

MED NOTES



Clinical cases

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eLecture

01

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Acute Abdominal Pain

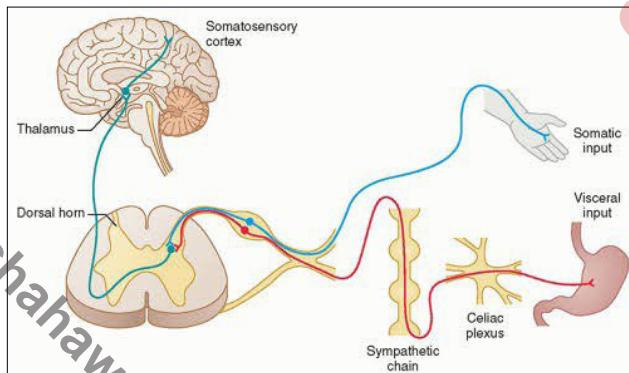
Definition

“An acute intra-abdominal condition of abrupt onset, usually associated with pain due to inflammation, perforation, obstruction, infarction or rupture of abdominal organs, and usually requiring emergency intervention. Called also surgical abdomen.” Dorland’s Medical Dictionary 2007

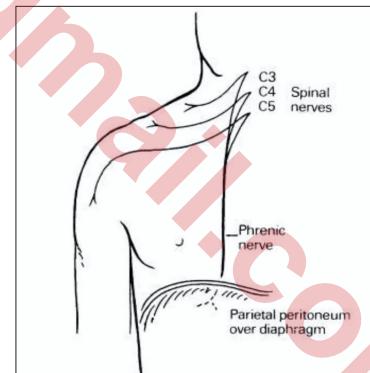
* Characters of acute abdominal pain :

- ① Recent or sudden onset of abdominal pain
- ② Either new pain, or increase in chronic pain
- ③ Pain of less than 1 week duration

Types of abdominal pain		
Visceral Pain	Parietal Pain	Referred Pain
<ul style="list-style-type: none"> - Due to stretching of fibers innervating the walls of hollow or solid organs. - It occurs early and poorly localized. - It can be due to early ischemia or inflammation. - The same site of embryonic dermatome 	<ul style="list-style-type: none"> - Caused by irritation of parietal peritoneum fibers (Supplied by somatic nerve not autonomic) - It occurs late and better localized and more intense - Can be localized to a dermatome superficial to site of the painful stimulus. 	<ul style="list-style-type: none"> - Pain is felt at a site away from the pathological organ. - Pain is usually ipsilateral to the involved organ and is felt midline if pathology is midline. - Pain receptors of pancreas relay in celiac plexus so be felt in the back - Pattern based on developmental embryology.



Mechanism of visceral and somatic pain



Mechanism of referred pain

Classification of abdominal pain

Intra-abdominal

(arising from within the abd cavity
retroperitoneum)

involves:

- ① GI (Appendicitis, Diverticulitis, etc)
- ② GU (Renal Colic, etc)
- ③ Gyn (Acute PID, Pregnancy, etc)
- ④ Vascular systems (AAA, Mesenteric Ischemia, etc)

Extra-abdominal

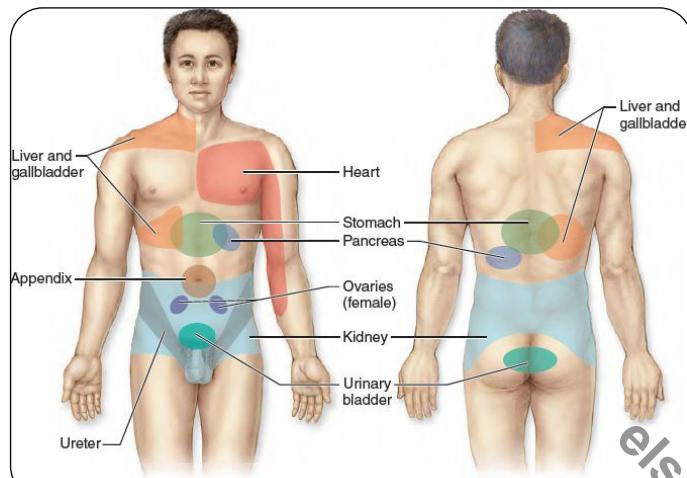
(less common)

involves:

- ① Cardiopulmonary (AMI, etc)
- ② Abdominal wall (Hernia, Zoster etc)
- ③ Toxic-metabolic (DKA, lead, etc)
- ④ Neurogenic pain (Zoster, etc)
- ⑤ Psychic (Anxiety, Depression, etc)

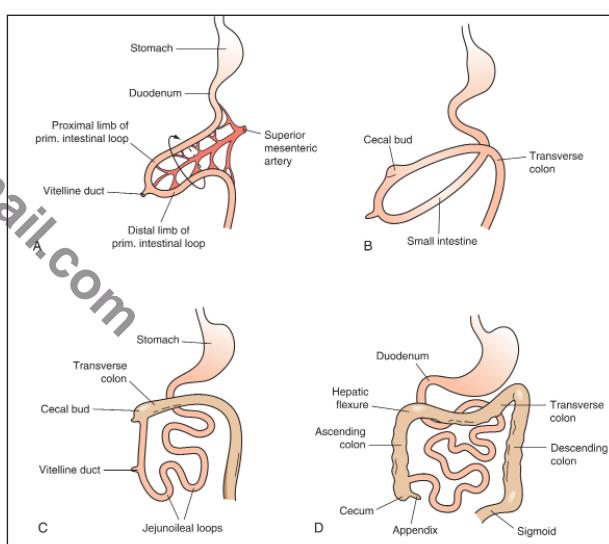
Nonspecific Abd pain

Not well explained or described.



Locations for acute abdominal pain caused by different conditions

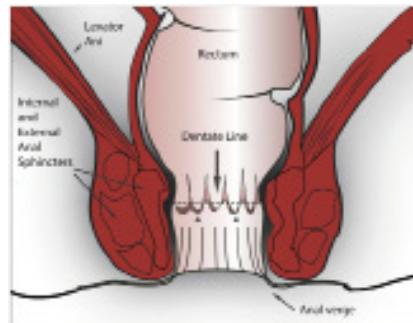
Organs of GIT			
Blood Supply	Foregut	Midgut	Hindgut
	Coeliac Trunk	Superior Mesenteric Artery	Inferior Mesenteric Artery
Lower Oesophagus	<ul style="list-style-type: none"> - Oesophagus - Spleen - Stomach - Liver - Gall Bladder - Pancreas - 1st and 2nd part of duodenum 	<ul style="list-style-type: none"> - 3rd and 4th part of duodenum - Jejunum - Ileum - Appendix - Ascending colon - Caecum - Proximal 2/3 of transverse colon 	<ul style="list-style-type: none"> - Distal 1/3 of transverse colon - Descending colon - Sigmoid - Rectum - Upper anal canal - Urogenital sinus



Embryology of the GIT

*** Note**

- Dentate Line:** It is the line that devides the anal canal into upper and lower parts
- The lower part is ectodermal in origin = Pain sensitive
 - The upper part is endodermal in origin = Painless



A-Right Upper Quadrant:
Cholecystitis
Choledocholithiasis
Hepatitis
Pyelonephritis
Herpes zoster
Pneumonia/empyema
Duodenitis
Pancreatitis

C-Right Lower Quadrant:
Appendicitis
Meckel
Mesenteric adenitis
Ectopic pregnancy
Ovarian cyst/torsion
Salpingitis
Endometriosis
Ureteral calculi
Pyelonephritis
Nephrolithiasis
Psoas abscess
Hernia
Diverticulitis
Perforated ulcer
Leaking aneurism

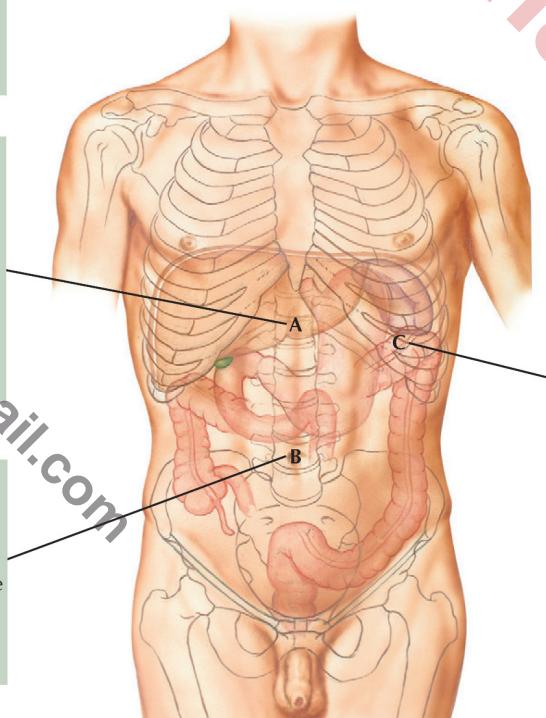
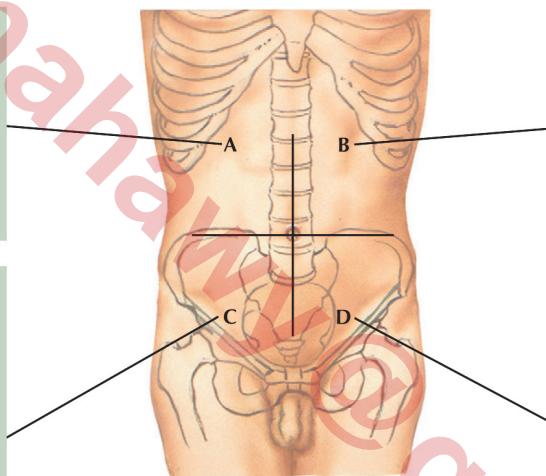
B-Left Upper Quadrant:
Gastritis
Pancreatitis
Splenic enlargement/rupture
Infarction/aneurysm
Pyelonephritis
Nephrolithiasis
Herpes zoster
Myocardial infarction
Pneumonia
Inflammatory bowel disease

D-Left Lower Quadrant:
Diverticulitis
Intestinal obstruction
IBD
Appendicitis
Leaking aneurism
Ectopic pregnancy
Ovarian cyst/torsion
Salpingitis
Endometriosis
Ureteral calculi
Pyelonephritis
Nephrolithiasis

A-Epigastic Region:
Peptic ulcer
Gastritis
Pancreatitis
Duodenitis
Gastroenteritis
Early appendicitis
Aneurysm
Cholecystitis
Myocardial infarction

B-Umbilical Region:
Early appendicitis
Gastroenteritis
Pancreatitis
Inflammatory bowel disease
Intestinal obstruction
Mesenteric thrombosis
Aneurysm

C-Hypochondrium Region:
Cystitis
Diverticulitis
Appendicitis/Meckel
Prostatism
Salpingitis
Hernia
Ovarian cyst/torsion
Pelvic inflammatory disease
Ectopic pregnancy
Inflammatory bowel disease
Intestinal obstruction



Common causes of Acute abdomen

- | | |
|---|--|
| <ul style="list-style-type: none"> - Acute appendicitis - Acute pancreatitis - Peptic ulcer - Gastroenteritis - Hepatitis - Bowel obstruction - Bowel Perforation - Herniation - Meckel's Diverticulitis - Toxic megacolon - Pancreatic pseudocyst - Ovarian cyst rupture - Adnexal torsion - Ureteral calculus | <ul style="list-style-type: none"> - Rupture of renal pelvis - Ureteral obstruction - SMA syndrome - Thrombosis/infarction - Ruptured visceral artery aneurysm - Pneumonia - Pulmonary embolus - Intraperitoneal hemorrhage - Splenic rupture - Abdominal trauma - Acute intermittent porphyria - Diabetic ketoacidosis - Sickle Cell Disease |
|---|--|

Historical features of Abdominal Pain

- ① Location, quality, severity, onset, and duration of pain, aggravating and alleviating factors
- ② GI symptoms (N/V/D)
- ③ GU symptoms
- ④ Vascular symptoms (A. fib / AMI / AAA)
- ⑤ Can overlap i.e. Nausea seen in both GI / GU pathologies.
- ⑥ **PMH**
 - Recent / current medications
 - Past hospitalizations
 - Past surgery
 - Chronic disease
 - Social history
 - Occupation / Toxic exposure (CO / lead)

Physical Examination of the Abdomen:

- Note pt's general appearance. Realize that the intensity of the abdominal pain may have no relationship to severity of illness.
- One of the initial steps of the PE should be obtaining and interpreting the vitals.
- Pts with visceral pain are unable to lie still.
- Pts with peritonitis like to stay immobile.
- **INSPECT** for distention, scars, masses, rash.
- Visible peristalsis indicates intestinal obstruction
- **PALPATION** to look for guarding, rigidity, rebound tenderness, organomegally, or hernias.
- **PERCUSSION** for Ascites or intraperitoneal fluid
- **AUSCULATE** for hyperactive, obstructive, absent, or normal bowel sounds.
- Women should have pelvic exam (check FHR if pregnant).
- Anyone with a rectum should have rectal exam (If no rectum check the ostomy).



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Note

- Pneumonia may cause abdominal pain: tachycardia and tachypnea attacks of cyanosis (with percussion: pleural effects)
- AF patient with acute abd pain taking anticoagulant may presents with mesenteric vascular occlusion
- Hernial orifices may be a site for intestinal obstruction

Special tests

	Definition
Carnett's sign	Lift head and shoulders off exam table with abdominal wall pain
Murphy's sign	<ul style="list-style-type: none"> - Patient breathes in during palpation below R costal margin - Positive if stops breathing and + tenderness → Cholecystitis - Source of pain is parital ie : due to abdominal wall not intraabdominal
Psoas sign (Obraztsova's)	Flex R thigh → iliopsoas irritation in retrocecal appendicitis
Obturator sign (Zachary Cpe)	Passive internal rotation of flexed R hip → Pelvic appendicitis
Rovsing's sign	RLQ pain with palpation of LLQ → Appendicitis
Bloomburg's sign	Rebound tenderness
Mc Fadden sign	In case of pelvic appendicitis the inflamed appendix could irritate the urinary bladder causing inertia and urinary retention commonly affect males
Baldwin's sign - Straight leg rising sign	--
Kher's sign	<ul style="list-style-type: none"> - The occurrence of acute pain in the tip of the shoulder due to the presence of blood or other irritants in the peritoneal cavity when a person is lying down and the legs are elevated. - Kehr's sign in the left shoulder is considered a classic symptom of a ruptured spleen.
Balance sign	During percussion there is fixed dullness on the left side and shifting dullness on the right side due to rupture of spleen

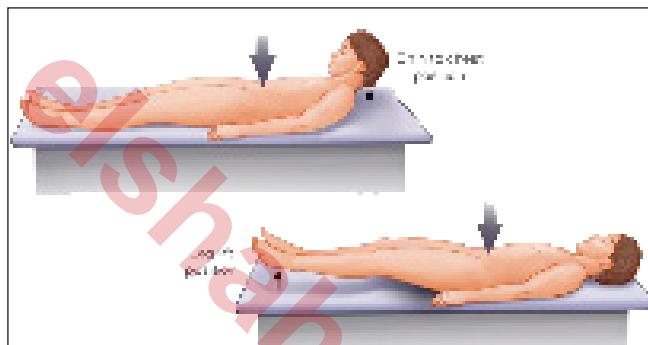
Definition

Mc Cullen sign

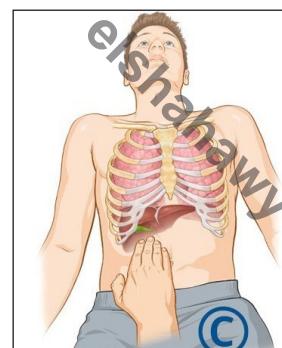
In retroperitoneal hematoma or intra-peritoneal hematoma complicated by pigmentation around the umbilicus

Grey Turner sign

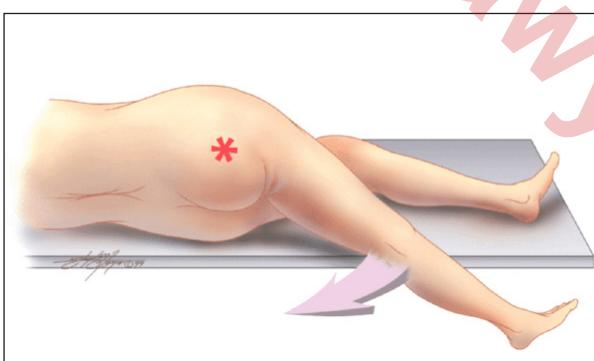
In retroperitoneal or hemorrhagic pancreatitis complicated by pigmentation of flanks



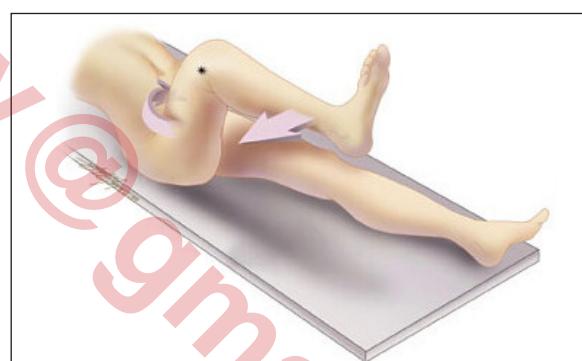
Carnett's sign



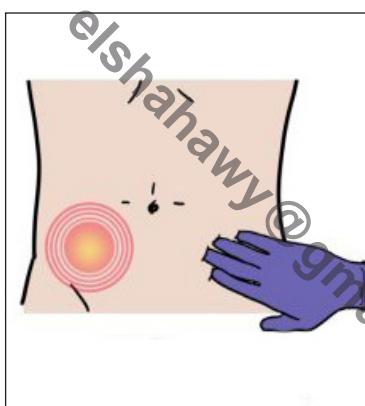
Murphy's sign



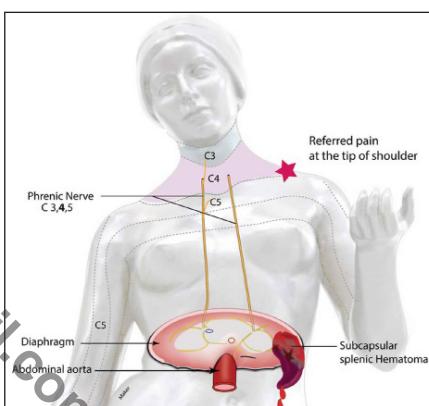
Psoas sign



Obturator sign



Rovsing's sign



Kher's sign



Red Flags – MD consult

- New onset of pain, change in pain or altered bowel habits in the elderly
- Weight loss, hx CAD
- Bleeding per rectum or melena
- New anemia, hx of alcohol abuse, trauma.
- Supraclavicular nodes (Mostly hidden abdominal malignancy)
- A personal or family history of serious bowel pathology Eg ,familial polyposis colitis or chrons or ulcerative colitis
- Pain waking the patient at night
- Immunocompromised, previous abd surgery
- Abnormal vital signs

Laboratory Tests

- CBC (limited clinical utility)
- Basic metabolic panel : BMP / CMP
- Comprehensive metabolic panel (CMP)
- UA / Urine culture
- Lactic acid
- LFT
- Amylase / Lipase (Routine investigation in acute abdomen)
- Cardiac enzymes : CE / Troponin
- HCG (quant / qual)
- Stool Culture

The comprehensive metabolic panel (CMP)

It is a blood test that gives doctors information about the body's fluid balance, levels of electrolytes like sodium and potassium, and how well the kidneys and liver are working.

Radiographic Test

- Plain x ray erect and supine position
 - ① Erect → multiple air and fluid
 - ② Features of obstruction → Supine



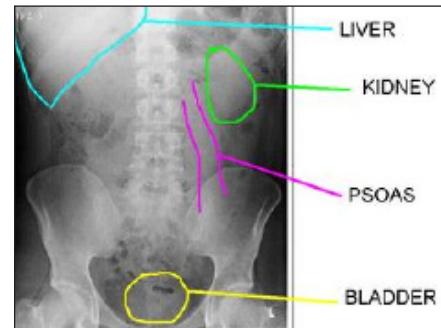
X-ray abdomen showing

Multiple air fluid levels in small bowel suggestive of distal small bowel obstruction

- Plain abdominal radiographs or abdominal series has several limitations and is subject to reader interpretation.
- CT scan in conjunction with ultrasound is superior in identifying any abnormality seen on plain film.

- AXR :

- Demographics/ Type of XR
- **Black** → Dilated loops / Air :
 - Small = central, valvulae conniventes
 - Large = Peripheral, Haustra
- **White** → Calcification :
 - Renal stones/ Gallstones
 - Foreign Bodies
 - Bone
- **Grey** → Soft tissue :
 - Liver, spleen, pancreas, gall bladder, ovary, uterus
 - Enlargement, calcification
 - Abdominal wall muscles, hernias
 - Stool

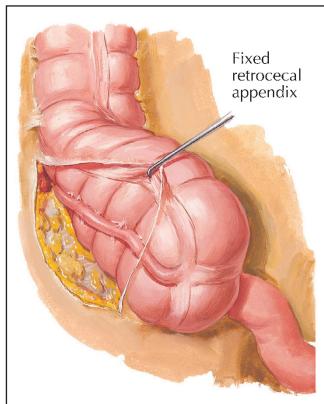


Re-review and summarise

RIF Pain : APPENDICITIS	LIF Pain : SUPERCLOTS
<ul style="list-style-type: none"> - Appendix/ abscess - Pelvic inflammation/ period pain - Pancreas - Ectopic/ endometriosis - Neoplasm - Diverticulitis - Intussusception - Crohn's/ Cyst - IBD - Torsion - IBS - Stones 	<ul style="list-style-type: none"> - Sigmoid diverticuli, volvulus - Ureteric colic - Pelvic inflammation/ period pain - Ectopic/ endometriosis - Rectal Haematoma - Colon cancer - Left lower pneumonia - Ovarian cyst - Torsion - Stones

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Appendicitis



Case

Middle age, childhood or adults (till 4th decade) presented with pain started 36 hrs ago as an umbilical or parabilical pain then shifted to be at the rt lower abdomen and associated with 1 or 2 attacks of vomiting. The patient is also constipated

During examination, there is localized tenderness in the right lower abdomen with +ve Rovsing sign and +ve Psoas Sign.

During auscultation, there is mild ileus on the right lower abdomen

Investigated with CBC which showed mild leukocytosis, elevated CRP, -ve BHCG and normal urine analysis

Abdominal US showed collections in right lower abdomen (Aprestaltic lower abdomen)

Symptoms

① Pain

- Onset : acute

- Site :

- At start : **colicky or visceral** at para-umbilical region because both umbilicus and appendix are supplied by T10 segment (Referred pain)

- Later : it will be localized (**stabbing, somatic**) in the Rt. iliac fossa.

- It is aggravated by movement and cough.

② Anorexia and nausea: due to reflex pylorospasm.

③ Vomiting: once or twice (not continuous)

④ Constipation: may present

Signs

① **General signs:** fever (37.2-37.8) but if high, it means complications

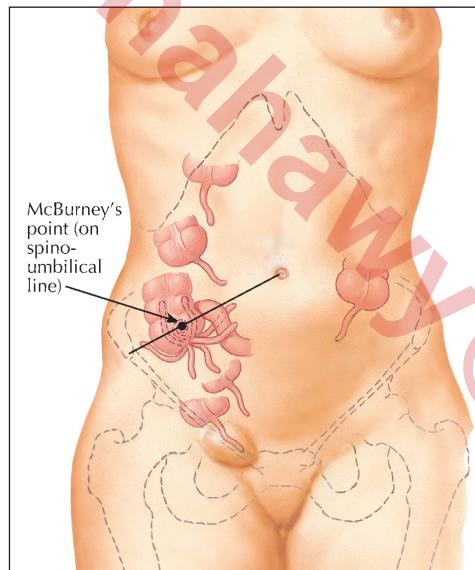
② **Local signs:**

- If the patient is asked to cough, the pain becomes sharp and well localized to the site of appendix (Cough tenderness).
- Localized tenderness and Rebound tenderness over the Rt. iliac fossa, usually but not always, over McBurney's point.

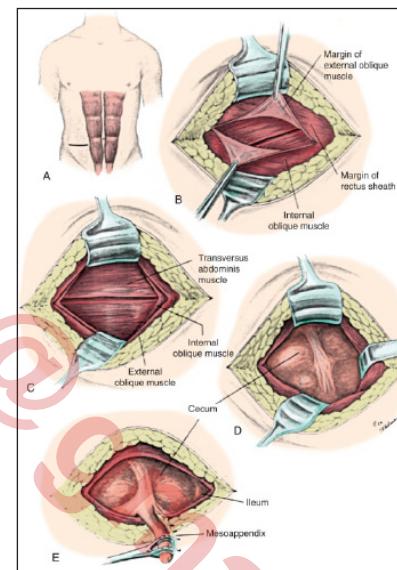
- Rovsing's sign (Crossed tenderness) pressure on Lt. iliac fossa causes pain in Rt. iliac fossa due to displacement of gas to the cecum & distend the inflamed appendix.

Notes

- ① **McBurney point** is defined as a point that lies one-third of the distance laterally on a line drawn from the umbilicus to the right anterior superior iliac spine. Classically, it corresponds to the location of the base of the appendix
- ② **Grid iron incision** means ms splitting not cutting along muscle fibres
- ③ In case of non obstructed appendix:
Perforation occurs on the tip which has the least blood supply
- ④ In case of obstructed appendix
Perforation occurs at site of obstruction



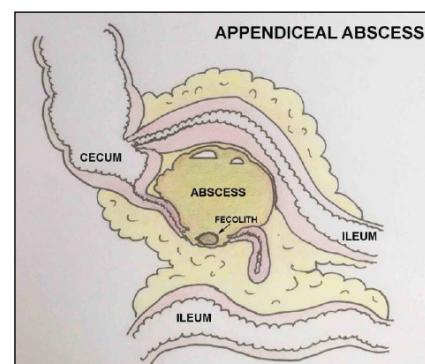
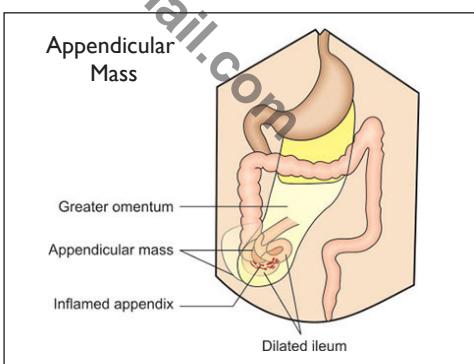
McBurney point



Grid iron incision

Complications of Appendicitis

- 1) Appendicular Mass
- 2) Appendicular abscess
- 3) Pelvic Peritonitis
- 4) Generalized peritonitis
- 5) Irrigation, aspiration and culture is done



Management according to presentation

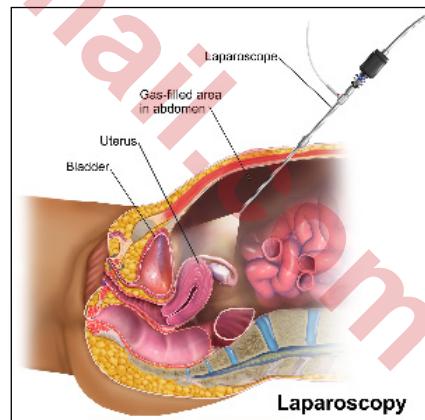
Appendectomy either open or laparoscopic depends on heart and lungs condition for peritoneal insufflation, well equipped field and experienced surgeon

Appendicular mass

- Urgent appendectomy is not performed because ;
 - ① The mass represents success of body (it is better undisturbed).
 - ② Appendectomy is difficult with increased morbidity
 - ③ Appendectomy is carrying hazards of injuring the intestine.
- Initial Conservative (Ochner-Sherre) treatment:
 - ① Rest in bed & Ryle's tube (No oral intake).
 - ② I.V fluid & I.V antibiotics
 - ③ Observation for vital signs, size of mass & degree of tenderness.
 - ④ In 80-90% of cases on conservative treatment
 - ⑤ Resolution of the mass for Interval appendectomy 3 months later.

Appndicular abscess

- The pus should be drained by open surgery or US percutaneous aspiration, then a rubber drain is left, then Interval appendectomy 3-6 months later.
- Muscle incision is muscle cutting not grid iron incision
- Parital peritoneum is not opened to avoid pus spreading instead extra-peritoneal dissection is done
- A drain should be left
- If appendix is appearant with easy dissection appendectomy is done
- If not don't try to avoid fistula then appendectomy is done 6 months later



Advantages of laparoscopy

- Diagnostic and therapeutic
- Confirmation or exclusion of conditions that mimic appendicitis eg ovarian torsion or hge
- Ovarian cyst
- Diagnosis and wash of peritoneum in case of peritonitis

Lecture

02

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Cholecystitis

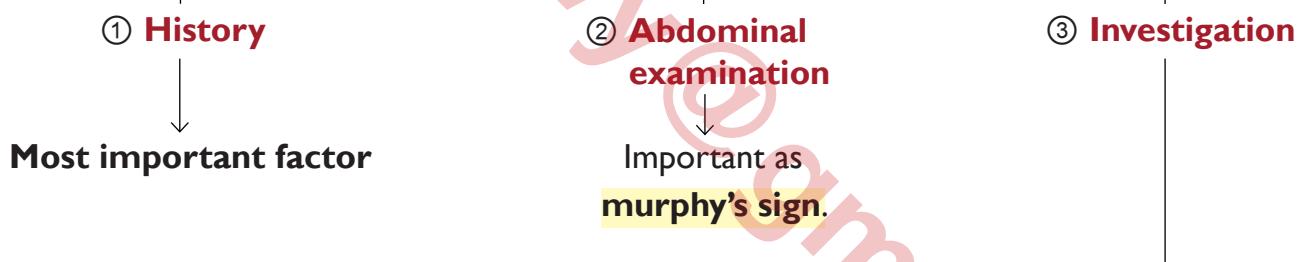


Case

40 y old female BMI is $35\text{kg}/\text{m}^2$ complains of acute onset of epigastric pain for 2 days.

(**Cholecystitis pain:** Pain on and off related to fatty meal in the right hypochondrium, radiating to right scapula)

The approach



Laboratory investigations

① CBC: ↑ WLA

② ↑ CRP

③ Liver function tests:

- as if ALT & AST are normal that doesn't exclude acute calculous cholecystitis
- while if they are elevated in addition bilirubin this indicates cholelithiasis or obstructive jaundice
(Acute calculous cholecystitis)

Radiological investigations

* Primary and most commonly asked is **US** which show:

- ① If there are stones
- ② Acutely inflamed bladder → the wall is thickened, edematous as double wall or pericholecystitis collection
- ③ The site of the stones
 - If stones are impacted in **Hartmann's pouch** (infundibulum), **neck** or **cystic duct** which indicates **acute inflammation**
 - if the stones are **floating in gall bladder** this indicates **chronic inflammation**.
- ④ If CBD is dilated or not and the cause of jaundice.
(Dilated intrahepatic biliary radicals)

Clinical picture

Symptoms: (maybe asymptomatic) discovered accidentally

- ① Biliary colic ③ Chronic Cholecystitis
- ② Acute Cholecystitis ④ Abscess

Due to Migration of the Stone: (Complications)

- ① Cholangitis ③ Pancreatitis
- ② Obstructive jaundice ④ Gallstone Ileus

Scenario 1 If asymptomatic gall stones :

No surgical treatment unless:

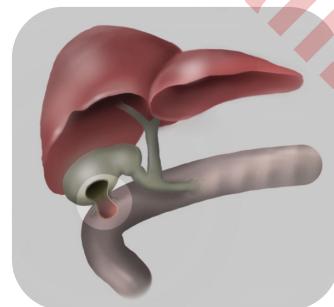
- ① Hemolytic anemia (soon or later It will complicated)
- ② Stones are more than 2cm sooner or later It will induce friction and this friction chronically will cause adenocarcinoma or fistulation between the gall bladder and duodenum (**cholecystoduodenostomy**) and the stone will pass through the intestine and may end at terminal ileum causing gall stone ileus.
- ③ Calcification of gall bladder (**porcelain gallbladder**) because it is precancerous.
- ④ Any Intraperitoneum procedure as hernia fixation
- ⑤ Uncontrolled DM patient or live in remote area (lose follow up ,15% of the patients)

Note

* Diabetic patient has low sensitivity to pain (autonomic neuropathy) May be complicated by acute calculous cholecystitis and he doesn't feel the pain.



porcelain gallbladder



cholecystoduodenostomy

Scenario example

A case with right hypochondrial pain with jaundice , dark urine and history of eating in restaurant fast food >>> Hepatitis

Scenario 2 Acute calculous cholecystitis:**The main criteria for diagnosis:**

- ① Pain is more than 24hs and not improve
- ② Gaurding and rigidity
- ③ Exaggerated murphy's sign
- ④ Leukocytosis
- ⑤ Increase CRP

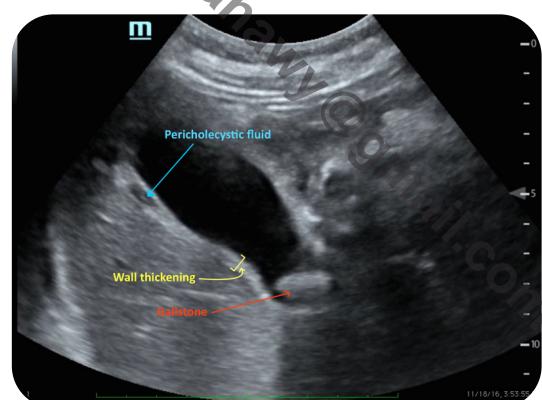
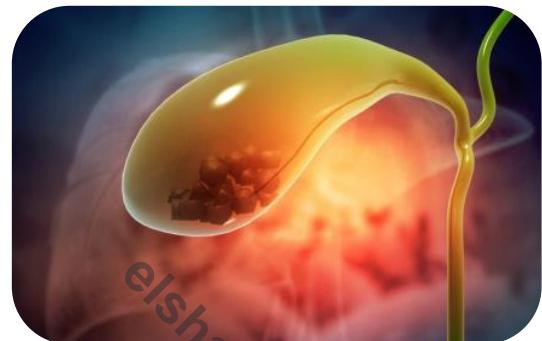
- By Us :

- ① Edema
- ② Pericholecystic collection
- ③ Stone in gall bladder

- TTT : First hospitalization then

Ochner sherre as in appendicular mass:

- ① NPO
- ② Broad spectrum antibiotics
- ③ Analgesia
- ④ IV fluid
- ⑤ Follow up for 48h

**Note**

* **If there is improvement:** less pain, less fever, improvement in leukocytic count & CRP and no nausea (**favorable signs**) elective surgery **after 6 weeks** (but in 13-30% may occur recurrent attack) so it is **better to do urgent laparoscopic or open cholecystectomy after 48hrs in the same admission.**

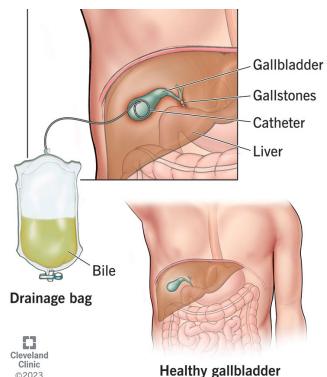
Indications of urgent Cholecystectomy in this scenario:

- ① Fit for surgery
- ② Expert surgeon in hepatobiliary surgeries
- ③ Well equipped hospital (if the patient is not ready for urgent surgery for any cause, should go on 6 weeks on medical treatment then elective surgery in suitable hospital).

- If **no improvement after 48hrs** and **fit for surgery** ➡ **urgent cholecystectomy**.
- If **no improvement on medical ttt** and **unfit for surgery** ➡ **intervention**

but if not provided :

- * Under local anesthesia,
- * Open at tip of right 9th costal cartilage (fundus of gall bladder)
- * Drainage of pus (cholecystostomy) Then later on laparoscopic or open cholecystectomy,



Note

- So patient with **acute calculous cholecystitis & unfit for surgery** & **no improvement with medical ttt**,
- * Need some sort of minor interventional procedure (**drainage only**)
- * Cholecystostomy for **2-6 weeks** until the patient get to some sort of stabilization, the cholecystectomy open or laparoscopic.

Scenario 3 Acute non calculous cholecystitis

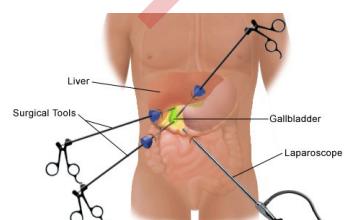
- is **the most serious situation** in gall bladder inflammation because it is usually associated with serious comorbidities as:
 - ① 3rd degree severe burn
 - ② After open heart surgery and stay in ICU for 2 or 3 days and have pain in R.T hypochondrium and diagnosed by US with acute non calculous cholecystitis
 - ③ Severe pancreatitis and necrotizing pancreatitis
 - ④ Major trauma and multiorgan affected & the patient in ICU

* So the patient with acute non calculous cholecystitis is usually ICU patient
- **TTT:** once diagnosed ➡ **urgent cholecystectomy** laparoscopic or open and if unfit, ➡ **cholecystostomy**.

Scenario 4 Symptomatic gall stones in form of Chronic calculous cholecystitis:-

TTT:

- **Cholecystectomy** (traditionally laparoscopic)

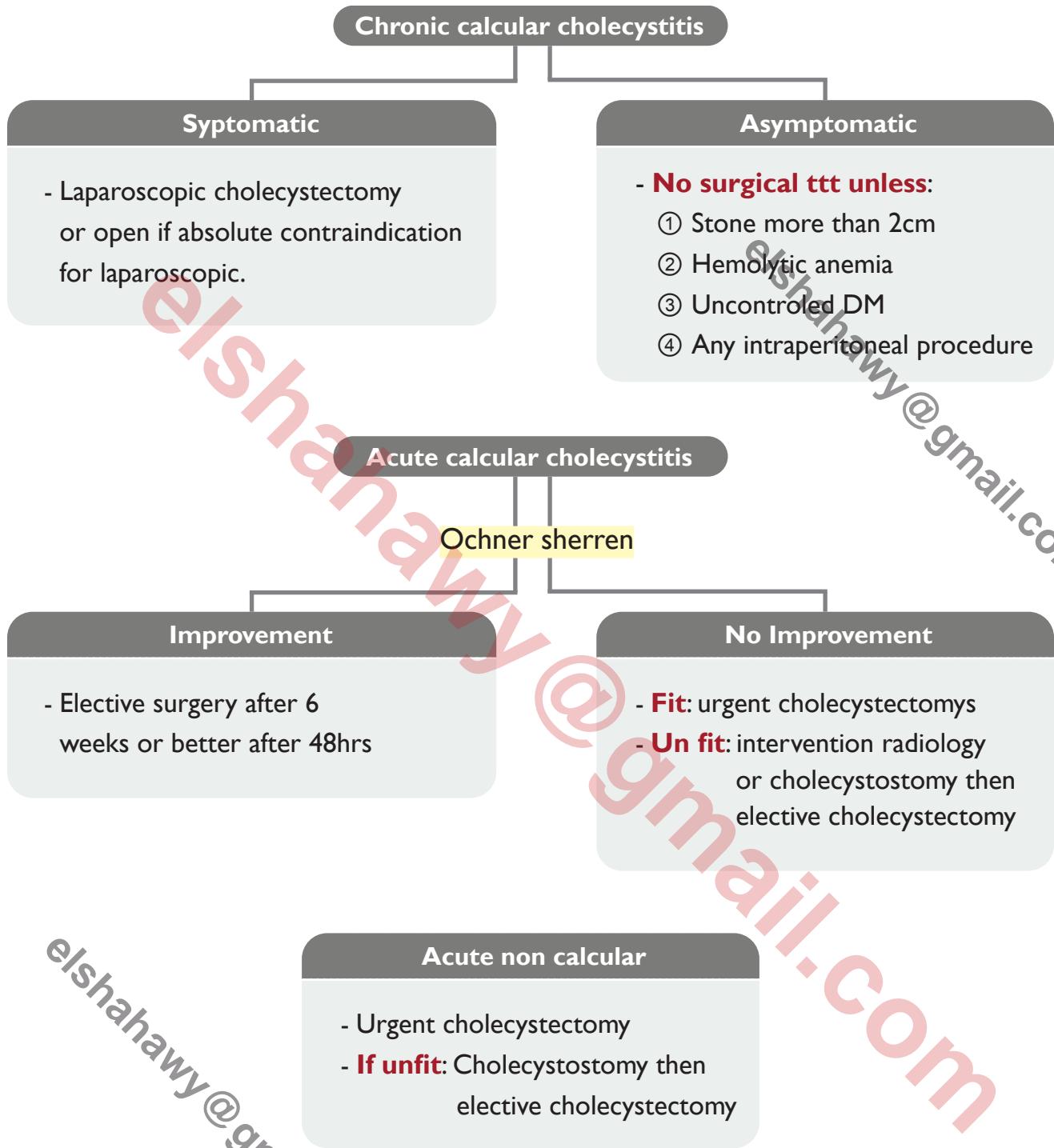


Note

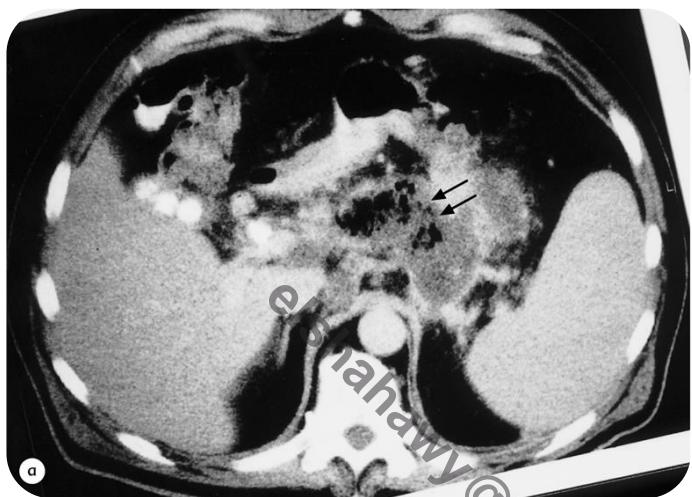
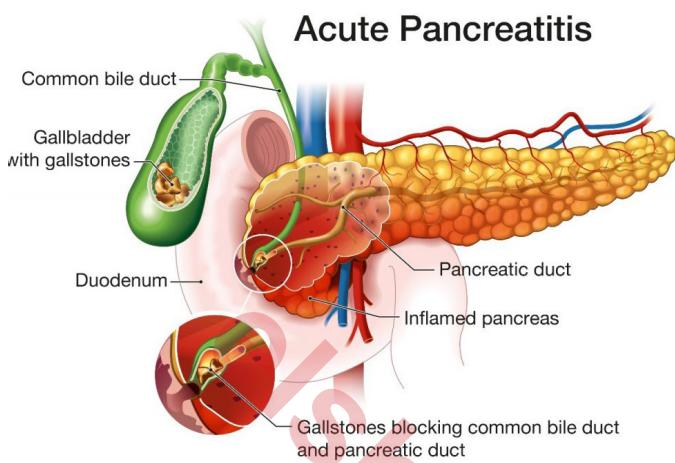
- should be laparoscopic unless there is absolute contraindication for Laparoscopy as:
 - * Perforation chest complication (can't do Insufflation) and cardiac patient.

Laparoscopic cholecystectomy is the optimal surgical treatment

Summary



Pancreas



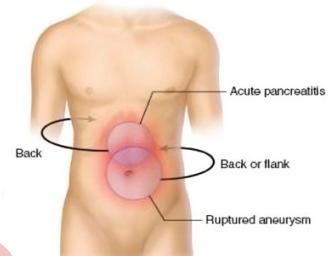
Introduction

Etiology: Acute pancreatitis most common causes:

- ① (>50%) is **gall stones** In Middle East
- ② (20-25%) **alcohol** in western countries
- ③ **Iatrogenic by ERCP**
- ④ **Other causes** (drug-viral-trauma)

The diagnostic parameters are firstly **clinically**, the most common Presentation:

- ① Acute onset of epigastric pain which is severe that Radiated to the back
- ② One or two attacks of vomiting
- ③ Tachycardia and tachypnea
- ④ The serum amylase and lipase shooting



Note

* Abdominal examination can't explain the severity of pain (the patient has severe pain but there is no guarding or rigidity as pancreas is retroperitoneal) only tenderness with palpation.

* There are 3 types of acute pancreatitis:

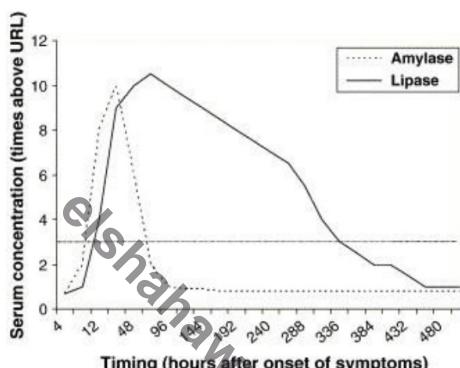
- ① **Edematous** pancreatitis
- ② **Hemorrhagic** pancreatitis
- ③ **Necrotizing** pancreatitis

Investigations

- **Amylase and lipase increase** specially amylase within 1st 48hrs while lipase starts to increase after 48hrs And becomes the top on 4th or 5th day up to 15day specially in urine but amylase in 1st 48hrs then regress

* So if patient **came within 3 days of pain**,
lipase is more diagnostic,

* While in **first 24hrs or 48hrs**,
amylase is diagnostic and if more than 1000 units.

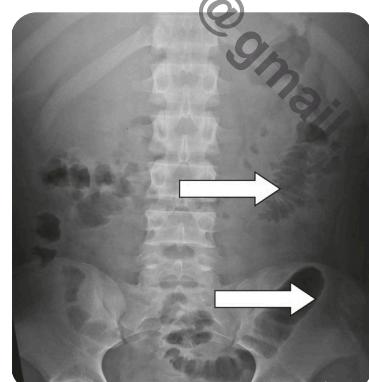


- **CT if you doubt of complications**
such as **Pancreatic necrosis**

- **Another investigation in 1st day**

* **US:** for gall stones pancreatitis and CBD is mild dilated

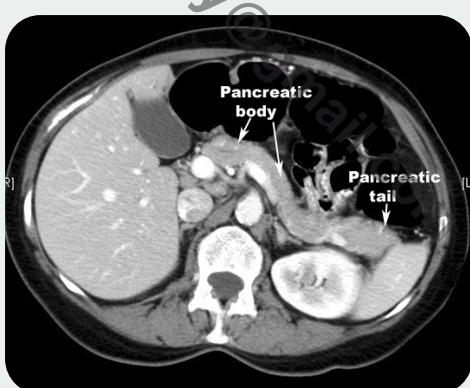
- * **Abdominal X-ray** in erect position to show:
 ① **Sentinel loop** (loop of small intestine) sausage shape
 ② **Colon cut off sign:** in transverse colon:
 part contains air and part collapsed.



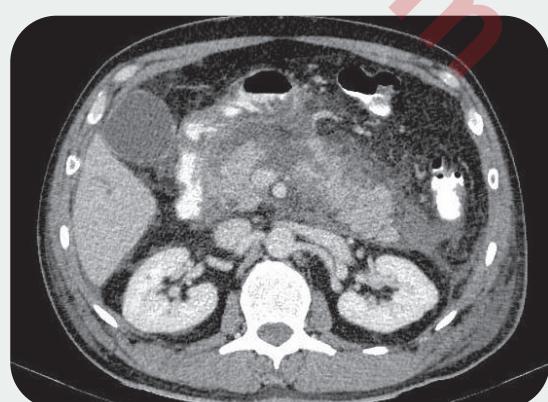
(ERCP IS HAZARDOUS IN ACUTE SITUATION).

Important scenario

- * If the patient deteriorated and no improvement (after medical treatment) at the end of 2nd day or 3rd day, we fear of transformation of hemorrhagic pancreatitis to necrotizing pancreatitis as necrosis starts to appear at **3rd day**, so we need to do **CT with IV contrast** to see a part of pancreas that does not absorb the contrast (no blood supply & necrotic part) to diagnose the complications as necrotizing pancreatitis & abscess.
- * Some patients come after undiagnosed Acute attack pancreatitis for 2 months, come with recurrent attack and pseudocyst of pancreatitis.



Normal pancreas



Necrotizing pancreatitis

Indication of CT with acute pancreatitis

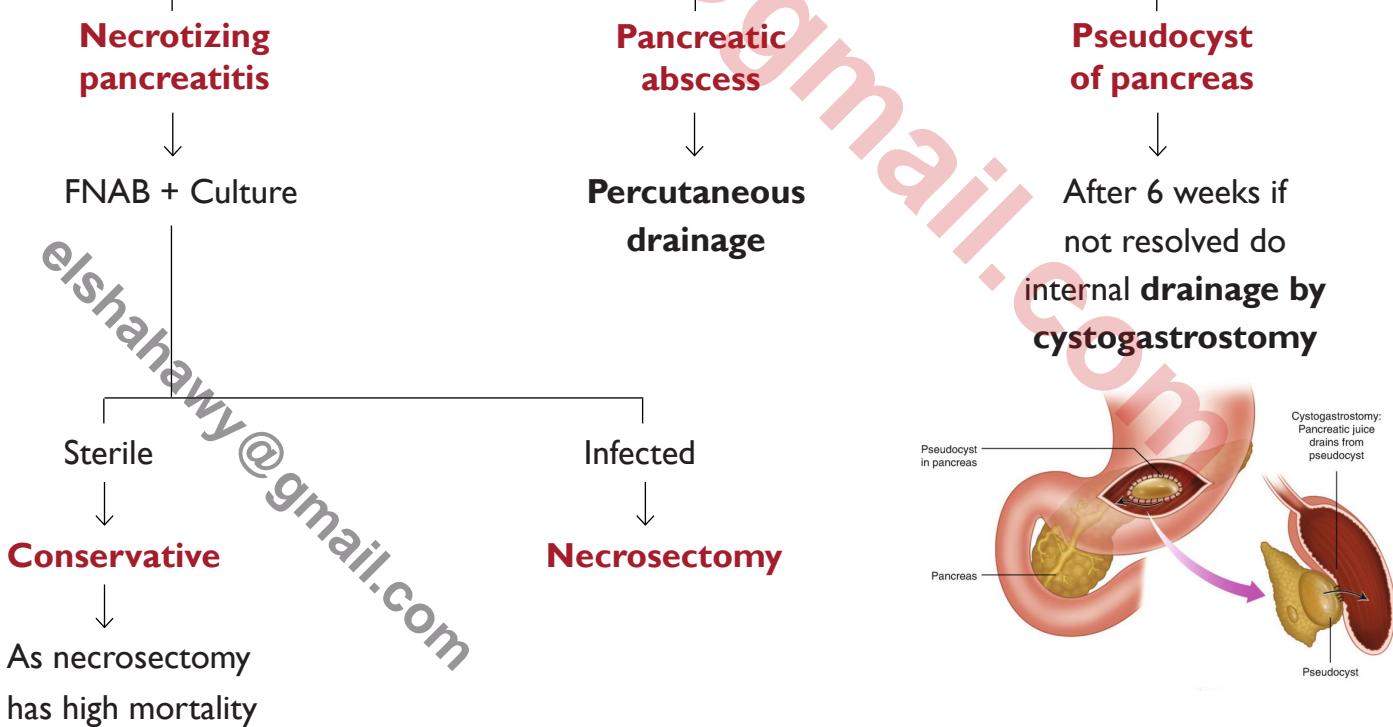
- * Doubtful diagnosis
- * Failure of conservative treatment after three days (necrotizing pancreatitis.)
- * To detect complication, such as Pseudocyst of pancreatitis

Treatment

- Primary treatment aggressive Conservative or supportive medical measures.

- ① I.V fluids (up to 7L)
- ② **Analgesia** (Avoid morphine)
- ③ **Correct electrolyte imbalance** as hypocalcemia
- NPO unless there is no nausea or vomiting.
- Antibiotics are not necessary as the acute pancreatitis is chemical inflammation But we worry about super added bacterial infection.
- After medical treatment, the patient is improved and discharged from hospital
(the majority of patients don't need CT OR ERCP OR MRCP)
- ERCP only in: unimproved patient and his CT scan show no necrosis & his bilirubin is progressively increase , MRCP is mandatory to decide if we need to do ERCP or not.

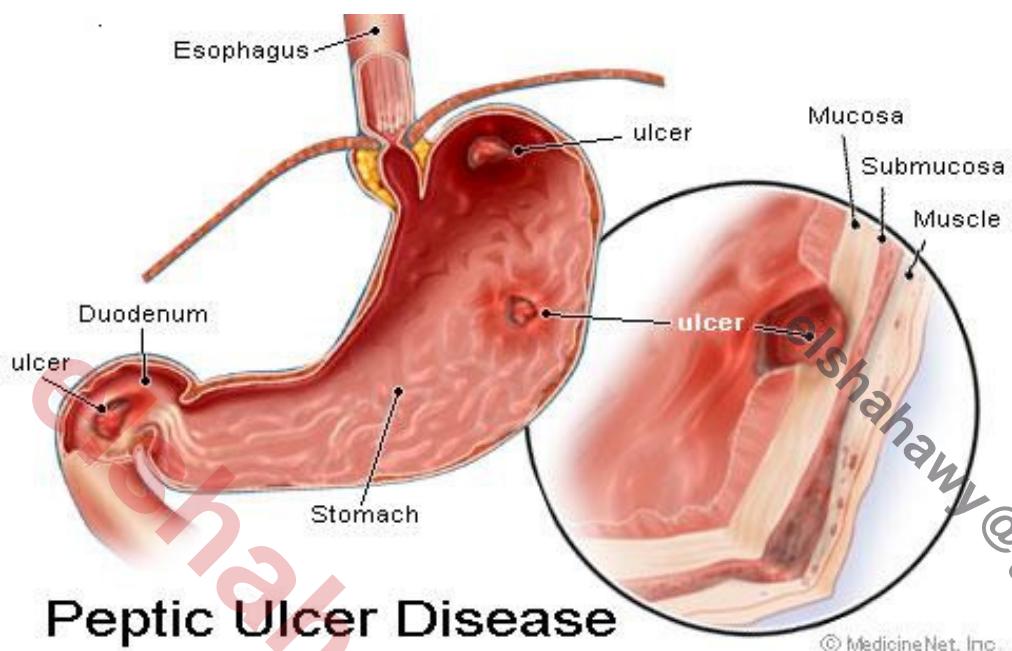
Treatment according to case complications



Note

- * Pancreas itself with acute attack is not an indication for surgery

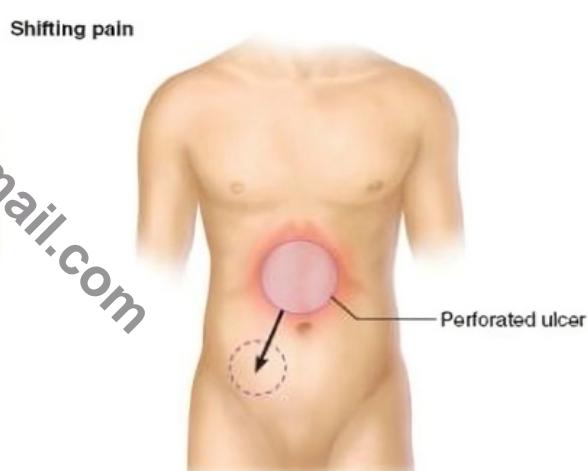
Perforated Peptic Ulcer

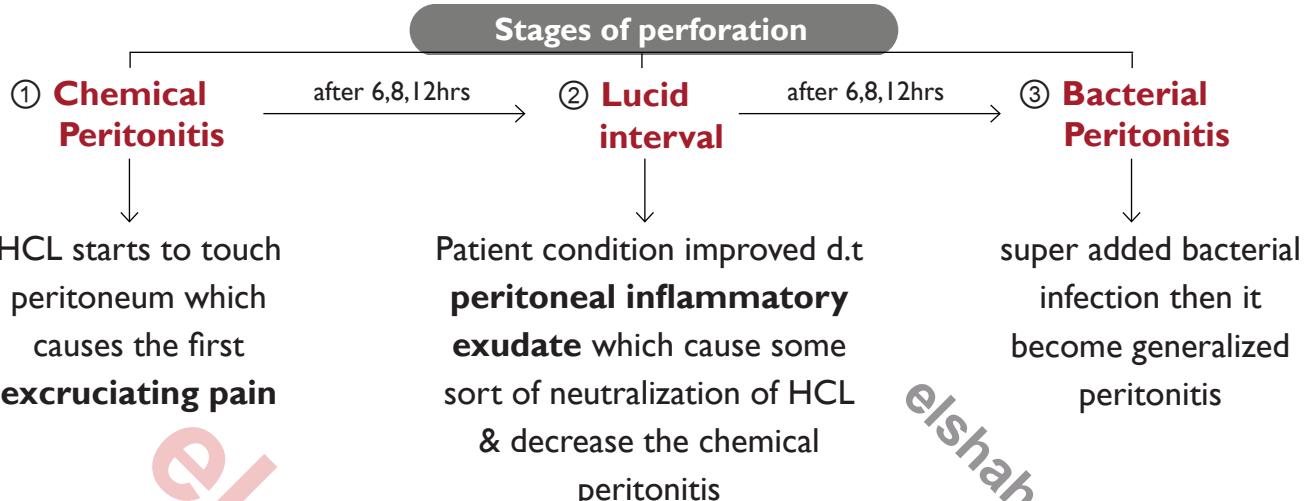


Peptic Ulcer Disease

Case

- Patient with a painful condition as (osteomyelitis, disc prolapse, osteoarthritis...) taking **NSAIDs** for **7 days** or **alcoholic** or **corticosteroid** or **chemotherapy** (immunosuppressed) & suddenly comes with an acute severe excruciating **epigastric pain** and after 6, 8 or 12hrs the patient condition improved (lucid or quiescent interval) then within few hours deteriorated and become generalized abdominal pain & sometimes starts from the right side and become generalized (**DD of acute appendicitis**).





Note

- * The abdomen as **board like rigidity** (as wood) due to reflex muscle spasm to guard against peritoneal movement.
- * The rigidity is involuntary while guarding is voluntary, there is also rebound tenderness, so **the diagnosis clinically** is
 - Peritonitis.
 - Suspected perforated peptic ulcer confirmed by chest X-ray (air under diaphragm confirmed that there is perforated viscus not confirmed perforated peptic ulcer).

* Signs and Symptoms of Peritonitis:

- ① **The physical findings depend on etiology and duration** and whether the process is diffuse or localized
- ② Usually associated with the **abrupt onset of abdominal pain**, often localized at first and then spreading throughout the abdomen
- ③ **Fever** is usually present early and may disappear
- ④ The abdomen is usually **distended** with hypoactive bowel sounds
- ⑤ **Tenderness** to percussion and palpation is present in all four quadrants

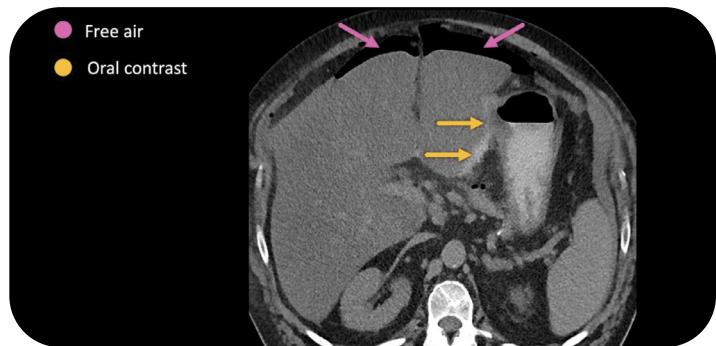
Investigations

- **Chest x-ray**: air under diaphragm
 - * Only in 70% of perforated peptic ulcer patients & 30% of cases are not associated with air under diaphragm



- CT scan with oral contrast:

- * CT shows ulcer crater & the contrast is out of stomach & duodenum & trickle on R.T paracolic gutter.
- * CT scan is not required in all patients, if you doubt of source of perforation



Note

- * Not all patients need CT as if clinical criteria are typical to perforated peptic ulcer and air under diaphragm.

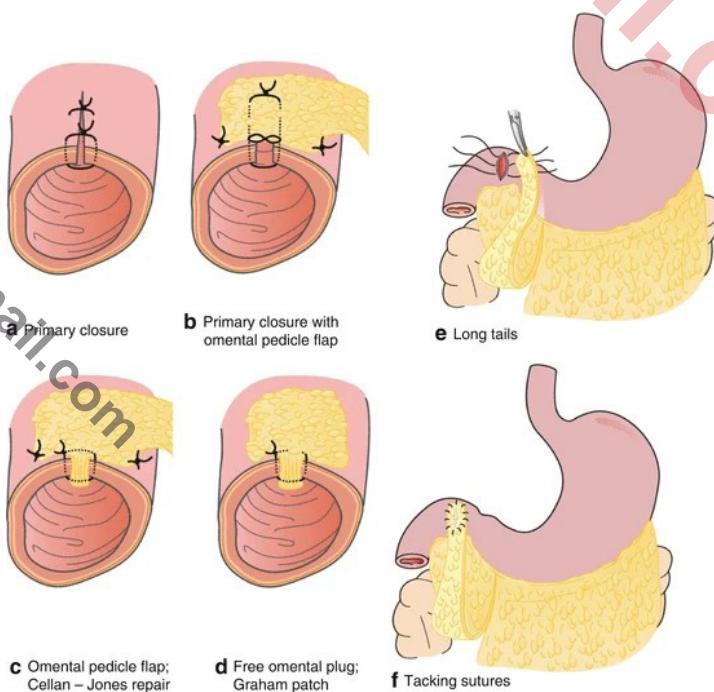
Treatment

- Preoperative preparation:

- ① A Ryle ➔ continuous aspiration
- ② I.V fluids (are guided by urine output, electrolyte and PH)
- ③ I.V antibiotics
- ④ I.V proton pump inhibitors

- Operation

- ① In PPU aspiration & re aspiration until cleaning of peritoneal cavity then pointing & localizing source of perforation.
- ② **Modified Graham's operation:** close the opening by 2 or 3 sutures then omental patch closure(to decrease tension on wall of duodenum)



Note

- Exploration:

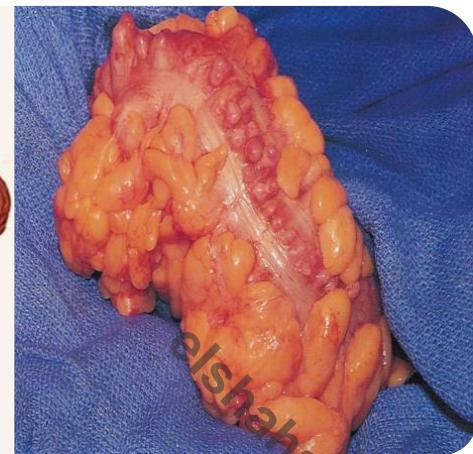
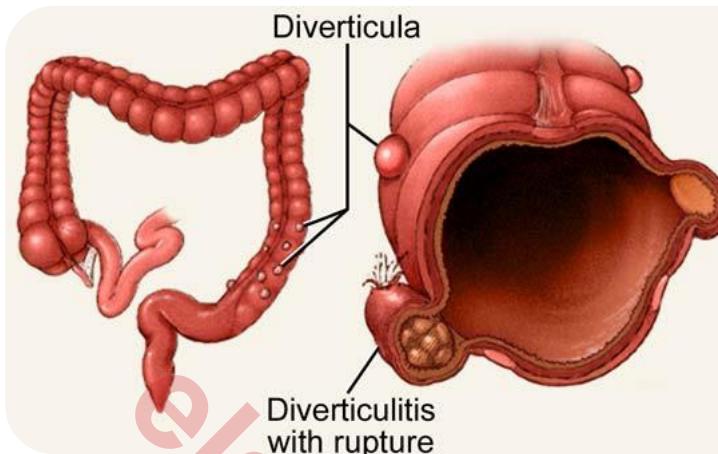
- * If you are sure from diagnosis ➡ open surgery exploration with midline incision,
(Midline incision is the most exploratory incision)
- * If you doubt of upper abdominal pathology (PPU) ➡ the open slightly above umbilicus and from the shape and smell of content you will expect the extension of incision

- Example:

- * If you found remnant food and bile ➡ it will be **upward extension** as it is **peptic ulcer**
- * If founded frank pus ,E-coli & smell of stool ➡ the extension will be **downward** to explore the colon specially L.t side more specific & localizing sigmoid colon.
- * So from the shape and smell of content you will expect the extension of incision

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Acute Diverticulitis

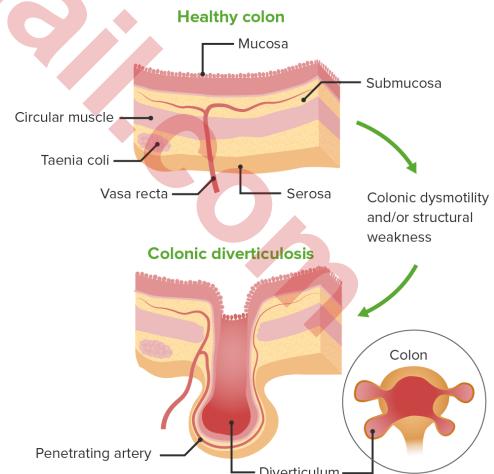


Case

- * 40 or 60 years old patient (middle or old age) more in old male , suffer from chronic constipation , left lower abdominal pain for several years and at the last week since 3 days the pain become more severe (acute abdomen) , increase in temperature and the clinical picture is the same as the clinical picture of acute complicated appendicitis , you have to suspect diverticulitis until proved otherwise
- * History-examination : tenderness , rigidity , high temperature , tachycardia , nausea , pain started at Left lower abdomen, history of chronic constipation and male patient
- The diagnosis is clinically and confirmed by C.T scan with Contrast water soluble

Pathology

- ① **Site** (any area of the colon may be involved):
 - * **The sigmoid colon** is the most common site affected
 - * **The rectum** is never affected.
- ② **Development:**
 - * In the early stages there is only muscular spasm and incoordination
 - * Next, the mucosa starts to bulge outwards through the circular muscular layer at the points of entry of blood vessels between the taenia at the anti-mesenteric border
 - * This is called **diverticulosis or non-complicated diverticular disease**



Note

- * **Most common cause** is chronic constipation due to long term lack of fibers in diet.
 - Which cause chronic constipation and increased intraluminal colonic pressure

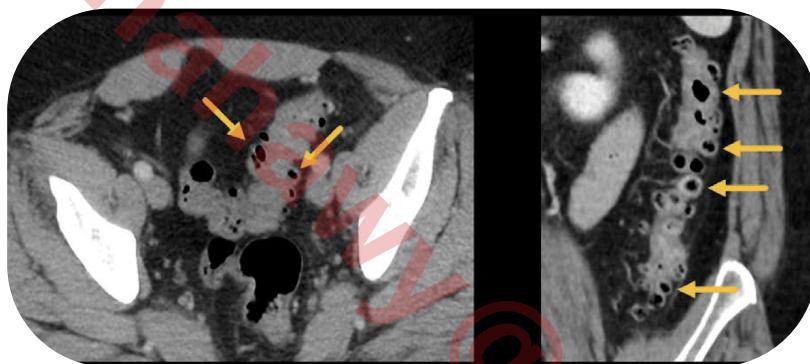
Notes

- * Less than 1/4 of pts present with LLQ pain.
- * 1/3 of pts present with pain to the lower half of the abdomen.
- * Elderly pts are at risk for a severe and often fatal complication of diverticulitis.
(Free perforation of the colon).

Investigations

- CT scan with Contrast water soluble (Test of choice for Acute Diverticulitis)

- * Can identify abscesses, other complications, and inform surgical management strategies.



- US

- * Ultrasound is **not a diagnostic tool** in diverticulitis.
(shows Amalgamation , mass surrounding the sigmoid , air foci around the sigmoid)
- * Relies on identification of an inflamed diverticulum to make the diagnosis which is often obscured in pts with complicated diverticulitis.

Note

- * **Colonoscopy is contraindicated in acute diverticulitis** due to high risk of perforation and complication.

Treatment

- ① **Non complicated diverticulitis** (no perforation or abscess or peritonitis) :
as **Ochsner sherren** (antibiotics , analgesia , IV fluid) , follow up.

If the patient condition has not improved:

② **Complicated diverticulitis**

- Usually local diverticular or peri diverticular abscess
- or perforation causing peritonitis. **Confirmed by CT :**
- show retro colic or paracolic localized single abscess:

Abscess is accessible

- Do percutaneous aspiration then resection + anastomosis after 3 month .

Abscess is inaccessible or ruptured caused peritonitis

- Exploration surgically (extension of incision downward)
then **peritoneal lavage** , aspiration and irrigation to clean
the peritoneal cavity.
- Then look for **sigmoid colon**: as repeated inflammation d.t diverticulitis
is worser than malignancy in adhesion to surrounding structure
(be adheres to small intestine, urinary bladder ,spleen & ureter)

Sigmoid diverticulitis is resectable:

- Resection with distal Hartman procedure,
and proximal end colostomy .

If the patient condition has improved:

- a) The patient discharged and takes broad spectrum **antibiotics**
oral covering gram (positive + negative + aerobic + anaerobic)
stool bulk forming (softening for stool)
- b) Reassessment after 6-12 weeks (1.5 to 3 months) ,
the assessment by **CT again + colonoscopy**.

Note

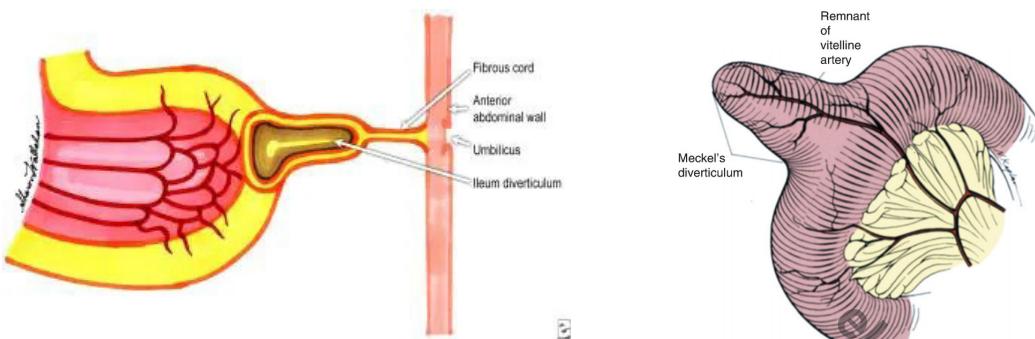
* We need colonoscopy to exclude synchronous malignant
colon lesion + assessment the extent of the resection
(can extend to all colon but the M.C is sigmoid)

- c) The patient candidate for colonic preparation then primary
resection + primary anastomosis or with the present
preparation of colonoscopy.

Sigmoid diverticulitis is Unresectable: (d.t severe adhesions surrounding the diverticulitis)

- (more aggressive than adhesions of malignancy) or attached to important structures :
- Do Drainage of the pus + proximal colostomy at Rt. Hepatic flexure (to divert stool away from
site of inflammation) and Wait 3-6 months till resolve the inflammatory process, then do either :
 - ① Resection + primary anastomosis and close colostomy at the same time (2 sessions)
 - ② Resection + primary anastomosis and on another session (3rd),
do closure of the colostomy (3 sessions) .

Meckel's Diverticulum



Introduction

- Persistent patent **proximal part of the vitello intestinal duct.**
- Separated blood supply → Vitelline artery is the end of SMA.

Clinical picture

- It present **R.T lower abdomen pain (D.D Acute appendicitis)**, we differentiate both:
 - * Meckel's diverticulitis pain is moving while the patient laying on Lt side from Rt iliac fossa to umbilical region (increase suspicion not diagnostic as long appendix & pelvic appendicitis cause the same)

Complications

① Intestinal obstruction (the commonest complication). It maybe due to:

- **Intussusception:** The ectopic mucosa at the base of the diverticulum acts as a foreign body and forms the apex of an ileo-ileal intussusception
- **Fibrous band:**
 - * Attach the diverticulum to the umbilicus → Pressure on an intestinal loop (Internal herniation)
 - * Allow rotation of the leum around its axis → volvulus.

② Peptic ulceration and bleeding (particularly in childhood)

- Caused by **the ectopic gastric mucosa,**
- The ulceration occurs in the intestinal mucosa adjacent to the base of the diverticulum

③ Acute diverticulitis

- Like acute appendicitis
- Gangrene and perforation may occur → peritonitis

④ Littre's hernia

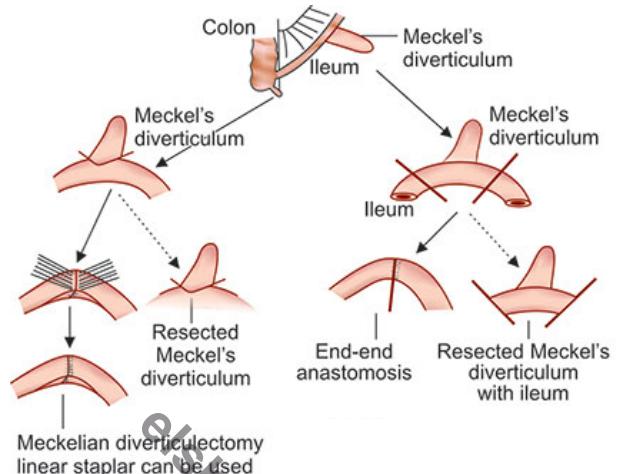
- Become content of an inguinal or a femoral hema

Note

* Bleeding 2ry to meckel's diverticulum is the commonest cause of lower GIT bleeding in children

Management

- In the past diverticulectomy without complete **incision , V-shape incision** in small intestine, however this may miss ulcer in the mesenteric wall (N.B: Meckel's-D present on **the antimesenteric side**) which may cause leakage or perforation,
- So **complete resection** with **primary anastomosis** & Histopathology



Note

- * Try **anastomosis not diversion** as it is **small intestine** (small intestine & ascending colon are primary anastomosis until prove other wise)
- * **Histopathology** to exclude adenocarcinoma or lymphoma of M.diverticulum.
- * **Accidentally discovered MD** while performing appendectomy for example, resection of non-complicated M.diverticulum indicated in:
 - ① If masses & nodules are felt(ectopic tissue , so liable to inflammation)
 - ② Narrow osteom(junction between the intestine of diverticulum) as it is liable to obstruction & inflammation
 - ③ Bleeding
 - ④ Young age (high life expectancy)

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