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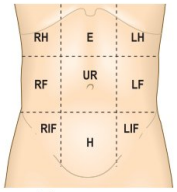

Fig. 6.1 Surface anatomy. A Abdominal surface markings of non-alimentary tract viscera. B Surface markings of the alimentary tract. C Regions of the abdomen. *E*, epigastrium; *H*, hypogastrium or suprapubic region; *LF*, left flank or lumbar region; *LH*, left hypochondrium; *LIF*, left iliac fossa; *RF*, right flank or lumbar region; *RH*, right hypochondrium; *RIF*, right iliac fossa; *UR*, umbilical region.

6.1 Surface markings of the main non-alimentary tract abdominal organs

Structure	Position
Liver	Upper border: fifth right intercostal space on full expiration Lower border: at the costal margin in the mid-clavicular line on full inspiration
Spleen	Underlies left ribs 9–11, posterior to the mid-axillary line
Gallbladder	At the intersection of the right lateral vertical plane and the costal margin, i.e. tip of the ninth costal cartilage
Pancreas	Neck of the pancreas lies at the level of L1; head lies below and right; tail lies above and left
Kidneys	Upper pole lies deep to the 12th rib posteriorly, 7 cm from the midline; the right is 2–3 cm lower than the left

6.2 Diagnosing abdominal pain

	Disorder			
	Peptic ulcer	Biliary colic	Acute pancreatitis	Renal colic
Site	Epigastrium	Epigastrium/right hypochondrium	Epigastrium/left hypochondrium	Loin
Onset	Gradual	Rapidly increasing	Sudden	Rapidly increasing
Character	Gnawing	Constant	Constant	~~Constant~~ Colicy
Radiation	Into back	Below right scapula	Into back	Into genitalia and inner thigh
Associated symptoms	Non-specific	Non-specific	Non-specific	Non-specific
Timing				
Frequency/periodicity	Remission for weeks/months	Attacks can be enumerated	Attacks can be enumerated	Usually a discrete episode
Special times	Nocturnal and especially when hungry	Unpredictable	After heavy drinking	Following periods of dehydration
Duration	½–2 hours	~~4–24 hours~~ <6h	>24 hours	4–24 hours
Exacerbating factors	Stress, spicy foods, alcohol, non-steroidal anti-inflammatory drugs	Eating – unable to eat during bouts	Alcohol Eating – unable to eat during bouts	–
Relieving factors	Food, antacids, vomiting	–	Sitting upright	–
Severity	Mild to moderate	Severe	Severe	Severe

** Peptic ulcers :

•• pain : gradual , gnawing , in the epigastrium , radiating to the back , especially Noturnal and with hungry
exacerbated by : stress , alcohol , spicy foods , NSAIDs
relived by : Food , antacids , vomiting

here we are talking about the duodenal one

• The most common cause of upper GI Bleeding and can manifest as Melaena , haematmesis or both
• peptic ulcers ~~really~~ Rarely cause painless vomiting unless they are complicated by pyloric stenosis
• reccurent > previous similar attacks
• can be familial > past family history is important
• acquired (environmental) >> such as transmission of H.pylori infection
• smoking is a risk factor — smoking increases the risk of (esophageal cancer , colorectal cancer , Crohn's disease and peptic ulcers) while it's a protective factor for ulcerative colitis
• waterbrash (salivation reflex) >> mostly with GERD, rarely with peptic ulcer

causes projectile vomiting that isn't bile stained
- projectile vomiting = either elevated ICP or GI obstruction (ex: PS)
- obstruction distal to the pylorus produces bile-stained vomit

complications:
• it can perforate >> sudden onset of severe abdominal pain rapidly progressing to become generalized and constant (acute abdomen) (this already indicates hollow viscus perforation) + vomiting at onset
• it can bleed >> leading to ~~hypertension~~ Hypotension and tachycardia following the onset of abdominal pain

** GERD :

•• pain : Retrosternal epigastric , sudden , radiates to the back sometimes to the arms , often at night time
exacerbated by laying a flat , bending forward , some food
relived by antacids , slightly by nitrates but not rest

• causes cough and waterbrash
• can cause esophageal ulceration or esophagitis >> odynophagia — may indicate oesophageal ulceration or oesophagitis from gastro-oesophageal reflux or oesophageal candidiasis. It implies intact mucosal sensation, making oesophageal cancer unlikely.
• can be caused by hiatus hernia

•obesity is a risk factor
• when heartburn is the principal symptom , GERD is the most likely diagnosis

** Acute pancreatitis :

•• pain : epigastrium and left hypochondrium , sudden , radiating to the back , for > 24h
exacerbated by : alcohol , eating (they don't eat during bouts = Anorexia) \ relieved by : sitting upright — sitting forward
• severe pain rapidly eased by potent analgesia is more typical of acute pancreatitis or peritonitis secondary to ruptured viscus

while ischemic vascular events are poorly relieved by opioids

••alcohol is a risk factor (common to occur after heavy drinking)

• commonly causes vomiting
• it's a rare cause of ascites (very high amylase content)
• it's a cause of secondary DM
• steatorrhea comes with chronic pancreatitis not the acute one

common in Celiac disease , chronic pancreatitis , and pancreatic insufficiency due to cystic fibrosis

• upon examination : there may be periumbilical or lion bruising (this comes with haemorrhagic pancreatitis)
+ with Aortic rupture and ruptured ectopic pregnancy

cullen — Grey turner

** Biliary colic :

colic is a misnomer

more than this > it's cholecystitis

•• pain : Epigastium \ right hypochondrium , radiating to below right scapula , (<6hours) constant , exacerbated by eating (unable to eat during bouts)

• can cause vomiting (here sever pain precipitate vomiting) → this occurs and renal or biliary colic or MI

• most common reason for the biliary colic is gallstones (biliary obstruction)

• biliary obstruction >> causes obstructive jaundice (remember that jaundice become clinically detectable when the bilirubin concentration rises above 3 mg\dL)

• obstructive jaundice triad : pale stool , dark urine and pruritis (due to skin deposition of bile salts)

••obstructive jaundice + abdominal pain >> gallstones (usually)

••obstructive jaundice +abdominal pain + fever = (Charcot's triad) >> ascending cholangitis

•• painless obstructive jaundice >> malignant obstruction cholangiocarcinoma or cancer of the head of the pancreas

pain after eating fatty meals >> gallbladder or pancreatic pathology

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** Renal Colic :

•• Pain : lion radiating to the groin and genitalia , it's a true colic , comes as discrete episodes mostly following periods of dehydration

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NOTE :

•• Visceral abdominal pain (distension of hollow organs, mesenteric traction or spasm) is deep and poorly localised in the midline , conducted via sympathetic splanchnic nerves

•• Somatic pain (from the parietal peritoneum and abdominal wall) is lateralised and localised to the inflamed area , conducted via spinal nerves.

•• sudden pain >> perforation : ruptured abdominal aortic aneurysm or mesenteric infarction

•• Volvulus >> sudden abdominal pain associated with acute intestinal obstruction

• abdominal pain for hours or days >> inflammation

•• Combination of abdominand and back pain may indicate ruptured or dissecting aortic aneurysm (remember also pancreatitis)

** Cholecystitis :

•• Pain : the right hypochondrium , radiating to the shoulder or interscapular region

• pain <6 hr it's biliary colic , if persisting for >6 hr this suggests cholecystitis

• vomiting is common , preceded by nausea

•• upon examination : +ve Murphy's sign increases the probability of Acute cholecystitis

•• Palpable distension of the gallbladder is rare and has a characteristic globular shape.
It results from either obstruction of the cystic duct, as in mucocoele or empyema of the gallbladder, or obstruction of the common bile duct with a patent cystic duct, as in pancreatic cancer.

•• In a jaundiced patient a palpable gallbladder is likely to be due to extrahepatic obstruction, such as from pancreatic cancer or, very rarely, gallstones (Courvoisier's sign).
In gallstone disease the gallbladder may be tender but impalpable because of fibrosis of the gallbladder wall.

Note : Pain exacerbated by movement or coughing suggests inflammation. Patients tend to lie still to avoid exacerbating the pain. People with colic typically move around or draw their knees up towards the chest during spasms.

6.3 Non-alimentary causes of abdominal pain

Disorder	Clinical features
Myocardial infarction	Epigastric pain without tenderness *Angor animi* (feeling of impending death) Hypotension Cardiac arrhythmias
Dissecting aortic aneurysm	Tearing interscapular pain *Angor animi* Hypotension Asymmetry of femoral pulses
Acute vertebral collapse	Lateralised pain restricting movement Tenderness overlying involved vertebra
Cord compression	Pain on percussion of thoracic spine Hyperaesthesia at affected dermatome with sensory loss below Spinal cord signs
Pleurisy	Lateralised pain on coughing Chest signs, e.g. pleural rub
Herpes zoster	Hyperaesthesia in dermatomal distribution Vesicular eruption
Diabetic ketoacidosis	Cramp-like pain Vomiting Air hunger Tachycardia Ketotic breath
Salpingitis or tubal pregnancy	Suprapubic and iliac fossa pain, localised tenderness Nausea, vomiting Fever
Torsion of testis/ovary	Lower abdominal pain Nausea, vomiting Localised tenderness

** Appendicitis :

•• Pain : center abdominal pain = periumbilical (visceral pain of a midgut structure) that later shifts into the right iliac fossa (somatic pain) when localized inflammation of the peritonium become established
• if the appendix rupture >> generalized peritonitis May develop

• Nausea, vomiting, fever,diarrhea
• Examination : tenderness, guarding or palpable mass in right iliac fossa, pelvic peritonitis on rectal examination
→ tenderness in the RtIF suggests appendicitis or Crohn's ileitis → if we said RtIF mass ?? >> add cecal cancer to the previous 2
• +ve Rovsing sign suggests Acute appendicitis (low sensitivity but high specificity)
• +ve iliopsoas sign >> Retroileal appendicitis, iliopsoas abscess, perinephric abscess
• Suspected appendicitis is an indication for rectal examination

---

** Peritonitis :

remember here : Acute pancreatitis
• Severe pain rapidly eased by potent analgesia may be peritonitis secondary to a ruptured viscus.
• Patients tend to lie still to avoid exacerbating the pain.
• Causes : ruptured appendix , perforated peptic ulcer , untreated strangulated hernia .... etc
• In peritonitis, the vomitus is usually small in volume but persistent
• Tuberculous peritonitis >> uncommon cause of ascites (low glucose content)

•••Examination :
• Tenderness in several areas on minimal pressure may be due to generalised peritonitis but is more often caused by anxiety.
• peritonitis >> causes Involuntary guarding (reflex contraction of the abdominal muscles)
• Generalized peritonitis >> The abdominal wall no longer moves with respiration , breathing becomes increasingly thoracic and the anterior abdominal wall muscles are held rigid (board-like rigidity).
• Absence of bowel sounds implies paralytic ileus or peritonitis.
• Rebound tenderness >> is a sign of intra-abdominal disease but not necessarily of parietal peritoneal inflammation (peritonism).

• suspected peritonitis is an indication for rectal examination
• rectal examination in women with lateralized tenderness suggests pelvic peritonitis

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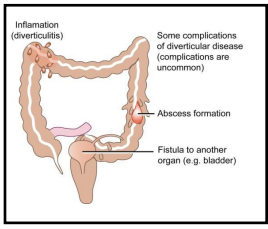
** Diverticular disease\diverticulosis and diverticulitis :

• diverticulosis >> outpouching from the colon
• once they are inflamed >> diverticulitis

• left iliac fossa pain \ tenderness\ mass
• abdominal pain + altered bowel bowel habits
→ Abdominal pain due to (irritable bowel syndrome, diverticular disease or colorectal cancer) is usually accompanied by altered bowel habit
• pain persisting for hours or days (inflammatory process)
• It's a common cause of rectal bleeding



• Complications :
✓ perforation >> causing sudden abdominal pain (peritonitis)
✓ diverticular abscess > fistula between the colon and urinary bladder > pneumaturia = bubbles of gas in urine
✓ Diverticular haemorrhage

•• left iliac mass DD >> sigmoid colon cancer \ constipation \ diverticular Mass

** Inflammatory Bowel Disease IBD : (Crohn's and ulcerative colitis)

- one of the GI causes of finger clubbing → other GI causes of clubbing : Coeliac disease , cirrhosis
- associated with mouth aphthous stomatitis \ ulcers → + Coeliac disease
- causes secretory diarrhea , and sometimes bloody diarrhea → other causes : Colonic ischemia , infective gastroenteritis
- stool mixed with pus → this also occurs with infective colitis
- Complications : colon-urinary bladder fistula >> pneumaturia

- IBD is one of the extra-articular signs of axial spondylitis

- family history is important (higher risk)

✓ Smoking increases the risk of developing Crohn's disease while people ulcerative colitis are less likely to be smokers
✓ tenderness in the right iliac fossa >> appendicitis or Crohn's ileitis
✓ Mass in the right iliac fossa >> appendix abscess , Crohn's disease , cecal cancer

Extra

Characteristics in Crohn's Disease and Ulcerative Colitis

	Crohn's disease	Ulcerative colitis
Age of onset	10 – 40 yr	10 – 30 yr
Location	Large intestine (distal ileum and colon)	Large or small intestine
	Involves ascending colon	Involves sigmoid and descending colon
Inflammation	Skip lesions	Uniform and continuous
Layers involved	Mainly submucosal	Mainly mucosal
Bloody stool	Rare	Common
Diarrhea	Common	Common
Malabsorption	Rate	Common
Abdominal pain	Mild to severe	Mild to severe

** Irritable Bowel Syndrome IBS :

•• Diagnosed by symptoms after ruling out all other possible bowel conditions (diagnosis of exclusion)

•• Abdominal pain, bloating, dyspepsia , altered bowel habit {diarrhea (Low-volume) or constipation}
•• exacerbated by stress and mental disorders in addition to certain food and drugs

✓ functional bloating (fluctuating abdominal distension that develops during the day and resolves over night, usually occurring in irritable bowel syndrome).

• Food intolerances: patients with irritable bowel syndrome often report specific food intolerances, including wheat, dairy products and others

• Normal gastrointestinal examination except for bloating or some tenderness that you may find

★Notes : change in bowel habits :

Matt black stool

✓ Constipation >> irritable bowel syndrome, colorectal cancer, hypothyroidism, hypercalcemia, drugs (opiates, iron) and immobility (Parkinson's disease, stroke)
✓ Obstipation >> intestinal obstruction
✓ Tenesmus >> rectal inflammation or tumour.

✓ secretory diarrhea >> intestinal inflammation, as in infections or inflammatory bowel disease
✓ Osmotic diarrhea >> malabsorption, drugs (as in laxative abuse) or motility disorders (autonomic neuropathy, particularly in diabetes).
✓ The most common cause of ACUTE diarrhoea is infective gastroenteritis due to norovirus, Salmonella species or Clostridium difficile.
✓ CHRONIC Infective diarrhoea (> 4 weeks) >> parasitic infections (Giardia lamblia ,amoebiasis or cryptosporidiosis).
✓ other causes of diarrhea >> colon cancerm in particular cancer of the right side of the colon , irritable bowel syndrome (low volume diarrhea)
✓ Painless diarrhea may indicate >> high alcohol intake, lactose intolerance or coeliac disease.

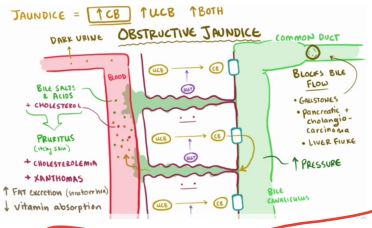
✓ Steatorrhoea >> coeliac disease, chronic pancreatitis and pancreatic insufficiency due to cystic fibrosis
✓ Bloody diarrhoea may be caused by >> inflammatory bowel disease, colonic ischaemia or infective gastroenteritis.

✓✓ Thyrotoxicosis is often accompanied by secretory diarrhoea or steatorrhoea and weight loss.

6.4 Typical clinical features in patients with an 'acute abdomen'

Condition	History	Examination
Acute appendicitis	Nausea, vomiting, central abdominal pain that later shifts to right iliac fossa	Fever, tenderness, guarding or palpable mass in right iliac fossa, pelvic peritonitis on rectal examination
Perforated peptic ulcer with acute peritonitis	Vomiting at onset associated with severe acute-onset abdominal pain, previous history of dyspepsia, ulcer disease, non-steroidal anti-inflammatory drugs or glucocorticoid therapy Note : Corticosteroids alone do not increase the risk for peptic ulcer disease; however, they can potentiate ulcer risk in patients who use NSAIDs concurrently.	Shallow breathing with minimal abdominal wall movement, abdominal tenderness and guarding, board-like rigidity, abdominal distension and absent bowel sounds → signs of peritonitis
Acute pancreatitis	Anorexia, nausea, vomiting, constant severe epigastric pain, previous alcohol abuse/cholelithiasis	Fever, periumbilical or loin bruising, epigastric tenderness, variable guarding, reduced or absent bowel sounds
Ruptured aortic aneurysm	Sudden onset of severe, tearing back/loin/abdominal pain, hypotension and past history of vascular disease and/or high blood pressure	Shock and hypotension, pulsatile, tender, abdominal mass, asymmetrical femoral pulses
Acute mesenteric ischaemia	Anorexia, nausea, vomiting, bloody diarrhoea, constant abdominal pain, previous history of vascular disease and/or high blood pressure	Atrial fibrillation, heart failure, asymmetrical peripheral pulses, absent bowel sounds, variable tenderness and guarding
Intestinal obstruction the 4 cardinal signs of ?	Colicky central abdominal pain, nausea, vomiting and constipation	Surgical scars, hernias, mass, distension, visible peristalsis, increased bowel sounds
Ruptured ectopic pregnancy there's haemorrhage	Premenopausal female, delayed or missed menstrual period, hypotension, unilateral iliac fossa pain, pleuritic shoulder-tip pain, 'prune juice'-like vaginal discharge	Suprapubic tenderness, periumbilical bruising, pain and tenderness on vaginal examination (cervical excitation), swelling/fullness in fornix on vaginal examination
Pelvic inflammatory disease Risk	Sexually active young female, previous history of sexually transmitted infection, recent gynaecological procedure, pregnancy or use of intrauterine contraceptive device, irregular menstruation, dyspareunia, lower or central abdominal pain, backache, pleuritic right upper quadrant pain (Fitz-Hugh–Curtis syndrome) Fitz-Hugh-Curtis syndrome is a rare disorder that happens when pelvic inflammatory disease causes swelling of the tissue around the liver. You may also hear it called "gonococcal perihepatitis" or "perihepatitis syndrome	Fever, vaginal discharge, pelvic peritonitis causing tenderness on rectal examination, right upper quadrant tenderness (perihepatitis), pain/tenderness on vaginal examination (cervical excitation), swelling/fullness in fornix on vaginal examination

** Jaundice :



6.7 Urine and stool analysis in jaundice

	Urine			Stools
	Colour	Bilirubin	Urobilinogen	Colour
Unconjugated (prehepatic or hemolytic)	Normal (UCB. will not be excreted in urine since it's not soluble)	–	++++	Normal
Hepatocellular (الخلية بتفقع و بتطلع كل اشي)	Dark (high levels of CB >> excreted in urine bcz it's soluble)	++	++	Normal
Obstructive	Dark	++++	– (CB doesn't reach the intestines)	Pale

6.6 Common causes of jaundice

Increased bilirubin production
- Haemolysis (unconjugated hyperbilirubinaemia)

Impaired bilirubin excretion
- Congenital:
  - Gilbert's syndrome (unconjugated) (Autosomal dominant; Low activity of UGT enzyme)
- Hepatocellular:
  - Viral hepatitis
  - Cirrhosis
  - Drugs
  - Autoimmune hepatitis
- obstructive
  - Intrahepatic cholestasis:
    - Drugs
    - Primary biliary cirrhosis
  - Extrahepatic cholestasis:
    - Gallstones
    - Cancer: pancreas, cholangiocarcinoma

Triad : pale stool , dark urine , pruritis

Note : Gilbert's syndrome is an autosomal dominant condition , haemochromatosis and Wilson's disease are autosomal recessive disorders.

** Primary biliary cirrhosis :

•• it's an autoimmune disease where you have antibodies attacking cells of the Biliary ducts
• since it's an autoimmune condition so it's associated with other autoimmune diseases such as thyroid diseases and autoimmune hepatitis
• Family history : Autoimmune diseases, particularly thyroid disease, are common in relatives of those with primary biliary cirrhosis and autoimmune hepatitis.

• it causes interhebatic cholestasis >> obstructive jaundice
• it causes Chronic parenchymal liver disease >> hepatomegaly

NOTE :
- Non-alcoholic fatty liver disease (NAFLD) is associated with diabetes and obesity
- A family history of diabetes is frequently seen in the context of NAFLD.

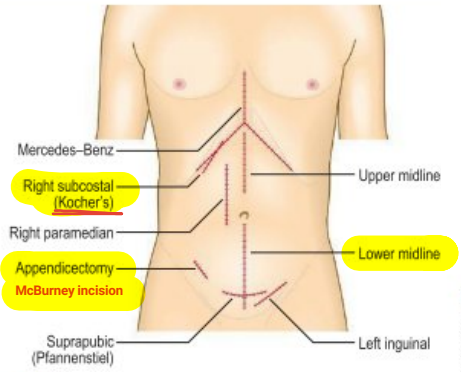
physical Examination : General

✓ **Skin redundancy** >> rapid weight loss
✓ **Striae** >> pregnancy, rapid weight gain , Cushing syndrome
✓ **Koilonychia** >> IDA
✓ **Onycholysis** >> hypoalbuminemia
✓ **Pallor of palmar creases** >> anemia
✓ **Palmar erythema** >> chronic liver disease but normal in pregnancy
✓ **Thenar & hypothenar muscle wasting** >> Low protein level in liver disease
✓ **Clubbing** >> Cirrhosis , IBD , celiac disease
✓ **Flapping tremor** >> liver failure
✓ **Spider navei** >> more than 5 on distribution of SVC = chronic liver disease
✓ **Sialadenitis and sialadenosis** >> bilateral and painless bulemia and chronic alcohol abuse
✓ **angular chelitis, angular stomatitis, atrophic glossitis** >> IDA
✓ **aphthous ulcer** >> IBD and Celiac disease
✓ **Beefy tongue** >> Vit.B12 and folate deficiency
✓ enlargement of left supraclavicular lymph node (troisier's sign) >> gastric \ pancreatic cancer
✓ **Gynecomastia , Breast atrophy** >> decreased estrogen breakdown
✓ **Abnormal hair distribution** >> chronic liver disease
✓ **Scratch marks** >> post hepatic jaundice (pruritis)

6.8 Examples of drug-induced gastrointestinal conditions

Symptom	Drug
Weight gain	Oral glucocorticoids
Dyspepsia and gastrointestinal bleeding	Aspirin Non-steroidal anti-inflammatory drugs
Nausea	Many drugs, including selective SRI serotonin reuptake inhibitor antidepressants
Diarrhoea (pseudomembranous colitis)	Antibiotics Proton pump inhibitors
Constipation	Opioids / iron
Jaundice: hepatitis	Paracetamol (overdose) Pyrazinamide → Tx of tuberculosis Rifampicin Isoniazid
Jaundice: cholestatic	Flucloxacillin → antibiotic Chlorpromazine → antipsychotics Co-amoxiclav (Amoxicillin / Clavulanic acid)
Liver fibrosis	Methotrexate

hepatotoxic drugs



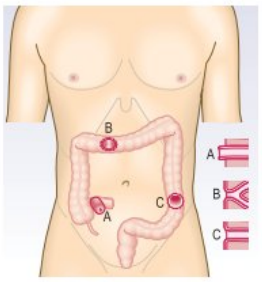


Fig. 6.11 Surgical stomas. A An ileostomy is usually in the right iliac fossa and is formed as a spout. B A loop colostomy is created to defunction the distal bowel temporarily. It is usually in the transverse colon and has afferent and efferent limbs. C A colostomy may be terminal: that is, resected distal bowel. It is usually flush and in the left iliac fossa.

** Liver disease :

• Palmar erythema & spider naevi (isolated telangiectasias) >> caused by excess oestrogen associated with reduced hepatic breakdown of sex steroids.
>> Spider naevi are found in the distribution of the superior vena cava (upper trunk, arms and face). Women may have up to five spider naevi in health
>> palmar erythema and numerous spider naevi are normal during pregnancy.
>> In men, these signs suggest chronic liver disease.

• Gynaecomastia with loss of body hair and testicular atrophy >> reduced breakdown of oestrogens.
• Leuconychia >> hypoalbuminaemia
• Finger clubbing >> Liver cirrhosis, IBD , malabsorption syndromes.
• Dupuytren's contracture >> alcohol-related chronic liver disease
• bilateral parotid swelling >> chronic alcohol abuse.
• asterixis >> hepatic encephalopathy
• fetor hepaticus (odour of dimethyl sulphide) on the breath >> portosystemic shunting (with or without encephalopathy)
• altered mental state
• Caput Medusa >> Portal HTN
• jaundice
• ascites
• late neurological features

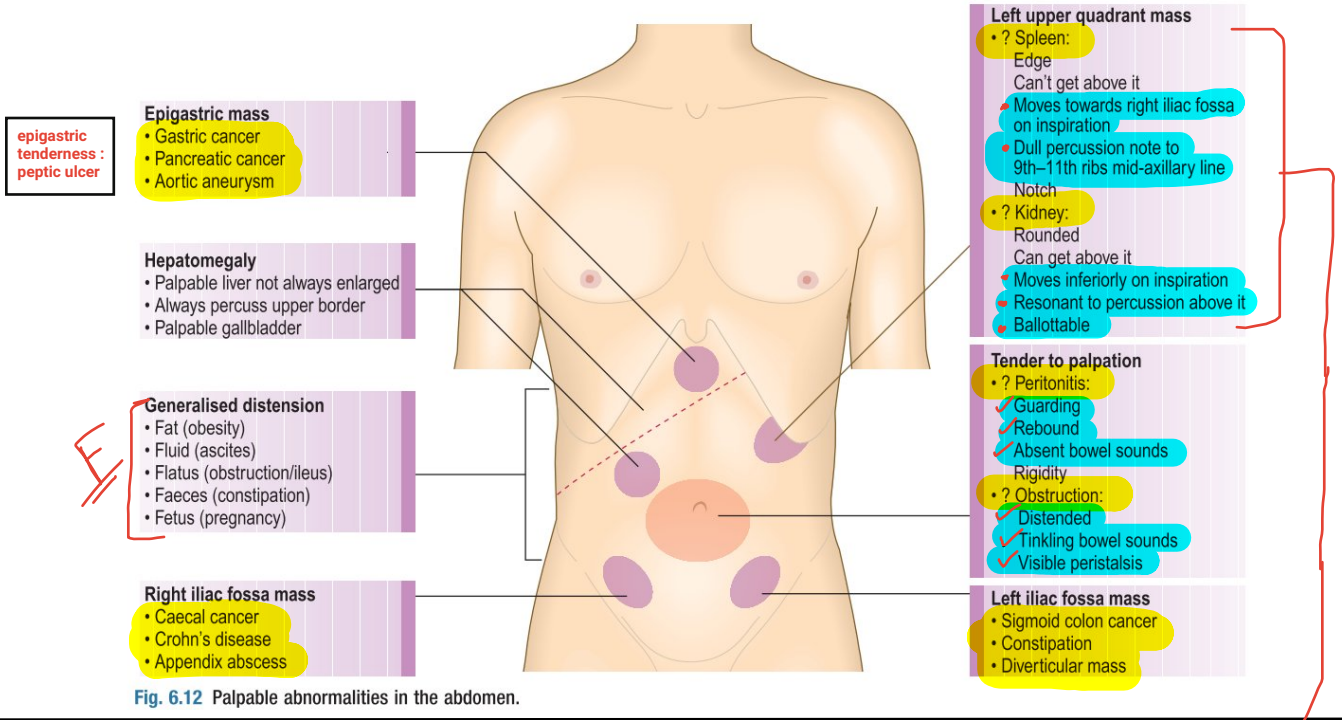


Fig. 6.12 Palpable abnormalities in the abdomen.

✓ In right heart failure the congested liver is usually soft and tender

✓ a pulsatile liver indicates tricuspid regurgitation.

✓ A bruit over the liver may be heard in acute alcoholic hepatitis, hepatocellular cancer and arteriovenous malformation.

✓ Most common reason for an audible bruit over the liver is a transmitted heart murmur.

6.10 Causes of hepatomegaly

Chronic parenchymal liver disease
- Alcoholic liver disease
- Hepatic steatosis
- Autoimmune hepatitis
- Viral hepatitis
- Primary biliary cirrhosis

Malignancy
- Primary hepatocellular cancer
- Secondary metastatic cancer

Right heart failure

Haematological disorders
- Lymphoma
- Leukaemia
- Myelofibrosis
- Polycythaemia

Rarities → Rare
- Amyloidosis
- Budd–Chiari syndrome
- Sarcoidosis
- Glycogen storage disorders

6.12 Differentiating a palpable spleen from the left kidney

Distinguishing feature	Spleen	Kidney
Mass is smooth and regular in shape	More likely	Polycystic kidneys are bilateral irregular masses
Mass descends in inspiration	Yes, travels superficially and diagonally (↓ toward RtIF)	Yes, moves deeply and vertically
Ability to feel deep to the mass	Yes	No
Palpable notch on the medial surface	Yes	No
Bilateral masses palpable	No	Sometimes, e.g. polycystic kidneys
Percussion resonant over the mass	No	Sometimes
Mass extends beyond the midline	Sometimes (diagonally ↓)	No (except with horseshoe kidney)

✓✓ Normally on percussion >> Dullness below the 5th intercostal space ,,, If resonant >> suggests hyperinflated lungs or occasionally the interposition of the transverse colon between the liver and the diaphragm (Chilaiditi's sign).

6.11 Grading of hepatic encephalopathy (West Haven)

Stage	State of consciousness
0	No change in personality or behaviour No asterixis (flapping tremor)
1	Impaired concentration and attention span Sleep disturbance, slurred speech Euphoria or depression Asterixis present
2	Lethargy, drowsiness, apathy or aggression Disorientation, inappropriate behaviour, slurred speech
3	Confusion and disorientation, bizarre behaviour Drowsiness or stupor Asterixis usually absent
4	Comatose with no response to voice commands Minimal or absent response to painful stimuli

Important causes of hepatosplenomegaly include : lymphoma or myeloproliferative disorders, cirrhosis with portal hypertension, amyloidosis, sarcoidosis and glycogen storage disease.

6.13 Causes of splenomegaly

Massive splenomegaly in the developed world is usually due to

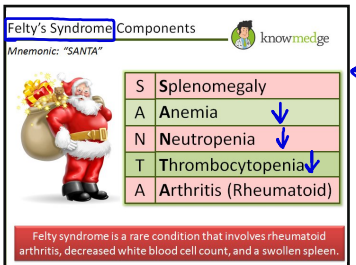
Haematological disorders
- Lymphoma and lymphatic leukaemias
- Myeloproliferative diseases, polycythaemia rubra vera and myelofibrosis
- Haemolytic anaemia, congenital spherocytosis

Portal hypertension

Infections
- Glandular fever
- Malaria, kala-azar (leishmaniasis)
- Bacterial endocarditis
- Brucellosis, tuberculosis, salmonellosis

Rheumatological conditions
- Rheumatoid arthritis (Felty's syndrome)
- Systemic lupus erythematosus

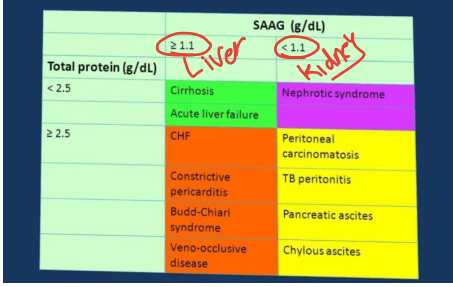
Rarities
- Sarcoidosis
- Amyloidosis
- Glycogen storage disorders



6.14 Causes of ascites

Diagnosis	Comment
Common	
Hepatic cirrhosis with portal hypertension	Transudate
Intra-abdominal malignancy with peritoneal spread	Exudate, cytology may be positive
Uncommon	
Hepatic vein occlusion (Budd–Chiari syndrome)	Transudate in acute phase
Constrictive pericarditis and right heart failure	Check jugular venous pressure and listen for pericardial rub
Hypoproteinaemia (nephrotic syndrome, protein-losing enteropathy)	Transudate
Tuberculous peritonitis	Low glucose content
Pancreatitis, pancreatic duct disruption	Very high amylase content

Serum-ascites albumin gradient (SAAG)



SAAG = (albumin concentration of serum) – (albumin concentration of ascitic fluid)