Colon ischemia

Bible class 12 September 2018

Stefan Christen

ACG Clinical Guideline: Am J Gastroenterol 2015
Definition
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Imbalance between blood supply and metabolic demands of the colonocytes
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A complete stop of the blood flow is not necessarily, sometimes only significantly reduction
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Reperfusion injury may produce more damage than just reduction of blood flow without reperfusion
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-> local hypoperfusion and reperfusion injury
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-> local hypoperfusion and reperfusion injury

In most cases, no specific cause for ischemia is identified
Manifestations (clinical)
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Sudden (mild) abdominal pain
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Urgent desire to defecate
Manifestations (clinical)

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Within 24 hours bright red maroon blood per rectum or bloody diarrhea
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Hb often stable (<5% transfusion)
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Within 24 hours bright red maroon blood per rectum or bloody diarrhea

Hb often stable (<5% transfusion)

Symptoms often resolve within 2–3 days
Manifestation II
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**Reversible:**

- Colopathy with subepithelial hemorrhage, edema and ulcerations
- Resorption usually within 3 day (Ulcerations may persist for several months)
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**Irreversible: (up to 9%)**

- Gangrene, fulminant colitis
- Chronic ischemic colitis (rare)
- Stricture (rare)
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Recurrent sepsis due to bacterial translocation
EPIDEMIOLOGY
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- 9–24% of all patients hospitalized for acute lower gastrointestinal Bleeding
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- More common in women than in men (57–76%)
- Mortality rate 4 to 12%
Classification
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Type I: Etiology not clear

-> no specific therapy
Classification

Type I: Etiology not clear

-> no specific therapy

Type II: Etiology identified

- systemic hypotension
- decreased cardiac output
- aortic surgery

-> treat the underlying disease
Risk Factors
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Cardiovascular RF

- hypertension (57–72%), diabetes mellitus (17–28%), dyslipidemia (18–33%), renal disease (4–18%), coronary artery disease (18–37%), congestive heart failure (9–16%), peripheral vascular disease (8–21%)
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Diseases with risk of embolism/thrombosis

- atrial fibrillation (9–14%), thrombophilia, hypercoagulable states (young patients! -> Further diagnostic tests)
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Chronic obstructive pulmonary disease (10–18%) (mortality ↑)
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Injury of the vessels:

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Irritable bowel syndrome, cases of longdistance running in runners (26-42 years of age), Sickle cell crisis
RF Drugs
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Moderate evidence:
RF Drugs

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constipation-inducing drugs, immunomodulator drugs, illicit drugs (amphetamines, cocaine)
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Low evidence:
RF Drugs

Moderate evidence:

constipation-inducing drugs, immunomodulator drugs, illicit drugs (amphetamines, cocaine)

Low evidence:

chemotherapeutic drugs, decongestants (pseudoephedrine), diuretics, ergot alcaloids, hormonal therapies, psychotropic drugs, serotoninergic drugs
Localisation
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Usually segmental
Localisation

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Left colon most affected
Localisation

Usually segmental

Left colon most affected

Rectum—uncommonly affected (dual blood supply)
Localisation

Usually segmental

Left colon most affected

Rectum-uncommonly affected (dual blood supply)

Isolated right colon ischemia:
Localisation

Usually segmental

Left colon most affected

Rectum-uncommonly affected (dual blood supply)

Isolated right colon ischemia:

- more frequently atrial fibrillation (2x), coronary artery disease, chronic kidney disease on hemodyalisis
- worse outcomes
- only 25-46% have rectal bleeding
Watershed
Recomended laboratory tests
Recomended laboratory tests

- Complete blood count
- Electrolyt pannel
- Albumin
- Lactate
- LDH
- pH
- CK
- Amylase (associated with acute bowel ischemia)

Exclude infectious colitis: Stool culture, Cl.difficile assay, ova and parasites
Risk factors of severe ischemia
Risk factors of severe ischemia

Male gender
Puls >100bpm
Blood pressure <90 mm Hg
Abdominal pain without rectal bleeding
BUN >20mg/dl
Hb <12g/dl
LDH >350U/l
Na<136
WBC>15.000

Ulcerations at endoscopy
Peritoneal signs
Ischemia of the right colon
Free fluid on CT
COPD, NI, Hepatitis C, Warfarin use
## Risk factors of severe ischemia

<table>
<thead>
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Classification of disease severity
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Mild: no risk factors
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Moderate: up to three risk factors
Classification of disease severity

Mild: no risk factors

Moderate: up to three risk factors

Severe: more than three risk factors or
- peritoneal signs
- pneumatosiss or portal gas at imaging
- gangrene on colonoscopy
- pancolonic distribution/IRCI
Imaging
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CT with i.v. and oral contrast (first imaging modality of choice)
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CT with i.v. and oral contrast (first imaging modality of choice)

Multiphasic CT angiography, MR angiography, Splanchnic angiography
Imaging

Plain radiography (thumbprinting sign)
Imaging

Air in the portal venous system

Air in the bowel wall

Axial CT

Coronal CT: Lung Windows
Colonoscopy
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- Early colonoscopy within 48h of presentation
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- Contraindication: acute peritonitis, gangrene, pneumatosis
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- Contraindication acute peritonitis, gangrene, pneumatisis

- No biopsy in gangrene
Histopathology
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Infarction and ghost cells (pathognomonic) (8%)
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Other histologic signs: mucosal and submucosal hemorrhage, edema, capillary fibrin thrombi
Treatment
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Mostly no specific therapy

- i.v. fluid, maybe parenteral nutrition
Treatment

Mostly no specific therapy
  ◦ i.v. fluid, maybe parenteral nutrition

Surgery
Treatment

Mostly no specific therapy
  ◦ i.v. fluid, maybe parenteral nutrition

Surgery

Antibiotic therapy in moderate or severe disease
  ◦ Broad antimicrobial regimens for 7 days
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Surgery

Antibiotic therapy in moderate or severe disease
  ◦ Broad antimicrobial regimens for 7 days

Cardial work-up if a cardiac source of embolism is suspected
Indication for surgery

Acute:

Subacute:

Chronic:
Indication for surgery

Acute:

peritoneal signs, massive bleeding, fulminant colitis, toxic megacolon, portal venous gas or pneumatosis intestinalis,

Subacute:

Chronic:
Indication for surgery

Acute:

peritoneal signs, massive bleeding, fulminant colitis, toxic megacolon, portal venous gas or pneumatosis intestinalis,

Consider if hypotension, tachycardia, pain without bleeding, fluid on CT, gangrene, right sided or pancolonic

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Chronic:
Indication for surgery

Acute:
peritoneal signs, massive bleeding, fulminant colitis, toxic megacolon, portal venous gas or pneumatosis intestinalis,
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Subacute:
failure to respond to treatment within 2-3 weeks with continued symptoms or a protein-losing colopathy

Chronic:
Indication for surgery

Acute:

peritoneal signs, massive bleeding, fulminant colitis, toxic megacolon, portal venous gas or pneumatosis intestinalis,

Consider if hypotension, tachycardia, pain without bleeding, fluid on CT, gangrene, right sided or pancolonic

Subacute:

failure to respond to treatment within 2-3 weeks with continued symptoms or a protein-losing colopathy

Chronic:

symptomatic colon stricture, symptomatic segmental ischemic colitis
Management

Algorithm for the management of patients suspected of having colon ischemia

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

**Mild disease**
- Typical symptoms of CI with none of the commonly associated risk factors for poorer outcome that are seen in moderate disease
  - CT of the abdomen and pelvis
    - Normal
      - Consider colonoscopy and biopsy
        - Consistent with CI
          - Supportive care, correction of cardiovascular abnormalities, volume replacement, broad-spectrum antimicrobials
        - No ulceration
          - Observation and supportive care
        - Ulceration
          - Supportive care, correction of cardiovascular abnormalities, volume replacement, broad-spectrum antimicrobials
      - Abnormal
        - Consider colonoscopy and biopsy
          - Consistent with CI
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            - Observation and supportive care
          - Ulceration
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**Moderate disease**
- Any patient suspected of CI with up to three of the risk factors associated with poor outcome (listed below)*
  - CT of the abdomen and pelvis
    - Non-IRCI
      - Consider colonoscopy and biopsy
        - Consistent with CI
          - Supportive care, correction of cardiovascular abnormalities, volume replacement, broad-spectrum antimicrobials
        - No ulceration
          - Observation and supportive care
        - Ulceration
          - Supportive care, correction of cardiovascular abnormalities, volume replacement, broad-spectrum antimicrobials
      - Consider CTA or MRA
        - Vascular occlusion
          - Mesenteric angiography
            - Occlusion relieved
            - Supportive care, correction of cardiovascular abnormalities, volume replacement and broad-spectrum antimicrobials
            - Occlusion not relieved
              - Surgical intervention, if possible
      - Surgical evaluation
        - Transfer to intensive care unit
        - Emergent surgical consultation

**Severe disease**
- Any patient suspected of CI with more than three of the criteria for moderate disease* or any of the following: peritoneal signs on physical examination, pneumatosis or portal venous gas on radiologic imaging, gangrene on colonoscopic examination and pan-colonic or IRLI involvement on imaging by colonoscopy or CT
  - Consider CTA, MRA, or mesenteric angiography
    - Vascular occlusion
      - Mesenteric angiography
        - Occlusion relieved
        - Supportive care, correction of cardiovascular abnormalities, volume replacement and broad-spectrum antimicrobials
        - Occlusion not relieved
          - Surgical intervention, if possible
      - Surgical evaluation
        - Transfer to intensive care unit
        - Emergent surgical consultation

* Risk factors associated with poor outcome: male gender, hypotension (SBP < 90 mm Hg), tachycardia (HR > 100 beats per min), abdominal pain without rectal bleeding, BUN > 20 mg/dl, Hgb < 12 g/dl, LDH > 350 UI, serum sodium < 136 mEq/l (mmol/l), WBC > 15 x 10^9/cmm
Questions?