



# *Complicanze dell'endoscopia digestiva: l'emorragia*

**Raffaele Manta**

U.O. Endoscopia Digestiva

Ospedale Santa Maria della Misericordia

Azienda Ospedaliera Universitaria di Perugia



## DICHIARAZIONE DI ASSENZA DI CONFLITTO DI INTERESSI

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Ai sensi e per gli effetti dell'art.53, comma 14, del d.Lgs. 165/2001,

il sottoscritto MANTA RAFFAELE nato a Potenza (PZ) il 16-07-72 e residente in Perugia (PG), Codice Fiscale MNTRFL72L16G942F  
DICHIARA

sotto la propria responsabilità ed in piena conoscenza della responsabilità penale prevista per le dichiarazioni false dall'art. 76 del D.P.R. 445/2000 e dalle disposizioni del codice penale e dalle leggi speciali in materia ai sensi degli articoli 46 e 47 del D.P.R. 445/2000:

- **L'insussistenza di situazioni, anche potenziali, di conflitto di interesse, ai sensi della normativa vigente**
- di aver preso piena cognizione del DPR 16 aprile 2013, n. 62 (Regolamento recante codice di comportamento dei dipendenti pubblici) e delle norme in esso contenute.

Udine, 26/09/2019

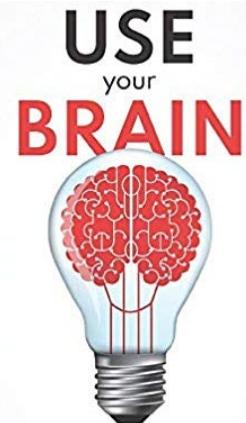
## 1. How to prevent? 1. How to manage?

- Why
- Why



## 2. How to

- Which is the best timing for endoscopy
- Which is the best treatment



**Insieme di azioni finalizzate ad  
impedire e/o ridurre il verificarsi  
di eventi indesiderati**

(...ex Wikipedia)

## Rewind



To prevent...is better

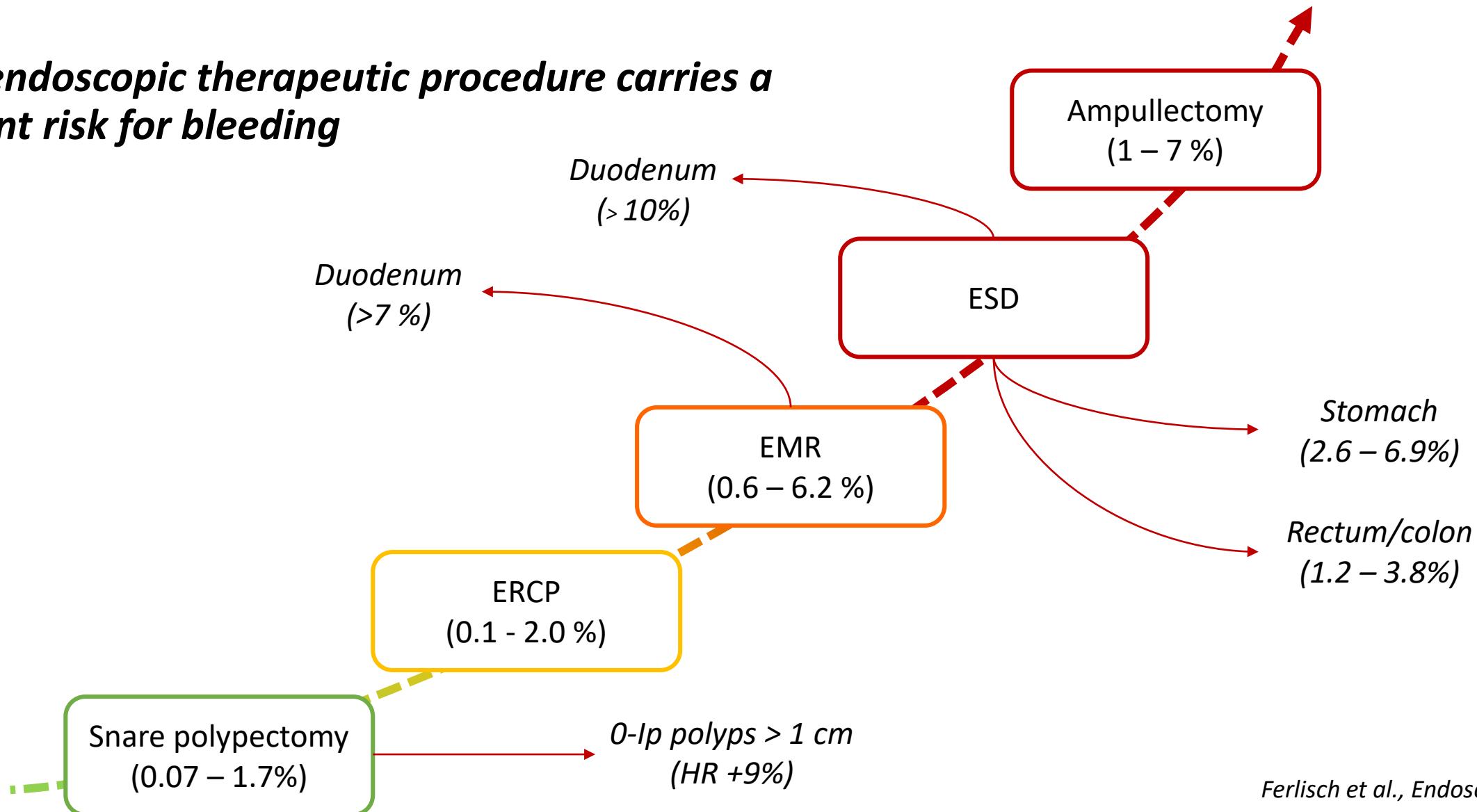


than to care !

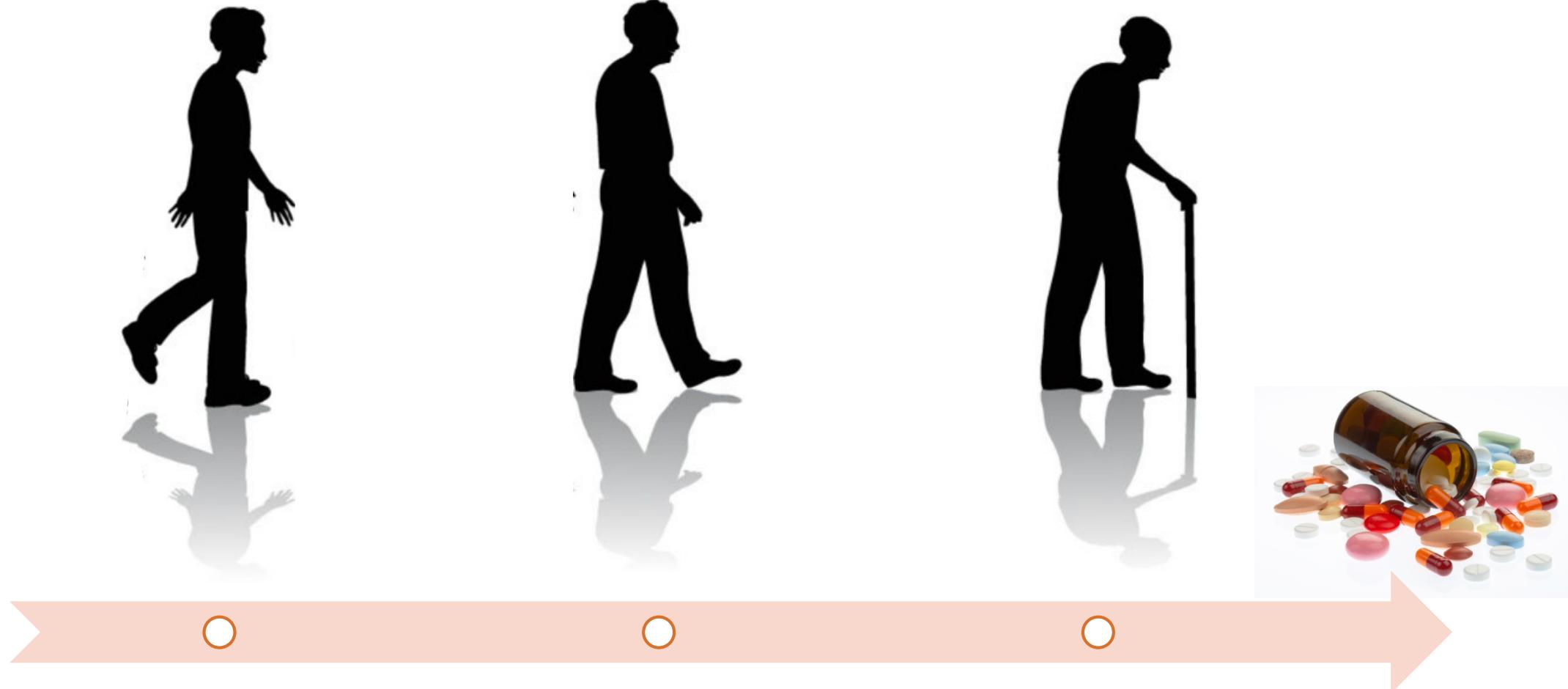


# Risk for bleeding: giving some numbers...

***Every endoscopic therapeutic procedure carries a different risk for bleeding***

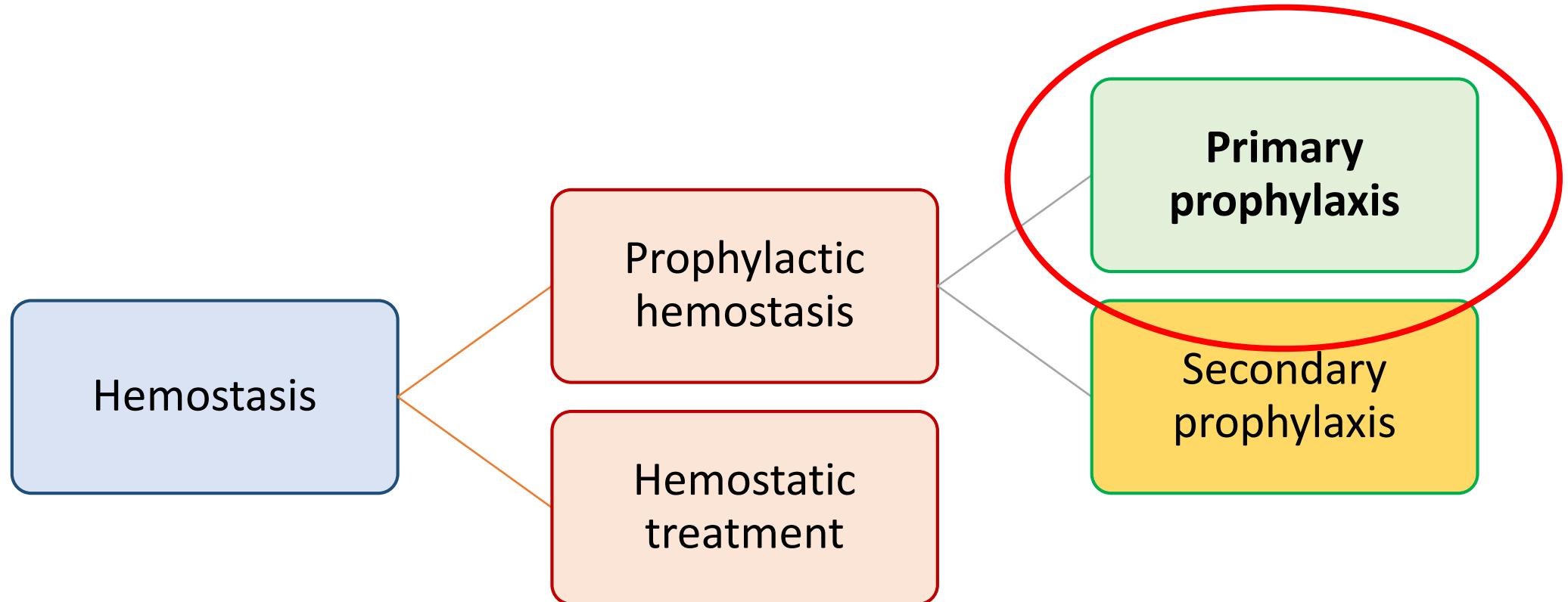


# Risk for bleeding: not all the patients are the same...



***More drugs***  
***More comorbidities***

# Endoscopic Hemostasis



# How to prevent bleeding

Primary prophylaxis

## ***Before the endoscopy***

- Oral anticoagulant therapy must be stopped according to cardiologist
- < 1 cm polyp resection in DAPT was associated with RR for bleeding of 2.54 (1.68 – 3.84)
- Discontinue anti-thrombotic therapy (if possible) when «dangerous» ablation is required

Endoscopy in patients on antiplatelet or anticoagulant therapy, including direct oral anticoagulants: British Society of Gastroenterology (BSG) and European Society of Gastrointestinal Endoscopy (ESGE) guidelines

**Follow guidelines!!**



# How to prevent bleeding

Primary prophylaxis

## *During endoscopic resection*

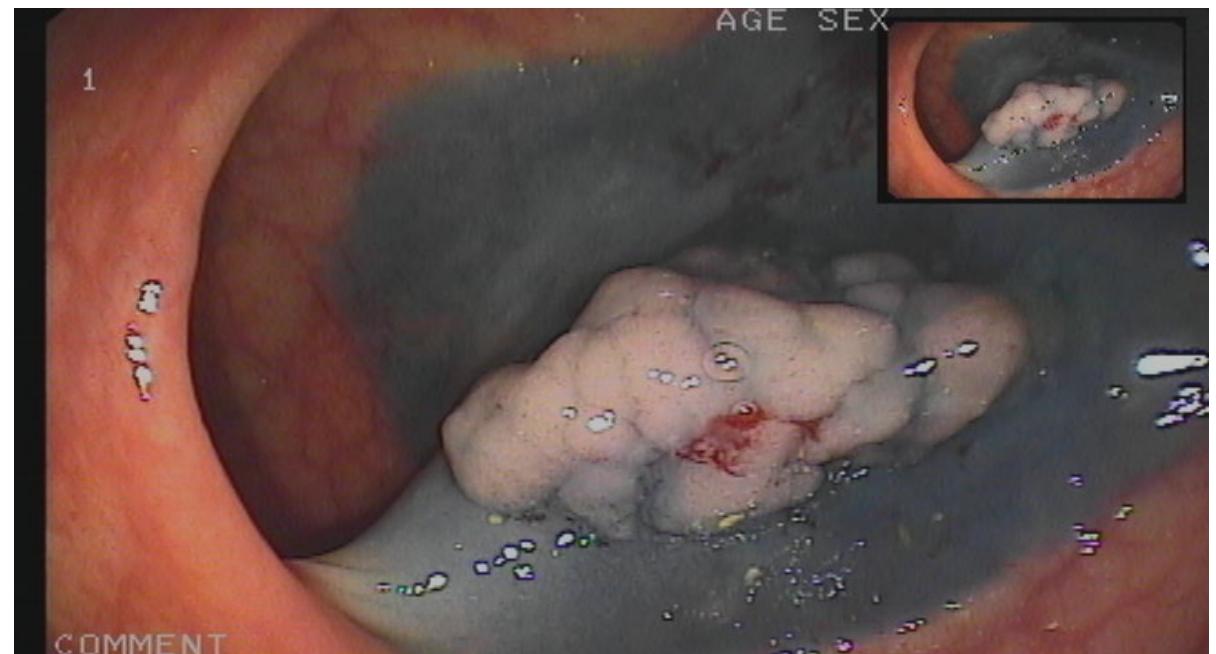
- use of pure cutting vs blended or coagulation mode increases the risk of bleeding (***OR 6.95; 4.42 – 10.94***)
- Both mechanical techniques (detachable loop or endoclip) or adrenaline injection reduce the risk of post-polypectomy bleeding (***RR 0.32; 0.20 – 0.52***)

# How to prevent bleeding

## INIEZIONE SOTTOMUCOSA

- le tecniche di iniezione sottomucosa oltre a prevenire la perforazione, riducono il sanguinamento dopo polipectomia

(Nivatvongs S. et al. Dis. Colon Rectum 1986)



# How to prevent bleeding

PO Box 2345, Beijing 100023, China  
www.wjgnet.com  
wjg@wjgnet.com



World J Gastroenterol 2007 June 7; 13(21): 2973-2977  
World Journal of Gastroenterology ISSN 1007-9327  
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RAPID COMMUNICATION

## Comparison of postpolypectomy bleeding between epinephrine and saline submucosal injection for large colon polyps by conventional polypectomy: A prospective randomized, multicenter study

Patients with a large colon polyp ( $n = 522$ )

Riduzione sanguinamento "totale" (6%)

Table 2 Postpolypectomy bleeding,  $n$  (%)

	Epinephrine group ( $n = 244$ )	Normal saline group ( $n = 242$ )	P value
Early bleeding	11 (4.5)	21 (8.7)	0.065
Late bleeding	1 (0.4)	4 (1.7)	0.154

Randomized ( $n = 48$ )

Epinephrine group ( $n = 244$ )

Saline group ( $n = 242$ )

No Bleeding ( $n = 232$ ) Bleeding ( $n = 12$ )

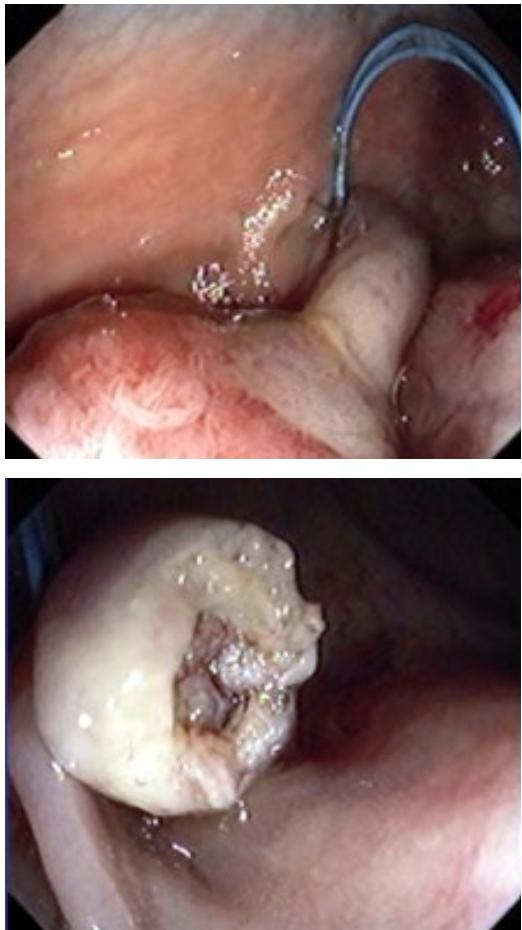
No bleeding ( $n = 217$ ) Bleeding ( $n = 25$ )

p=n.s.

Suck -Ho-Lee et al., WJG 2008

Primary prophylaxis

# How to prevent bleeding: snare polypectomy



## Clinical randomized trial Pedunculated polyps > 2 cm

Primary prophylaxis

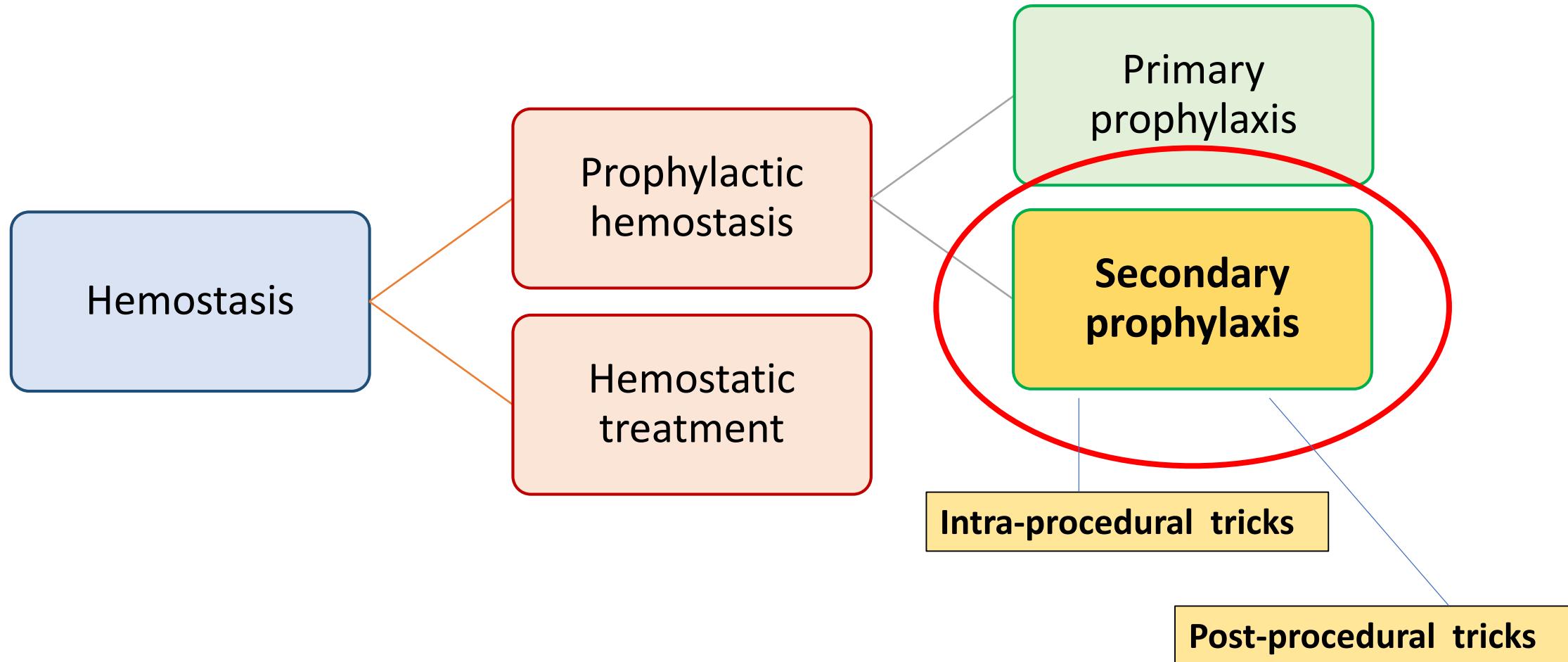
	Adrenaline injection	Endoloop e/o TTS clips on residual stalk
Patients (n)	32	32
Bleeding (%)	4 (12.5)	1 (3.1)

Combined endoscopic techniques seem to be more effective in preventing postpolypectomy bleeding in large pedunculated colonic polyps

## Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline

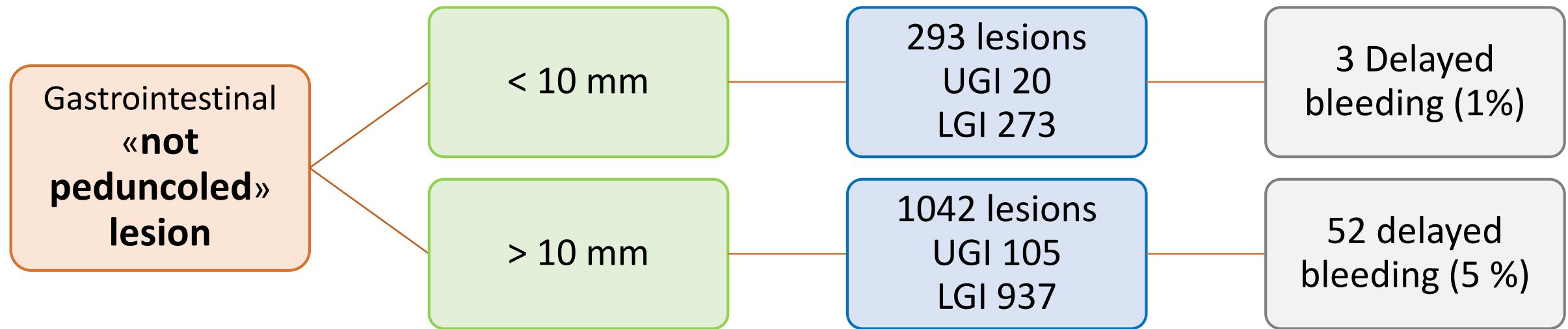
- *In pedunculated polyps with head > 20 mm or stalk > 10 mm pre-treatment adrenaline injection or mechanical device is recommended*
- *Mechanical techniques (detachable loop or endoclip) are superior to adrenaline injection (RR 0.28, 0.14 – 0.57)*

# Endoscopic Hemostasis



# How to prevent bleeding: EMR < or > 10mm

## *French national survey of endoscopic resection of gastrointestinal lesions*

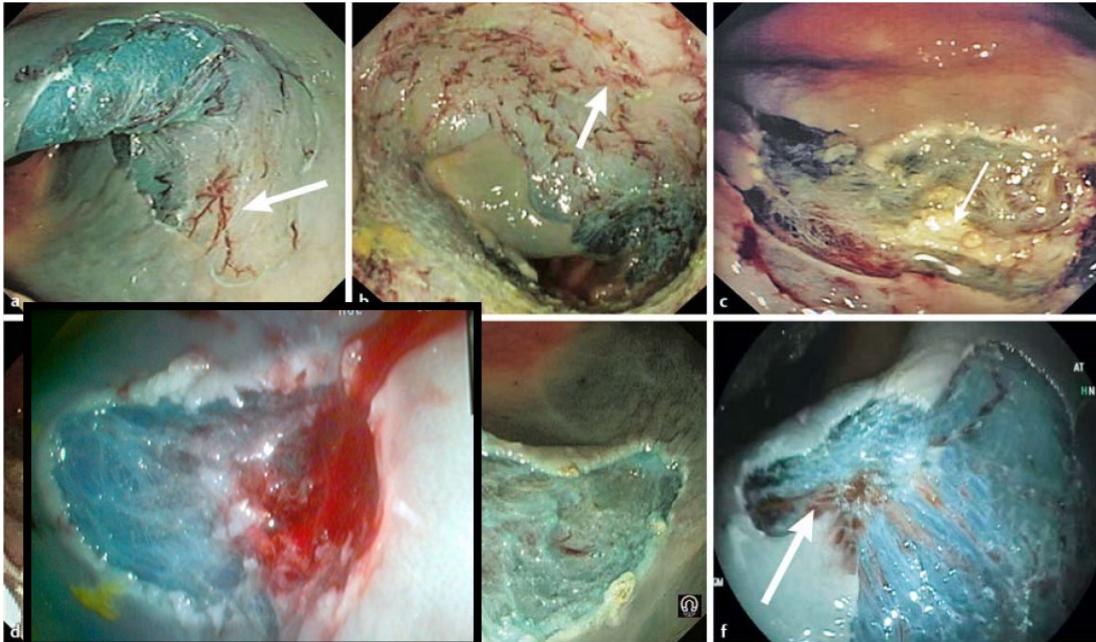


*Risk for bleeding of EMR <10 mm = Risk for bleeding of polypectomy*

# How to prevent bleeding: EMR > 20 mm

## Study population

Location	Standard p-EMR	Spiral snare p-EMR	Hybrid p-EMR/EMA	Hybrid p-EMR/ESD
Proximal, n(%) (n=139)	116 (83)	1 (1)	32 (16)	0 (0)
Distal, n (%) (n=191)	111 (58)	46 (24)	30 (16)	4 (2)



**22/330 delayed bleeding (6.7%)**

## Risk factor for bleeding:

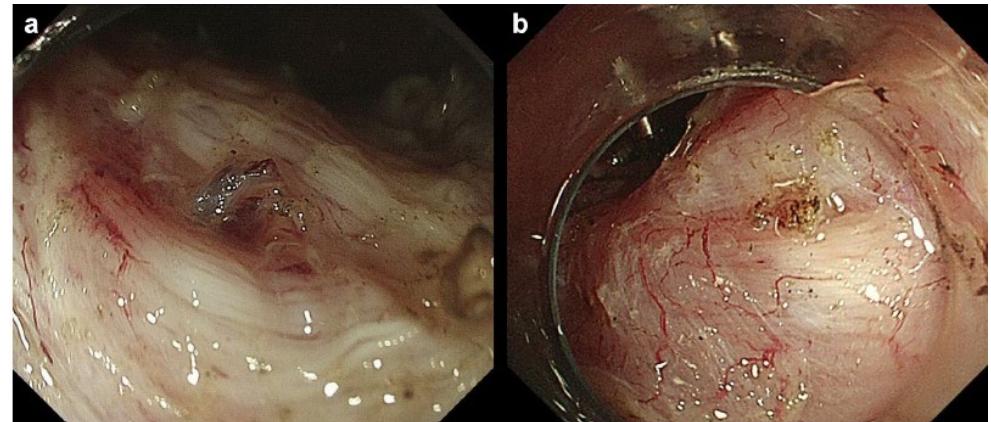
- Visible muscle layer (46% vs 19%)
- Visible submucosal hematoma (38% vs 16%)

# How to prevent: use of coagrasper

Secondary prophylaxis

## Post-ESD coagulation of visible vessel reduces incidence of PPB

Author	% of bleeding with post-ESD coagulation	% of bleeding without post-ESD coagulation
Takizawa (2008)	3.1	7.1
Mukai (2013)	1.3	4.5



*Coagulation by hemostatic forceps can lead to coagulation syndrome or delayed perforation*

# How to prevent: use of coagrasper

Secondary prophylaxis

(EMR compl. / ESD)

**Coagulation of muscular layer's vessels**



(NOCSAE Baggiovara)

**NCC Tokyo Center  
112 ESD colon-retto:**

**58 “Coagrasper  
10 sanguinamenti**

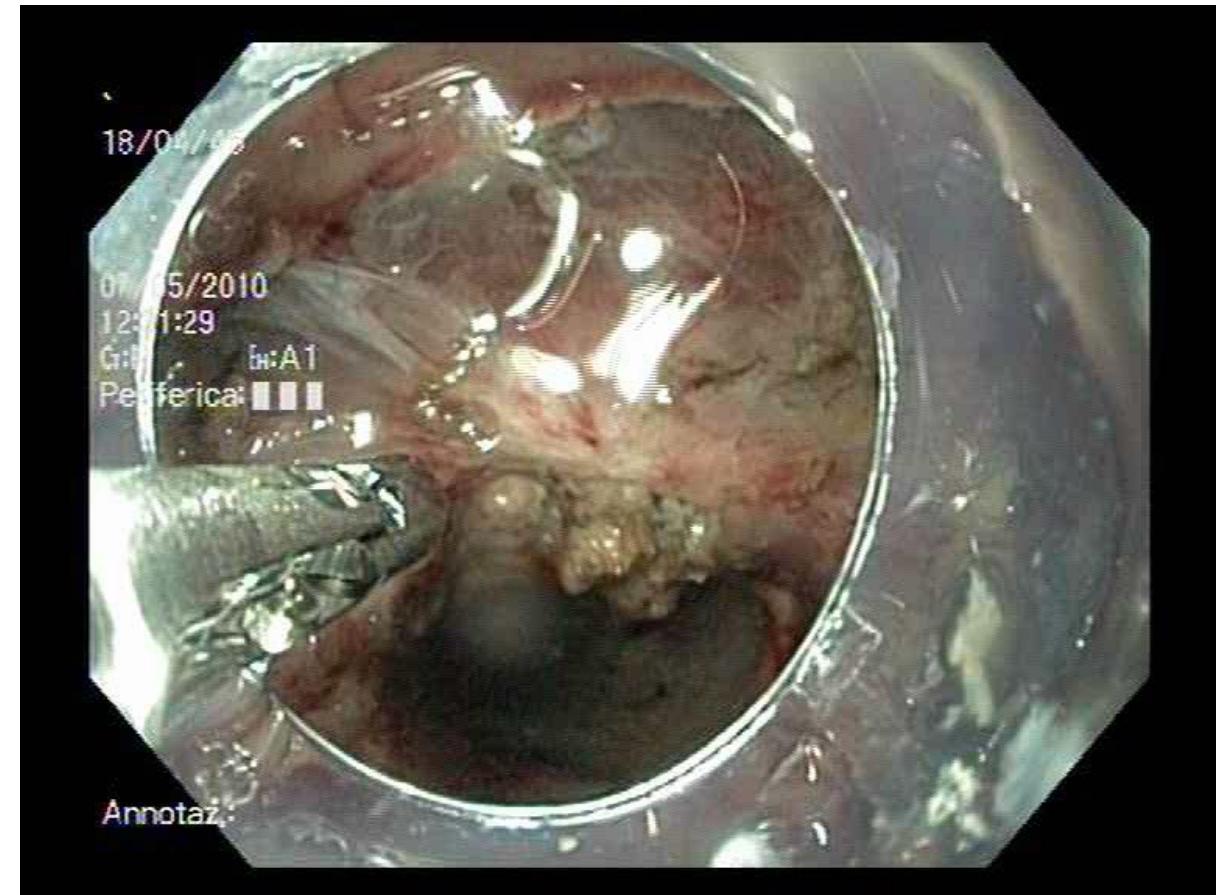
**54 “non Coagulazione”  
21 sanguinamenti**

**p: 0,0001**

SaitoY., Endoscopy 2012)

# How to prevent: use of «coagulant tools»

Secondary prophylaxis



# How to prevent: to clip or not to clip?



***Not univocal results about utility of prophylactic clipping***

Secondary prophylaxis

Author (year)	Patient (n)	Procedure/type of clip	Size (mm)	Delayed bleeding (clip vs control)
Liaquat (2010)	524	EMR/Resolution clip	> 20 (20 – 100)	<u>1.8 vs 9.7</u>
Albeniz (2016)	1255	EMR/-	> 20	<u>1.4 vs 3.9</u>
Zhang (2015)	348	EMR-ESD/Resolution clip	10 – 40	<u>1.1 vs 6.9</u>

Author (year)	Patient (n)	Procedure/type of clip	Size (mm)	Delayed bleeding (clip vs control)
Doloshi (2015)	288	EMR-polypectomy/Resolution clip	> 20	<u>3.7 vs 3.0</u>
Feagins (2014)	368	EMR (RCT)	> 20	<u>1.0 vs 0.6</u>
Feagins (2019)	1098	EMR (RCT)	> 10	<u>2.3 vs 2.9</u>

## Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline

- *Mechanical profilaxis (closure of mucosa defect) is suggested in high risk polypectomy/EMR*
- *Mechanical prophylaxis is cost-effective only in patients receiving antiplatelet or anticoagulation therapy (OR 0.40; 0.20 – 0.80)*

DYNAMIC MANUSCRIPT

## Complete closure of artificial gastric ulcer after endoscopic submucosal dissection by combined use of a single over-the-scope clip and through-the-scope clips (with videos)

Satoshi Maekawa · Ryosuke Nomura ·  
Takayuki Murase · Yasuyoshi Ann ·  
Masaru Harada

### Pazienti

- 12 pts sottoposti a ESD gastrica e a successiva chiusura con OTSC e/o TTS della base di taglio



### Risultati

- Diametro medio della base di taglio: 5 cm
- Successo tecnico di chiusura breccia di taglio: 11/12 (97.5%)
- Riduzione significativa dei giorni di degenza: 5-6 vs. 1.5 giorni
- Riduzione dei costi

# Duodenal EMR, a particular case

Secondary prophylaxis

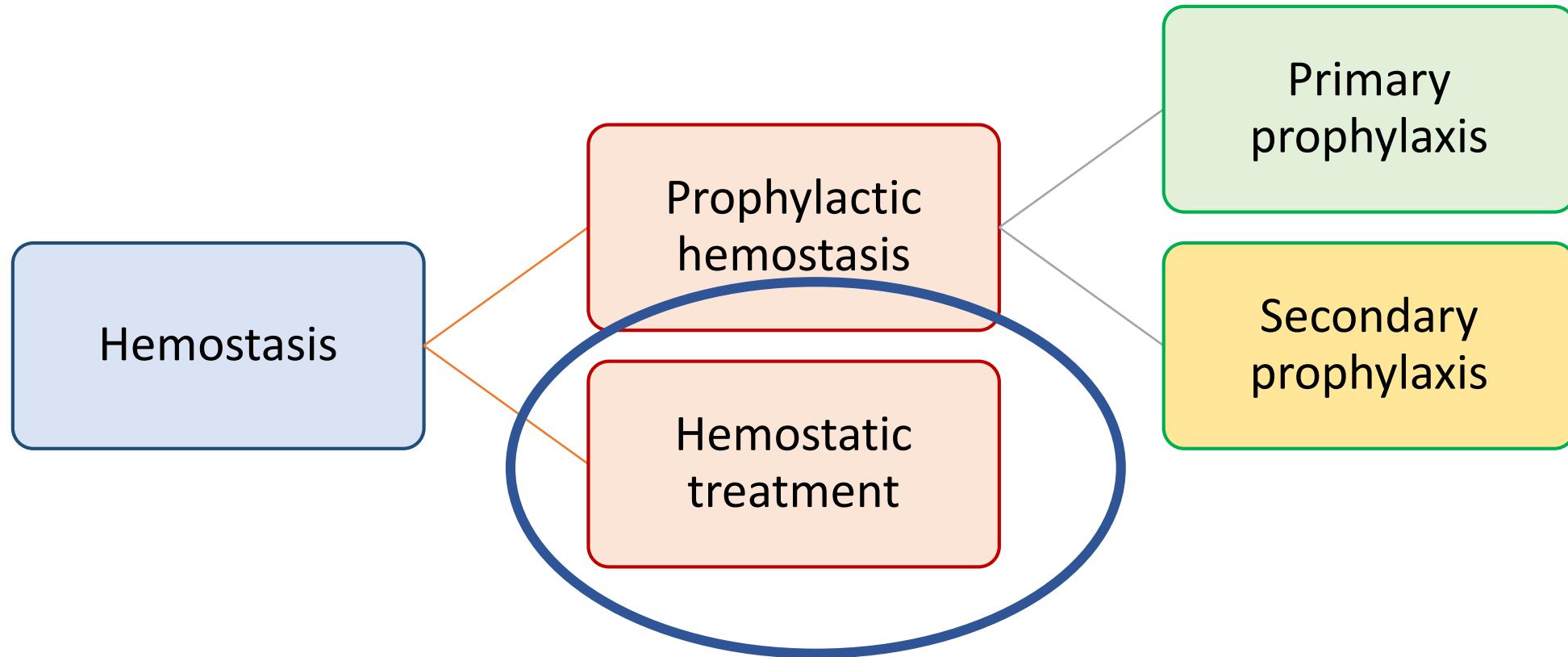
- Duodenal EMR is a high risk procedure for post-procedural bleeding (up to 12.3%)
- Prophylactic clipping reduces PPB (7% vs 32%)



Complication	Patients n (%)
Delayed bleeding	14/121 (12)
- First part	0/20 (0)
- Second part	12/92 (13)
- Third part	2/6 (33)
- With prophylactic clipping	7/99 (7)
- Without prophylactic clipping	7/22 (32)

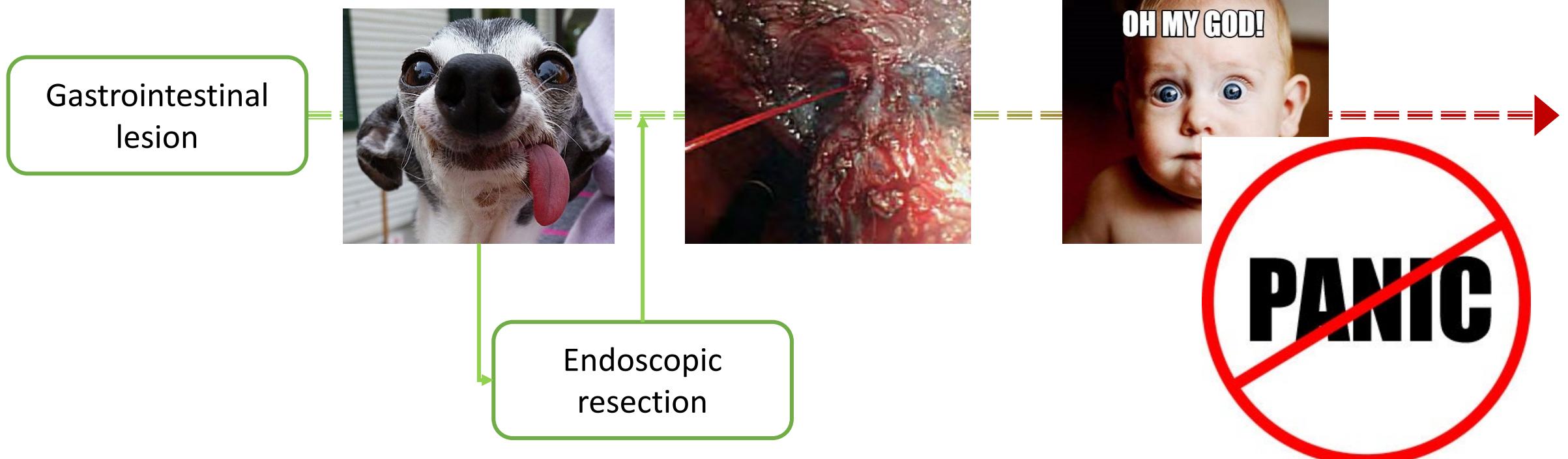
# Endoscopic Hemostasis

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# How to manage bleeding

*What's in the mind of the endoscopist?*



# How to manage bleeding

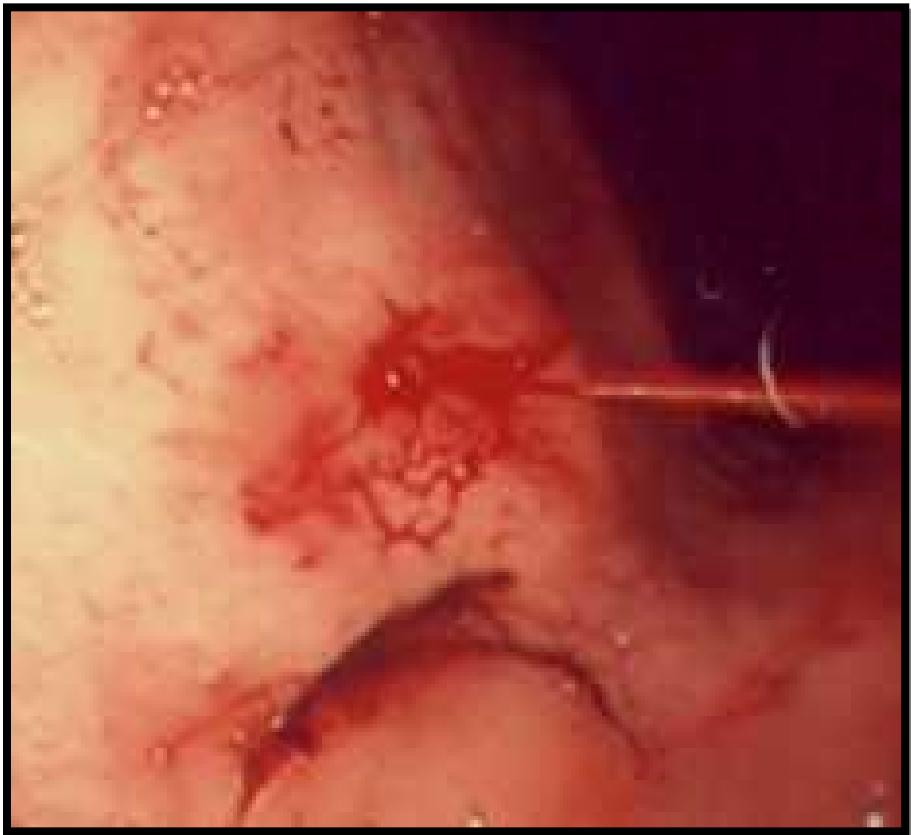
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*A lot of device available*

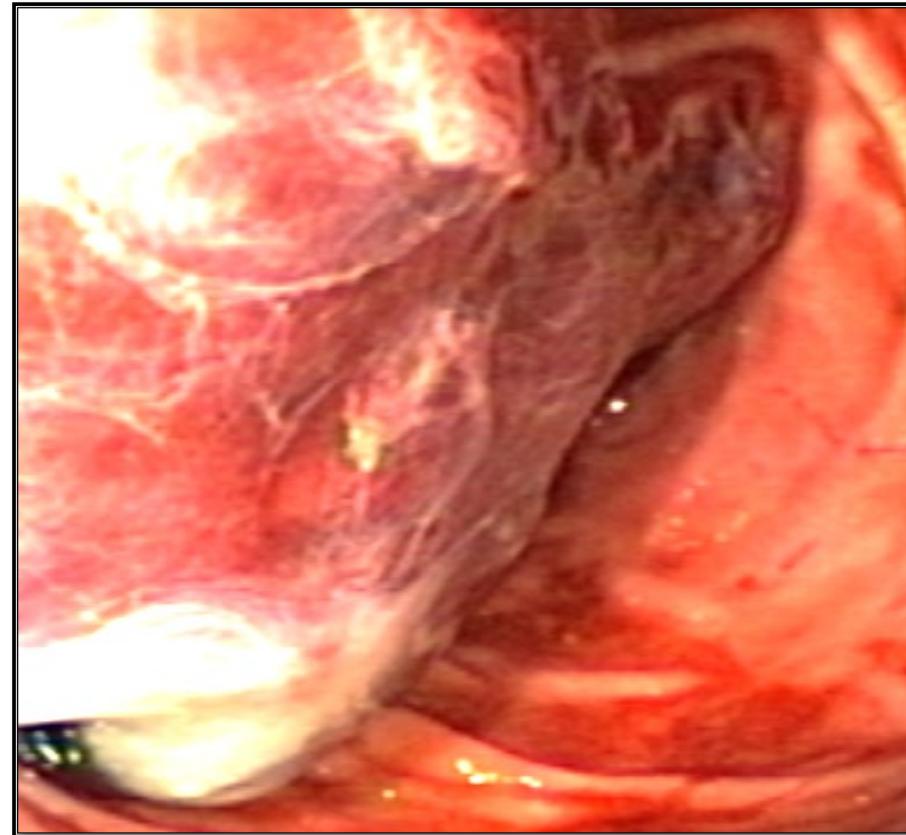


# How to manage bleeding

*Intraprocedural*



*Post-procedural*

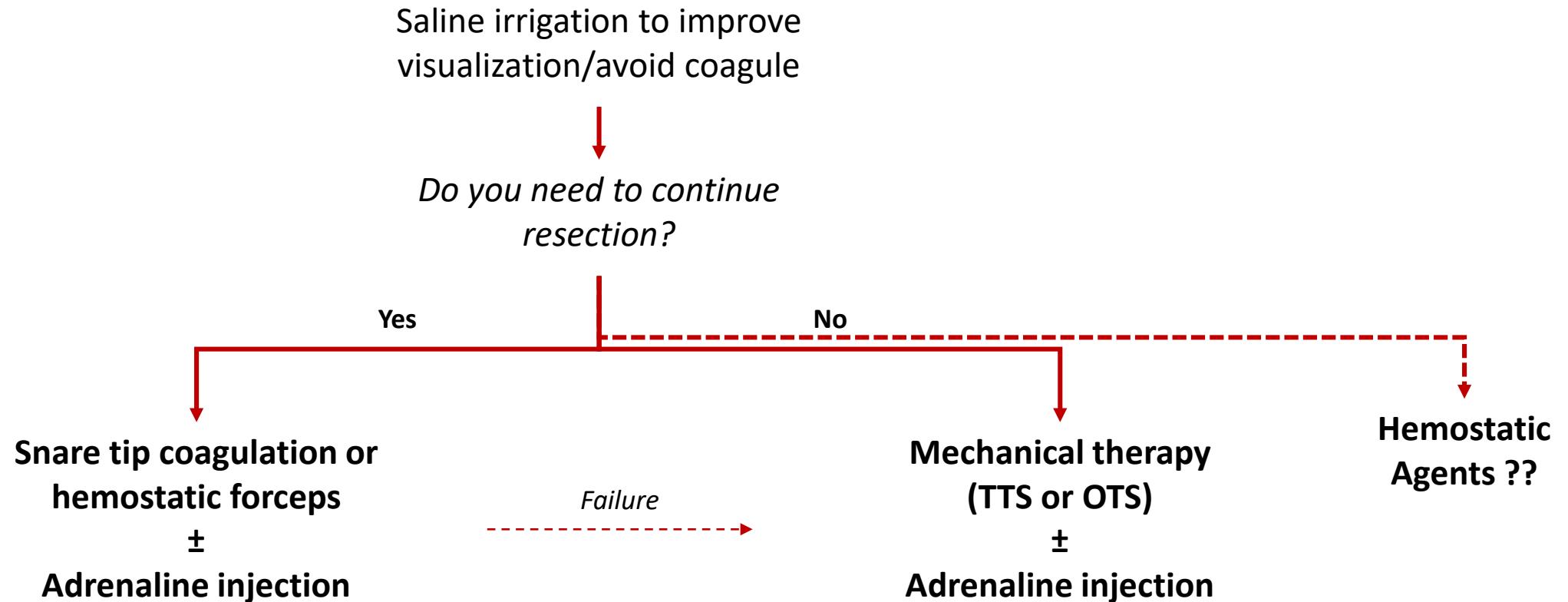


**(up to 30 days)**

# How to manage bleeding



## Intra-procedural bleeding (2.8 – 12%)



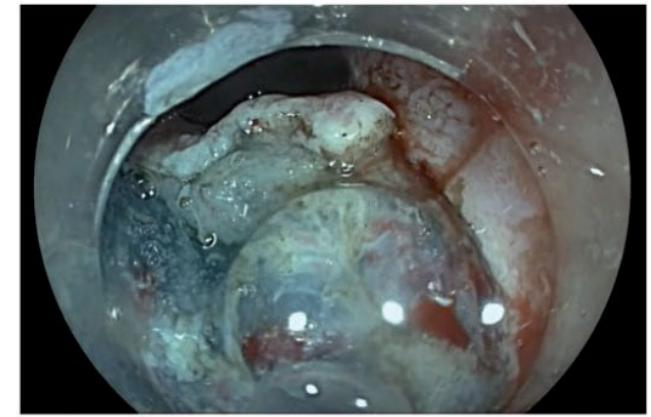
# Haemostasis and prevention of bleeding related to ER: The role of a novel self-assembling peptide

(PURASTAT experience)

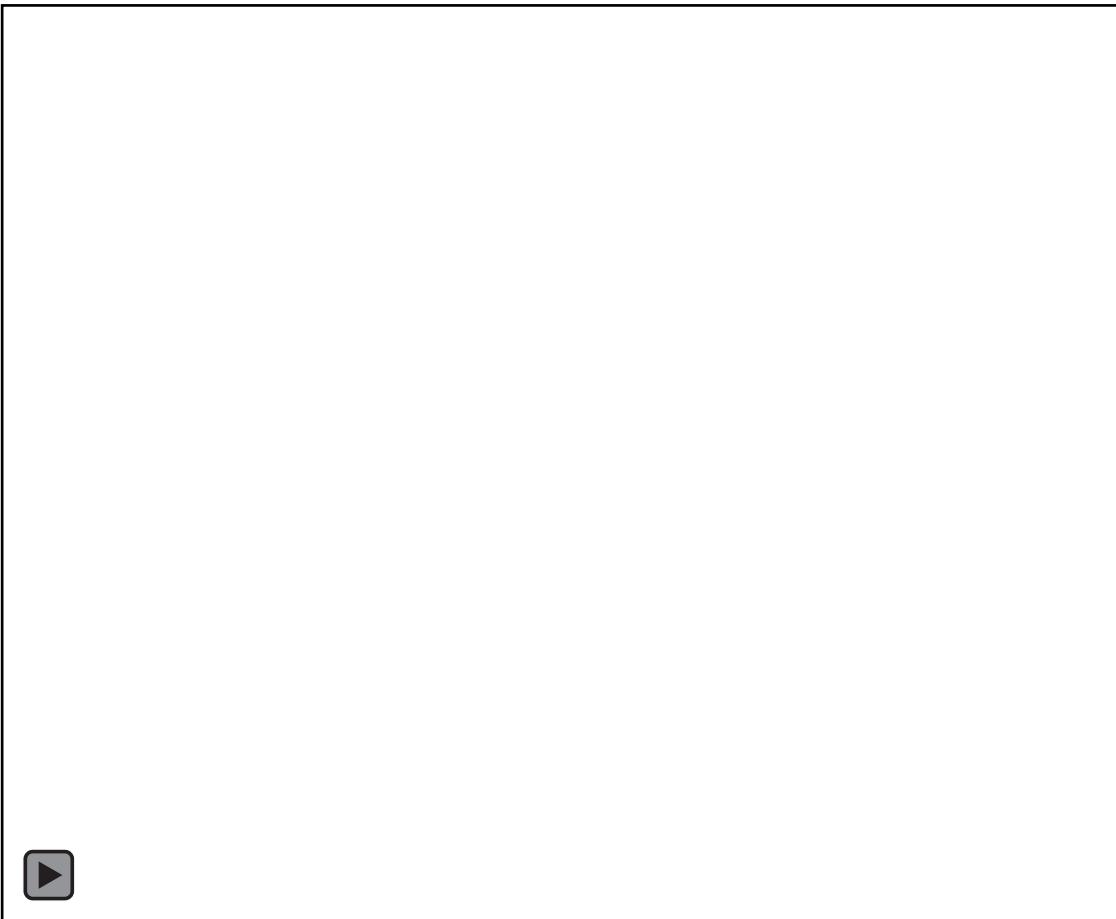
*Study population: 100 pts: 69 ESD, 31 EMR*

	Esophagus/stomach	Duodenum	Colon/rectum
Patients, n	59	10	31
Primary hemostasis, n(%)	38 (64%)	6 (60)	20 (64)
Purastat® successfully hemostasis	30/38 (79%)	6/6 (100)	12/20 (60)

**75% of primary successfull hemostasis  
3% of delayed bleeding**



From Image 2018



From Baggiovara  
hospital 2014



## Hemostasis: when endoscopy is suggested?

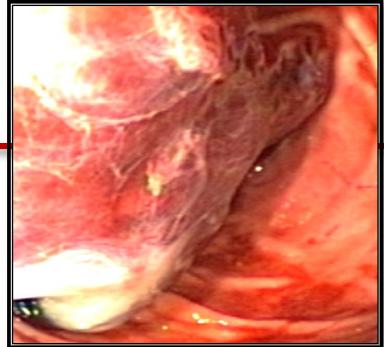
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- *Timing for PPB colonoscopy should be individualized*
- *In several series PPB colonoscopy was useful in about 22% of patients (NNT 4.5)*
- *Hemoglobin drop >2g/dl and need for blood trasfusion are good predictors for need of intervention.*

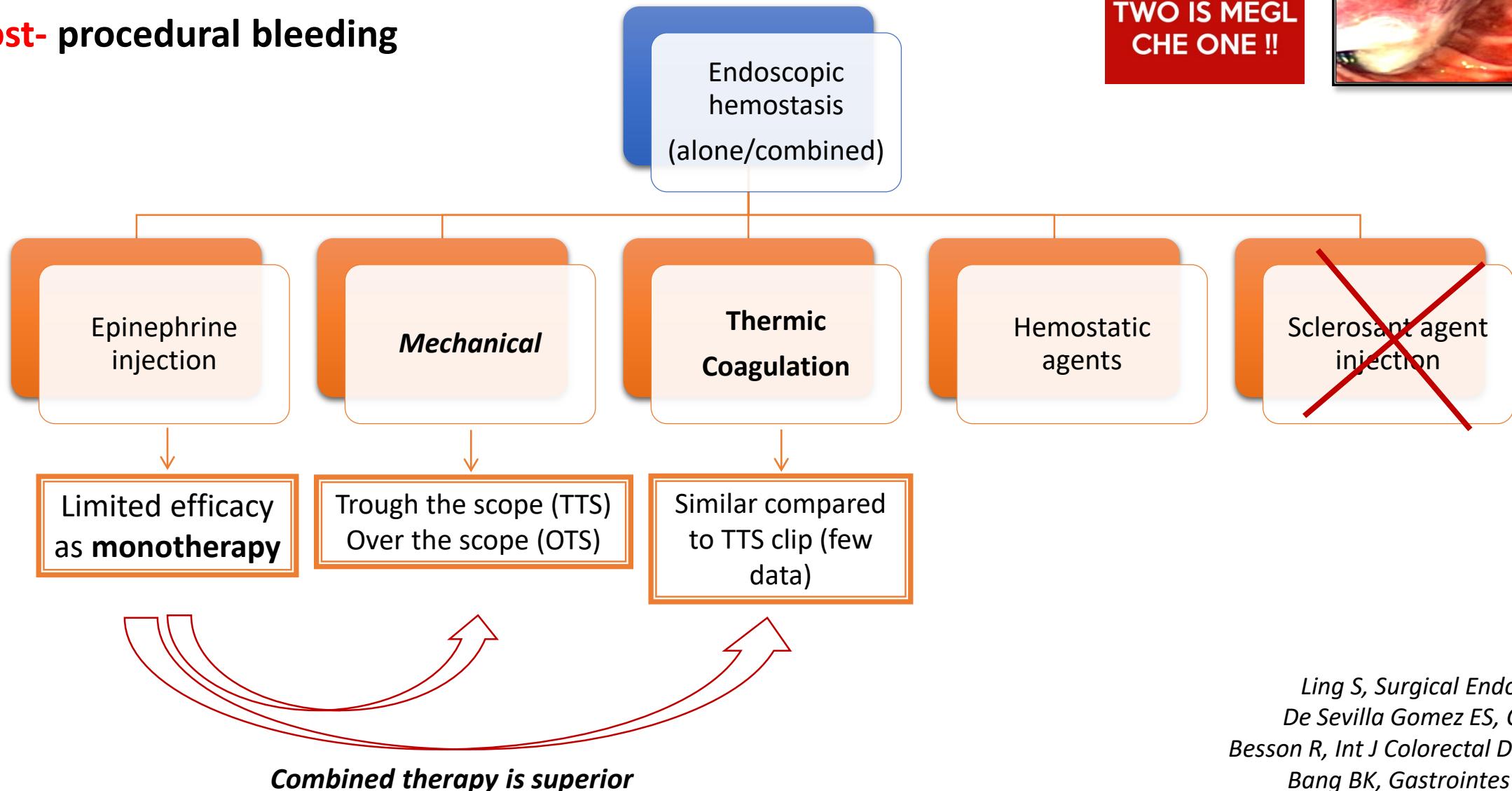
# Endoscopic hemostasis: the role of the endoscopist



KEEP  
CALM  
AND  
TWO IS MEGL  
CHE ONE !!



## Post-procedural bleeding



Ling S, Surgical Endoscopy 2016  
De Sevilla Gomez ES, Cir Esp 2014  
Besson R, Int J Colorectal Disease 2016  
Bang BK, Gastrointest Interv 2018

# Hemostasis: Injection therapy

- Diluted adrenaline  
*(1:10000 or 1:20000)*



The principle is to create a combination of hydrostatic pressure, tissue edema, vasoconstriction, and inflammatory changes

- Sclerosing agents
- Tissue adhesives

Not  
commonly  
used



# Hemostasis: Thermal therapy

## Contact modalities

- Heater probes
- Bipolar electrocautery probes
- Coagrasper

## Non-contact modalities

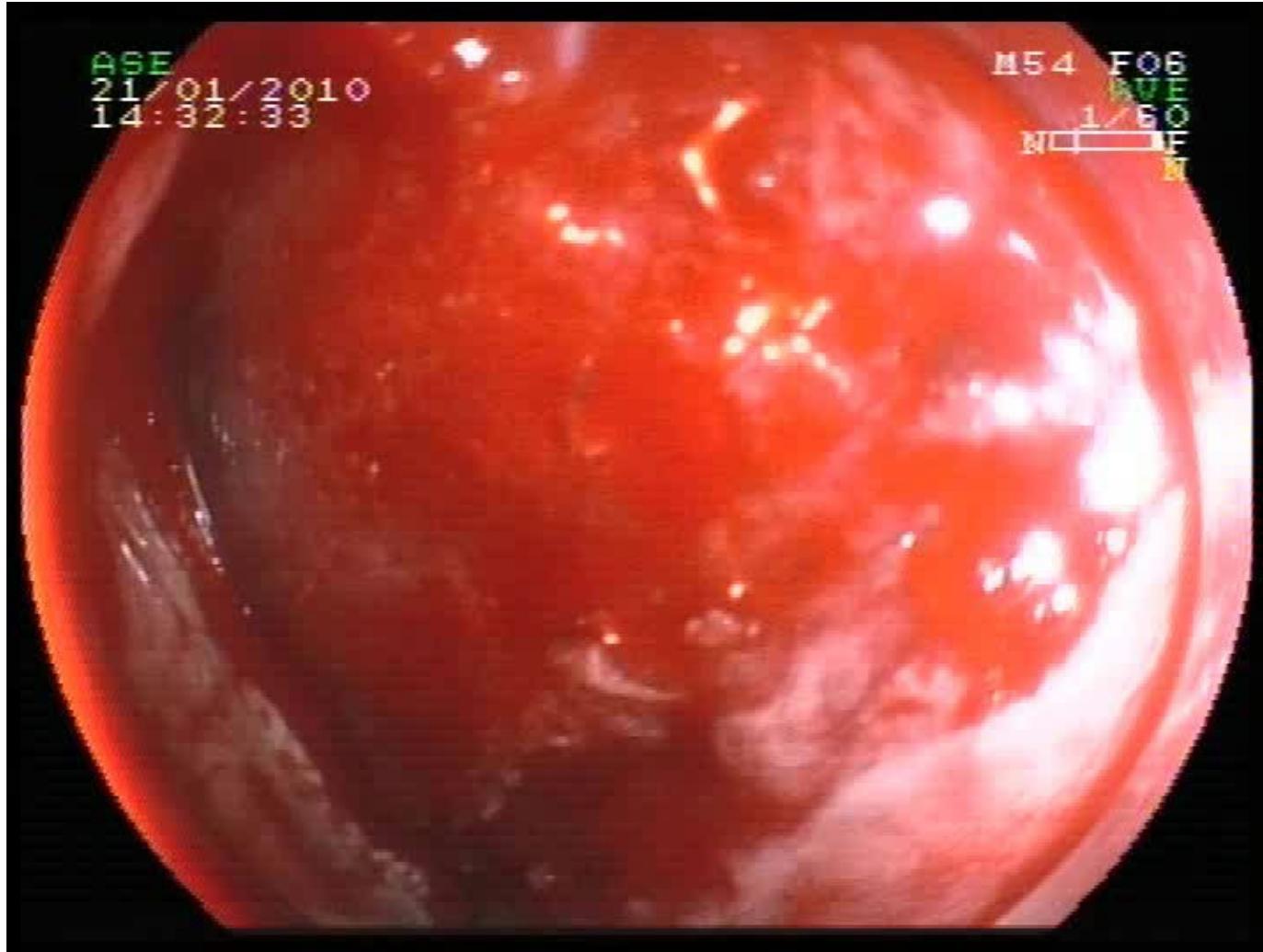
- Argon plasma coagulation (APC)

**Table 1**  
Thermal probes most commonly used for cautery hemostasis

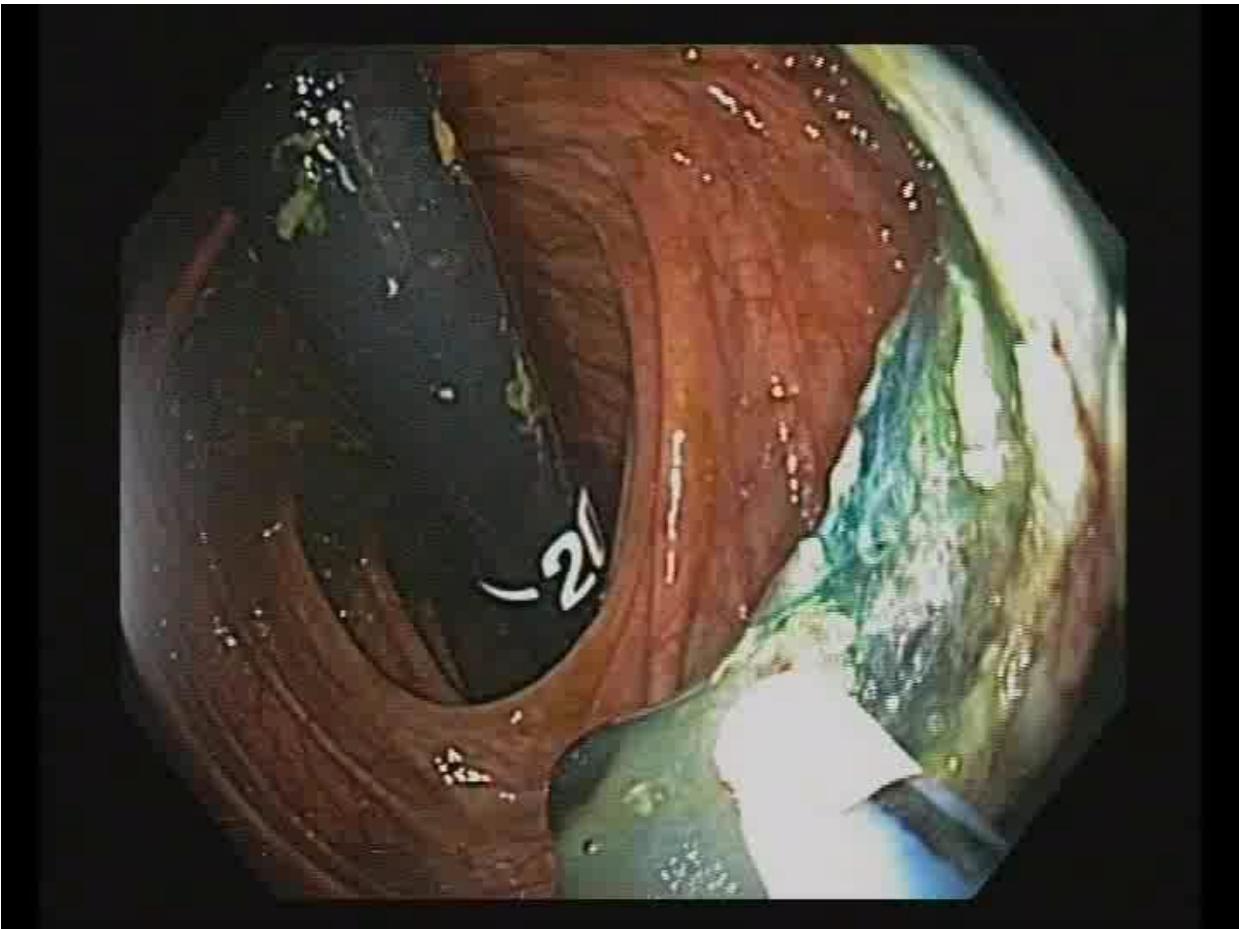
Type of Coagulation	Device Name and Manufacturer	Sheath Diameter (Fr)	Pulse Duration (s)	Fire Direction	Power	Supplementary Features	Gas Flow (Lt/min)
<b>Contact thermal devices</b>							
Hydrothermal	Heater probe ( <i>Olympus</i> )	7, 10	3–4		25–30 J	Reusable*	—
Bipolar	Gold Probe ( <i>Boston</i> )	7, 10	5–10		15–25 W	25-G retractile injector needle	—
	Injector Gold Probe Quicksilver ( <i>Cook</i> )						
	BiCoag Probe ( <i>Olympus</i> )						
	Bicap ( <i>ConMed</i> )						
<b>Noncontact thermal devices</b>							
APC	Canady Plasma ( <i>Canady</i> )	5, 7		Straight, side	30–60 W		1.5–3
	Beamer argon ( <i>ConMed</i> )	5, 7, 10		Straight	30–60 W		1.5–3
	APC ( <i>ERBE</i> )	5, 7, 10		Straight, side, circumferential	30–60 W		1.5–3

# “CONTACT” Thermal Coagulation

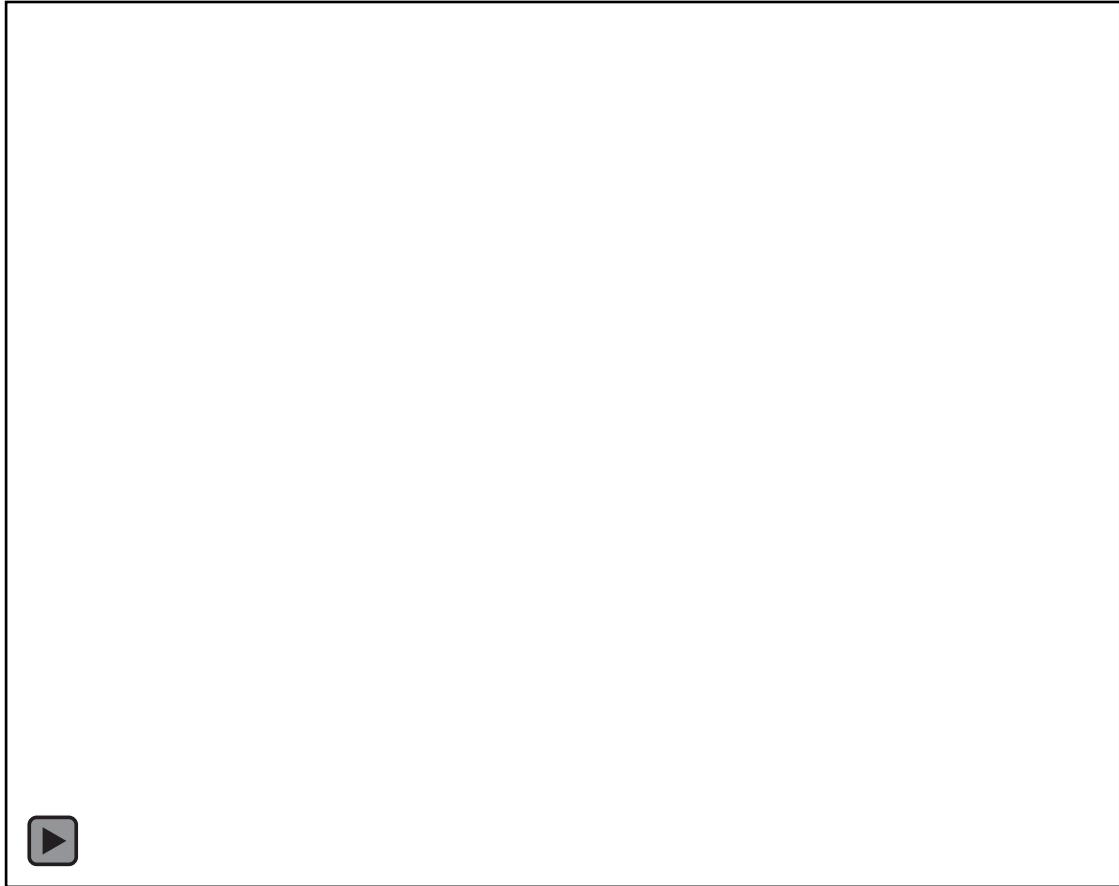
## “Coagrasper Forcep”



**Setting:** (forced coagulation 60 W)



*Perugia Endoscopy Unit*

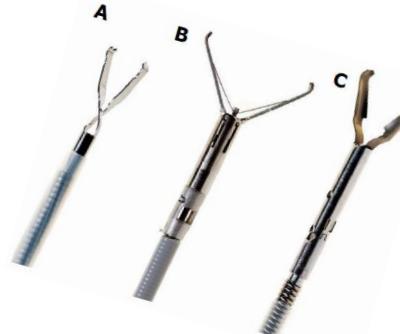


*Courtesy by N. Pagano*

# Hemostasis: Mechanical therapy

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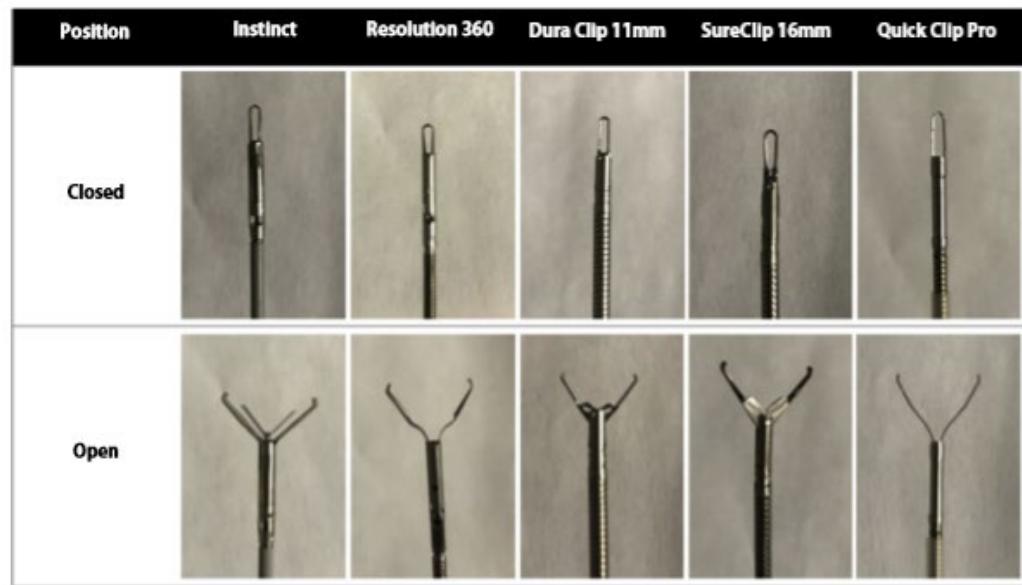
- *Through the scope device*



- *Over the scope device*



# Mechanical hemostasis: Through the scope (TTS) clips



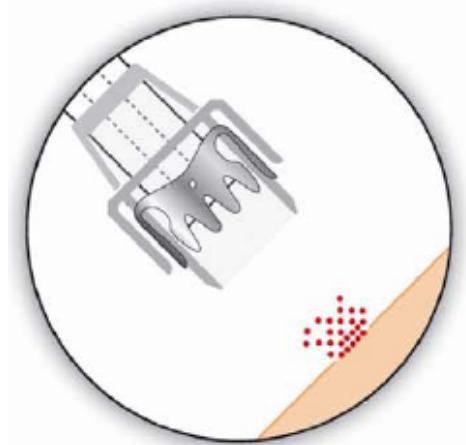
Physical Characteristic	Instinct	Resolution 360	Dura Clip 11mm	SureClip 16mm	Quick Clip Pro
Open Width (mm)	 13.5	 11	 11	 14**	 11
Jaw Length (mm)	 9	 9	 7	 11	 10
Clip Length (mm)	 15	 16	 10	 14	 15
Tail Length (mm)	 6	 7	 3	 3	 5
Material	Stainless steel, nitinol	Stainless steel, cobalt	Stainless steel	Stainless steel	Elgiloy

## *Endoclip Features*

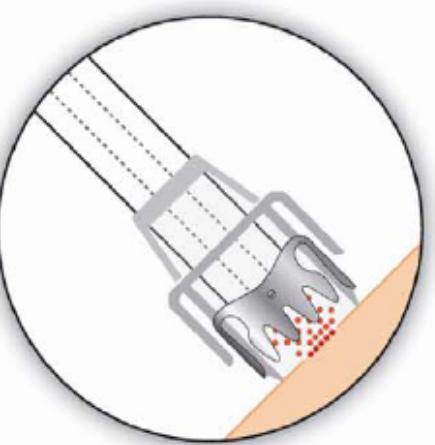
- Rotatability
- Overshoot/whip
- Precision of open/close
- Tensile strength of lateral tissue manipulation
- Strength of tissue compression

**Primary hemostasis  
> 80%**

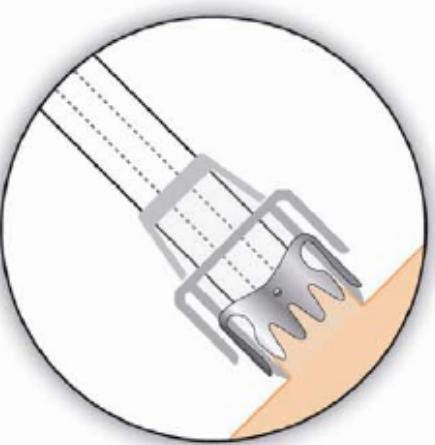
# Mechanical hemostasis: Over the scope device (OTSC) clip



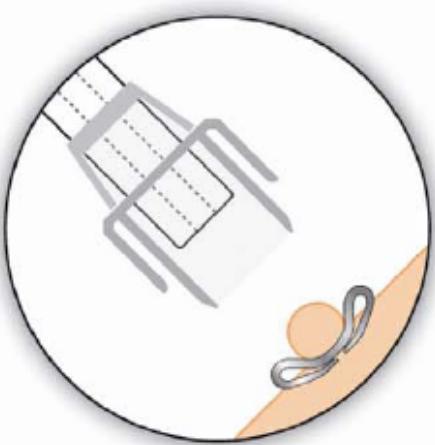
Targeting the lesion



Bring OTSC® cap in connection to tissue



Target tissue is suctioned into the cap and OTSC® Clip is released by turning the hand wheel

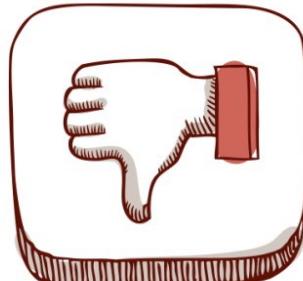


Clip is applied

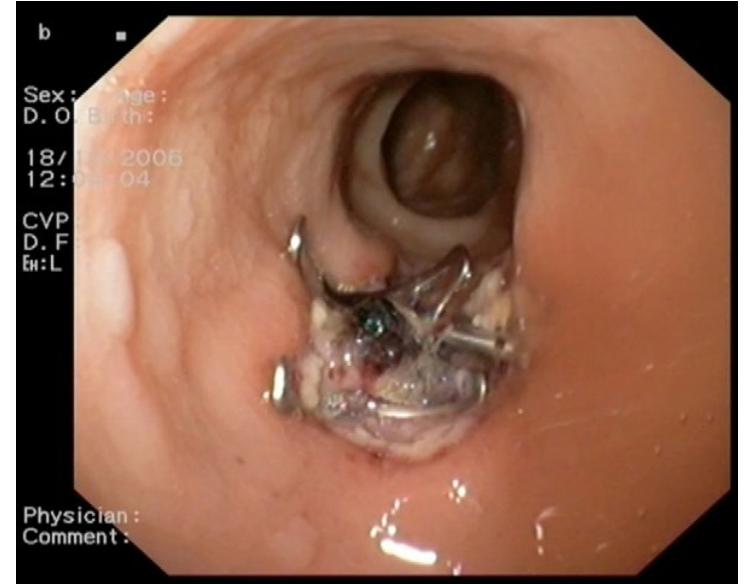
# Mechanical hemostasis: Over the scope device (OTSC) clip



- ↓↓ risk of rebleeding
- ↓ need for blood transfusion
- ↓ hospital stay
- ↓↓ morbidity/mortality



- ↑↑ device cost
- need for endoscopist/nurse training



# Mechanical hemostasis: Over the scope device (OTSC) clip

Original article

 Thieme

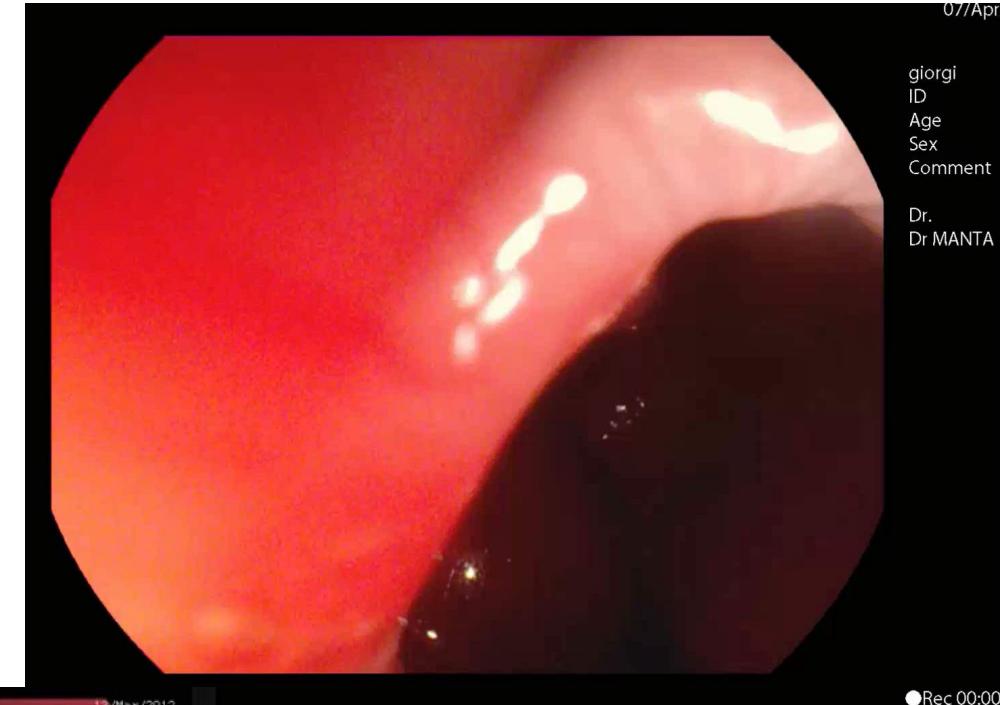
## First-line endoscopic treatment with over-the-scope clips in patients with either upper or lower gastrointestinal bleeding: a multicenter study

OPEN  
ACCESS

- **70 patients with PPB treated**
  - 24 post gastric ESD (11 spurting, 13 oozing)
  - 25 post colorectal EMR (9 spurting, 16 oozing) and 21 post colorectal ESD (9 spurting, 122 oozing)
- **Technical success: 70/70 (100%)**
- **Primary hemostasis: 67/70 (96%)**



Milano Niguarda experience



Modena Niguarda experience

courtesy by dr B. Mangiavillano

# Hemostasis: Hemostasis agents

*Hemospray*

*EndoClot*

*Ankaferd Blood Stopper*

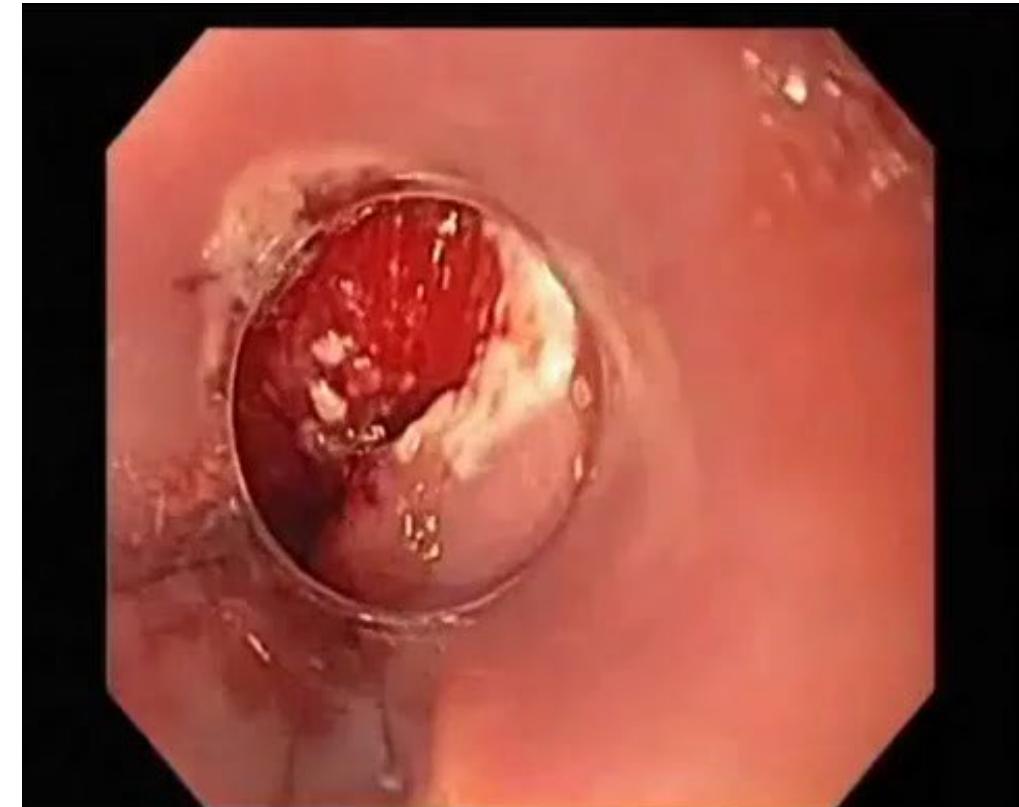
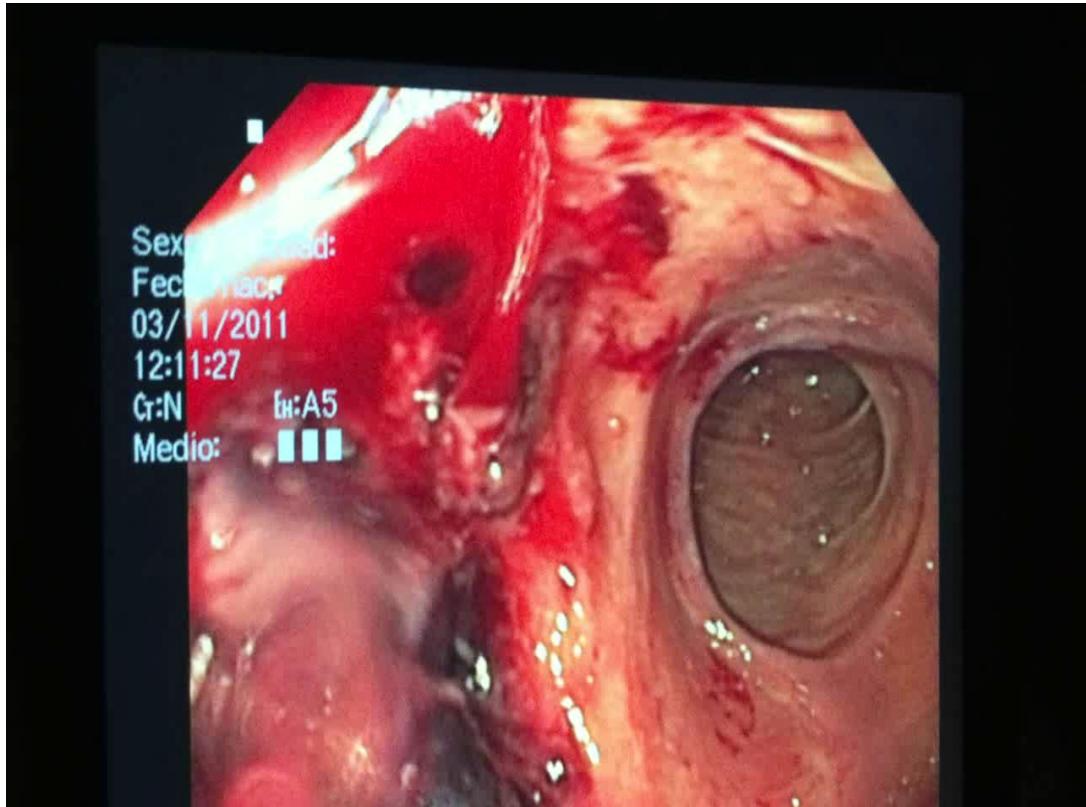
*Purastat*



Still few data  
More studied needed

Compound	Constituent	Mechanism of action	Approved human application	Formulation
Ankaferd blood stopper	Herbal mixture	Absorbs H <sub>2</sub> O, activates clotting cascade	Dental procedures, first aid services	Tampons, sprays, ampoules
Hemospray	Mineral powder	Absorbs H <sub>2</sub> O, mechanical tamponade, activates clotting cascade	Nonvariceal GI bleeding	CO <sub>2</sub> pressurized handheld canister (20 g)
EndoClot	Absorbable polymers	Absorbs H <sub>2</sub> O and concentrate cells, activates clotting cascade	Adjuvant hemostatic therapy	Pressurized air compressor

# Hemospray



# Quali sono i benefici previsti?

Hemospray, a differenza delle terapie tradizionali, non è una modalità termica, è atraumatico, non richiede contatto e non richiede la precisione di applicazione richiesta da altri dispositivi endoscopici.

In altre parole:

- **Non termica:** non provoca alcuna variazione tessutale immediata o cronica come invece a volte avviene nel caso delle modalità termiche.
- **Atraumatico:** dal momento che non viene applicata alcuna forza meccanica, la polvere riduce al minimo il rischio di trauma tessutale riscontrabile invece con le modalità meccaniche.
- **Non da contatto:** Il sistema di rilascio della polvere mediante Aerosol elimina la necessità del contatto diretto con il sito da trattare.
- **Non Richiede precisione di applicazione:** la polvere viene spruzzata verso l'origine dell'emorragia, senza la precisione richiesta dalle modalità convenzionali.





Corso Nazionale SIED UDINE | 25-27 Settembre 2019



## LE COMPLICANZE IN ENDOSCOPIA DIGESTIVA

Special thanks to ....





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## LE COMPLICANZE IN ENDOSCOPIA DIGESTIVA

Grazie per  
l'attenzione

Raffaele Manta MD  
[raffaelemanta4@gmail.com](mailto:raffaelemanta4@gmail.com)

