

Right Lower quadrant abdominal pain

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Acute appendicitis

❖ Pathophysiology :

- Obstruction of the lumen.
- Increase intraluminal pressure.
- The pressure exceeds capillary perfusion pressure and venous and lymphatic drainage are obstructed.
- Epithelial mucosa breaks down and bacterial invasion by bowel flora occurs.
- Increased pressure also leads to arterial stasis and tissue infarction.

❖ History:

Primary symptom: **Abdominal pain**

- Initial luminal distention triggers visceral afferent pain fibers, which enter at the 10th thoracic vertebral level. This pain is generally vague and poorly localized. Pain is typically felt in the periumbilical or epigastric area.
- As inflammation continues, the serosa and adjacent structures become inflamed , This triggers somatic pain fibers, innervating the peritoneal structures. Typically causing pain in the RLQ.

Associated symptoms:

- Indigestion, discomfort, flatus, need to defecate, anorexia, nausea, vomiting

❖ Physical Exam:

- Findings depend on duration of illness prior to exam.
- Early on patients may not have localized tenderness. With progression there is tenderness to deep palpation over McBurney's point
- McBurney's Point: just below the middle of a line connecting the umbilicus and the ASIS
- Rovsing's sign: pain in RLQ with palpation to LLQ
- Rectal exam: pain can be most pronounced if the patient has pelvic appendix
- Additional components : rebound tenderness, voluntary guarding, muscular rigidity.

Psoas sign

- ✓ Patient can lay on side and extend leg at the hip or have patient lay on back and try to flex hip against the resistance of examiner's hand on thigh. If patient has an inflamed retrocecal appendix, this will produce pain.
- ✓ Anatomic basis for the psoas sign: inflamed appendix is in a retroperitoneal location in contact with the psoas muscle, which is stretched by this maneuver.

Obturator sign

- ✓ Internally rotate right leg at the hip with the knee at 90 degrees of flexion. Will produce pain if inflamed appendix is in pelvis.
- ✓ Anatomic basis for the Obturator sign: inflamed appendix in the pelvis is in contact with the Obturator internus muscle, which is stretched by this maneuver.
- Fever: another late finding. At the onset of pain fever is usually not found. Temperatures >39 C are uncommon in first 24 h, but not uncommon after rupture

❖ **Diagnosis:**

- Acute appendicitis should be suspected in anyone with epigastric, periumbilical, right flank, or right sided abdomen pain who has not had an appendectomy
- Women of child bearing age need a pelvic exam and a pregnancy test.
- Additional studies: CBC, UA, imaging studies
- CBC: the WBC is of limited value.
- UA: abnormal UA results are found in 19-40%
- Abnormalities include: pyuria, hematuria, bacteruria
- Presence of >20 wbc per field should increase consideration of Urinary tract pathology
- Imaging studies: include X-rays, US, CT
- Abnormal findings include: fecalith, appendiceal gas, localized paralytic ileus, blurred right psoas, and free air
- Barium enema study :
 - ✓ A single-contrast study can be performed on an unprepared bowel. Absent or incomplete filling of the appendix coupled with pressure effect or spasm in the cecum suggests appendicitis.
- Abdominal x-rays have limited use b/c the findings are seen in multiple other processes.

- Graded Compression US:
 - ✓ Basis of this technique is that normal bowel and appendix can be compressed where as an inflamed appendix can not be compressed.
 - ✓ DX: noncompressible >6mm appendix, appendicolith, periappendiceal abscess.
 - ✓ Limitations of US: retrocecal appendix may not be visualized, perforations may be missed due to return to normal diameter.
- CT: best choice based on availability and alternative diagnoses.
 - ✓ Even if appendix is not visualized, diagnose can be made with localized fat stranding in RLQ.

❖ **Special Populations:**

- Very young, very old, pregnant, and HIV patients present atypically and often have delayed diagnosis.
- High index of suspicion is needed in the these groups to get an accurate diagnosis.

❖ **Treatment:**

- Appendectomy is the standard of care.
- Patients should be NPO, given IVF, and preoperative antibiotics (Flagyl, Gentamicin, Cefoxitin).
- short acting narcotics should be used for pain management.

Other disorders present with symptoms similar to those of appendicitis. Examples include the following:

- | | |
|--------------------------------------|--------------------------|
| – (PID) or tubo-ovarian abscess . | – Colonic carcinoma . |
| – Endometriosis . | – Rectus sheet hematoma. |
| – Ovarian cyst or torsion. | – Cholecystitis. |
| – Ureterolithiasis and renal colic . | – Bacterial enteritis . |
| – Degenerating uterine leiomyomata . | – Mesenteric adenitis . |
| – Diverticulitis. | – Omental torsion. |
| – Crohn’s disease. | |

Diverticulitis

❖ Definitions:

- Colonic diverticulum: herniation of mucosa and muscularis mucosa through colonic wall (technically, a false diverticulum).
- Diverticulosis: presence of diverticula without inflammation .
- Diverticular disease: presence of symptomatic diverticula.
- Diverticulitis: Acute inflammation of the wall of a diverticulum and surrounding tissue. Caused by either a micro- or macroperforation

❖ Pathophysiology:

- Cause is not known.
- Low residue diets have been implicated.
 - ✓ Mechanism was thought to occur when fecal material was inspissated in the neck of a diverticulum, resulting in bacterial proliferation, mucous secretion, and distention

❖ Complications:

- Free perforation can occur with generalized peritonitis, but is uncommon.
- Abscess.
- Obstruction.
- Fistulas, e.g., colovesical, colovaginal, coloenteric, colocutaneous .
- Haemorrhage.

❖ Risk Factors:

- Age, low-fibre diet, obesity, physical inactivity, left-sided colon cancer, Ehlers-Danlos, Marfan's, polycystic kidney diseases.

❖ Clinical Features:

- Most common symptom is pain, Described as steady, deep discomfort in the LLQ.
- Change in bowel habit, tenesmus, dysuria, frequency, UTI, distention, nausea, vomiting.
- Presentation may be indistinguishable for acute appendicitis.
- Perforation is characterized by sudden lower abdominal pain progressing general abdominal pain.

❖ Physical Exam:

- Low-grade fever.
- Localized tenderness.
- Rebound and guarding.
- Peritoneal signs: Suggest perforation or abscess rupture.
- As always, Pelvic should be done with female .
- Left-sided pain on rectal exam.
- Occult blood.

❖ Diagnosis:

- Abdominal plain films can show partial SBO, free air, extraluminal air.
- CT is procedure of choice. Demonstrates inflammation of pericolic fat, diverticula, thickening of bowel wall, peridiverticular abscess.
- Barium enema can be done, but are insensitive and may cause perforation due to the introduction of barium at high pressures.
- Routine labs : CBC, electrolytes, BUN/creatinine, UA.
- Sigmoidoscopy and colonoscopy are performed only after inflammation has decreased.

❖ Treatment:

- NPO, IVF, electrolyte correction, NG for obstruction, Broad spectrum antibiotic, observation for complications.
- Patients who present with diffuse peritonitis require prompt fluid resuscitation, intravenous antibiotics, and emergency surgical exploration. Resection of the perforated colonic segment with descending end colostomy and closure of the rectal stump (Hartmann procedure) is usually required.
- Patients without signs of peritonitis or systemic infection maybe treated as outpatients with careful follow up arranged. Should be instructed to return for fever or increasing pain.
- Outpatient management includes liquids only for 48 hours and oral antibiotics(Cipro, flagyl, bactrim, ampicillin).
- ***Special considerations exist for some forms of complicated diverticulitis***
 - ✓ For diffuse peritonitis, an appropriate initial empiric antibiotic regimen must include either single agent therapy with imipenem/cilastin or piperacillin/tazobactam or multiple drug therapy with ampicillin, gentamicin, and metronidazole.
 - ✓ Obstruction needs to be differentiated from carcinoma, and, even if biopsy results are negative, resection may be necessary to exclude carcinoma if there is enough suspicion based upon appearance alone.

- ✓ Abscesses without peritonitis may be amenable to percutaneous drainage with an elective single-stage operation after the episode has resolved. Drainage is usually through the anterior abdominal wall but may be done transgluteally or through the rectum or the vagina, depending on the location of the abscess. Catheter drainage may be helpful in patients who cannot undergo surgery and should be left in place until drainage is less than 10 mL in 24 hours. Catheter sinograms can be performed periodically to monitor the resolution of the abscess cavity before the catheter is removed.
- ✓ Fistulas generally do not close spontaneously, but they may be managed with an elective 1-stage procedure in most cases. Also, in the absence of urinary tract obstruction, observation appears safe in patients with contraindications to surgery.
- ✓ Patients who are immunosuppressed are at an increased risk of perforation, and surgery is necessary in almost all patients who are either already immunosuppressed or are about to start immunosuppressive therapy.

Meckel's Diverticulum

- Meckel's diverticulum is a small bulge in the small intestine present at birth.
- Failure of obliteration of the vitellointestinal duct of the embryo.
- Located in the distal ileum, usually within about 60-100 cm of the ileocecal valve. It is typically 3-5 cm long, runs antimesenterically and has its own blood supply.
- Rule of 2's: 2% (of the population) - 2 feet (from the ileocecal valve) - 2 inches (in length) - 2% are symptomatic, there are 2 types of common ectopic tissue (gastric and pancreatic), the most common age at clinical presentation is 2, and males are 2 times as likely to be affected.

❖ Presentation:

- The most common presentation is as an incidental finding at laparotomy. Complications manifest as ulceration, hemorrhage, small bowel obstruction, diverticulitis, perforation and incarceration of Meckel's diverticulum (Littre's hernia).
- Approximately 98% of people afflicted with Meckel's diverticulum are asymptomatic. If symptoms do occur, they typically appear before the age of two.
- The most common presenting symptom is painless rectal bleeding, followed by intestinal obstruction, volvulus and intussusception.
- Occasionally, Meckel's diverticulitis may present with all the features of acute appendicitis. Also, severe pain in the upper abdomen is experienced by the patient along with bloating of the stomach region.

- Hemorrhage :
 - ✓ Hemorrhage is the most common complication. It is more common in children younger than 2 years and in males.
 - ✓ The patient complains of passing bright red blood in the stools. Bleeding may vary from minimal recurrent episodes of hematochezia to massive, shock-producing hemorrhage. Hemorrhage from a Meckel diverticulum may or may not be associated with abdominal pain or tenderness. Patients may also present with weakness and anemia and may have a history of self-limiting episodes of intestinal bleeding.
 - ✓ The gastric mucosa found in the diverticulum may form a chronic ulcer and may also damage the adjacent ileal mucosa because of acid production. Ectopic gastric mucosa is found in about 50% of all Meckel diverticulum; in bleeding Meckel diverticulum, the incidence increases to 75%. Perforation may occur, and the patient then presents with an acute abdomen, often associated with air under the diaphragm, best visualized on an erect chest radiograph.
 - ✓ Diagnosis of a bleeding Meckel diverticulum is established by technetium Tc 99m-pertechnate radioisotope scanning. This isotope, administered intravenously, is readily taken up by gastric mucosa.
- Intestinal obstruction :
 - ✓ This is another frequent complication and is observed in 20-25% of patients with symptomatic Meckel diverticulum. Because the omphalomesenteric duct may be attached to the abdominal wall by a fibrotic band, a volvulus of the small bowel around the band may occur. The diverticulum may also form the lead point of an intussusception and cause obstruction. Infrequently, a tumor arising in the wall of the diverticulum may form the lead point for intussusception. When incarcerated in an inguinal hernia, a Meckel diverticulum is called Littré hernia.
 - ✓ Patients with intestinal obstruction due to Meckel diverticulum present with abdominal pain, vomiting, and constipation
 - ✓ In cases of intussusception, patients may also present with a palpable lump in the lower abdomen and currant jelly stools.
- Diverticulitis :
 - ✓ This condition occurs in approximately 10-20% of patients with symptomatic Meckel diverticulum and occurs more often in the elderly population.
- Umbilical anomalies :
 - ✓ These occur in up to 10% of patients. The anomalies consist of fistulas, sinuses, cysts, and fibrous bands between the diverticulum and the umbilicus.
 - ✓ A patient may present with a chronic discharging umbilical sinus, superimposed by infection or excoriation of periumbilical skin.

– Neoplasm :

✓ This is the least commonly associated pathology and is reported in approximately 4-5% of complicated Meckel diverticulum cases.

❖ **Workup:**

- Bloods: FBC, U&Es, clotting and cross-match (if PR bleeding)
- Isotope scan:
 - Technetium Tc 99m-pertechnate radioisotope scanning should be performed in patients with hemorrhage. Taken up by Meckel's diverticulum if ectopic gastric mucosa is present; however, negative scan does not exclude its presence.
 - Barium contrast studies: it may be seen.
- AXR, erect CXR: if signs of obstruction or perforation.
- Superior mesenteric angiography may be helpful in patients presenting with acute GI bleeding and is effective when blood loss exceeds 0.5 mL/min.

❖ **Treatment:**

- *Emergency* (bleeding or obstruction): Resuscitation with correction of fluid and electrolyte abnormalities.
- *Surgical*: if bleeding or obstruction, surgical resection (diverticulectomy) with or without small bowel resection and division of bands.

❖ **Indications for surgical resection:**

- Symptomatic Meckel diverticulum.
- Absolute indications are hemorrhage, intestinal obstruction, diverticulitis, and umbilico-ileal fistulas.
- Incidentally discovered Meckel diverticulum.

Resection is recommended for :

1. Patients younger than 40 years.
 2. Diverticula longer than 2 cm.
 3. Diverticula with narrow necks.
 4. Diverticula with fibrous bands.
 5. Suspected ectopic gastric tissue.
 6. Inflamed, thickened diverticula.
- ✓ Removal of a healthy diverticulum in the presence of peritonitis, Crohn disease, ulcerative colitis, or any other complication that would militate against resection is not advised.

Acute Epiploic Appendagitis

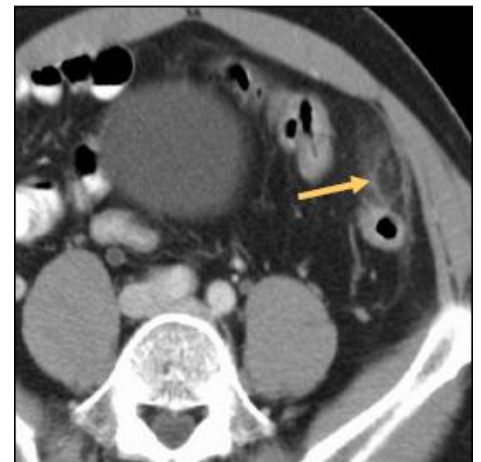
- Fingerlike projections of adipose tissue arranged in parallel rows along the colon
- Acute epiploic appendagitis is an uncommon cause of abdominal pain , that occurs secondary to torsion or spontaneous venous thrombosis of a draining vein from the serosal surface of the colon.
- Acute epiploic appendagitis is associated with obesity and hernia . Rarely, acute epiploic appendagitis may result in adhesion, bowel obstruction, intussusception, intraperitoneal loose body, peritonitis.

❖ Clinical Course:

- The average patient is about 40 years old and develops acute abdominal pain, usually non-migratory, which may be left-sided, right, or central. The pain is sharp and stabbing and may be associated with nausea or vomiting.
- Patient does not appear ill:
 - Unusually afebrile and normal WBC.
 - May have low grade fever and WBC up to 12.0.
- Symptoms worsen with coughing, deep breathing and abdominal stretching
- No change in bowel habits
- The symptoms from EA often mimic acute appendicitis, diverticulitis, or cholecystitis. Initial lab studies are usually normal.
- Typically, a CT scan is ordered to help exclude more serious or surgical problems and the inflammatory changes of EA are seen coincidentally.

❖ CT of Epiploic Appendagitis :

- Paracolic 1-4 cm oval fat density surrounded by inflammatory fat stranding.
- May be slightly denser than normal fat and have a central blood vessel density.
- May show adjacent bowel wall thickening.



Why is it Important to Correctly Diagnose Epiploic Appendagitis?

- Commonly mistaken clinically for appendicitis or diverticulitis.
- Self-limited condition, majority of symptoms subsiding in 2 weeks.
- Can be managed with analgesics.
- No antibiotics needed.

- Does not require surgical intervention.

Mesenteric Adenitis

- Mesenteric adenitis is a self-limited inflammatory process that affects the mesenteric lymph nodes in the right lower quadrant. It is often a childhood illness, though occasionally seen in adults.
- It is a very common cause of abdominal pain in children, mimicking appendicitis, and often difficult to differentiate from appendicitis.
- Until recently, the diagnosis was most frequently made when laparotomy performed to assess presumed appendicitis yielded negative findings; now, cross-sectional imaging is routinely applied in the examination of patients.

❖ Causes :

- ✓ Mesenteric lymphadenitis usually follows viral infection with the common cold or with infection by *Yersinia enterocolitica*, Pseudo tuberculosis, *Streptococcus viridans* or *Campylobacter jejuni*. In younger children and infants, concurrent ileocolitis may be present; this finding suggests that the lymph node involvement may occur in reaction to a primary enteric pathogen.

❖ Presentation:

- The child is usually not as unwell as one will expect in appendicitis, though in early appendicitis, children may look rather well even though they are symptomatic.

The main signs and symptoms include:

- Abdominal Pain. This is often located in the right lower abdomen or right iliac fossa. It is a colicky abdominal pain which just resolves momentarily without any intervention. The sufferer, usually a child, may be completely pain free between attacks. Characteristically, the pain may shift when the patient's position changes.
 - In appendicitis, the pain may initially start around the umbilicus, then moves over to the right iliac fossa. The location of the tenderness tends to be fixed with appendicitis.
- Preceding Cold or Sore Throat. One thing in the history that gives away the diagnosis of mesenteric lymphadenitis is that of the presence of common cold or sore throat in the days or week before the onset of abdominal pain. There may even still be an ongoing cough and cold in the child. The neck glands may still be swollen on examination.
- Anorexia. Usually, with mesenteric lymphadenitis, patients are still able to eat and drink. If a patient complains of abdominal pain, and appetite remains good, it is most unlikely he or she has appendicitis.
- The presentation also include fever, nausea, vomiting and, occasionally, diarrhea.

❖ **Diagnosis :**

The diagnosis of mesenteric adenitis is one of exclusion; confirmation is based on a benign clinical course, some laboratory and radiological investigations can be done. These include:

- Full blood Count. This may show evidence of infection, with elevated white blood cells. It cannot differentiate between appendicitis, mesenteric lymphadenitis, or any other infection.
- Yersinia enterocolitica Serology. A positive serology will support the diagnosis of mesenteric adenitis.
- Barium Enema. This is a very unlikely option in a child with abdominal pain. If done however, it may show indentation of the bowel walls from pressure by the enlarged mesenteric lymph nodes.
- Ultrasound Scan. This may demonstrate hypoechoic nodules, which will be quite different from the surrounding tissues. Mesenteric thickening will also support a diagnosis of mesenteritis. This is often the first preferred investigation in children, since it is non –invasive, and there is no exposure to radiation (X-rays).
- CT scan. If done because the cause of abdominal pain remains unclear, in mesenteric adenitis, contrast CT will demonstrate enlarged mesenteric lymph nodes, plus a normal appendix.
- Laparoscopy. If the diagnosis is still in doubt, a laparoscopy may lay it to rest. At laparoscopy, the lymph nodes surrounding the terminal ileum and colon may be found to be more in number and enlarged, with swelling of the mesentery, and a normal looking appendix.

❖ **Intervention :**

- Mesenteric adenitis is usually a self-limited disease, and management is conservative. Most cases resolve without antibiotic treatment.
- Sometimes, mesenteric lymphadenitis infection may become severe, requiring the administration of antibiotics or even outright surgical operation to remove a section of diseased bowel plus the appendix.

Omental Torsion

- ✓ Torsion of the omentum is a condition in which the organ twists on its long axis to such an extent that its vascularity is compromised.

❖ **Problem :**

- Although Omental torsion is rarely diagnosed preoperatively, knowledge of the entity is important to the surgeon because it mimics the common causes of acute surgical abdomen.

❖ **Precipitating factors:**

- Displacement of the omentum, including trauma, violent exercise, and hyperperistalsis with resultant increased passive movement of the omentum.

❖ **Presentation:**

- Torsion of the omentum is difficult to clinically diagnose preoperatively b/c it present with symptoms similar to those of appendicitis or acute abdomen .

❖ **Investigation :**

– Laboratory Studies:

- CBC counts may reveal moderate leukocytosis, which occurs in two thirds of cases.

– Imaging Studies:

- Recent reports suggest that ultrasonography and CT scan may show a characteristic appearance of twisted omentum; however, because the disease may mimic other surgical emergencies, extensive radiological studies are usually not indicated.
- CT scanning may show a concentric distribution of fibrous and fatty folds converging radially toward the torsion.
- Ultrasonography, on the other hand, may show a complex mass and mixture of solid material and hypoechoic zones.

– Diagnostic Procedures:

- Laparoscopy is a safe diagnostic and therapeutic modality.

– Histological Findings:

- Acute hemorrhagic infarct and fat necrosis.

❖ **Treatment :**

– Surgical Therapy

- Resection of the affected portion of the omentum. Correct any disease process associated with secondary torsion.

Cecal carcinoma

- ✓ It is a cancer the first part of the large intestine.

Crohn's Disease

❖ Definition:

- Crohn's Disease is an idiopathic, chronic, transmural inflammatory process of the bowel that can affect any part of the GI tract from the mouth to the anus (skip area)
- Most cases involve the small bowel, particularly the terminal ileum.
- 80% small bowel (usually distal ileitis), 50% ileocolitis (ileum and colon), 33% perianal disease
- Small percentage predominant involvement of mouth or gastroduodenal area, small amount in esophagus and proximal small bowel.

❖ Pathophysiology:

- Dysregulation of normal immune system directed against dietary or microbial antigens found in the intestinal lumen pathogenic organisms in the intestine
- Appropriate immune responses to which normally do not elicit a response, possibly due to intrinsic alterations in mucosal barrier function

❖ Types:

- **Ileocolitis:** Ileocolitis is the most common type of Crohn's disease. It affects the small intestine, known as the ileum, and the colon. People who have ileocolitis experience considerable weight loss, diarrhea, and cramping or pain in the middle or lower right part of the abdomen.
- **Ileitis:** This type of Crohn's disease affects the ileum. Symptoms are the same as those for ileocolitis. In addition, fistulas, or inflammatory abscesses, may form in the lower right section of the abdomen.
- **Gastroduodenal Crohn's disease:** This form of Crohn's disease involves the stomach and duodenum, which is the first part of the small intestine. People with this type of Crohn's disease suffer nausea, weight loss, and loss of appetite. In addition, if the narrow segments of bowel are obstructed, they experience vomiting.
- **Jejunoileitis:** This form of the disease affects the jejunum, which is the upper half of the small intestine. It causes areas of inflammation. Symptoms include cramps after meals, the formation of fistulas, diarrhea, and abdominal pain that can become intense.
- **Crohn's (granulomatous) colitis:** This form of Crohn's disease involves only the colon. Symptoms include skin lesions, joint pains, diarrhea, rectal bleeding, and the formation of ulcers, fistulas, and abscesses around the anus.

❖ Clinical feature :

- Prolonged diarrhea.
- +/- Gross bleeding.
- Crampy abdominal pain.
- Fever.
- Weight Loss.
- 10-20% Appendicitis.
- 25-50% Peri-Anal Disease.
- Stricture-Obstruction.
- Fistula with Abscess.
- Can mimic Appendicitis.
- Aphthous ulcers, dysphagia.
- Failure to thrive is common in affected children.

❖ Extra-Intestinal Findings:

Cutaneous: Pyoderma gangrenosum, Erythema nodosum .

Ocular: Conjunctivitis, Episcleritis, Uveitis, Iritis, Iridocyclitis.

Musculoskeletal: Arthritis, Ankylosing Spondylitis

Biliary: Primary Sclerosing Cholangitis

❖ Diagnosis :

- History of compatible clinical features +/- family history.
- Physical exam normal, nonspecific signs (weight loss, palor), or findings suggestive of Crohn's (perianal skin tags, palpable abdominal mass).

❖ Investigation:

- Normocytic anaemia of chronic disease or macrocytic anaemia due to vitamin B12 or folate malabsorption
- Elevated ESR and acute-phase proteins such as C-reactive protein are useful in monitoring disease
- Barium follow through shows:
 - ✓ A long irregular stricture and rose-thorn ulcers.
 - ✓ Thickening, luminal narrowing, separation of loops, ulceration, spike-like fissures and a cobblestone appearance (in active disease).
- Proctoscopy, sigmoidoscopy and colonoscopy : are useful to determine the present and extent of large bowel disease.
- CT Scan.
- Biopsy .

❖ **Complication :**

- Fistulas.
- Perianal.
- Enterocutaneous.
- Peristomal.
- Enteroenteric.
- Rectovaginal.
- Enterovesical .
- Abscesses .
- Toxic megacolon(5%).
- Obstruction .
- Perforation .
- Carcinoma of colon .

❖ **Classification of disease:**

- Mild-Moderate : able to tolerate an oral diet without dehydration, toxicity, abd pain, mass, or obstruction.
- Moderate-Severe : failed Rx, prominent symptoms fever, weight loss, abd pain, nausea, vomiting, or anemia.
- Severe-Fulminant : persisting symptoms despite Rx with steroids or persons presenting with fever, vomiting, obstruction, rebound tenderness, cachexia, or abscess.
- Remission : asymptomatic either spontaneously or after medical or surgical intervention (does NOT include pts requiring steroids).

❖ **Treatment:**

Medical treatment:

- 5-ASA.
- Steroids: Bedesonide.
- Chemotherapy: Azathioprine, Cyclosporine, Methotrexate.
- Flagyl.
- Biologics : Infliximab.

Surgical treatment:

Indications:

- Obstruction, fistula, abscess, bleeding
- Long-term pancolitis (cancer risk)

Operations:

- Strictureplasty, resection, bypass, drainage.
- Guiding principle: Preserve Bowel Length.
- Radical surgery is contraindicated .
- The recurrence rate following small bowel resection is 30%.

Cholecystitis

Acute cholecystitis:

- RUQ pain, fever, leukocytosis associated with gallbladder inflammation .
- Acalculous cholecystitis – same inflammation of gallbladder in absence of stones (typically critically ill) .

Chronic cholecystitis:

- Usually due to repetitive acute cholecystitis.
- Most associated with gallstones, may also be associated with bacterial infection in biliary tract.

❖ **Pathogenesis :**

- Gall stone irritation of the gall bladder .
- Cystic duct obstruction.
- Histologically : can be mild edema and inflammation .

❖ **Clinical Appearance:**

- RUQ pain after a fatty meal 4-6 hours.
- Sometimes epigastric and radiating to shoulder or back.
- Pain is steady and severe.
- Nausea/Vomiting/Anorexia.
- Usually ill appearing, febrile, tachycardic.
- Peritoneal inflammation.
- Voluntary/Involuntary Guarding.

– Murphy's signe :

- Palpate patient's liver in the area of the gall bladder fossa.
- Hold your hand in the area and ask patient to inspire deeply .
- Gall bladder moves toward hand.
- Inspiratory arrest will occur secondary to severe tenderness.
- Elderly/Chronically ill not as sensitive.

❖ **Complications :**

Gangrene

- Sepsis like picture pre-operatively.
- Can have high morbidity/mortality.

Cholecystoenteric Fistula

- Direct fistula from gall bladder to duodenum or jejunum.
- Secondary to pressure necrosis from stones more often than acute inflammation.

Gallstone Ileus

- Gallstone can travel through fistula down through GI tract and block the terminal ileum

Emphysematous cholecystitis

- Secondary infection of gall bladder wall with gas-forming organism.
- Crepitus can occur with palpation of skin overlying gallbladder .
- Herald of impending necrosis and perforation.

❖ **Laboratory:**

- Leukocytosis often with left shift .
- Alk Phos and Bilirubin are not typically elevated unless.
 - Cholangitis.
 - Choledocolithiasis.
 - Obstruction of the CBD by cystic duct (Mirizzi Syndrome).
- Bile culture :E.coli , Klebsiella aerogenes and strep.faecalis.

❖ **Ultrasound:**

- Look for wall thickening.
- Look for sonographic Murphy's.
- 88% sensitivity 80% specificity.

❖ **Management :**

- Supportive care with IVFs, bowel rest, & Abx.
- Almost half of patients have positive bile cultures.
- E. Coli is most common organism .
- Antibiotic choice: Ampicillin + Aminoglycoside or 3rd generation cephalosporin (No evidence exists showing a definite benefit with use of antibiotic) .
- NSAIDs may improve course of acute cholecystitis.
- SURGERY is the only definitive treatment (cholecystectomy) .

Ruptured Ovarian cyst

- An ovarian cyst is any collection of fluid, surrounded by a very thin wall, within an ovary. Any ovarian follicle that is larger than about two centimeters is termed an ovarian cyst. An ovarian cyst can be as small as a pea, or larger than a cantaloupe.
- Most ovarian cysts are functional in nature, and harmless (benign). In the US, ovarian cysts are found in nearly all premenopausal women, and in up to 14.8% of postmenopausal women.
- Ovarian cysts affect women of all ages. They occur most often, however, during a woman's childbearing years.
- Some ovarian cysts cause problems, such as bleeding and pain. Surgery may be required to remove cysts larger than 5 centimeters in diameter.
- In some cases, especially when an ovarian cyst is not found early on, it can rupture. A ruptured ovarian cyst is not only extremely painful, but it can lead to serious medical problems. A ruptured ovarian cyst can have potentially life-threatening complications, such as hemorrhage and infection.

❖ **Treatment:**

- The treatment you receive for a ruptured ovarian cyst will depend on the severity of condition, the extent of damage caused by the rupture and upon whether or not there were any complications associated with the cystic rupture.

- First: Stabilize the patient (ABC), for unstable patient do culdocentesis, to determine the type and extent of fluid in abdominal cavity.
- Then start broad-spectrum antibiotic & analgesic medication.
- In pre-menopausal women, try to induce an anovulatory state, to prevent ovulation by OCP.
- Surgical management of a hemorrhagic cyst.

Good Luck

