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11/23/2011

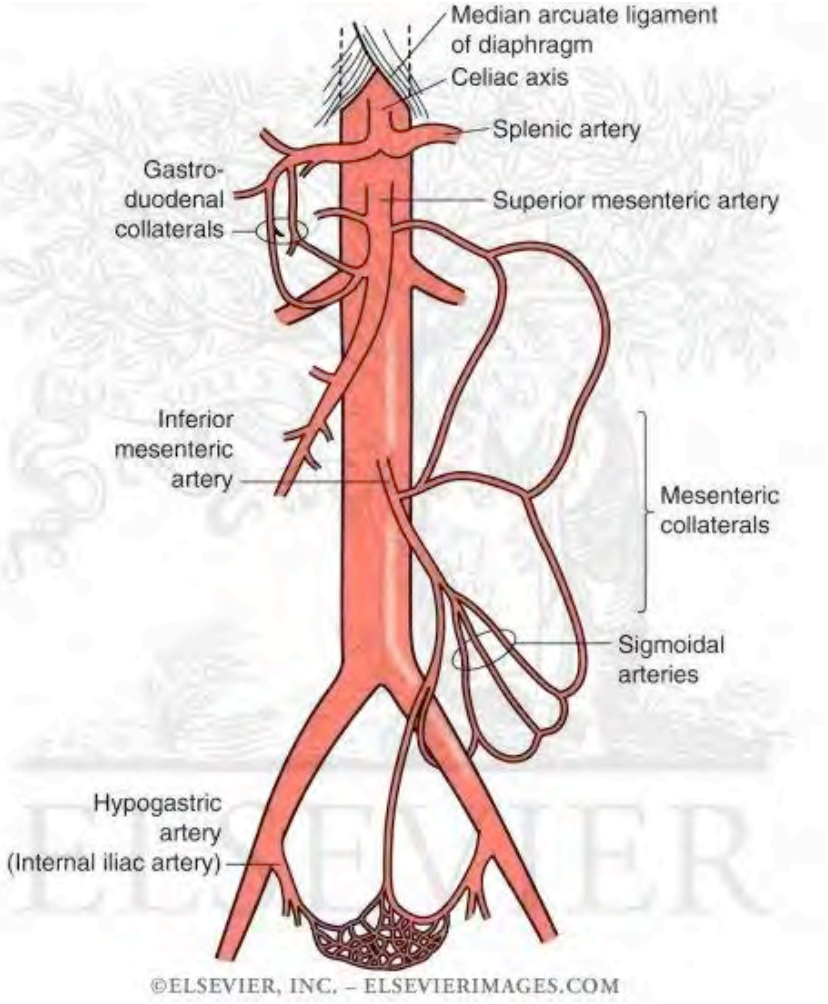
Mesenteric Ischemia and Expected Complication of Short Gut Syndrome

Mesenteric Ischemia

- Four causes:
  - Embolic occlusion of the mesenteric circulation
  - Acute thrombosis of the mesenteric circulation
  - Intense splanchnic vasoconstriction
  - Mesenteric venous thrombosis
- Risk factors
  - HTN
  - Tobacco
  - PVD
  - CAD
  - Recent cardiac event
  - Previous thrombosis
  - Acutely ill on vasopressors or requiring dialysis with large fluid shifts

Acute Arterial Occlusion

- Mesenteric anatomy has rich collateral flow
- Gradual occlusion of one or even two mesenteric trunks is well tolerated
- Acute occlusions are not tolerated as well
  - Usually from cardiogenic embolus and usually involves the SMA



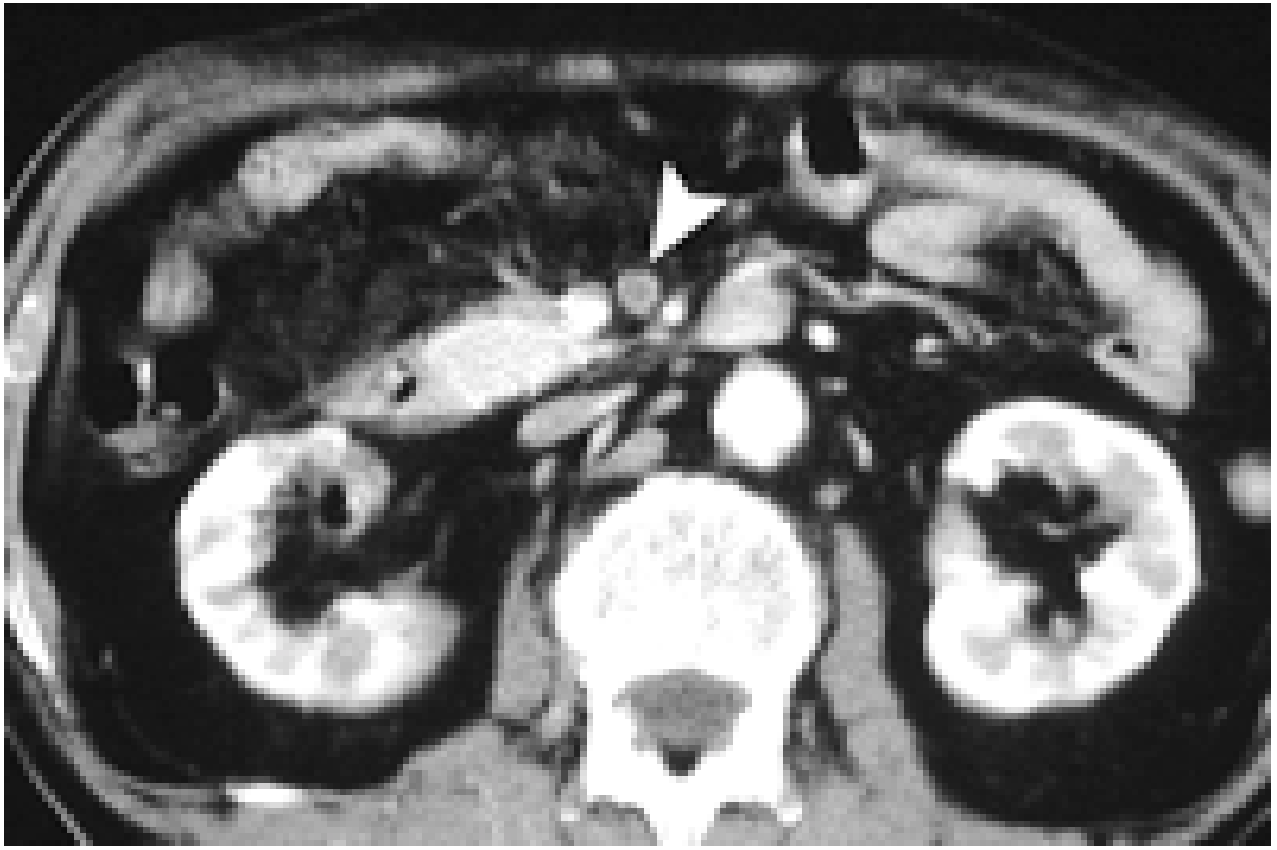
Acute Arterial Occlusion

- Compromised bowel mucosa allows unrestricted influx of toxic materials from the bowel lumen.
- If full-thickness necrosis occurs, bowel perforation and peritonitis ensue

Acute Arterial Occlusion: Presentation

- Concurrent cardiac or debilitating disease
- Pain out of proportion to tenderness
- Abdominal distention, gastrointestinal dysfunction
- Evidence of third spacing—oliguria, hemoconcentration
- Blood in stool
- Elevated white blood cell count– often >20,000
- Metabolic acidosis
- Elevated serum enzymes
- Bowel distention, wall thickening on KUB imaging and CT
- Endoscopic findings in colon
- Specific findings on arteriogram

Acute Arterial Occlusion

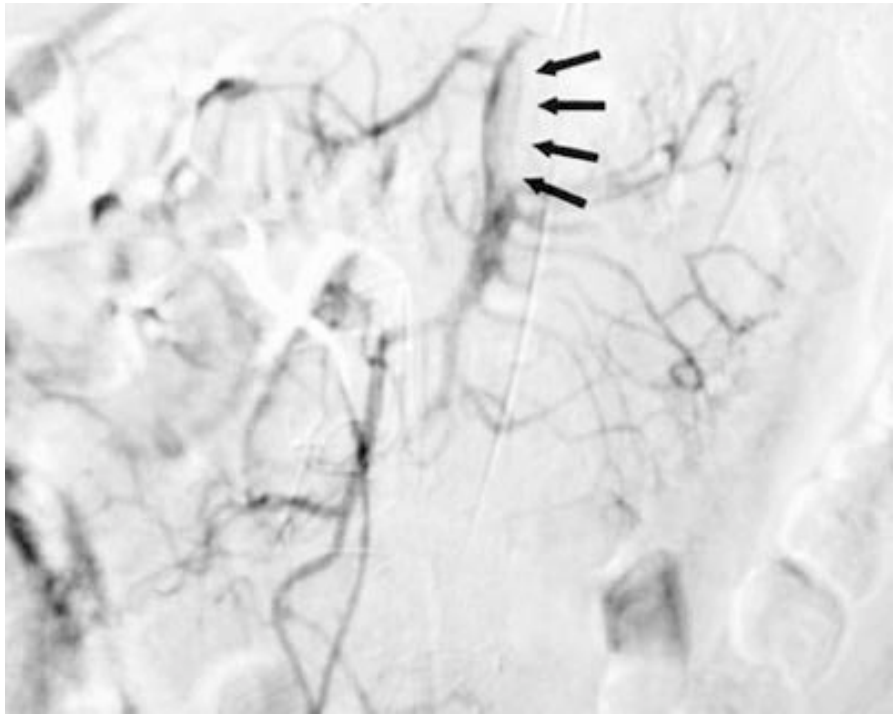


Acute Arterial Occlusion Management

- Fluid resuscitation
- Antibiotics
- Surgery
  - Restore normal pulsatile flow
  - Entire bowel is frankly necrotic: likelihood of survival is virtually nil
  - Patchy or segmental necrosis or generalized ischemia that appears reversible:
    - Expose proximal superior mesenteric artery
    - Thromboembolectomy with patch angioplasty to close the artery
    - If significant disease is present thromboembolectomy alone is not enough and a bypass graft is needed
  - Second look is recommended to evaluate the viability of the remaining bowel
- Mortality rate is as high as 85%

Nonocclusive Mesenteric Insufficiency

- Usually presents in patients that are seriously ill
- Diffuse abdominal pain
- Acidosis
- Arteriography is a valuable confirmatory diagnostic step
  - Absence of large vessel occlusion
  - Sequential vasospasms "beading" and pruned tree appearance of the distal vasculature

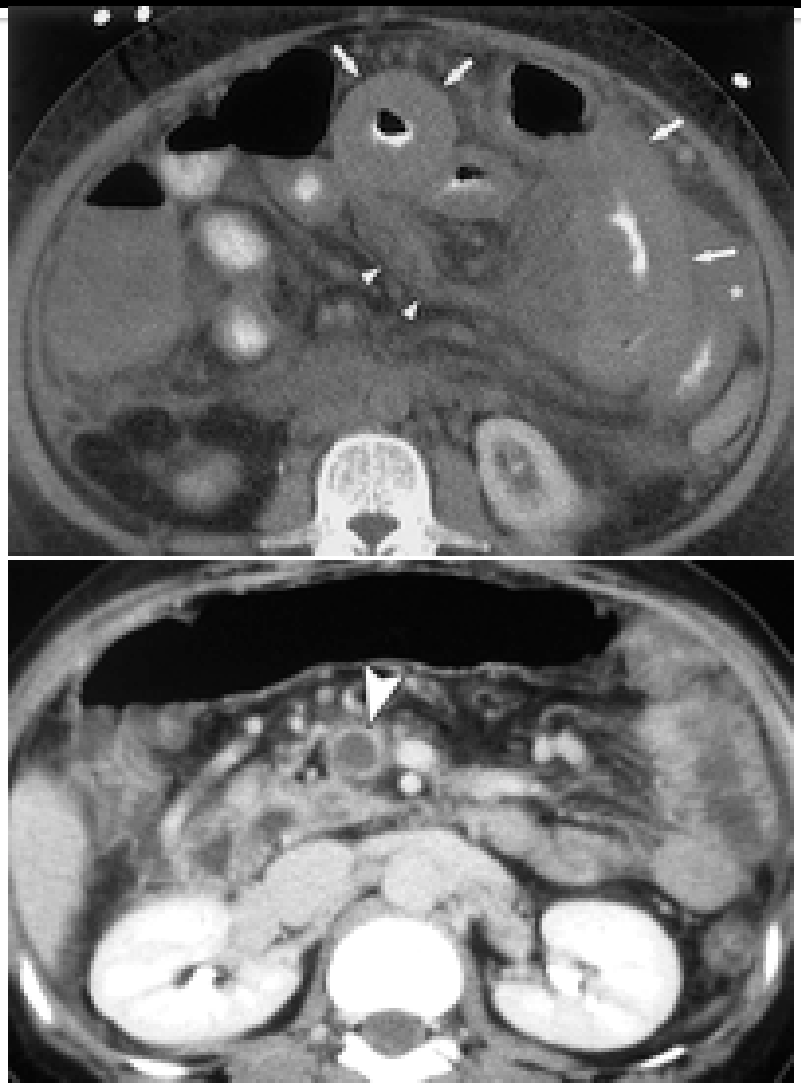


Nonocclusive Mesenteric Insufficiency: Management

- Arteriography can also be therapeutic
  - Infusion of vasodilators like Papaverine into SMA
- Fluid resuscitation
- Withdrawal of vasoconstrictors
- Antibiotics
- Surgery:
  - For patients who show deterioration or evidence of peritonitis suggesting bowel infarction
- Poor prognosis

Mesenteric Venous Occlusion

- Occurs in patients with concurrent illnesses:
- Abdominal pain is vague and tenderness is mild
- CT scan shows thickened bowel walls
  - Lack of prompt filling into the portal system



Mesenteric Venous Occlusion: Management

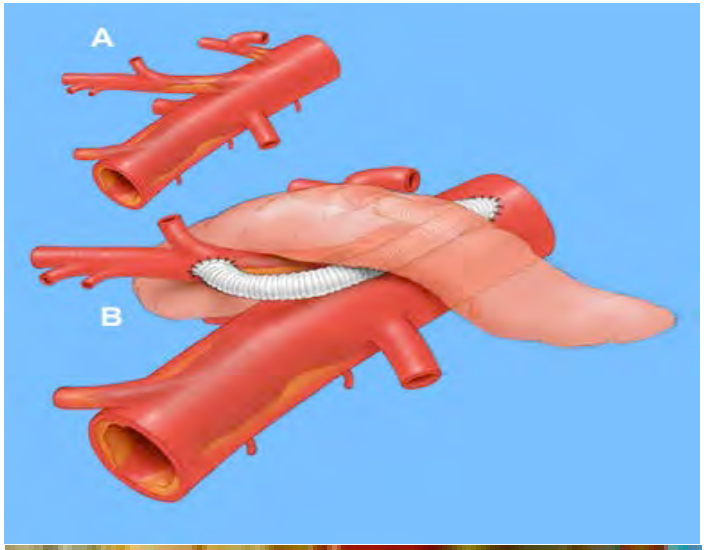
- Hemodynamic support
- Anticoagulation
- Serial Examinations
- If peritonitis develops:
  - Exploratory laparotomy
  - Fibrinolytic therapy is not recommended
    - Bowel wall is susceptible to hemorrhage

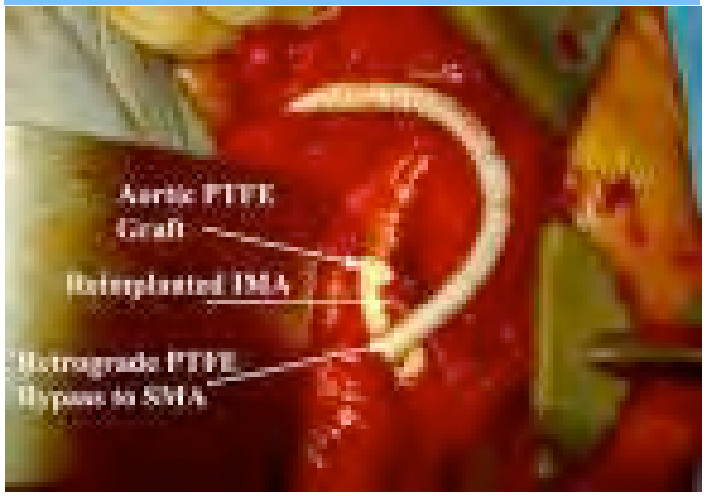
Chronic Mesenteric Insufficiency

- Present with postprandial pain in periumbilical region
- Definitive diagnostic study is angiography
  - Occlusion of at least two of the three major vessels
  - Large collaterals may be present

Chronic Mesenteric Insufficiency: Management

- Balloon angioplasty or stent placement
- Transaortic endartrectomy or bypass grafting
  - Prosthetic graft originating in the supraceliac aorta and connecting to both the celiac and superior mesenteric arteries
  - Retrograde bypass from the infrarenal aorta or iliac





No matter what

- If you do bowel resection, plan for a second look procedure

Short-Bowel Syndrome

Short-Bowel Syndrome

- Total small bowel length that is inadequate to support nutrition
  - <200cm
- Approximately 50-75cm of viable bowel is required to sustain life if the ileocecal valve is present
  - Prefer 100cm
  - 150cm if the colon is not present
- Clinical hallmarks of short bowel syndrome include:
  - Diarrhea
  - Fluid and electrolyte deficiency
  - Malnutrition.
  - Gallstones
  - Nephrolithiasis

Phases of Short Bowel Syndrome

- Acute
- Adaptation
- Maintenance

Sundaram A, Koutkia P, Apovian CM. **Nutritional management of short bowel syndrome in adults**. *J Clin Gastroenterol*. Mar 2002;34(3):207-20.

Short Bowel Syndrome

- Bowel may sometimes undergo adaptive hyperplasia
  - 1 to 2 yrs
  - Reducing the number and volumes of bowel movements
  - Increase in the capacity for enteral nutrition assimilation
  - Reducing TPN requirements

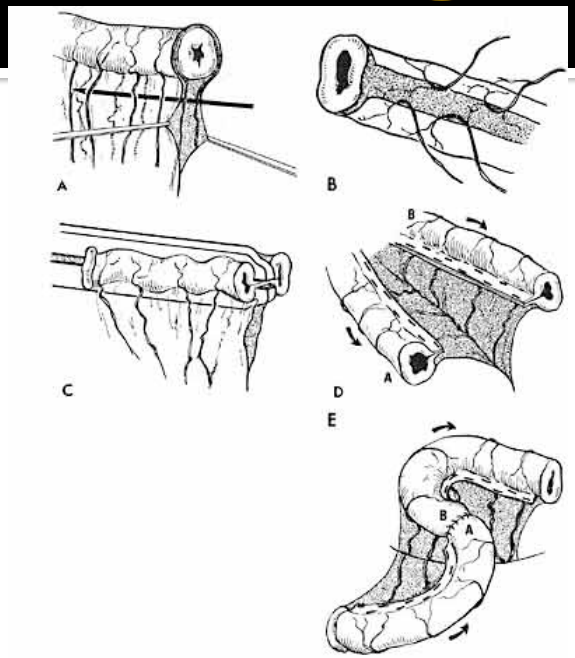
Short Bowel Syndrome: Therapy

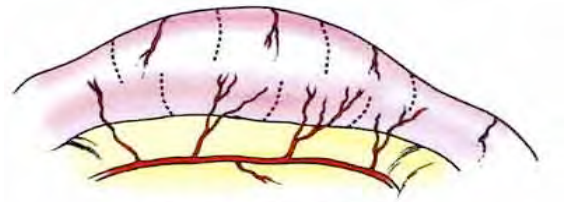
- TPN
- Enteral nutrition introduced gradually
- High dose PPI or H2 Blockers
- Antimotility agents
- GLP-2, glutamine, growth hormone and a modified high carbohydrate diet

Short bowel syndrome: the role of GLP-2 on improving outcome. - Wallis K - *Curr Opin Clin Nutr Metab Care* - 01-SEP-2009; 12(5): 526-32

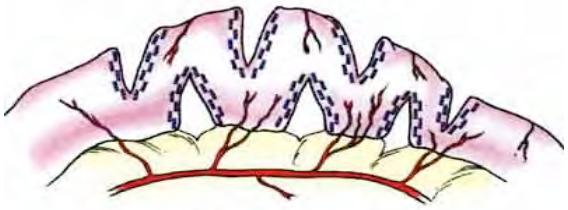
Short Bowel Syndrome: Surgery

- Intestinal transplantation
- Longitudinal intestinal lengthening and tailoring procedure
- Serial transverse enteroplasty





Pre-lengthening



Post-lengthening

Intestinal lengthening in adult patients with short bowel syndrome. - Yannam GR - *J Gastrointest Surg* - 01-DEC-2010; 14(12): 1931-6

Complications

- Cholelithiasis
- Liver disease
- Renal Stones
- D-lactic acidosis

Jeejeebhoy, K. **Short bowel syndrome: a nutritional and medical approach.** *Canadian Medical Association Journal* . Volume 166, Issue 10 (May 2002)

Questions

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- Brunicardi C, **Schwarts's Principles of Surgery**, 9th edition.
- 49.Buchman AL: **Etiology and initial management of short bowel syndrome**. *Gastroenterology* 2006; 130:S5-S15.