



SAPIENZA
UNIVERSITÀ DI ROMA



AZIENDA OSPEDALIERO-UNIVERSITARIA
SANT'ANDREA

CLINICAL CASE

Meeting 2021

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Roma



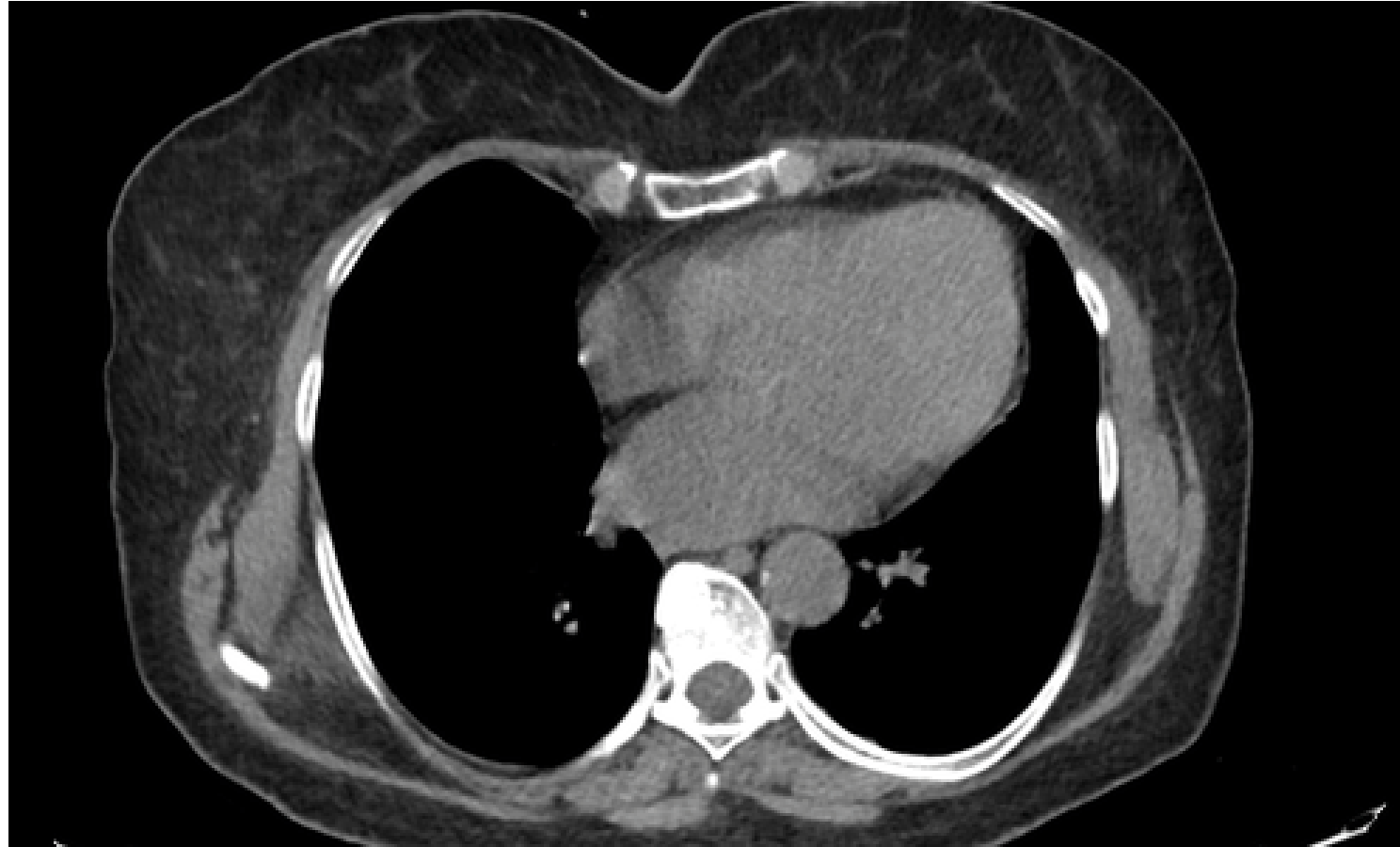
CLINICAL CASE

- 74 y.o. patient, F
- Abdominal pain
- Rectorrhagia (the day before)

- Diabetes mellitus

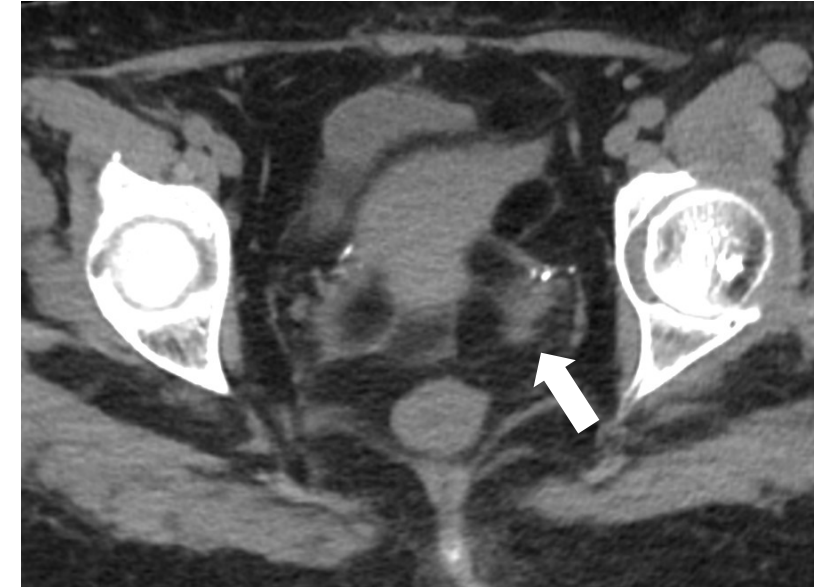
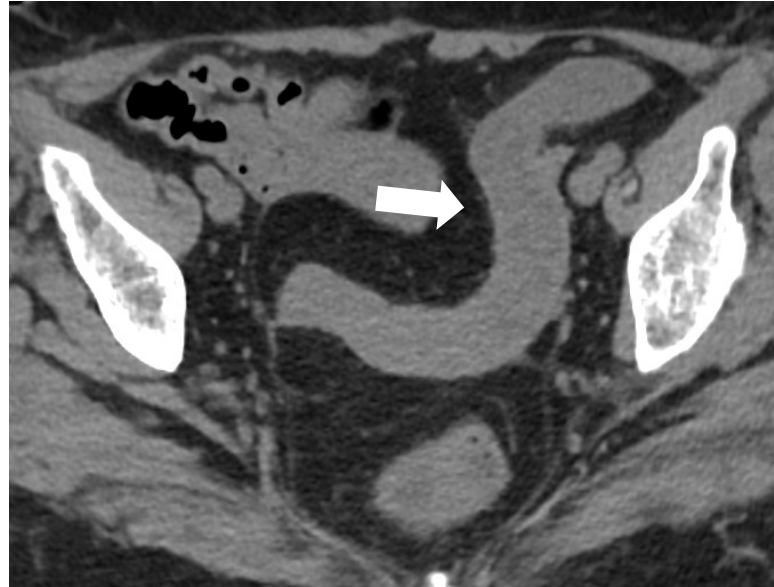
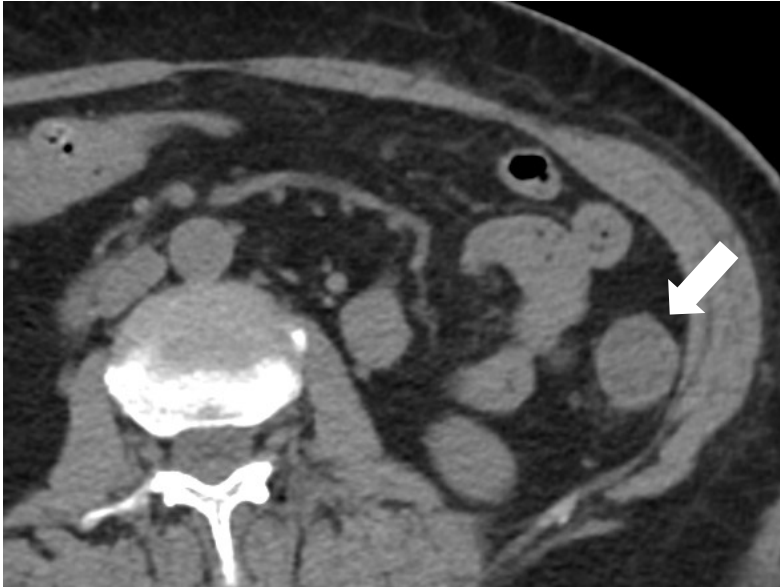
- Blood tests: **WBC 14.400/mm**, N 86,8 %, L 10,5 % (Neutrophilic leukocytosis)
Glucose 316 mg/dl
LDH 225 U/L
D-Dimer 3024 ng/ml

?



Basal phase CT scan

?



- Uniform thickening (from the splenic flexure to the sigmoid colon)
- Pericolic fluid + Free intraperitoneal fluid

Basal phase CT scan



D.D.

- **INFLAMMATORY** (Diver ~~colitis~~)
- **INFECTION**
- **ISCHEMIA**

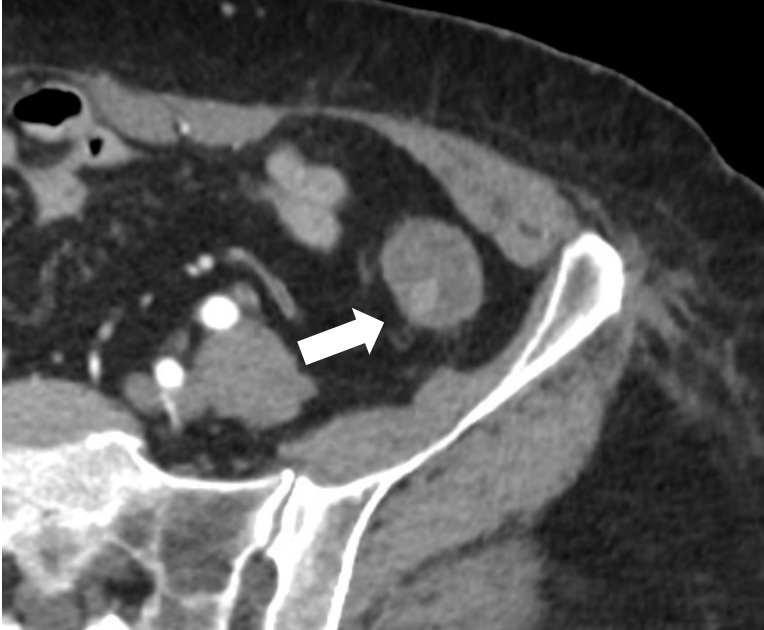


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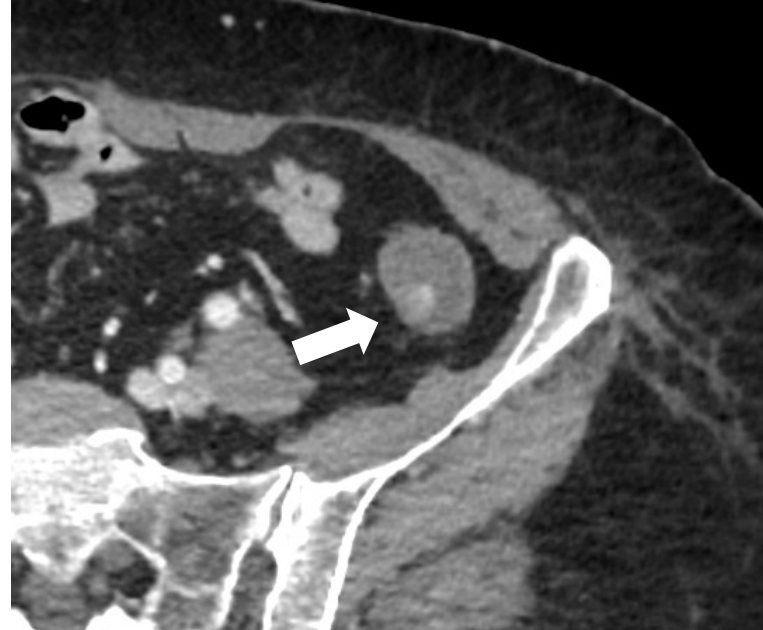


Arterial phase CT scan

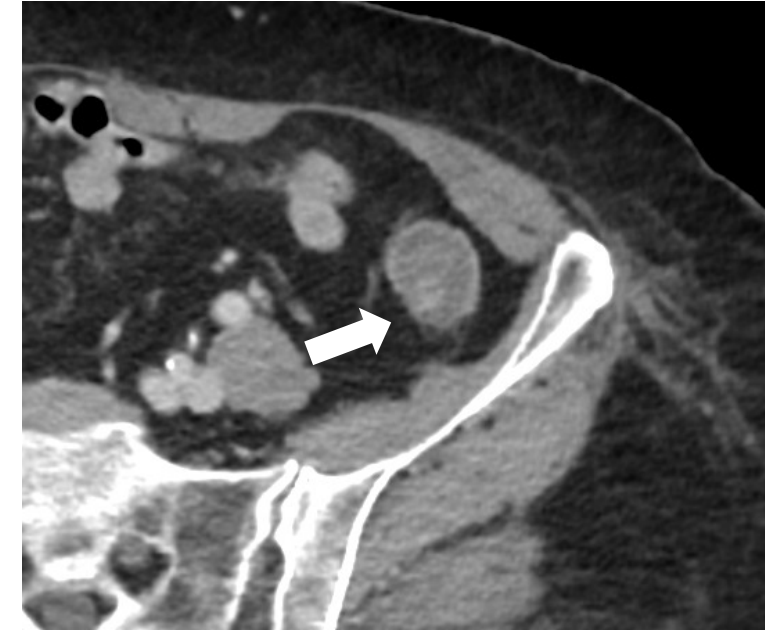
Blush ?



Arterial phase CT scan

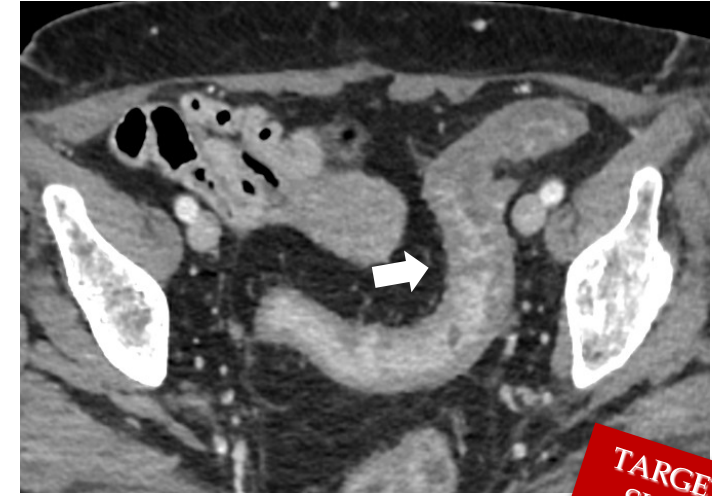
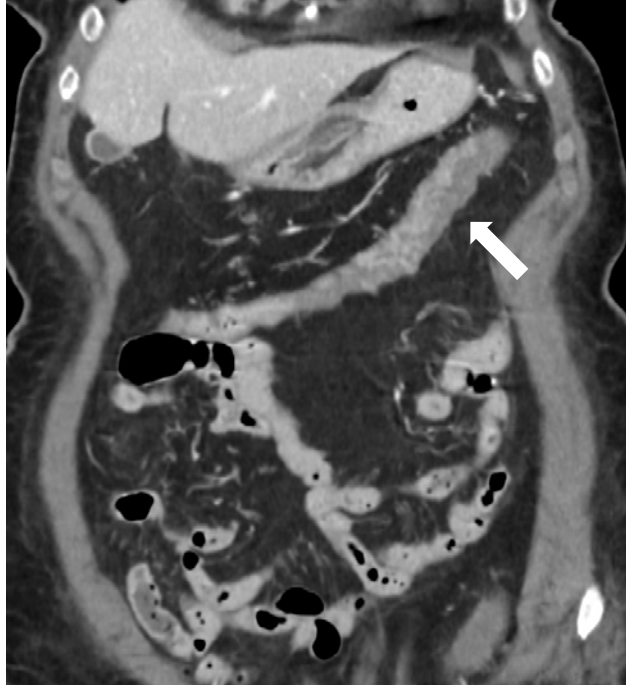


Portal venous phase CT scan



Delayed phase CT scan

?



TARGET
SIGN

- Uniform thickening (from the splenic flexure to the sigmoid colon)
- Splenic flexure + sigmoid colon: stratified pattern; **Descending colon: grey pattern**
- Rectal sparing

Portal venous phase CT scan



D.D.

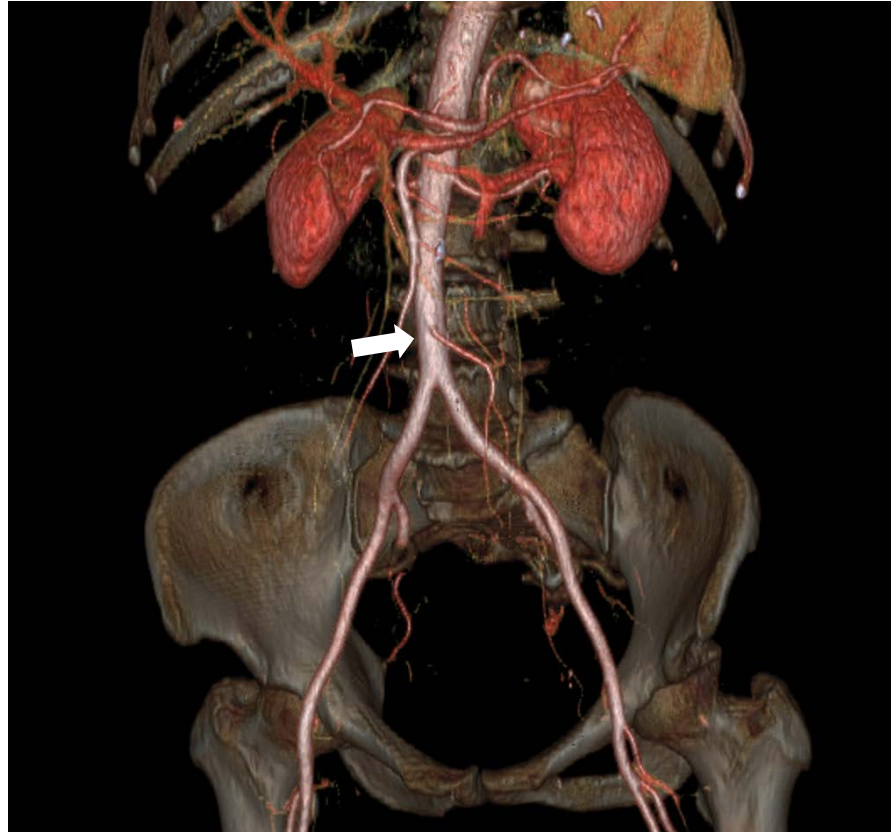
- ~~INFLAMMATORY (Diverculitis)~~

- ~~INFECTION~~

- **ISCHEMIA**



No defect in abdominal vessels !



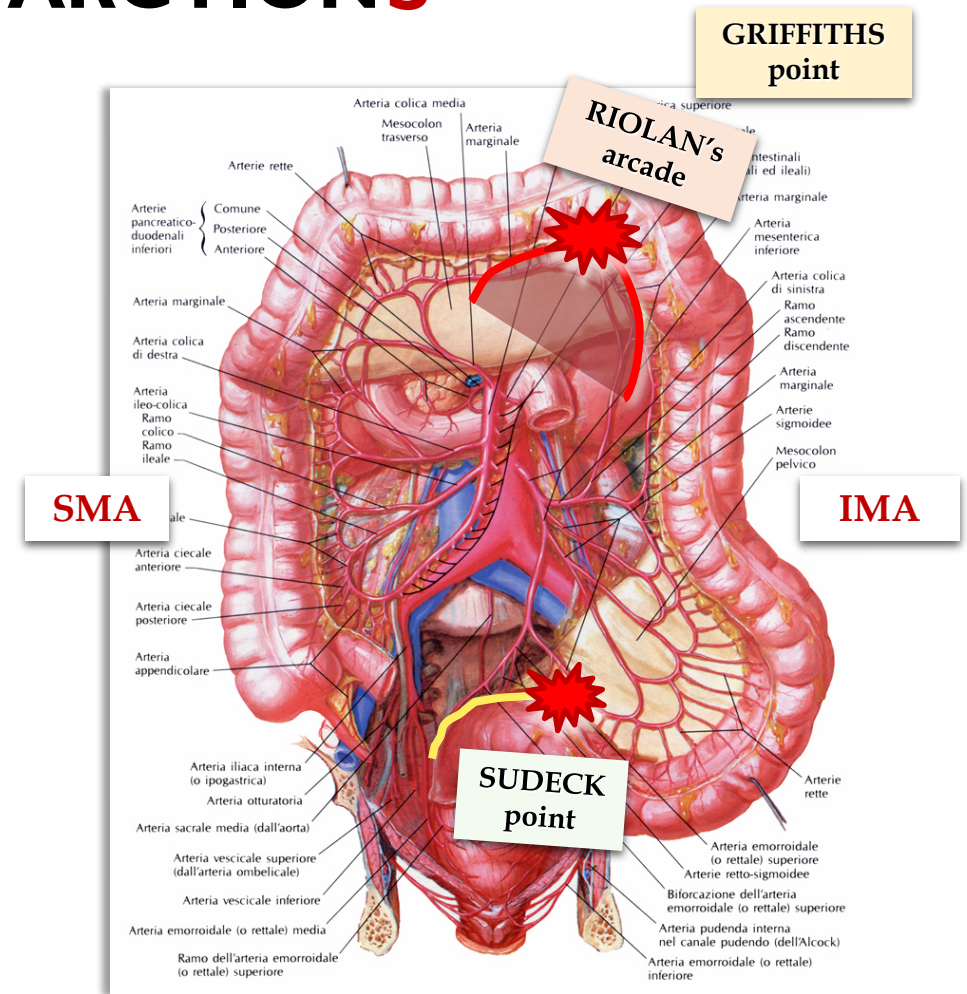
3D vascular image



MIP vascular image

MESENTERIC INFARCTIONS

- Acute Arterial Mesenteric Infarction (AAMI)
- Acute Venous Mesenteric Infarction (AVMI)
- Non Occlusive Mesenteric Infarction (NOMI)
- Ischemia and Reperfusion (IR)
- Ischemic Colitis (IC)





ISCHEMIC COLITIS

- The most frequent form of intestinal ischemia
- **Elderly patients (80%)**
- F: M = 2:1 (unknown reason)
- Comorbid cardiovascular disease and **diabetes mellitus**
- Mostly NOMI ("watershead areas" as sites of high susceptibility) or atherosclerosis of small vessels
- Challenging diagnosis (combination of clinical suspicion, radiological, endoscopical, and histological findings)



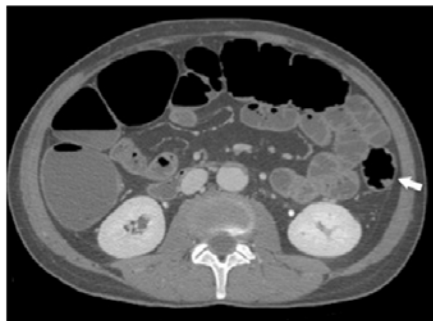
*Extent of the reduction in blood flow
Number of vessels involved
Duration of ischemia
Development of collateral circulation*

ACUTE ISCHEMIC COLITIS

■ No occlusion (NOIC)

- No defect in the vessels
- Thinning
- Bowel dilatation
- Absence of wall enhancement
- Pericolic fluid
- Other abdominal parenchyma

Myocardial infarction
Congestive heart failure
Aortic insufficiency
Renal or hepatic disease



■ Occlusion (OIC)

- Luminal defect
- Uniform thickening (Riolan's arcade)
- Reduced caliber
- Target sign (Riolan's arcade)
- Pericolic fluid

Hypertension
Diabetes mellitus
Cardiovascular disease



SUBACUTE ISCHEMIC COLITIS

■ No reperfusion

- Thinning
- Bowel dilatation
- Absence of wall enhancement
- ↑ Pericolonic fluid / Ascites

■ Riperfusion

- Thickening
- Various enhancement pattern (Target sign / Absence of wall enhancement / Hyperenhancement)
- ↓ Pericolonic fluid

Duration and
extent of
ischemia

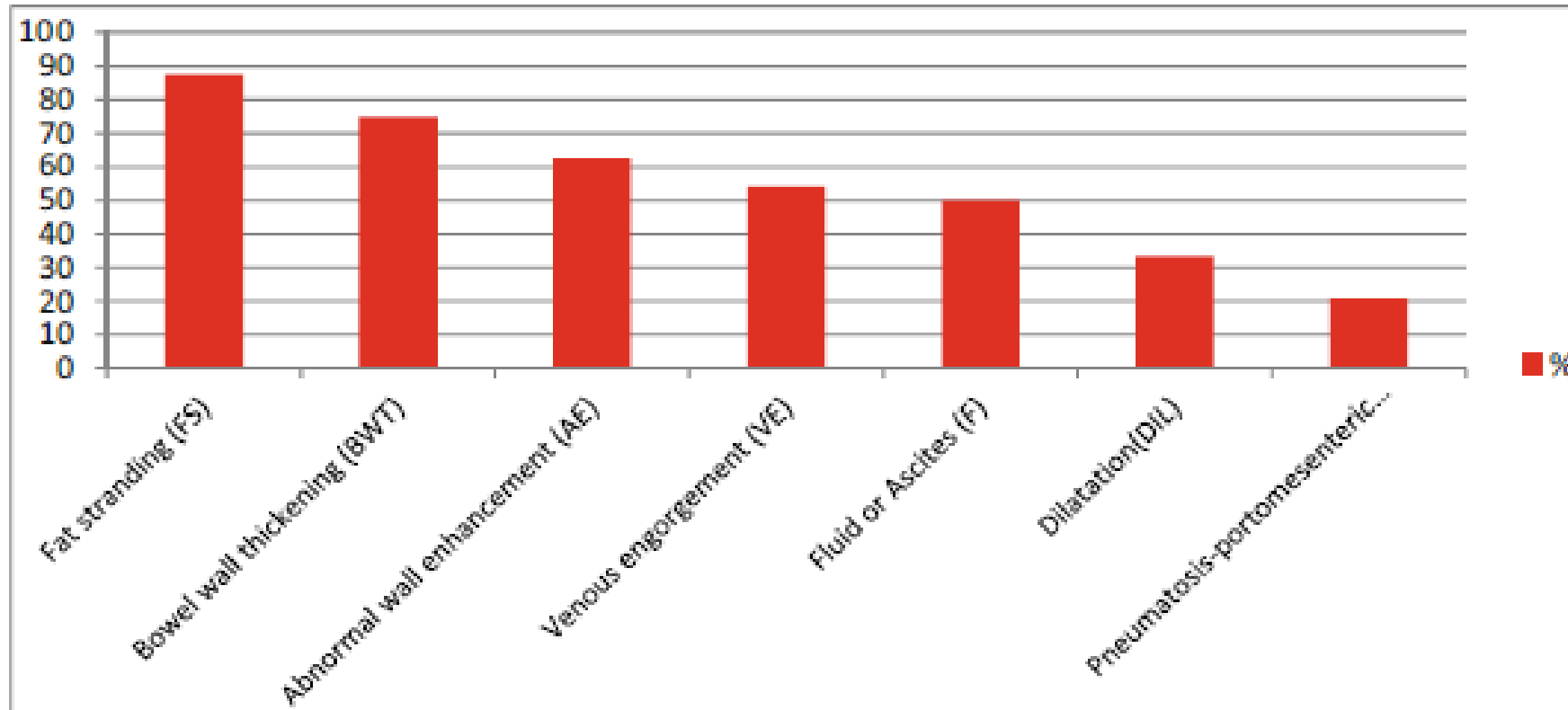


CHRONIC ISCHEMIC COLITIS

- Irregular thickening
- Gaping lumen
- No haustral folds
- No target sign
- Pale mucosa
- No pericolic fluid / Ascites



MESENTERIC INFARCTIONS



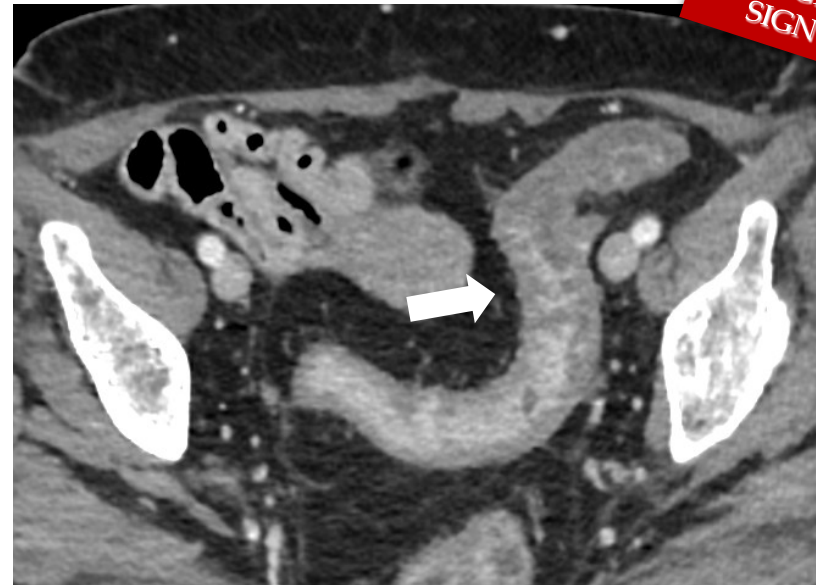
**High sensitivity but
Low specificity**

**No correlation with
severity (except for the
association of
Pneumatosis +
Dilatation + Thinning
+ Ascites)**

CLINICAL CASE

- No defect in the vessels
- Thickening
- Target sign
- Absence of wall enhancement
- Pericolonic fluid

~~Pneumatosis
Dilatation
Thinning
Ascites~~



ISCHEMIC COLITIS

Colon Ischemia Recommendations and Best Practice Summary Statements

Recommendation and Best Practice Statements

Clinical Presentation

1. The diagnosis of CI is usually established in the presence of symptoms including sudden cramping, mild, diffuse abdominal pain, and passage within 24h of bright red or maroon blood or bloody diarrhea. (Strong recommendation, very low level of evidence) (7,9,17)
2. A diagnosis of non-isolated right colon ischemia (non-IRCI) should be considered when patients present with symptoms of acute colitis. (Strong recommendation, very low level of evidence) (7,9,17)

Imaging of CI

1. CT with intravenous and oral contrast should be the first imaging modality of choice for patients with suspected CI to assess the distribution and phase of colitis. (Strong recommendation, moderate level of evidence) (111-115)
2. The diagnosis of CI can be suggested based on CT findings (e.g., bowel wall thickening, edema, and pericolonic stranding). (Strong recommendation, moderate level of evidence) (111-113)
3. Multiphasic CTA should be performed on any patient with suspected CI to assess the distribution and phase of colitis. (Strong recommendation, moderate level of evidence) (113,114)
4. CT or MRI findings of colonic pneumatosis and porto-mesenteric venous gas can be used to predict the presence of transmural colonic infarction. (Strong recommendation, moderate level of evidence) (115)
5. In a patient in whom the presentation of CI may be a heralding sign of AMI (e.g., IRCI, severe pain without bleeding, atrial fibrillation), and the multiphasic CT is negative for vascular occlusive disease, traditional splanchnic angiography should be considered for further assessment. (Conditional recommendation, low level of evidence) (114)

Colonoscopy in the Diagnosis of CI

1. Early colonoscopy (within 48h of presentation) should be performed in suspected CI to confirm the diagnosis. (Strong recommendation, low level of evidence) (17)
2. When performing colonoscopy on a patient with suspected CI, the colon should be inspected proximally to the site of disease. (Strong recommendation, low level of evidence) (69,135)
3. In patients with severe CI, CT should be used to evaluate the distribution of disease. Limited colonoscopy is appropriate to confirm the nature of the CT abnormality. Colonoscopy should be halted at the distalmost extent of the disease. (Strong recommendation, low level of evidence)
4. Biopsies of the colonic mucosa should be obtained except in cases of gangrene. (Strong recommendation, very low level of evidence) (17)
5. Colonoscopy should not be performed in patients who have signs of acute peritonitis or evidence of irreversible ischemic colitis (e.g., pneumatosis, perforation, or free air). (Strong recommendation, very low level of evidence)

Severity and Treatment of CI

1. Most cases of CI resolve spontaneously and do not require specific therapy. (Strong recommendation, low quality of evidence) (107,108,139)
2. Surgical intervention should be considered in the presence of CI accompanied by hypotension, tachycardia, and abdominal pain without rectal bleeding; for IRCI and pan-colonic CI; and in the presence of gangrene. (Strong recommendation, moderate level of evidence) (117,118,122)
3. Antimicrobial therapy should be considered for patients with moderate or severe disease. (Strong recommendation, very low level of evidence) (107,108,140)

CLINICAL PRESENTATION:

Abdominal pain
Rectal bleeding/diarrhea

RADIOLOGICAL IMAGING:

CT with intravenous contrast: first imaging modality of choice in suspected CI

COLONOSCOPY:

Within 48h of presentation
Risk of perforation
Not if signs of peritonitis or gangrenous forms

TREATMENT:

Spontaneous resolution
Antimicrobial therapy
Surgery

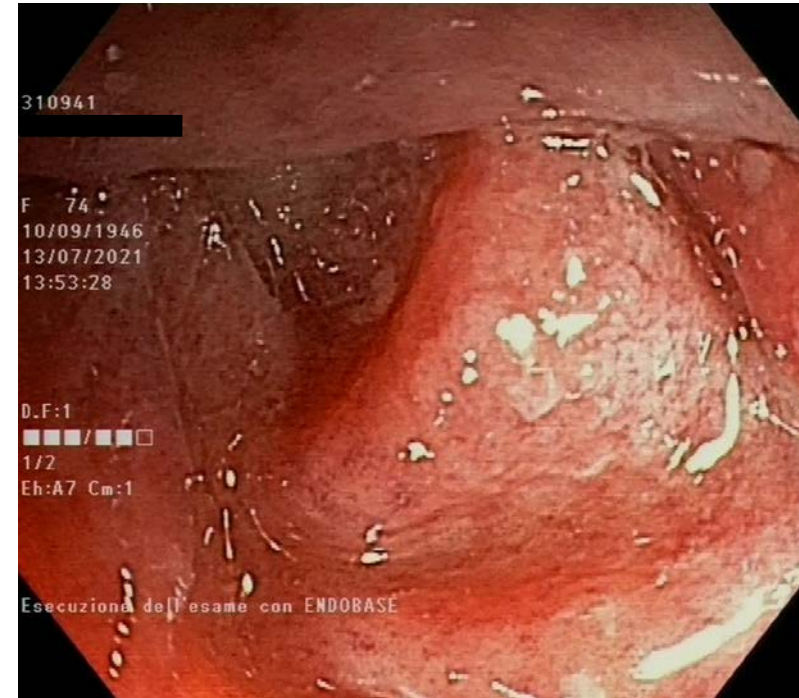
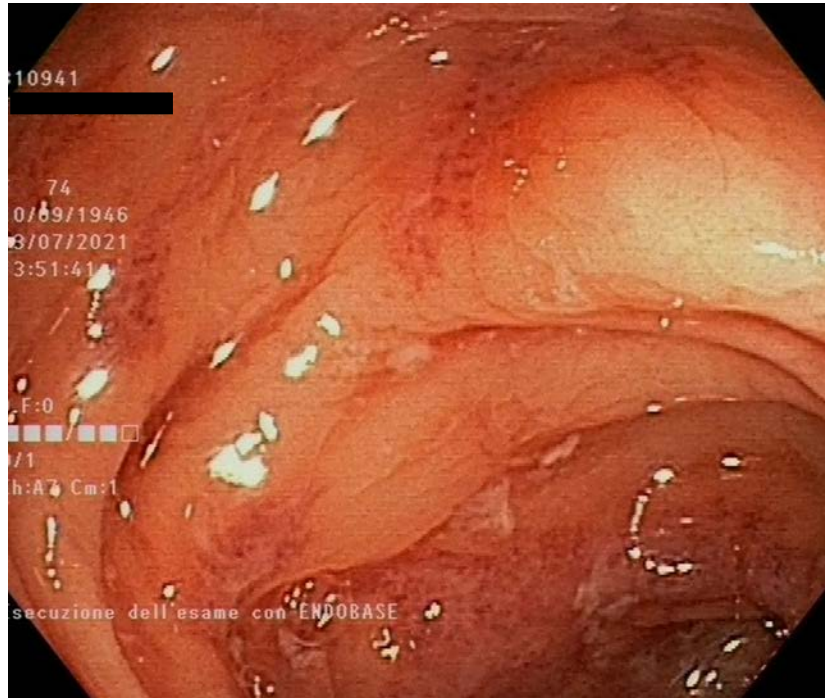


DISEASE SEVERITY

Disease severity	Criteria	Treatment
Mild	Typical symptoms of CI with a segmental colitis not isolated to the right colon and with none of the commonly associated risk factors for poorer outcome that are seen in moderate disease	Observation Supportive care
Moderate	Any patient with CI and up to three of the following factors:	Correction of cardiovascular abnormalities (e.g., volume replacement) Broad-spectrum antibiotic therapy Surgical consultation
	Male gender	
	Hypotension (systolic blood pressure <90 mmHg)	
	Tachycardia (heart rate >100 beats/min)	
	Abdominal pain without rectal bleeding	
	BUN >20 mg/dl	
	Hgb <12 g/dl	
	LDH >350 U/l	
	Serum sodium <136 mEq/l (mmol/l)	
	WBC >15 cells/cmm ($\times 10^9/l$)	
	Colonic mucosal ulceration identified colonoscopically	
Severe	Any patient with CI and more than three of the criteria for moderate disease or any of the following:	Emergent surgical consultation (treatment is likely to be surgical) Transfer to intensive care unit Correction of cardiovascular abnormalities (e.g., volume replacement) Broad-spectrum antibiotic therapy
	Peritoneal signs on physical examination	
	Pneumatosis or portal venous gas on radiologic imaging	
	Gangrene on colonoscopic examination	
	Pancolonic distribution or IRCI on imaging or colonoscopy	

- **CLINICAL PRESENTATION**
- **SEGMENTAL DISTRIBUTION OF CI**
- **RISK FACTORS**
- **COLONOSCOPY**

COLONOSCOPY

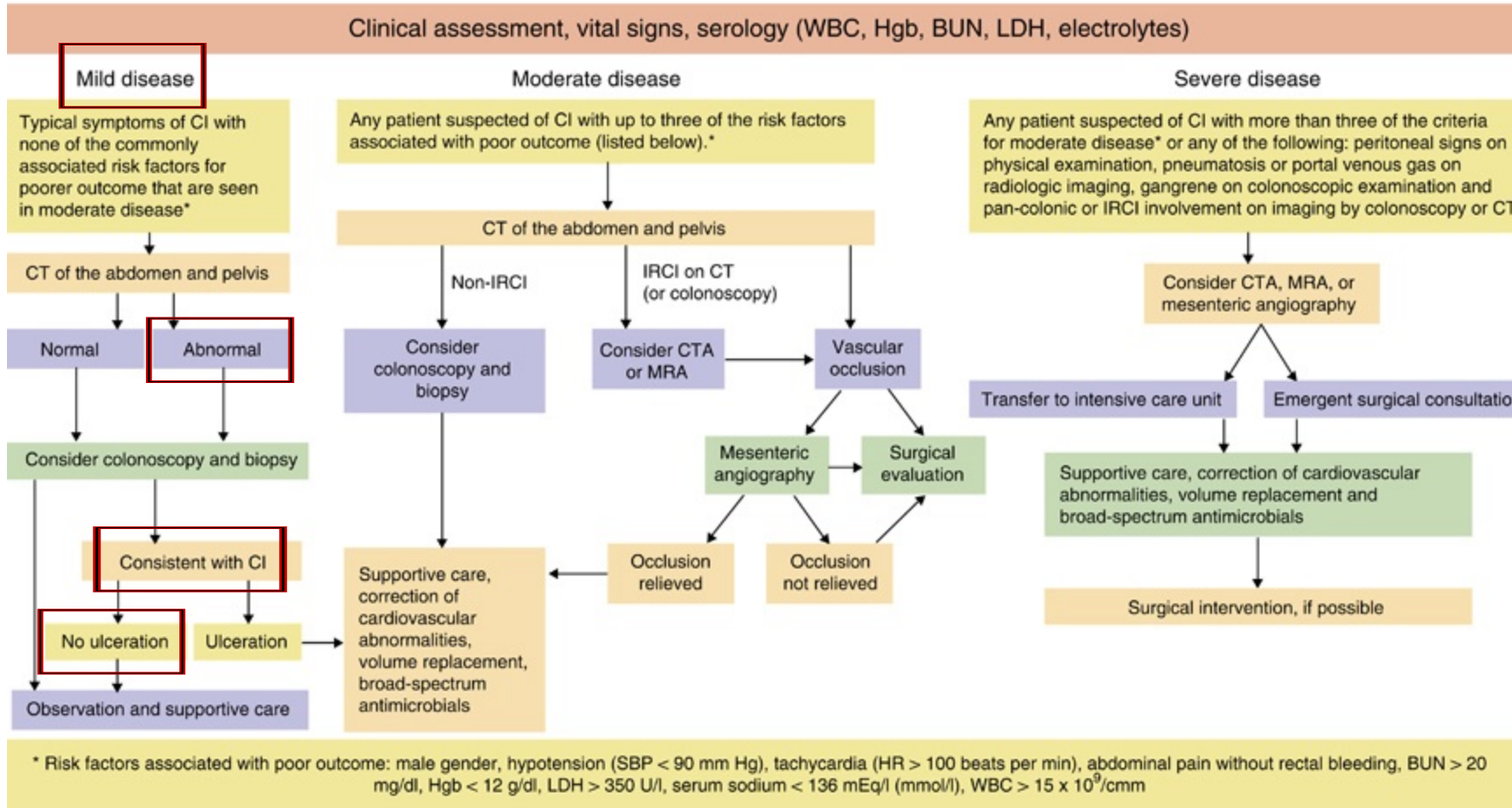


« La mucosa dal sigma prossimale fino al colon discendente appare edematosa-eritematosa con diffuse erosioni, in un quadro compatibile con **colite ischemica**. »

MANAGEMENT

Algorithm for the management of patients suspected of having colon ischemia

Clinical assessment, vital signs, serology (WBC, Hgb, BUN, LDH, electrolytes)



- **SIMPTOMS**
- **SEROLOGY**
- **CT**
- **COLONOSCOPY**



Fasting
Parenteral nutrition
Heparin
Insulin
Ciprofloxacin
Metronidazole





TAKE HOME MESSAGE

- CT is the first-line imaging test for **early diagnosis** and differentiation from other causes of acute abdomen.
- CT can depict **extension** of mesenteric ischemia and often its underlying **causes** (OIC/NOIC) and **severity** (Pneumatosis + Dilatation + Thinning + Ascites).

MESENTERIC INFARCTIONS

	AAMI	AVMI	NOMI	IR	IC
Vessels	Defects in the SMA (embolism / thrombosis); The diameter of the SMA is greater than that of the SMV	Defects in the porto-mesenteric veins (thrombosis); Venous engorgement	No defect; (reduced diameter)		Defects in the IMA/IMV or No defect
Mesentery	Not hazy (until mesenteric infarction occurs)	Hazy with ascites	Not hazy (until mesenteric infarction occurs)	± Hazy with ascites	All
Bowel wall thickness	± Thinning	Thickening	± Thinning	Thickening	All
Bowel wall enhancement	Diminished/ absent	Diminished/ absent/ increased; target sign	Diminished/absent	Increased; target sign	All
Bowel dilatation	Hypotonic dilatation	Not hypotonic dilatation; Pneumatosis	Hypotonic dilatation		All



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