Role of radiology in colo-rectal bleedings

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CHUV LAUSANNE

Epidemiology

- Lower GI bleeding accounts for 20-25% of all GI bleeding
  - Annual incidence in USA :21-27/100000
    - Longstreth GF Am J gastroenterol 2005 21 (11): 1281-1298
  - Risk factors
    - Bour B endoscopy 2008
    - 1333pts
      - Mean age of 72+/-16
      - ASA score 2.5+/-0.9
      - Predisposing factors medications in 75% of pats

Lower GI bleeding: Etiology

- Small bowel (2-9% of lower GI bleeding):
  - Arteriovenous Malformations
  - Small Bowel Neoplasms
  - Duodenal, jejunal diverticula, Meckel ’s diverticulum
  - Crohn ’s disease, radiation enteritis
  - Venous bowel infarction, segmental ischemia
  - Amyloidosis, celiac disease
  - Secondary aortoenteric fistula (SAEF)

Antes, Eur Radiol 1996

Gourtsoyiannis, Eur Radiol 1997

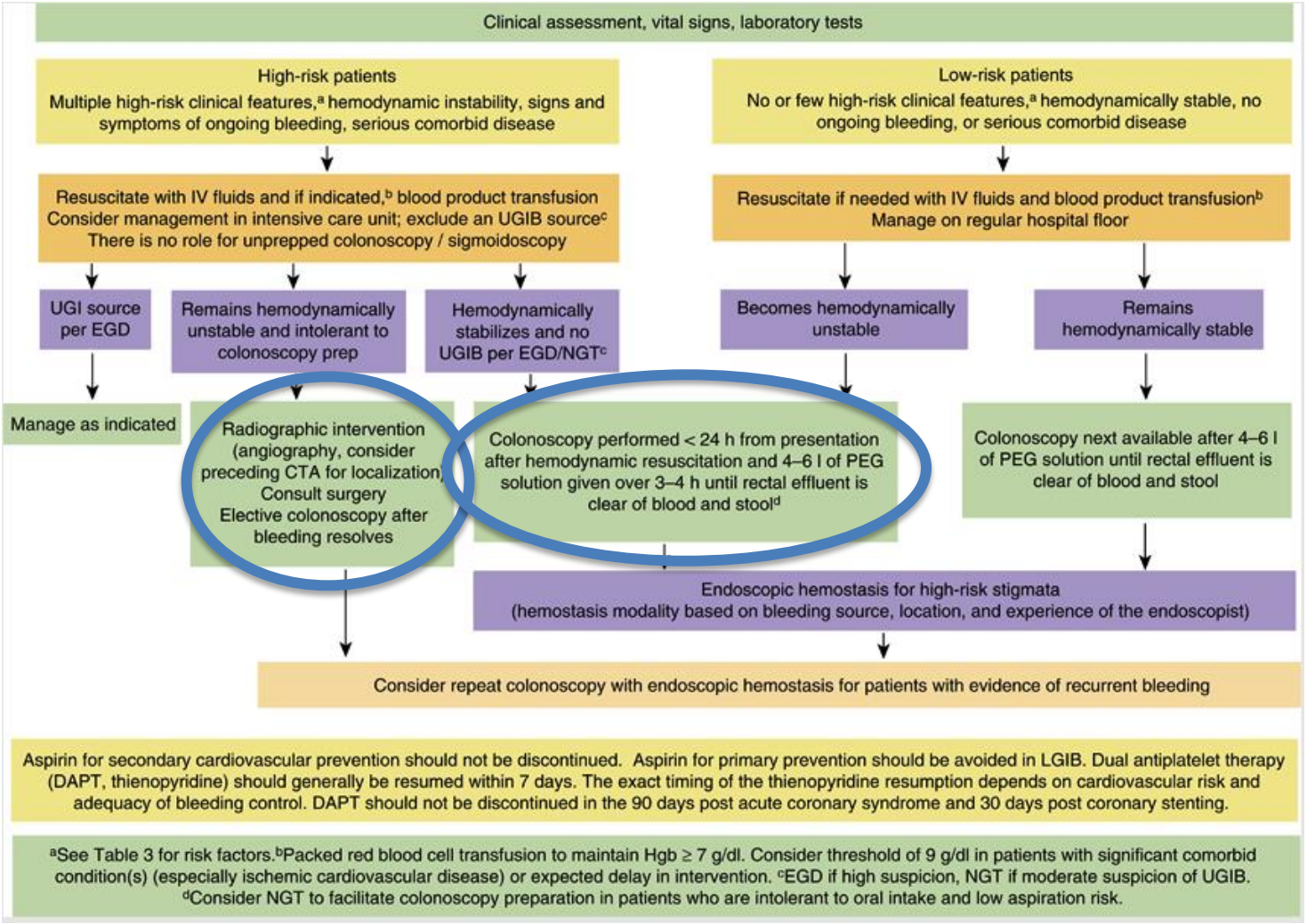
Lewis, Gastroenterology, 1988

Lower GI bleeding: Etiology

- Large bowel (81-98% of lower GI bleeding):
  - Diverticular bleeding (17-40%)
  - Angidysplasia (2-30%)
  - Colitis (infectious, inflammatory, radiation) (9-21%)
  - Colorectal neoplasms (4-10%)
  - Other (anorectal lesions, hemorrhoids) (4-10%)

Vernava AM, Moore BA, Longo WE, et al. Lower gastrointestinal bleeding. Dis Colon Rectum 1997;40:846–58.
Jensen DM, Machicado GA. Colonoscopy for diagnosis and treatment of severe lower gastrointestinal bleeding. Gastrointest Endosc Clin North Am 1997;7:477–98.

What are the official recommandations?



Practice Guidelines

CME *Am J Gastroenterol* 2016; 111:459–474; doi:10.1038/ajg.2016.41; published online 1 March 2016

There is an Erratum (6 May 2016) associated with this article.

ACG Clinical Guideline: Management of Patients With Acute Lower Gastrointestinal Bleeding

Lisa L Strate MD, MPH, FACG[1] and Ian M Gralnek MD, MSHS[2]

What is the level of evidence behing urgent colonoscopy

Table 4. Prospective studies of urgent colonoscopy for acute LGIB

Previous table | Figures and tables index

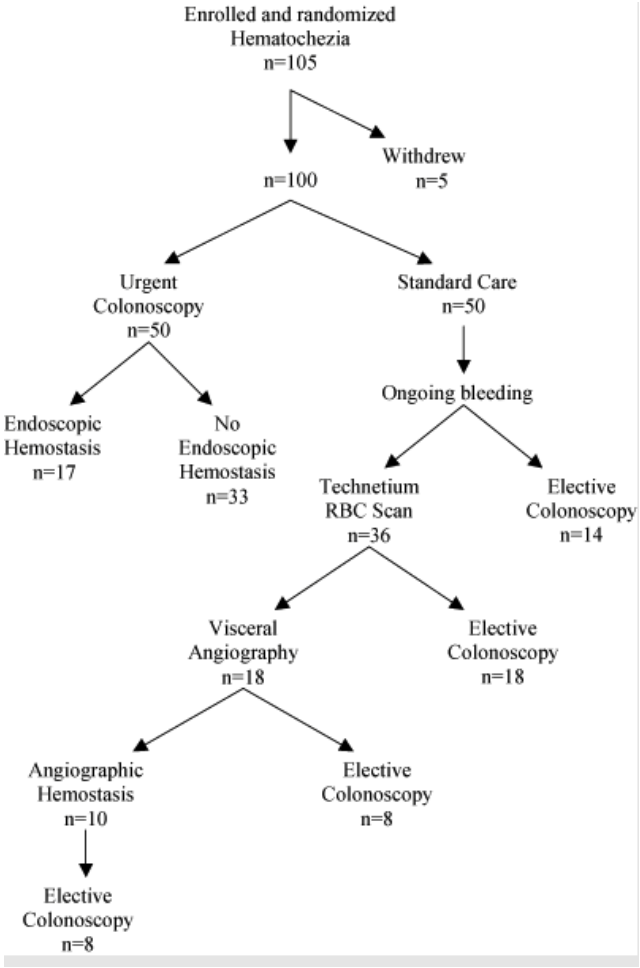
Study	Study design	No. of patients	Intervention	Control	Study conclusion
Jensen *et al.* (22)	Case–control, diverticular bleeding only	121	Colonoscopy <12 h after rapid PEG preparation; endoscopic hemostasis for stigmata of hemorrhage	Colonoscopy <12 h after rapid PEG preparation; no endoscopic hemostasis for stigmata of hemorrhage	Urgent colonoscopy with endoscopic therapy reduced rebleeding and need for surgery
Green *et al.* (11)	RCT	100	Colonoscopy <8 h after rapid PEG preparation	Elective colonoscopy within 96 h; if ongoing bleeding technetium scan followed by angiography, if positive	More definite diagnoses in urgent colonoscopy arm; no difference in other outcomes
Laine *et al.* (6)	RCT	72	Colonoscopy <12 h after rapid PEG preparation	Elective colonoscopy 36–60 h after admission	No difference in clinical outcomes or costs

LGIB, lower gastrointestinal bleeding; PEG, polyethylene glycol; RCT, randomized controlled trial.

Previous table | Figures and tables index

Evidence was considered as very low from the ASG expert group
There is room for discussion and reflexion

Urgent colonoscopy or RBCS+ Angio?



	Urgent Colonoscopy (n = 50)	Standard Care (n = 50)
Early rebleed	11 (22%)	15 (30%)
Late rebleed	8 (16%)	7 (14%)
Mortality		
LGIB	1 (2%)	2 (4%)
Other	0	2
Hospital stay (days)		
Total	5.8	6.6
ICU	1.8	2.4
Total PRBC (u)	4.2 + 0.4	5.0 + 0.5
Surgery	7 (14%)	6 (12%)
Subtotal colectomy	0	3
Hemicolectomy	5	2
Segmental	2	1
Complications	1	0

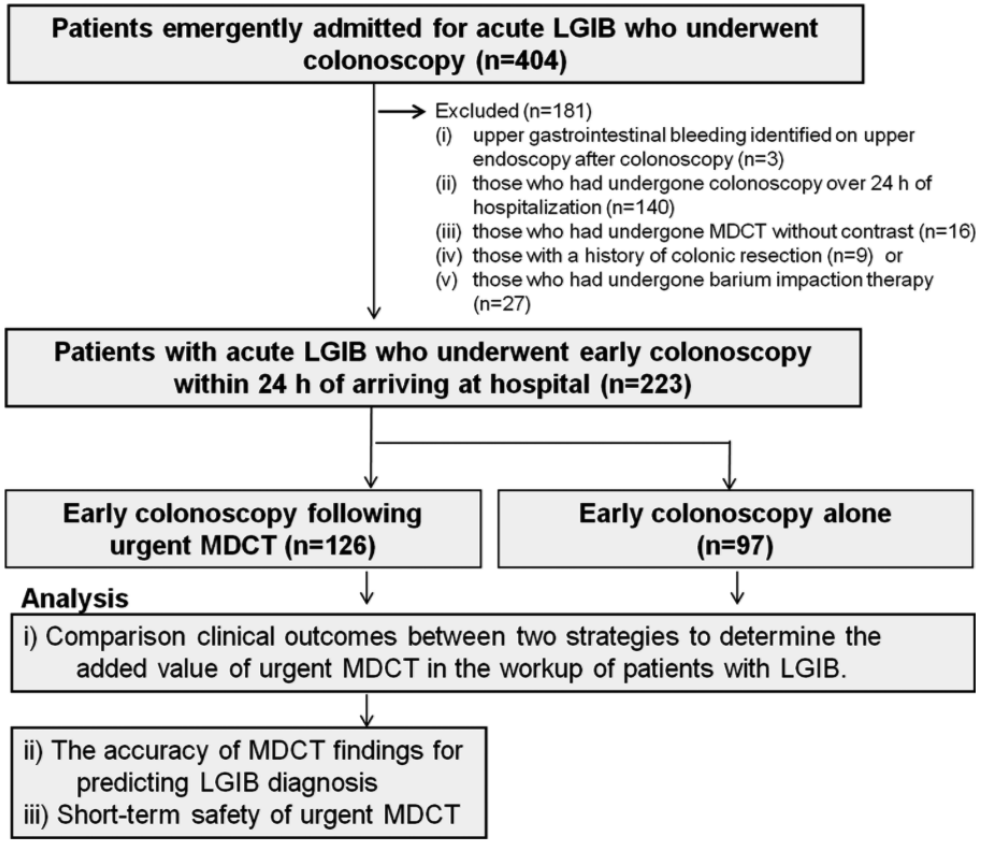
Only one randomized study in 2005
Compared urgent colonoscopy vs standard treatment including RBC scintigraphy and angiography if needed: No difference of outcome

Am J Gastroenterol. 2005 Nov;100(11):2395-402.

Urgent colonoscopy for evaluation and management of acute lower gastrointestinal hemorrhage: a randomized controlled trial.

Green BT[1], Rockey DC, Portwood G, Tarnasky PR, Guarisco S, Branch MS, Leung J, Jowell P.

Should we incorporate CT earlier in the patient management?



Gastroenterol
DI 10.1007/s00535-015-1069-9

The Japanese Society of Gastroenterology

ORIGINAL ARTICLE—ALIMENTARY TRACT

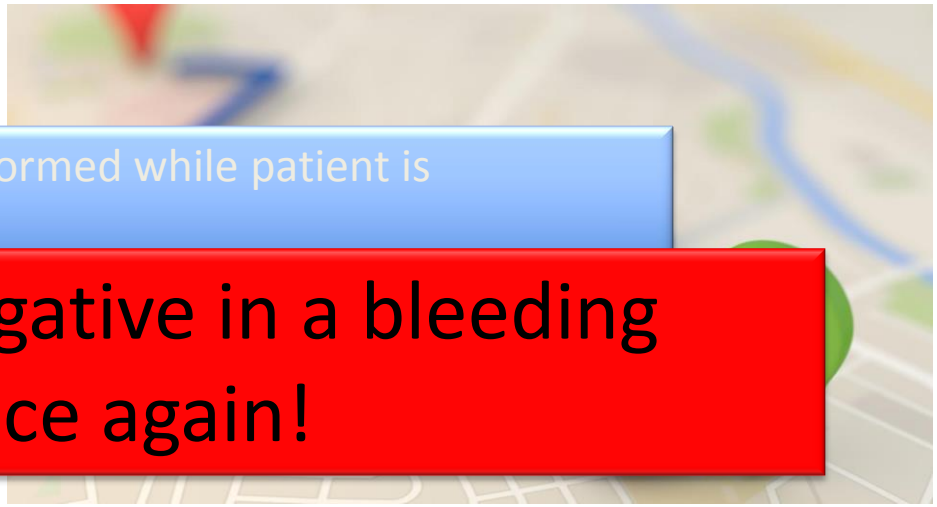
Role of urgent contrast-enhanced multidetector computed tomography for acute lower gastrointestinal bleeding in patients undergoing early colonoscopy

Naoyoshi Nagata[1] · Ryota Niikura[1] · Tomonori Aoki[1] · Shiori Moriyasu[1] · Toshiyuki Sakurai[1] · Takuro Shimbo[2] · Masafumi Shinozaki[3] · Katsunori Sekine[1] · Hidetaka Okubo[1] · Kazuhiro Watanabe[1] · Chizu Yokoi[1] · Mikio Yanase[1] · Junichi Akiyama[1] · Naomi Uemura[4]

Received: 13 January 2015 / Accepted: 15 March 2015

Acute Lower GI-bleeding: Diagnostic

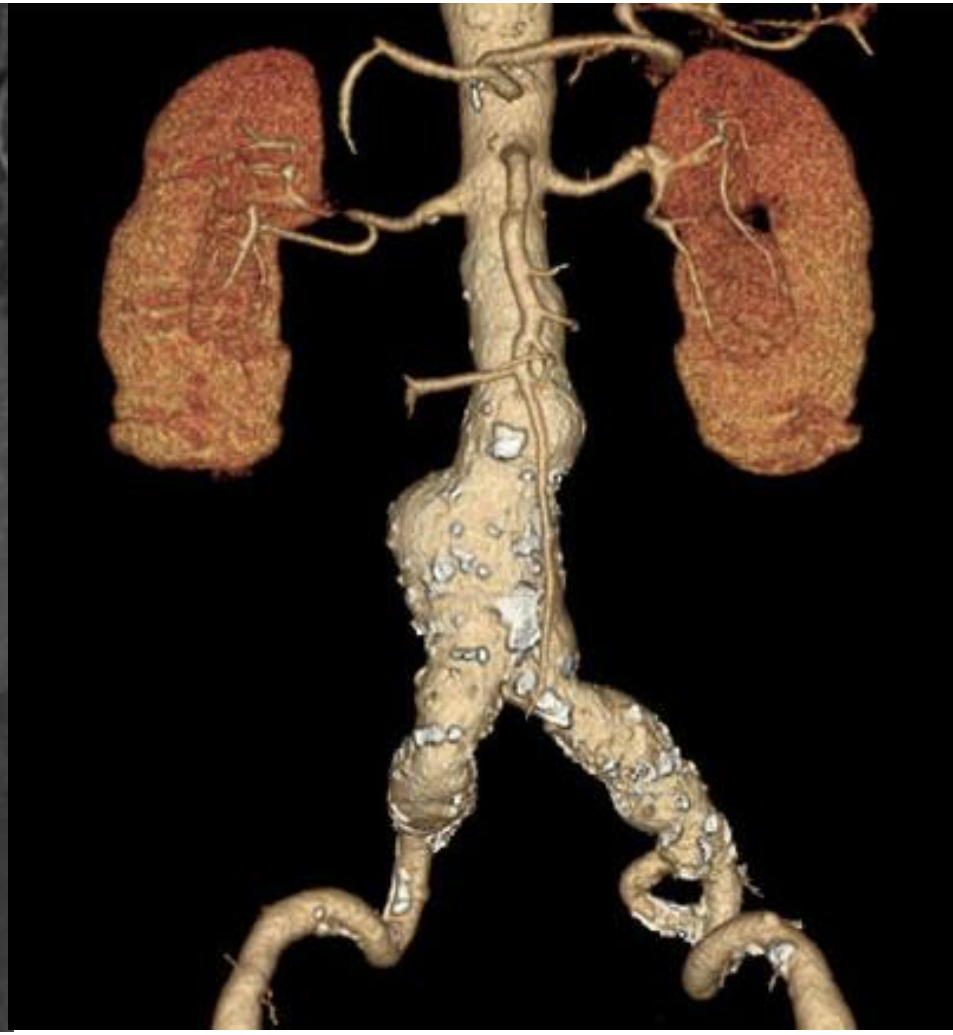
2) Angio-CT
- Sensitivity 0.3-1 ml/min
- Oral positive contrast FORBIDDEN !!!
- Late aquisition may show blood pooling
- Angio CT images serve as a road map for embolization



Angio CT should be performed while patient is bleeding!!!

If Angio CT is negative in a bleeding patient: Do it once again!

Kuhle, Radiology 2003



Diverticular hemorraghe

Duodenal varices in portal vein hypertension

Weishaupt, AJR 2002

Table 3 Clinical outcomes between the two strategies ($n = 223$)

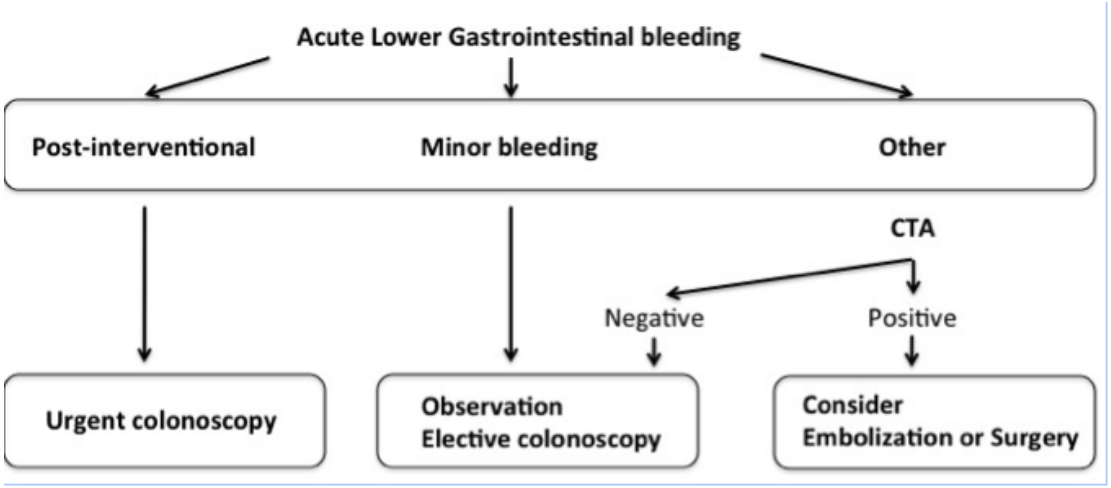
	Early colonoscopy following urgent MDCT ($n = 126$)	Early colonoscopy alone ($n = 97$)	p
Detection rate of bleeding source			
CT findings			
Extravasation (vascular findings)	26 (20.6)		
Location (C/A/T/D/S/R)	1/13/3/3/5/1		
Nonvascular findings	34 (27.0)		
Colonoscopy findings			
Vascular lesion	45 (35.7)	20 (20.6)	**0.01**
Location (I/C/A*/T/D/S/R)	1/2/21*/4/4/10/3	0/1/7*/2/1/3/6	0.09
Nonvascular lesion (inflammation or tumor)	16 (12.7)	11 (11.3)	0.76
Other outcomes			
Need for endoscopic therapies	44 (34.9)	13 (13.4)	**<0.01**
Need for angiographic procedures	0	0	NA
Need for surgery	0	2 (2.0)	0.47
Rebleeding after colonoscopy	16 (12.7)	15 (15.5)	0.554
Need for endoscopic therapies for rebleeding	3 (20.0)**	2 (14.3)**	1.00
Need for angiographic procedures for rebleeding	0	0	NA
Need for surgery for rebleeding	0	0	NA
Transfusion after colonoscopy	30 (23.8)	15 (15.5)	0.124
Units of transfused blood per patient after colonoscopy	1.5 ± 3.3	0.7 ± 1.9	0.102

Bold values indicate statistically significant differences with a p value less than 0.05

CT is more widely available than colonoscopy in emergency setting

Exam findings	CTA (n=32)	LE (n=122)	*P*-value
Active bleeding	10 (31.3)	18 (14.8)	0.031
Non-active bleeding source	7 (21.9)	38 (31.1)	0.305
Inconclusive	15 (46.9)	66 (54.1)	0.396

Delay between emergency admission and colonoscopy (22hours) or CTA (3hours) p<0.001



Delay between CT and angiography

Table 1 Patient demographics and characteristics

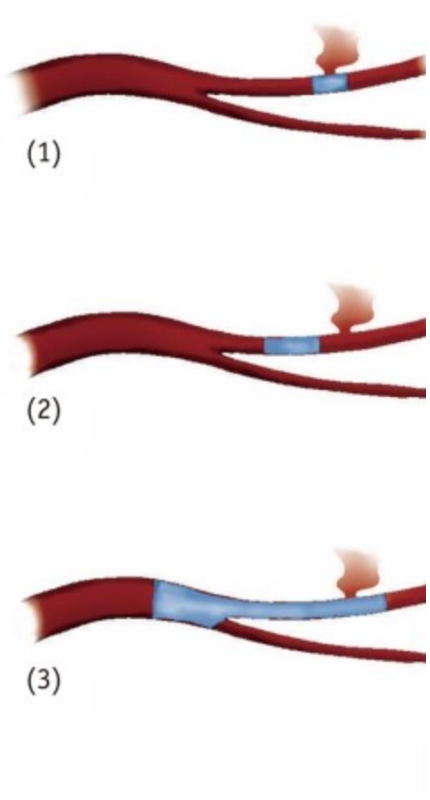
	Positive MA (%)	Negative MA (%)	*p* value	OR (95 % CI)
n	25	23	–	–
Median age (range)	65 (18–88)	73 (26–86)	0.51	–
Male	16 (64)	10 (43)	0.25	–
Median Charlson's comorbidity index score (range)	3 (0–15)	2 (0–8)	0.77	–
Use of anti-platelets/anti-coagulants	10 (40)	10 (43.5)	1.00	0.87 (0.28–2.73)
Blood investigation prior to invasive MA (range)				–
Haemoglobin (g/dl)	8.2 (4.9–16.9)	8.7 (6.8–10.9)	0.22	
Platelet ($\times 10^9$/l)	154 (49–344)	151 (61–932)	0.67	
International normalized ratio (INR)	1.27 (0.96–1.9)	1.16 (0.95–3.22)	0.33	
Transfused blood products 24 h preceding invasive MA				–
Packed cell transfusion (units)	3 (0–16)	2.5 (0–5)	0.36	
Platelets (units)	0 (0–16)	0 (0–10)	0.38	
Fresh frozen plasma (ml)	0 (0–4500)	0 (0–1000)	0.16	

	Positive MA (%)	Negative MA (%)	*p* value	OR (95 % CI)
n	25	23	–	–
Etiology				
Non-diverticular	12 (48)	13 (56.5)	0.58	0.71 (0.23–2.22)
Diverticular	13 (52)	10 (43.5)		
Site of LGIB				
Small bowel	10 (40)	10 (43.5)	1.00	0.87 (0.28–2.73)
Large bowel	15 (60)	13 (56.5)		
Median time lapsed between CTMA and invasive MA (range)	131 (48–214)	156 (32–587)	0.06	–
Time lapsed between CTMA and invasive MA				
≤90 min	7 (28)	1 (4.3)	0.05	8.56 (0.96–76.1)
>90 min	18 (72)	22 (95.7)		

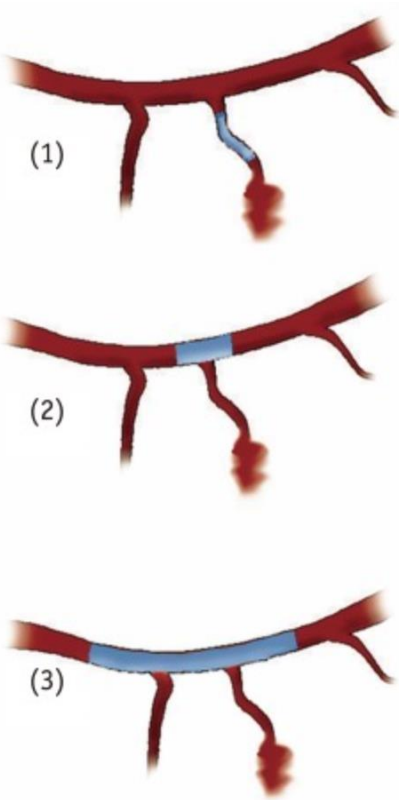
Trans arterial embolization

Technique of embolization:

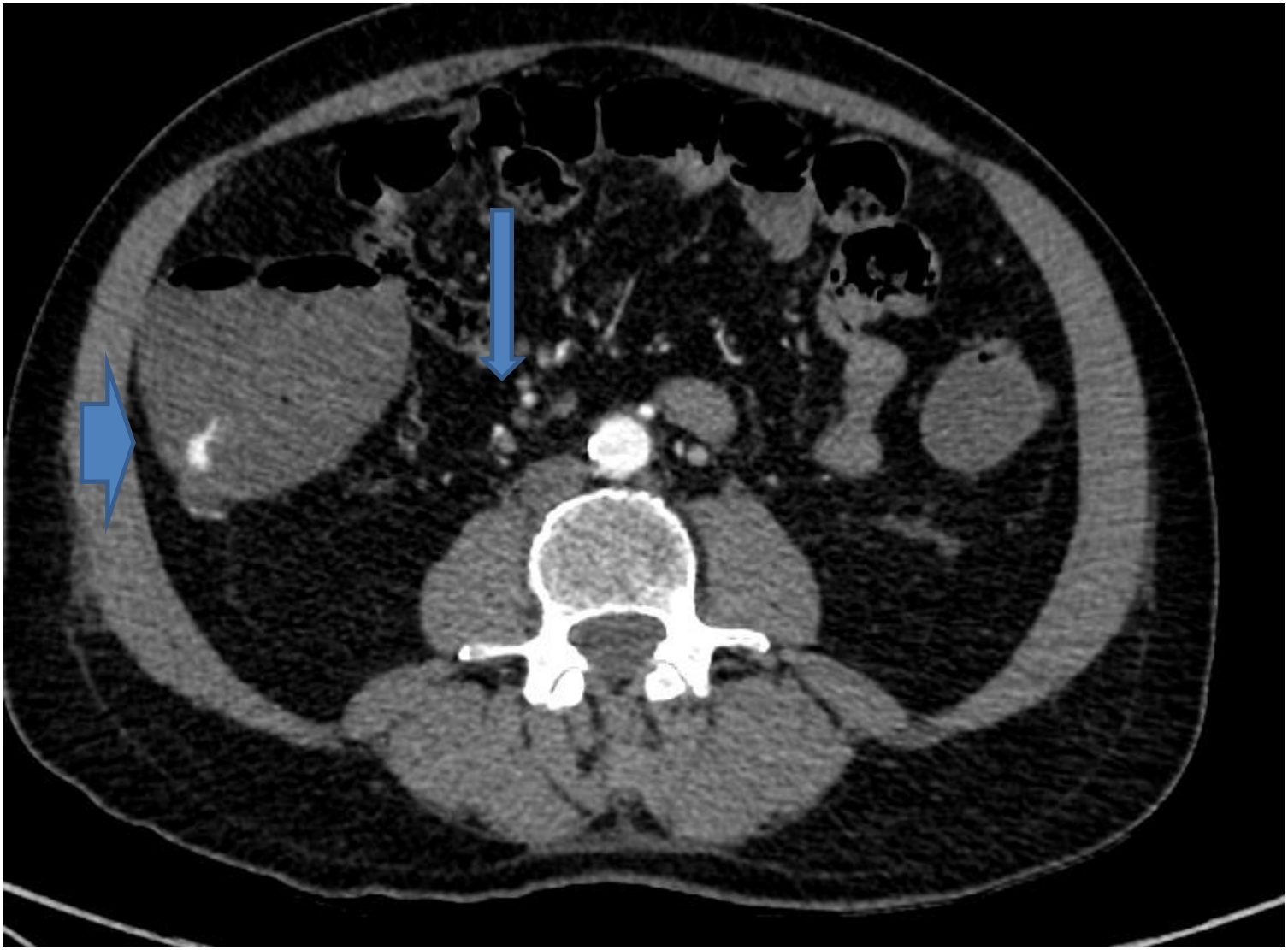
Terminal arteries

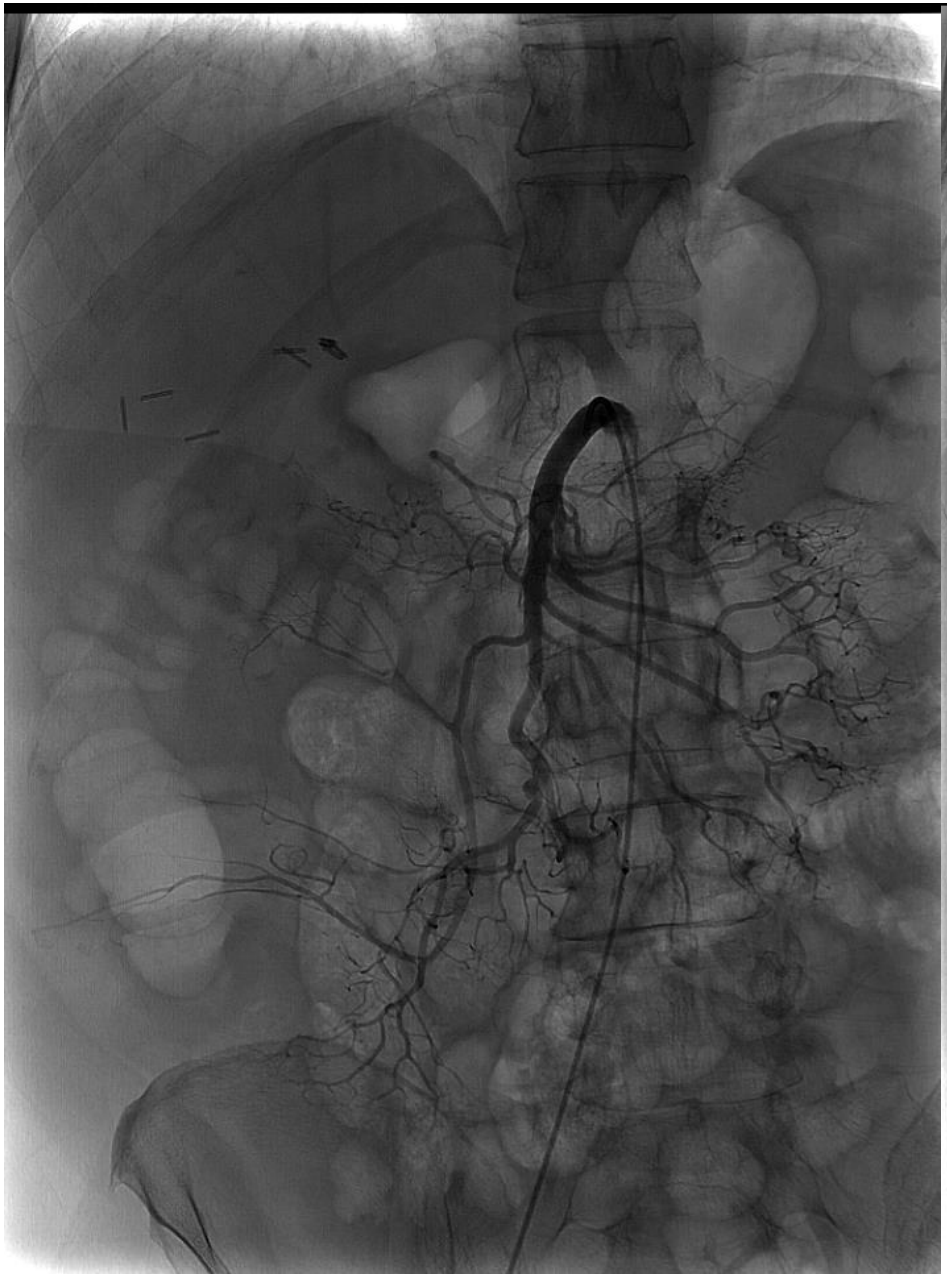
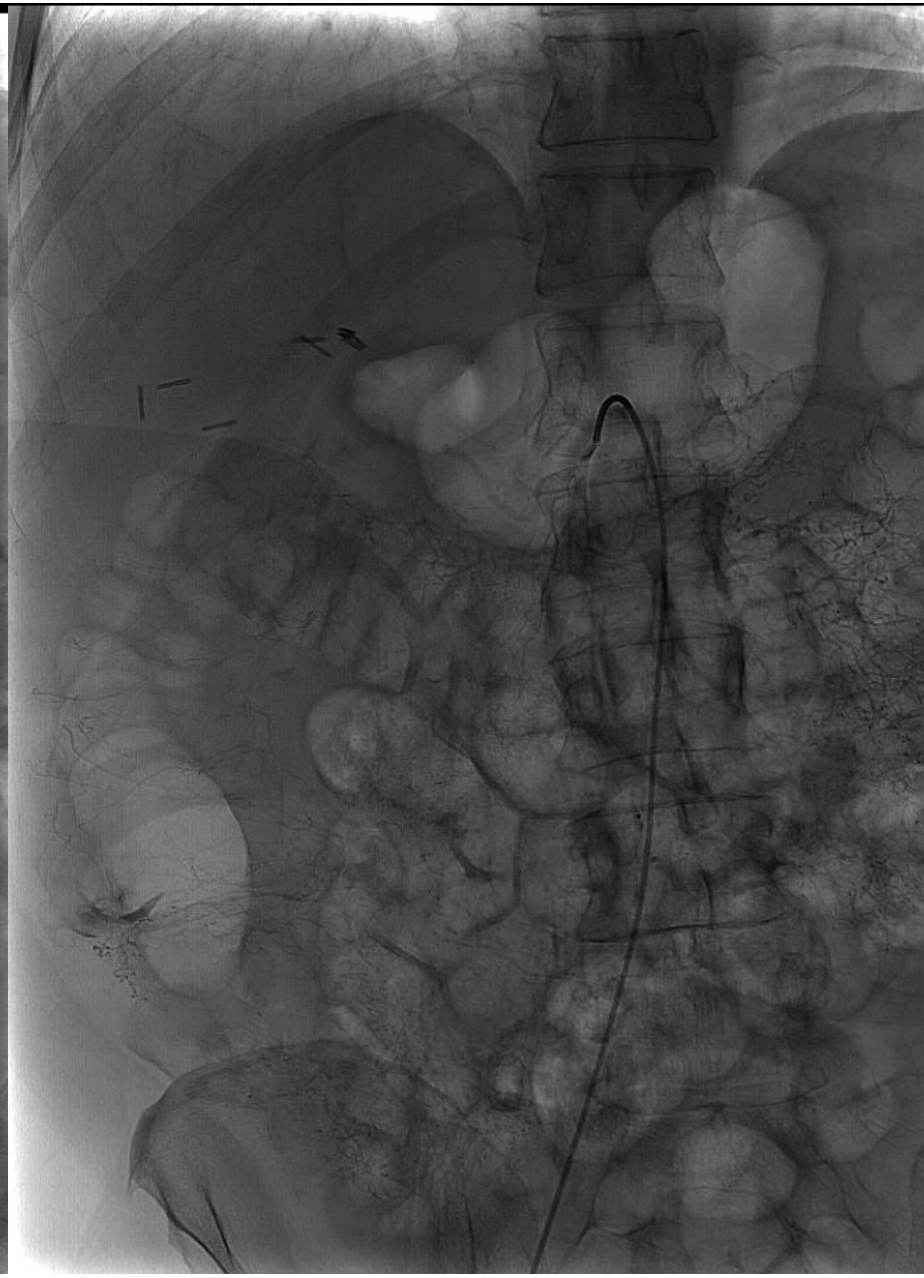


Non terminal arteries



Shin JH. Recent Update of Embolization of Upper Gastrointestinal Tract Bleeding. *Korean Journal of Radiology*. 2012;13(Suppl 1):S31-S39. doi:10.3348/kjr.2012.13.S1.S31.



Embolization results

- Sensitivity is increased when
  - Acute bleeding with >5BU, 50% drop in Hb, hemodynamic instability
  - Sensitivity varies from 40-86%
  - Treatement / embolization
    - Should be done in arcuate arcades or at the bleeding site
    - Avoid particles, coils and/or glue are recommanded
    - 14% rebleeding
    - 9% ischemia most of them asymtomatic

Marion Y Journal of visceral surgery, 2014 151, 191-201

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Marion Y Journal of visceral surgery, 2014 151, 191-201

Selected results from the literature

Selected series of transcatheter embolotherapy for lower GI bleeding

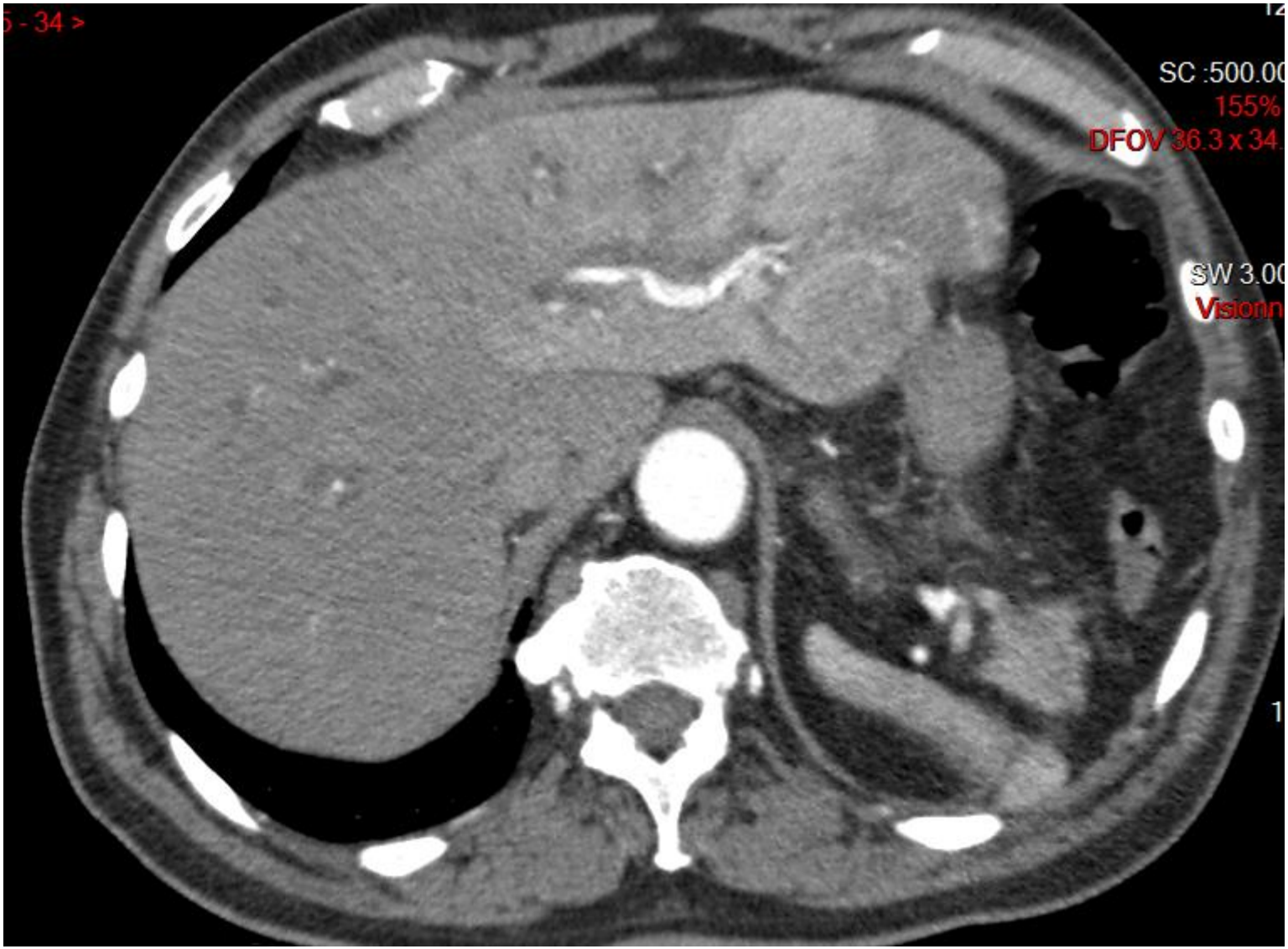
Author	Year	No. of patients	No. successfully embolized (n/%)	Ischemic complications (n/%)	Rehemorrhage (n/%)
Peck [37]	1998	21	17 (81)	0 (0)	11 (52)
Evangelista [38]	2000	17	17 (100)	2 (12)	2 (13)
Luchtefeld [44]	2000	17	17 (100)	4 (24)	3 (18)
Bandi [40]	2001	48	35 (73)	6 (13)	14 (40)
Krämer [45]	2000	19	18 (95)	4 (11)	5 (22)
Funaki [39]	2001	27	25 (93)	4 (15)	5 (20)
DeBarros [46]	2002	27	23 (100)	2 (7)	5 (22)
Kuo [43]	2003	22	22 (100)	1 (7)	3 (14)
Burgess [47]	2004	15	14 (93)	6 (43)	8 (53)
Silver [48]	2005	11	10 (91)	7 (70)	1 (10)
Nicholson [49]	2005	14	14 (100)	3 (21)	2 (14)

Trans arterial embolization

Special cases

Hemobilia

- Always iatrogenic or traumatic
  - Embolization is the best treatment since it spares normal parenchyma
  - Attention when bile ducts are dilated or when bilioenteric anastomosis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SW 3.00
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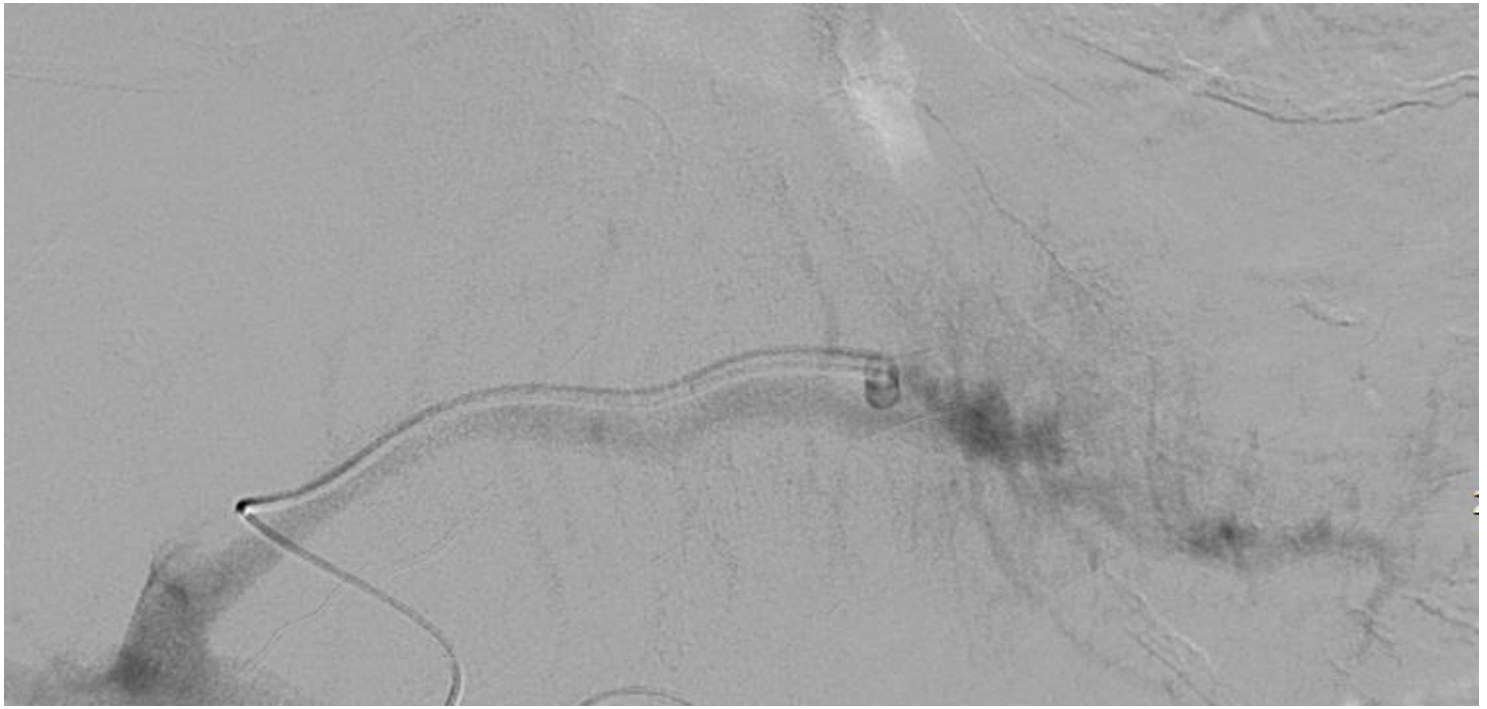
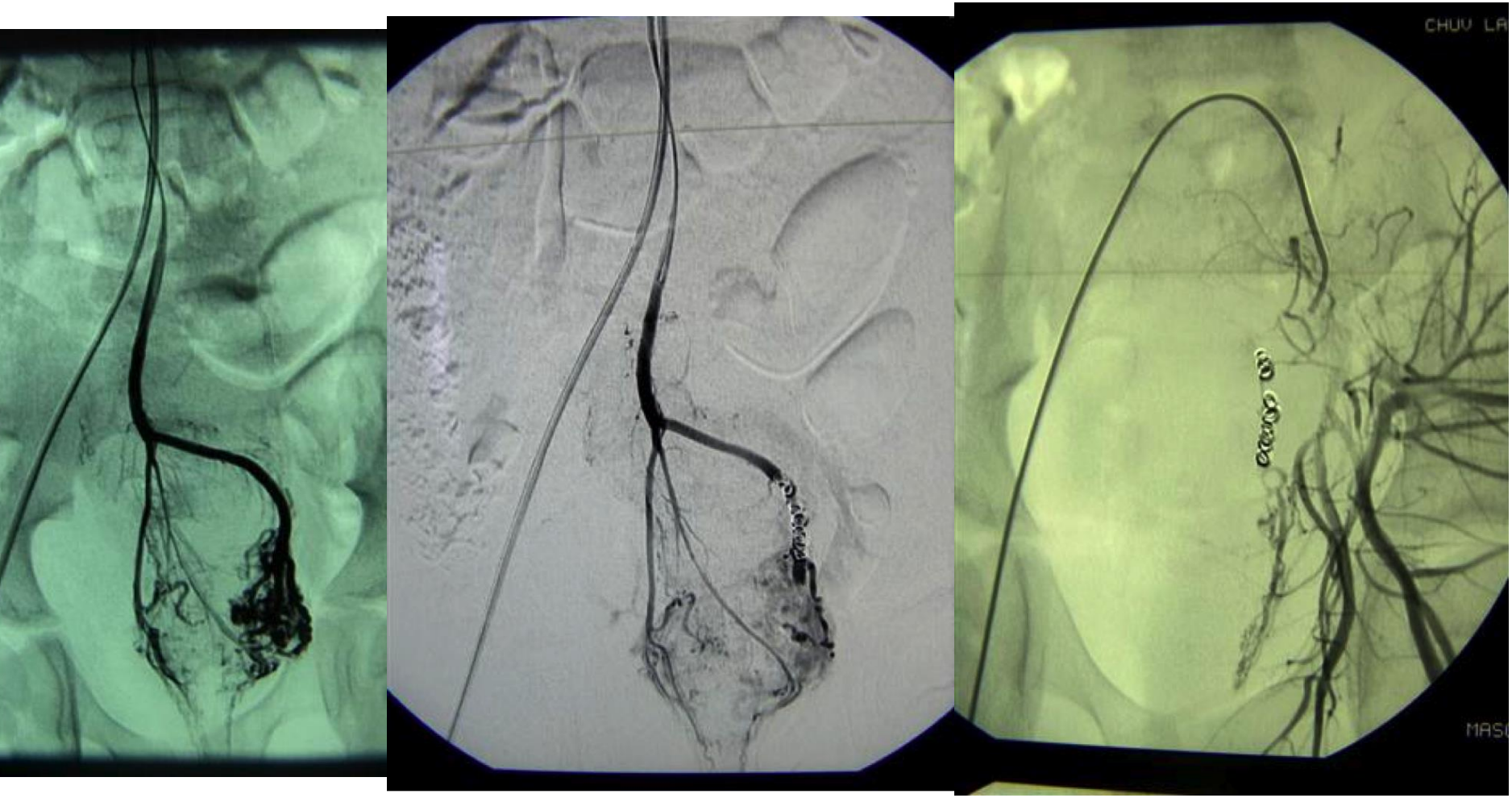
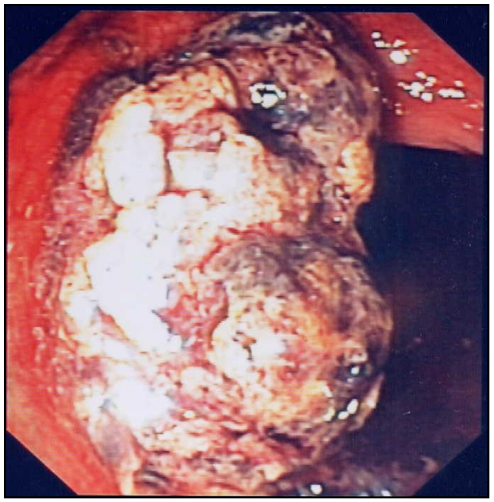
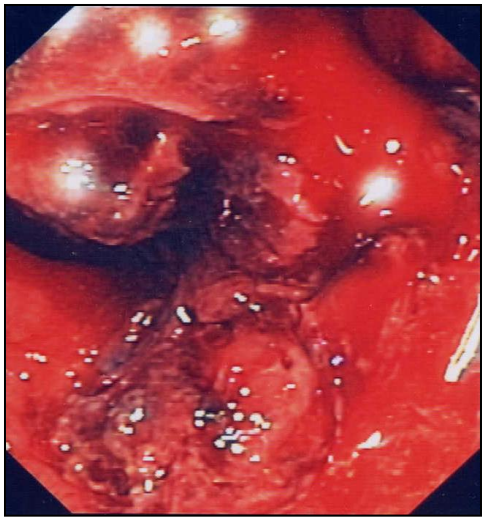


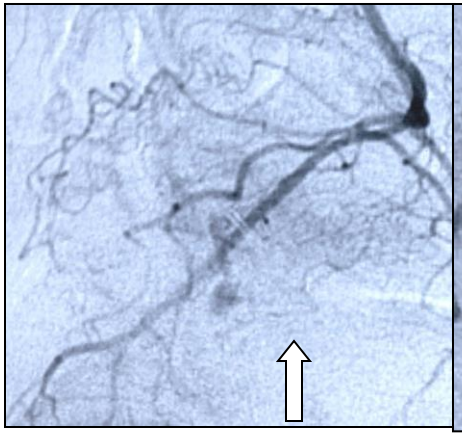
8yo reccurent rectal bleeding in Kippel Trellaunay syndrome uncontrolled by endoscopy



Recurrent bleeding after endoscopic mucosectomy







Conclusion

- Embollization is recommanded in 2 situations
  - In active severe bleeding
    - After CTA
    - Pending short delays between CTA and MA
  - After a positive CTA in a stabilized patient
    - Rate of success is similar to endoscopy
    - Wait and see strategy
  - In the post-operative setting

Thanks to GE and surgeons to be galant wit with IR


We will help you next time……..