

The Acute Abdomen

Radiologic-Pathologic Correlation



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“Acute Abdomen”

- abdominal pain that persists for more than a few hours
- abdominal tenderness
- evidence of inflammatory reaction or visceral dysfunction

Patient Evaluation

- History
 - past medical history
 - history of the present illness
- Physical examination
 - pelvic examination in females
- Laboratory examination
- Radiologic evaluation

Five Principle Signs and Symptoms

- Pain
- Collapse
- Vomiting
- Muscular rigidity
- Abdominal distension

Radiologic Evaluation

- Abdominal Radiographs
 - Supine (KUB) and upright abdominal films
- Ultrasound
- Computed Tomography

Case 1: 55-old-male with right lower quadrant pain, fever, malaise, and poor appetite

Normal Appendiceal Anatomy

- Posteromedial cecum at the convergence of the taenia coli
- 8 to 10 cm long (range 4 to 25 cm)
- Mesoappendix
- Appendiceal artery and vein

Acute Appendicitis

- Pathogenesis: luminal obstruction followed by infection
 - stones, food, mucus, adhesions, mucosal edema, parasites, tumors, endometriosis, foreign objects, lymphoid hyperplasia
- Appendiceal Stones (appendicolith)
 - 7-12% adults
 - 50% children

Why Order Imaging Studies?

- Confusing clinical picture
- Pregnancy
 - ultrasound is modality of choice
- Older age patient
 - Suspect neoplasm as etiology
- Suspected complication

Acute Appendicitis

- Most common surgical emergency
- Peak incidence second and third decades of life
- Complications
 - Perforation 20%
 - Abscess/phlegmon 5%
 - Septic thrombophlebitis (rare)

Differential Diagnosis: RLQ Pain

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| <ul style="list-style-type: none">• Appendicitis• Inflammatory bowel disease• Right-sided diverticulitis<ul style="list-style-type: none">– ileal, cecal• Complications of GI tumors<ul style="list-style-type: none">– intussusception– perforation– obstruction• Meckel's diverticulitis• Small bowel obstruction• Epiploic appendagitis | <ul style="list-style-type: none">• PID• Complications of ovarian cysts<ul style="list-style-type: none">– Hemorrhage– Rupture– Torsion• Ectopic pregnancy• Ureteral obstruction<ul style="list-style-type: none">– Stones, tumors, inflammatory disease |
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- Mesenteric adenitis
- Omental infarction
- Peritoneal carcinomatosis
- Peritonitis/abscess

Case 2: 35-year-old male who complained of abdominal pain and collapsed.

Etiology of Acute Pancreatitis

- Metabolic
 - alcohol, hyperlipidemia, hypercalcemia, hereditary pancreatitis, kwashiorkor
- Mechanical
 - gallstones, post-operative, trauma, duct anomalies, iatrogenic, neoplasm, gastric ulcers
- Vascular
 - vasculitis, atherosclerotic embolism
- Drugs
 - steroids, aspirin, sulfonamides, tetracycline, opiates, cholinergics
- Infection
 - mumps, measles, HIV, CMV

Acute Pancreatitis

- Clinical
 - abdominal pain, nausea, vomiting, abdominal distension, shock
 - flank ecchymosis (Grey Turner's sign), periumbilical hematoma (Cullen's sign)
- Laboratory Evaluation
 - amylase, lipase
- Radiologic Evaluation

Why Order Imaging Studies?

- Exclude other abdominal disorders that may mimic pancreatitis
- Confirm clinical diagnosis of acute pancreatitis
- Evaluate extent of pancreatic injury and inflammation
- Evaluate for complications
 - pseudocyst, abscess, intestinal obstruction, vascular complication

Case 3: 9-year-old female with abdominal pain, vomiting, diarrhea, and abdominal distension

Inflammatory Conditions of the Colon

- Clinical
 - diarrhea, nausea, vomiting, fever, malaise
- Laboratory evaluation
 - stool culture, WBC count
- Radiologic evaluation

- abdominal radiograph, computed tomography

Etiology of Inflammatory Conditions of the Colon

- Bacterial Infections
 - salmonella, shigella, campylobacter, yersina, E. coli, tuberculosis, actinomycosis
- Viral Infections
 - CMV
- Parasitic Infections
 - amebiasis, schistosomiasis, trichuriasis
- Fungal Infections
 - histoplasmosis, mucormycosis
- Noninfectious colitis
 - ulcerative colitis, Crohn's disease, ischemia
- Exogenous Causes
 - radiation, drug-induced, pseudomembranous colitis

Why Order Imaging Studies?

- Exclude other intra-abdominal processes
- Evaluate for complications
 - toxic megacolon
 - pneumatosis
 - perforation
 - abscess formation

Toxic Megacolon

- Transmural inflammation
- Serosal inflammation
- Vasculitis
- Destruction of neural plexuses
- Disintegration of normal tissue cohesiveness
 - "wet tissue paper"

- Diagnosis made on abdominal radiograph
- Colonic dilatation
 - >5cm
- Transverse colon
- Colonic wall thickening
 - thumbprinting
- Loss of haustral pattern
- Fluid levels
- Ileus

Case 4: 65-year-old female with abdominal pain and rigidity of the abdominal wall

Intestinal Perforation

- Gastric or duodenal ulcer
- Intestinal obstruction
 - Adhesions
 - Neoplasm
 - Inflammation
- Tumor
- Severe inflammation
 - diverticulitis, appendicitis
- Severe colitis
 - Ischemia, infection, ulcerative colitis

Summary

- Clinical signs and symptoms of an acute abdomen
 - pain, collapse, vomiting, muscular rigidity, abdominal distension
- Why order radiological studies?
- Common disorders causing an acute abdomen
 - appendicitis, pancreatitis, severe gastroenteritis/colitis, intestinal perforation