephrine injection in cases with active bleeding, removal of the adherent clot with forceps if present and clipping of the bleeder (Figs. 1 and 2). In cases where the bleeding site was on the right flap, the clipping was done as close to the edge of the flap as possible to avoid injury to the pancreatic duct (Fig. 2).

RESULTS

The results are shown in Table 1. Six cases were of major bleeding: 3 needed blood transfusion (mean: 7.3 units: 6-8 units) and 3 had a reduction of hemoglobin > 2

Table 1. Demographics and results of hemoclipping

Age	Sex	Bleeding			Prior epinephrine	Shock	HB gm/dL		Blood transfusion	Location of flap	No. of clips		Clip	
		Immediate	delayed	recurrent			initial	later			loss	success		
54	M	+			+		13	9	8U	Failure and operation			-	
82	F		+		-	+	13	9.7	8U	Left	7	3	+	
57	F	+		+	+		13.4	11.4		Right	1	0	+	
50	M	+		+	+		13.5	10.5		Right	2	0	+	
37	M	+		+	+		14.5	9.4	6U	Left	5	1	+	
70	M	+		+	+		11.6	9.6		Left	1	0	+	
49	M	+			+		14	13		Both	2	1	+	
79	M	+			+		11.7	11.1		Left	2	0	+	
42	M	+			+		13.5	13		Left	1	3	+	

g/dL but without blood transfusion. The location of bleeder was 5 on the left side, 2 on the right side and 1 in both flaps of post-EST papilla. The median clips used were 2 (1-7), and the median missed clips were 0.5 (0-3). The success rate of hemostasis was 88.8% (8/9 cases) including 4 recurrent major bleeding after previous local epinephrine injection. Some technical difficulties were encountered. There were no recurrent bleedings nor any immediate or late complications related to hemoclipping.

The only failure was due to inability to locate the bleeder despite all efforts including epinephrine injection around the incised papilla and H₂O₂ irrigation as a result of massive bleeding. The patient was a case of diabetes mellitus and uremia, and he underwent operation.

DISCUSSION

Endoscopic hemostasis for post-EST bleeding includes injection and thermal therapy. The most commonly used agent for injection is epinephrine; the mechanisms of hemostasis are tamponade and vasoconstrictive effects. *Leung et al.*² injected about 0.3 mL of 1:10,000 diluted epinephrine around the post-EST bleeding point using a sclerosing injection needle, whereas *Kim et al.*³ injected alcohol in addition to epinephrine in patients with exposed vessels. They have a recurrent rate of bleeding from 11%-28.5%.^{2,3} Sclerosing agent injection¹²⁻¹⁶ has been reported to produce extensive necrosis of gastric mucosa and even mortality complications due to chemical injuries. Thermal applications^{10,17} include electrocoagulation, and argon plasma coagulation. Nine cases of post-EST

bleeding treated with electrocoagulation with 25% recurrence of bleeding, and 2 cases of refractory post-EST bleeding managed by endoscopic argon plasma coagulation have been reported. But potential complications of thermal injuries of necrosis and perforation are present.⁹

*Hayashi et al.*¹⁸ first described hemoclipping as a therapeutic endoscopic maneuver in Japan, and with improvements in the design of the applicator device, hemoclipping has been used in various conditions. It has been widely used to control gastrointestinal bleeding,¹⁹ but there has only 1 case report of hemostasis by hemoclip in post-EST bleeding.¹¹ Some experts have different opinions on using hemoclip for post-EST bleeding.²⁰

In our series, we had 6 cases belonging to major bleeding, and 3 needed blood transfusion. We had a success rate of 88.8% with hemoclipping in post-EST bleeding, including 4 recurrent bleeding after previous local epinephrine injection. Recurrent bleeding in these 4 cases might be due to the disappearance of vasoconstrictive effect of epinephrine. If the bleeder can be clipped accurately, then hemostasis is more certain. As the pancreatic duct lies in the direction of 3 o'clock position, for clipping on the right flap of the post-EST papilla, we try to clip the bleeder as close to the edge of the flap as possible to avoid injury to the pancreatic duct. There are controversial points in hemoclipping for post-EST bleeding owing to the technical difficulties.²⁰ We did find some technical difficulties in the procedure, namely missed clipping, as our median clips loss were 0.5(0-3). The other technical problem was difficulty in closing the clip when the elevator was fully elevated with short route position of the endo-

scope, due to the tension created by the elevator on the clipping device. This problem could be overcome by using a semi-long route position of the endoscope and with elevator slightly released. The failed case was due to massive bleeding leading to a poor visual field for the location of the bleeder.

In summary, hemoclipping for post-EST bleeding is an alternative method of endoscopic hemostasis.

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