

Endoscopic Treatment of Bleeding Peptic Ulcers

Panagiotis Katsinelos, MD, PhD

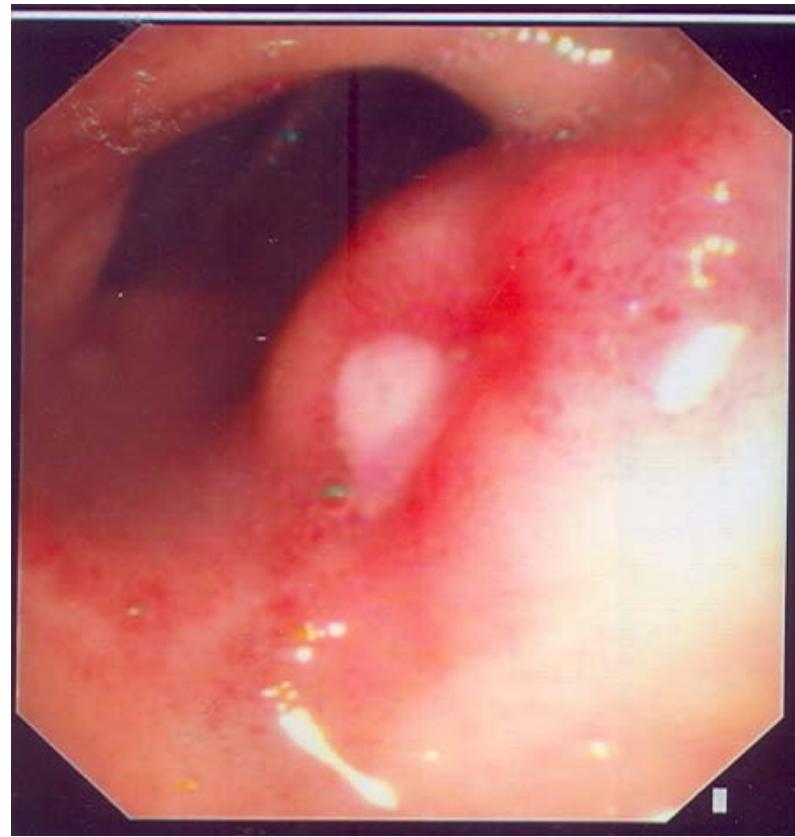
Department of Endoscopy and Motility Unit
G. Gennimatas General Hospital of Thessaloniki

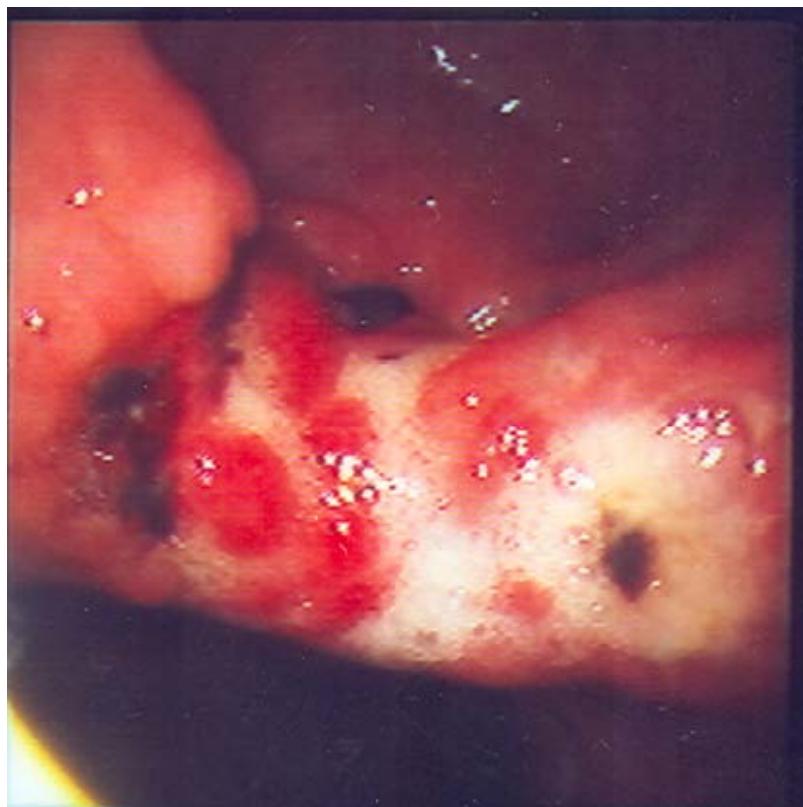
Endoscopic diagnosis for UGI bleeding in 2225 patients

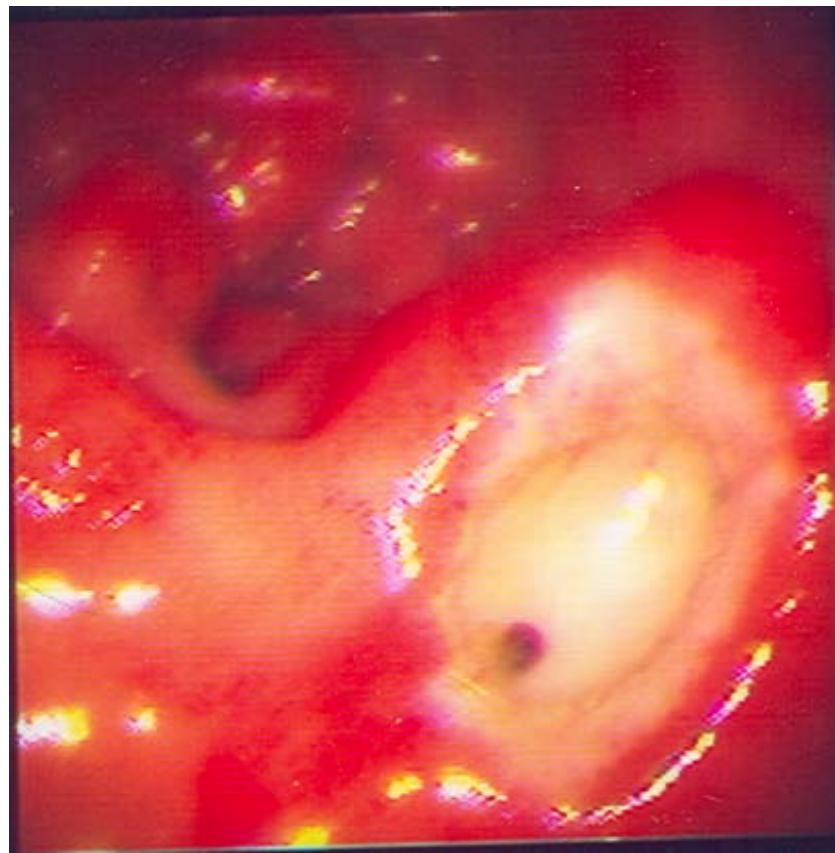
Diagnosis	Frequency (%)
<i>Duodenal ulcer</i>	24.3
<i>Gastric erosions</i>	23.4
<i>Gastric ulcer</i>	21.3
<i>Varices</i>	10.3
<i>Mallory-Weiss tear</i>	7.2
<i>Esophagitis</i>	6.3
<i>Erosive duodenitis</i>	5.8
<i>Neoplasm</i>	2.9
<i>Stomal ulcer</i>	1.8
<i>Esophageal ulcer</i>	1.7
<i>Miscellaneous</i>	0.8

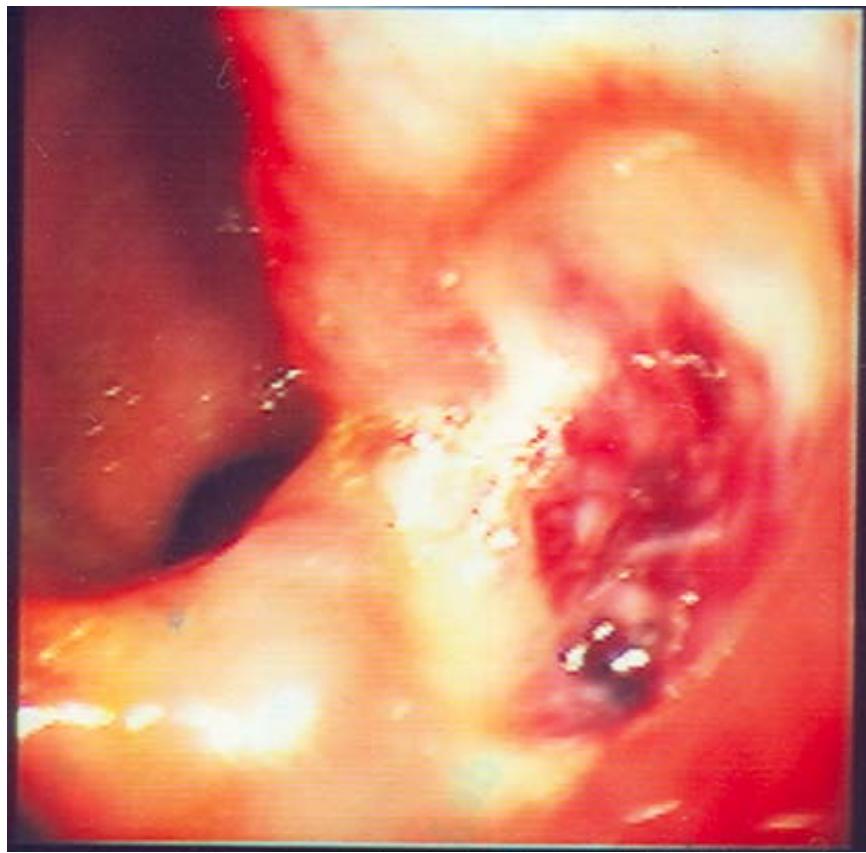
Risk of recurrent bleeding by endoscopic criteria

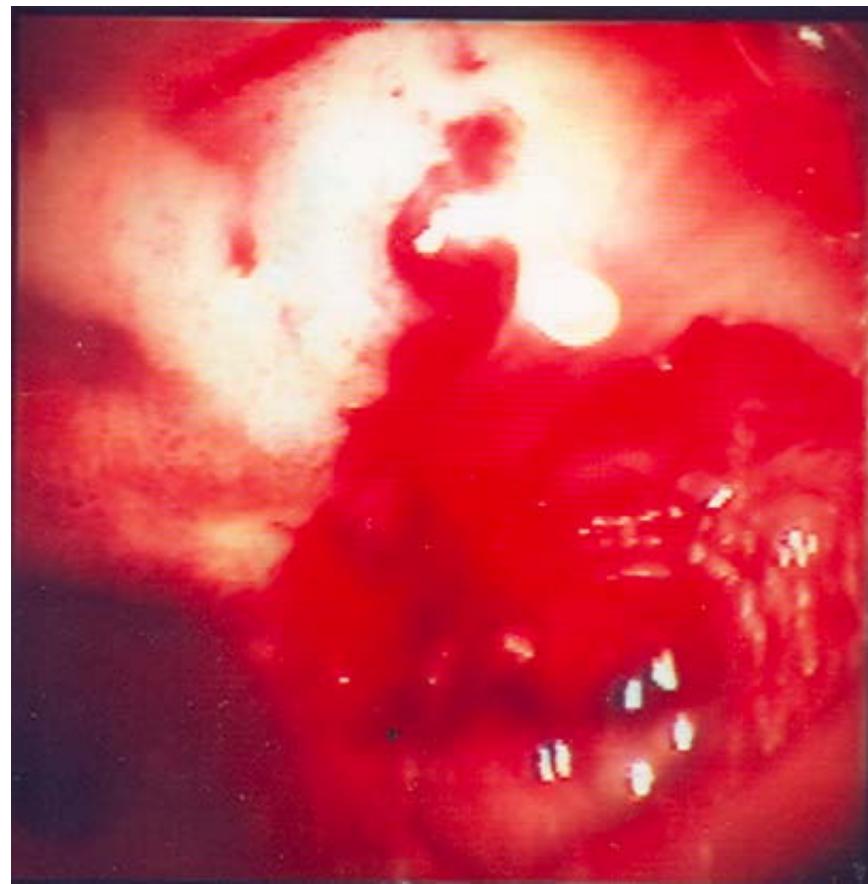
Endoscopic finding	Risk of recurrent bleeding (%)	Mortality (%)
<i>Active bleeding</i>	55	11
<i>Visible vessel</i>	43	11
<i>Adherent clot</i>	22	7
<i>Flat spot</i>	10	3
<i>Clean base</i>	5	2

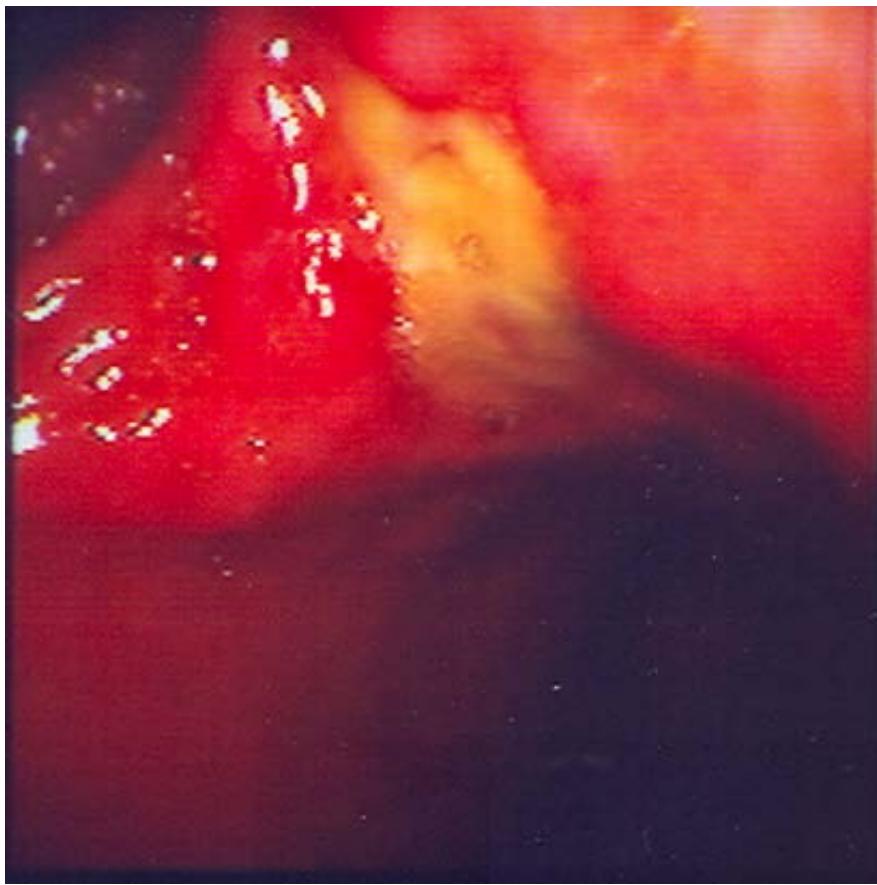








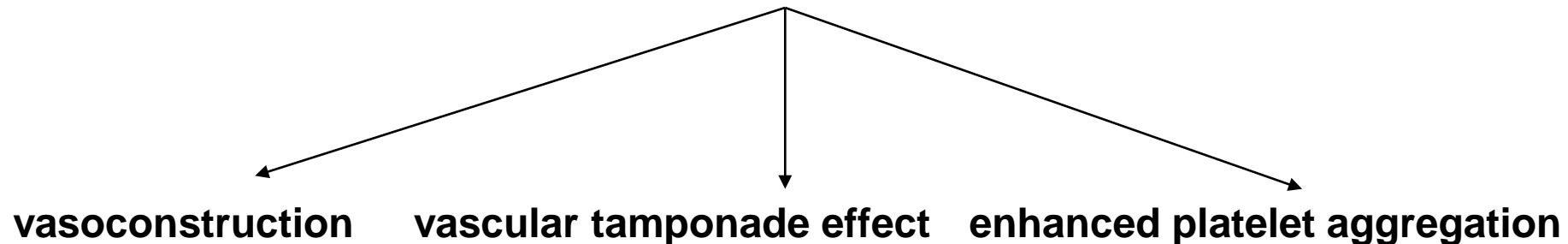




Recommendations for endoscopic stigmata

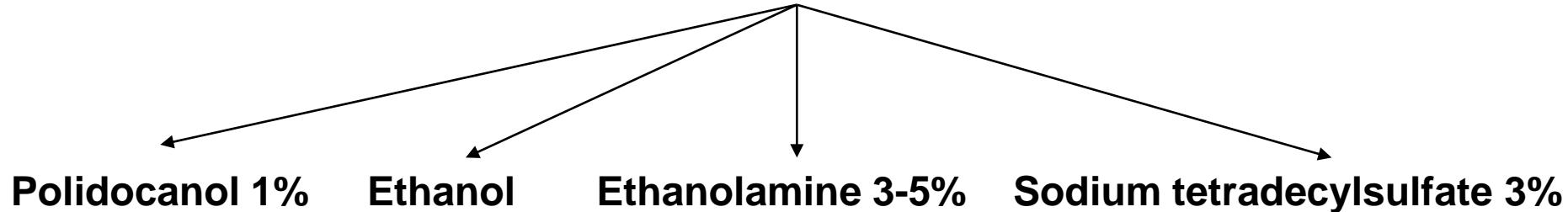
- Arterial spurting: combination therapy, injection followed by coaptive coagulation or clipping
- Nonbleeding visible vessel: monotherapy or combination therapy
- Active oozing from focal spot in ulcer base: monotherapy, injection or coaptive coagulation
- Adherent clot: combination therapy, injection followed by clot removal, then coaptive coagulation
- Pigmented flat spot or clean based ulcer: no therapy
- Stigmata of recent hemorrhage and patient with coagulopathy: monotherapy or combination therapy followed by clipping or clipping alone

Mechanism of epinephrine's action



Epinephrine solution (1:10000-1:100000)
Usual injection volume: 15 to 25 ml

Sclerosants



Usual dose: small aliquots of 0.1-0.2ml=2-5ml

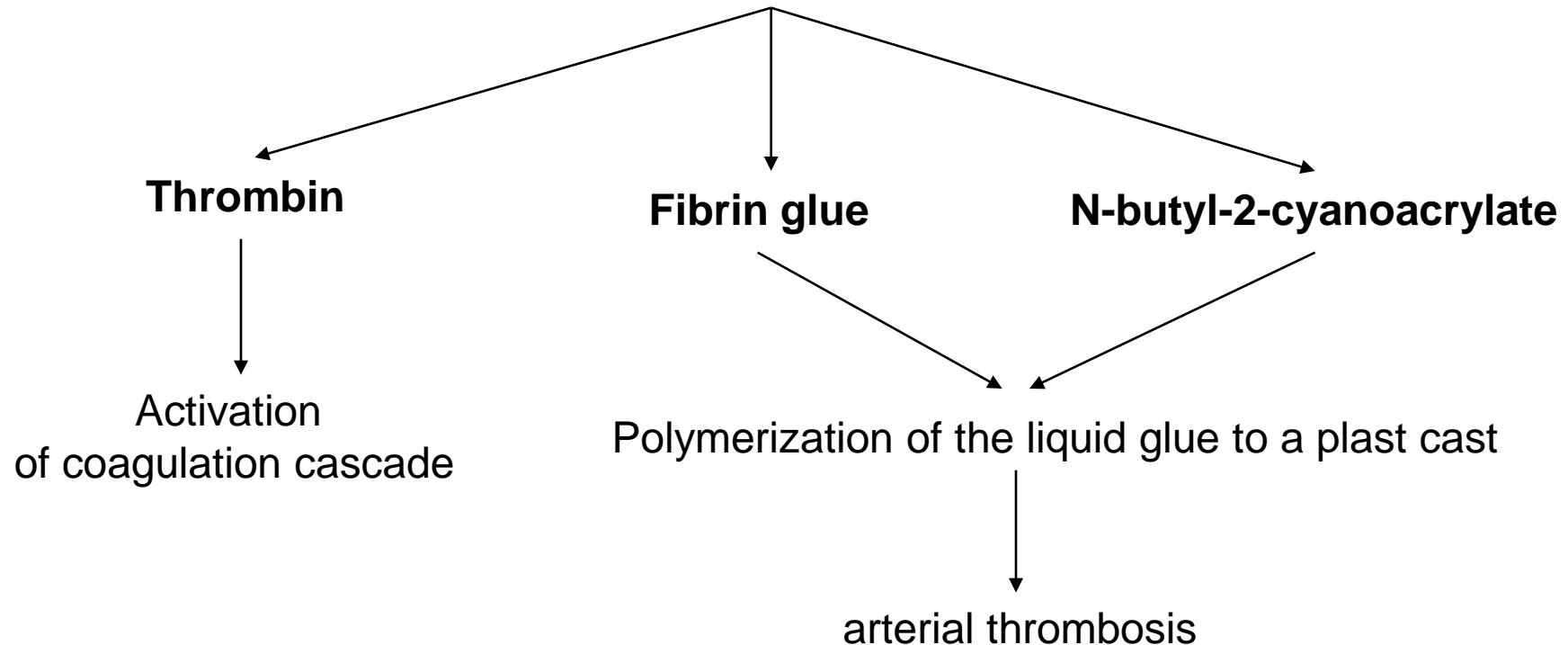
Mechanism of sclerosant's action

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graph TD; A[Mechanism of sclerosant's action] --> B[Desiccation of vascular structures and adjacent tissues]; A --> C[arterial thrombosis]
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Desiccation of vascular structures and adjacent tissues

arterial thrombosis

Tissue adhesives



Heater probe

- The larger (10Fr) probe is preferred
- Firm tamponade must be applied
- Three to four 30J pulses should be delivered before changing position
- The endpoint of treatment is a “footprint” or “cavitation” at the site of the vessel

Multipolar electrocoagulation

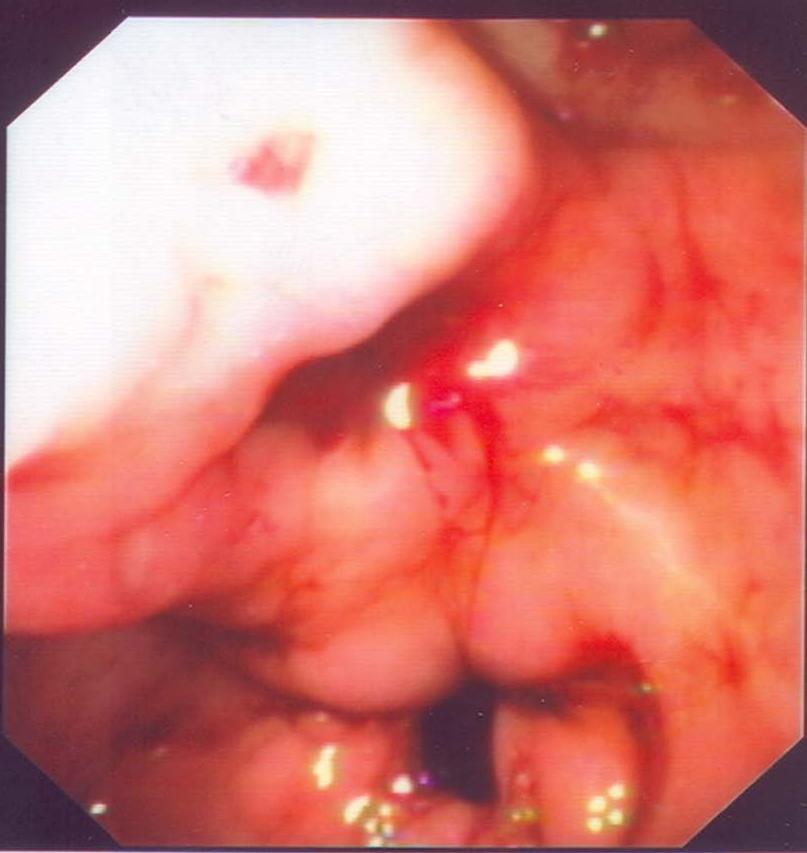
- Forceful tamponade
- Large (3.2mm) probe
- Low (15-25) watt setting
- Sustained period of application of up to 10-14 2-second pulses

Endoclips

Mechanism of action is mechanical closure of the bleeding vessel

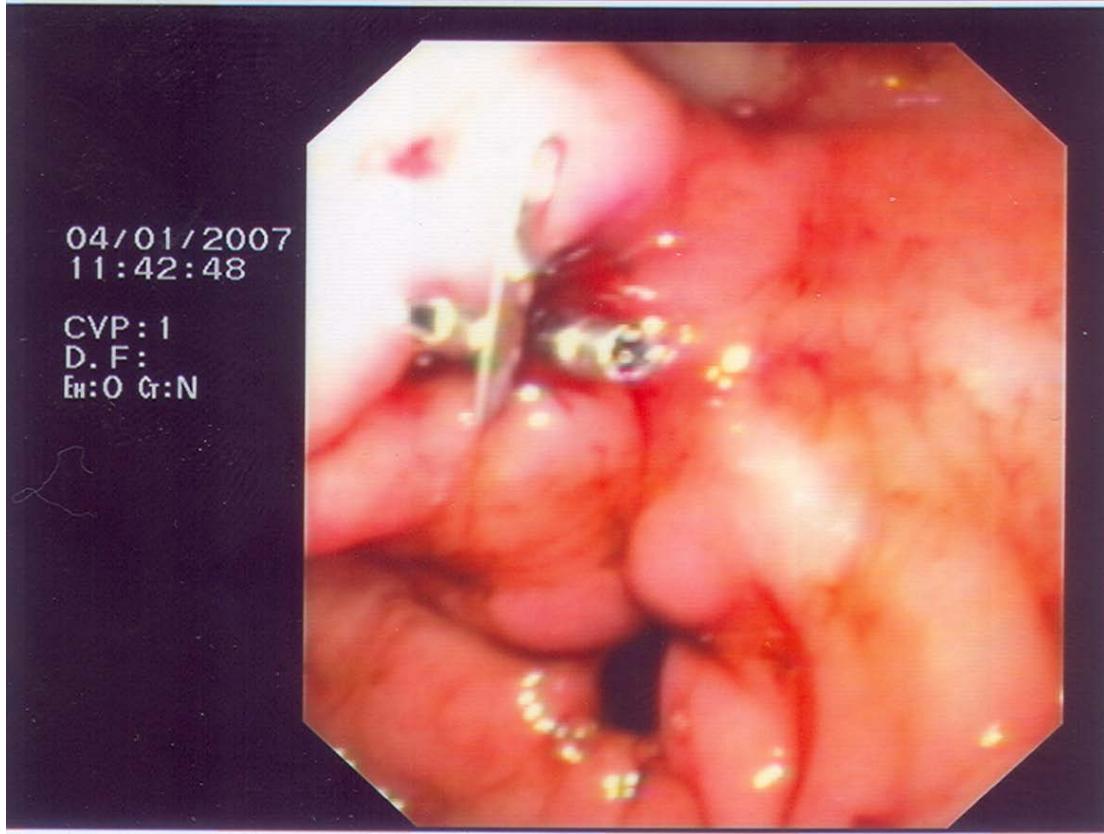
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Summary of various injection therapies in the treatment of bleeding peptic ulcer

Injection therapy	Acute hemostasis (%)	Recurrent bleeding (%)
<i>Epinephrine</i>	80-100	6-36
<i>Distilled water or saline solution</i>	76-98	7-29
<i>Ethanol</i>	83-100	6-29
<i>Sodium tetradecylsulfate</i>	80-90	7-25
<i>Thrombin</i>	86-97	4-15
<i>Fibrin glue</i>	92-100	11-22
<i>N-butyl-2-cyanoacrylate</i>	95	12
<i>Combination epinephrine therapy</i>	97.6	10.6

Randomized studies on injection therapy with sclerosant solutions for bleeding ulcers

Author	N	Agent(s)	Rebleeding rate (%)	
			Treatment	Control
Chung et al	68	Adrenaline	15	41
Panes et al	113	Adrenaline+polidocanol	5.5	43.1
Raigopal et al	109	Adrenaline+ethanolamine 3%	12.5	47
Oxner et al	93	Adrenaline+ethanolamine 5%	16.7	46

p<0.05 for all groups

Randomized studies comparing adrenaline alone with double agents for endoscopic injection for bleeding peptic ulcers

Author	N	Agent(s)	p
<i>Chung et al</i>	200	<i>Adrenaline</i> vs. <i>adrenaline+STD</i>	NS
<i>Villaneuva et al</i>	63	<i>Adrenaline</i> vs. <i>adrenaline+polidocanol</i>	NS
<i>Choudari et al</i>	100	<i>Adrenaline</i> vs. <i>adrenaline+ethanolamine</i>	NS

Thermal devices in endoscopic hemostasis of bleeding peptic ulcers

Author	N	Device	Rebleeding rate (%)		p
			Treatment	Control	
Laine et al	44	<i>Multipolar electrocoagulation</i>	10	87	<0.0001
Laine et al	75	<i>Multipolar electrocoagulation</i>	18	41	<0.005
Jaramillo et al	101	<i>Heater probe</i>	10	26	0.003
Matthewson et al	143	<i>Laser vs. heater probe</i>	20 vs. 28	42	0.005
Hui et al	91	<i>Laser vs. heater probe vs. bipolar electrocoagulation</i>	10 vs. 19.4 vs. 10		NS

Studies on endoclipping of bleeding peptic ulcers (hemoclips injection vs. injection)

Table 1. Studies on endoclipping of bleeding peptic ulcers. Hemoclips ± Injection vs Injection

Study	Treatment	Type of study	N	Clip type	Acid suppression	Primary hemostasis	Rebleeding	Transfusion (units)	Hospital stay (d)	Surgery/Embolization	Mortality rate related to bleeding	
Chung 1999 ¹	Clips (n=41)	RCT	124	Hemo clip	H2	97.6%	2.4%	7	NA	4.9%	2.4%	
	Hypertonic saline+epinephrine (n=41)				H2	95.1%	14.6%		8	NA	14.6%	
	Combination (n=42)				H2	97.6% NS	9.5% NS					
Nagayama 1999 ²	Clips (n=100)	Retrospective	191	Hemo clip	H2 or PPI	96%	15%	4.1	19.9	NA	2%	
	Ethanol (n=91)					96%	29%		6.2	27.7	NA	3.2% NS
Buffoli 2001 ³	Epinephrine (n=54)	Retrospective	99	Hemo clip	H2	96.3%	16.6%	2.4	16.5	7.4%	0%	
	Clips+epinephrine (n=45)				H2	100%	4.4%		2.6	16.3	0%	0% NS
						NS	NS					
Gevers 2002 ⁴	Clips (n=35)	RCT	101	Hemo clip	H2	63%	20%	4.6	NA	NA	0%	
	Epinephrine+polidocanol (n=34)				H2	85%	6%		4.9	NA	NA	0% NS
	Combination (n=32)				H2	75% NS	15% NS					
Shimoda 2003 ⁵	Ethanol (n=42)	RCT	126	Hemo clip	H2	100%	14.3%	331±77ml	NA	0%	0%	
	Clips (n=42)					100%	9.5%		274±54ml	NA	0%	0% NS
	Combination (n=42)					100% NS	7.1% NS					
Chou 2003 ⁶	Clips (n=39)	RCT	79	Hemo clip	H2	100%	10.3%	NA	9.3	5.1%	2.6%	
	Water (n=40)					97.5% NS	28.2% p=0.04					
Park 2004 ⁷	Clips+epinephrine (n=23)	RCT	68	Hemo clip	H2	95.7%	8.7%	NA	NA	4.3%	0%	
	Epinephrine (n=45)					97.8% NS	20.5% NS		4.1	11	4.4% NS	
Ljubicic 2004 ⁸	Clips ± epinephrine (n=31)	RCT	61	Hemo clip	H2 or PPI	96.8%	6.5%	1387ml	13.2	3.2%	3.2%	
	Polidocanol + epinephrine (n=30)					96.7%	13.3%		1282ml	11.9	3.3%	0% NS
						NS	NS					
Chua 2005 ⁹	Clips+epinephrine (n=91)	Controlled	293	Hemo clip	H2 or PPI	100%	11%	NA	NA	1.1%	0% NS	
	Epinephrine (n=202)					98.5% NS	4% NS					

Studies on endoclipping of bleeding peptic ulcers (hemoclips vs. thermocoagulation)

Table 2. Studies on endoclipping of bleeding peptic ulcers. Hemoclips vs thermocoagulation

Study	Treatment	Type of study	N	Clip type	Acid suppression	Primary hemostasis	Rebleeding	Transfusion (units)	Hospital stay (d)	Surgery/Embolization	Mortality rate related to bleeding
Cipolletta 2001 ¹¹	Clips (n=56)	RCT	113	Hemoclip	H2	89%	1.8%	3	6	4%	3.6%
	Heater probe (n=57)					86%	21%	4	7	7%	3.5%
						NS	p<0.05	p<0.05	p<0.05	NS	NS
Lin 2002 ¹²	Clips (n=40)	RCT	80	Hemoclip	PPI	85%	8.8%	750±129ml	8.3%	5%	0%
	Heater probe (n=40)					100%	5%	713±197ml	8.8%	2.5%	0%
Lin 2003 ¹³	Clips (n=46) Heater probe + epinephrine (n=47)	RCT	93	Hemoclip	PPI	95.1%	10.3%	760±132	8.3	0%	0%
						100%	6.4%	720±124	8.7	4.7%	0%
						p=0.01	NS	NS	NS	NS	NS
Saltzman 2005 ¹⁴	Clips (n=26)	RCT	47	Hemoclip	PPI	100%	15.4%	4	4	11.5%	0%
	Bipolar + epinephrine (n=21)					95.2%	23.8%	5	4	4.7%	0%
						NS	NS	NS	NS	NS	NS

Various studies on endoclipping of bleeding peptic ulcers

Table 3. Various studies on endoclipping of bleeding peptic ulcers.

Study	Treatment	Type of study	N	Clip type	Acid suppression	Primary hemostasis	Rebleeding	Transfusion (units)	Hospital stay (d)	Surgery/Embolization	Mortality rate related to bleeding
Ohta 2003 ¹⁵	Clips (n=44)	Prospective	44	Hemoclip		100%	15.9%	NA	NA	9%	0%
Goto 2002 ¹⁶	Clips+epinephrine (n=9)	Prospective	22	Hemoclip	H2	100%	0%	1620ml	8	0%	0%
	Clips (n=13)					92.3% NS	0% NS	962ml p<0.05	7.8 NS	7.7% NS	0% NS
Lee 2002 ¹⁷	Clips (n=20) Heater probe + epinephrine (n=30)	Prospective	50	Hemoclip	H2 or PPI	100% 100%	5% 33.3%	2.04 2.36	7.2 9.8	0% 6.7%	0% 6.7%
Lai 2000 ¹⁸	Clips (n=40)	Prospective	40	Hemoclip	H2	95%	7.5%	NA	NA	5%	2.5%
Binmoeller 1993 ¹⁹	Clips (n=27)	Prospective	27	Hemoclip	Yes	100%	14.8%	NA	NA	3.7%	NA

Effectiveness of omeprazole in peptic ulcer bleeding

Author	N	Endoscopic therapy	Omeprazole	Control	p
<i>Lau et al</i>		+	15/120(7%)	24/120(23%)	0.001
<i>Sung et al</i>		+	0/78(%)	7/78(7%)	0.01
<i>Hassegren et al</i>		+	12/159(%)	26/163(17%)	NS
<i>Shoffalitzky de Muckadell et al</i>		+	20/111(18%)	37/118(25%)	NS
<i>Lin et al</i>		+	0/50(0%)	8/50(16%)	0.01

Second – look endoscopy

- Routine second-look endoscopy in all patients is not recommended
- It may be justified in selected high-risk patients

Dealing with recurrent bleeding

- Primary hemostasis → 95%
- Rebleeding → 10-20%
- Mortality → 4-10%
- Recurrent bleeding after a second intervention should initiate plans for alternative interventions

Author	No of patients	Therapy		Hemostasis		Complications
		<i>Endoscopy</i>	<i>Surgery</i>	<i>Endoscopy</i>	<i>Surgery</i>	
Lam et al	90	48	42	35/48	42/42	14.6% vs. 34.4%

Thank you very much for your attention