Peritonitis

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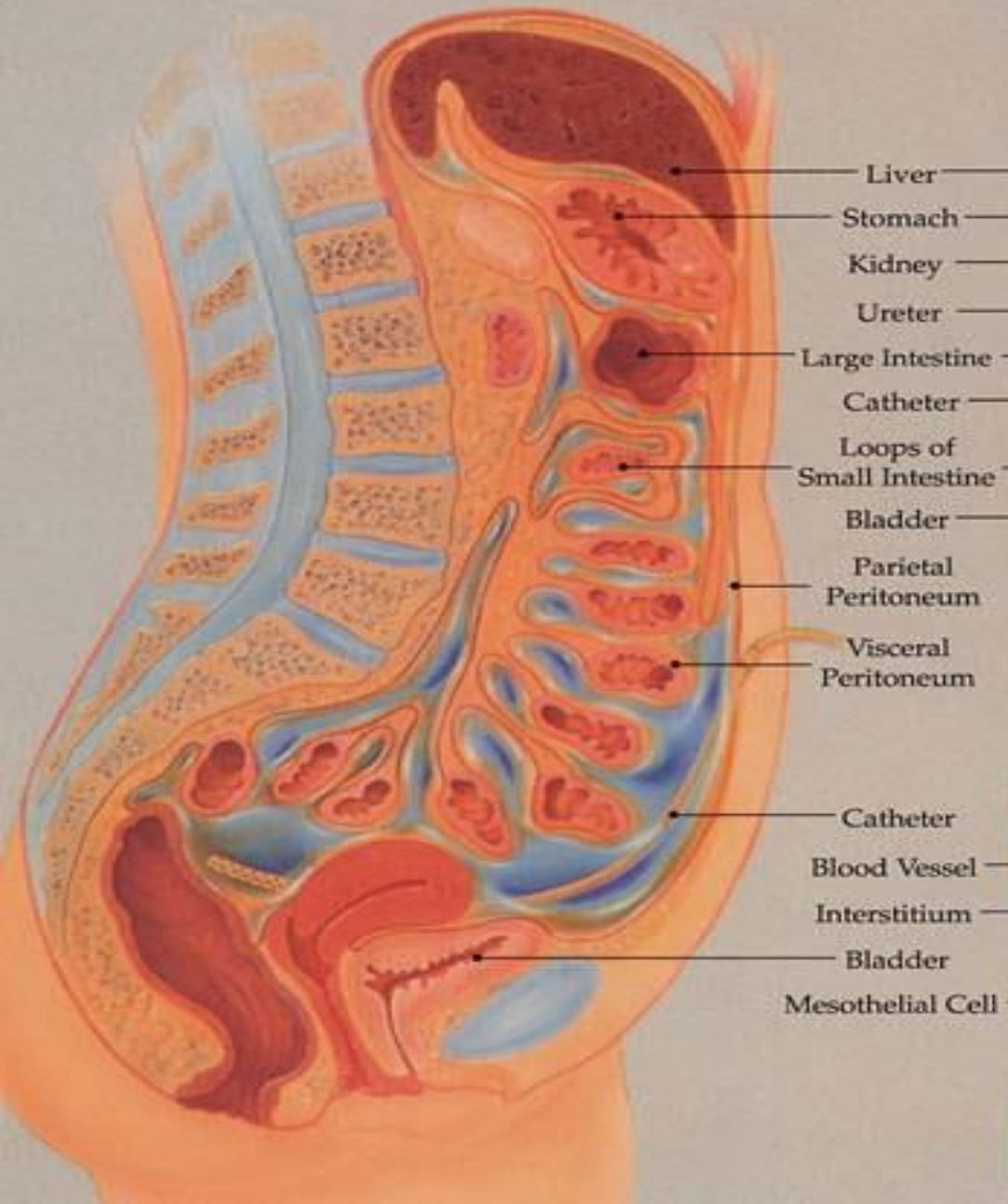
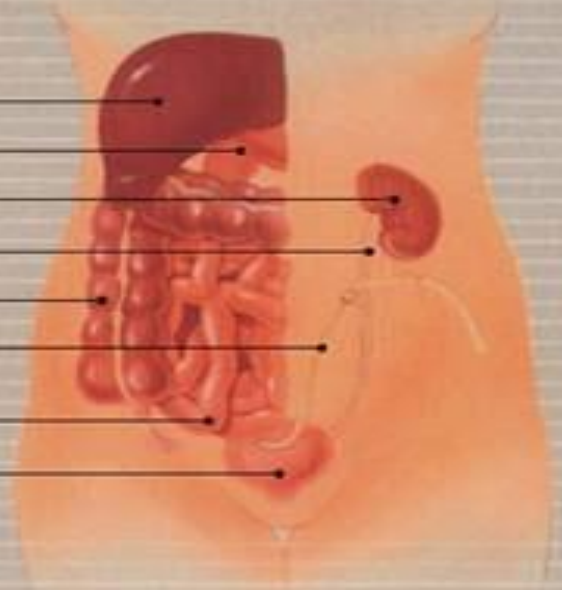
- **The peritoneum** is conveniently divided into two parts – the visceral surrounding the viscera, the parietal lining the rest of the cavity. The parietal portion is richly supplied with nerves and, when irritated, cause severe pain accurately localized to the affected area. The visceral peritoneum, on the other hand, is poorly supplied with nerves and pain arising threrefrom is vague and poorly localized .

parietal :- Rich Nerve and Blood supply → sharp localized pain
visceral :- Poor Nerve and Blood supply → Dull poorly localized

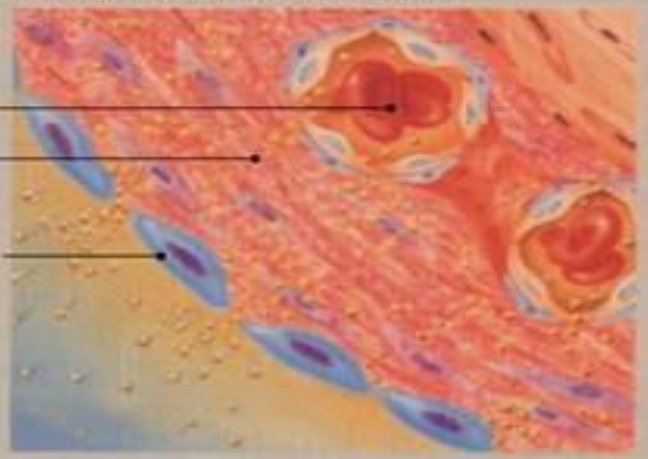
Dialysate-Filled Peritoneal Cavity.



Major Peritoneal Structures and Catheter Location.



Diffusion Across the Peritoneal Membrane



Bacteriology

- Bacteria from *the Alimentary Canal*. – Usually the infections is caused by two or more strains. The commonest invaders are *Escherichia coli*, aerobic and anaerobic streptococci, and the bacteroides. Less frequently the clostridium *welchii* is found; still less frequently staphylococci or *Klebsiella pneumonia* (Friedlander's bacillus) , and so on. Many of strains of Ech. *coil* , bacteroides , and Cl. welchii produce toxins which cause illness or death when they invade a large absorptive area (endotoxin shock) .

The Bacteroides

- These Gram-negative, non-sporing organisms though predominnat in the lower intestine often escape detection.

- These organisms are resistant to penicillin and streptomycin but sensitive metronidazole, clindamycin and lincomycin .

Gram -ve non spore forming live in lower intestine are Resistant to penicillin

Tx:- Metronidazole, clindamycin, lincomycin

Paths of bacterial invasion

- **Direct infection :**

- Via perforation of some part of the gastro-intestinal canal .
- Through a penetrating wound of the abdominal wall.
- Post – operative .

- **Local extension :**

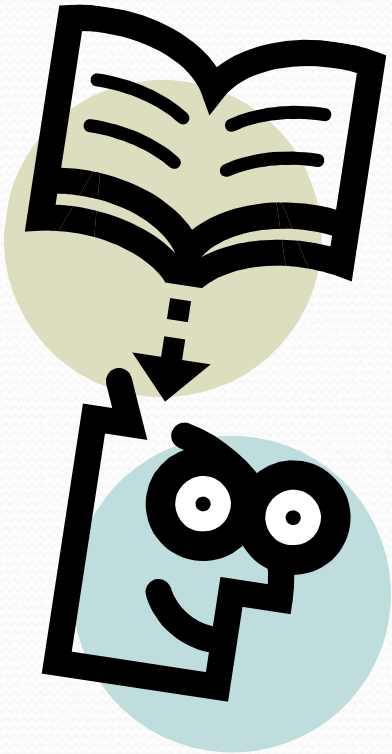
- From an inflamed organ, e.g. appendicitis, cholecystitis .

- Migration through gut well , e.g. strangulated hernia.
- From or via the Fallopian tubes

- **Blood-stream :**

- Part of general septicaemia .

Bacteremia :- presence of Bacteria without multiplication
septecemia :- symptoms + multiplication



Factors which favour Localisation of Peritonitis

- Anatomical
- Pathological

Factors which tend to cause diffusion of Peritonitis

(a) A prime factor is the spread of peritonitis is whether it develops rapidly or slowly. If an inflamed appendix or other hollow viscus perforates before localization has taken place, there is a gush of intestinal contents into the peritoneal cavity which spreads over a large area almost instantaneously.

(b) The ingestion of food , or even water, by stimulating peristaltic action, hinders localization. Violent peristalsis occasioned by the administration of a purgative or an enema , causes a widespread distribution of an infection that would otherwise have remained localized.

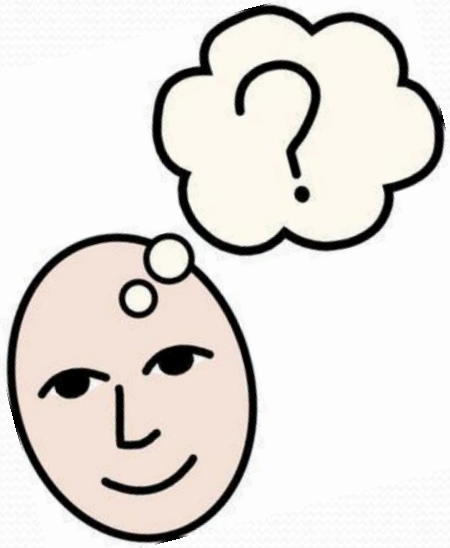
(c) When the virulence of the infecting organism is so great as to render the localization of the infection difficult or impossible.

(***d***) In children the omentum is small .

Causes of Peritonitis

- **Acute :**

Bacterial :



- **primary (*rare*) :**

- Streptococci, pneumococci.
- Haematogenous spread .
- Occurs in young girl, ascites, nephrotic syndrome and postsplenectomy

- **Secondary (common) :**

- Related to perforation, infection , inflammation or ischaemia of Gl or GU tract .

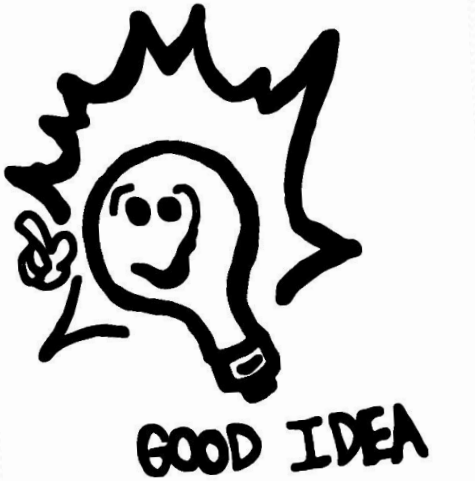
Chemical :

- Gastric juice (e.g. perforated gastric ulcer)
- Pancreatic juice (e.g. acute pancreatitis)
- Bile (e.g. perforation of the gall bladder)
- Blood (e.g. ruptured spleen)
- Urine (e.g. intraperitoneal rupture of the bladder)

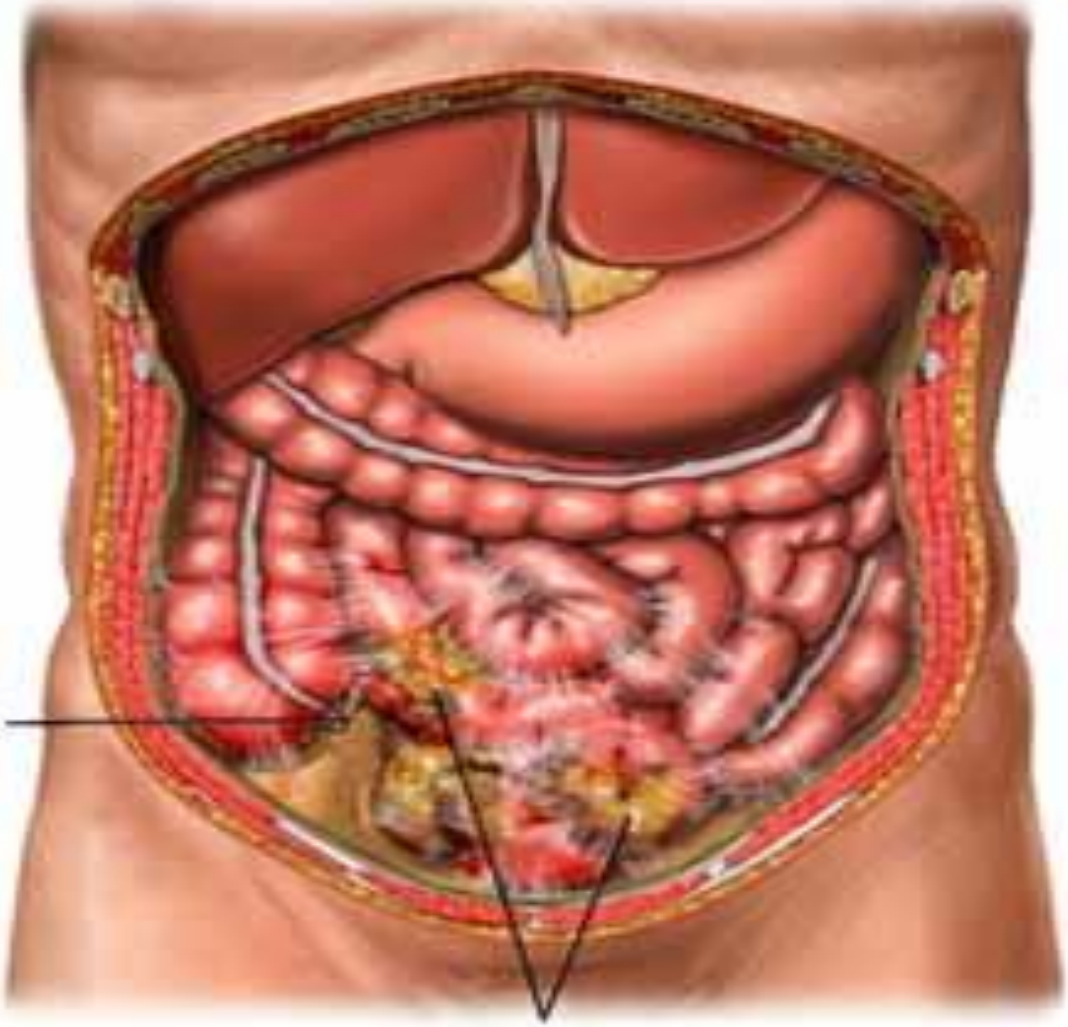
- **Chronic :**

- Tuberculosis

- Strach (immunological reaction) .



most common cause of Acute Abdomen is Appendicitis



Recurrence of abscesses, acute peritonitis, necrosis of intestinal fat, interstitial hemorrhages within the bowel and widespread adhesions

Clinical Features

1. Onest – Pain, which is 'sore' , 'cutting' or 'burning' , is made worse by moving or breathing.

Tenderness, guarding, and rigidity on palpation are typically found when the peritonitis affects the anterior abdominal wall.

Patients with pelvic peritonitis may complain of urinary symptoms; they are tender on rectal or vaginal examination. Bowel sounds may still be heard for a few hours but gradually cease with the onset of paralytic ileus.

2. ***Intermediate*** – peritonitis may resolve , so that the pulse slows, the pain and tenderness diminish, leaving a silent, soft, abdomen. The condition may localise, producing one or more abscesses, with overlying swelling and tenderness.

3. ***Terminal*** – circulatory failure ensues, with cold, clammy extremities, sunken eyes, dry tongue, drawn and anxious face .

(presentation of p.t)

1) Acute peritonitis symptome :- cutting pain, worsen with Respiration and movement
Anterior Abdomin → Tenderness, gurding, Rigidity on Abdomin
pelvic peritonitis → urinary symptome + Rectal or vaginal Exam tenderness
firstly Bowel sound present Then gradully ceases Due to paralytic illius

2) intermediate :- Resolve of peritonitis, so All symptome of peritonitis Begain to Diminsh (Become soft, silent Abdomen)
so why p.t come to Hospital (ما عنده اعراض peritonitis)?? He come BCZ of some swelling and tendernes Due to complication of peritonitis (Abcess formation)

3) terminal :- p.t come Due to circulatory failure (cold, sunken eye, Dry mouth, anxious face) (shock) complication

Diagnostic aids :

plain film Abdomen

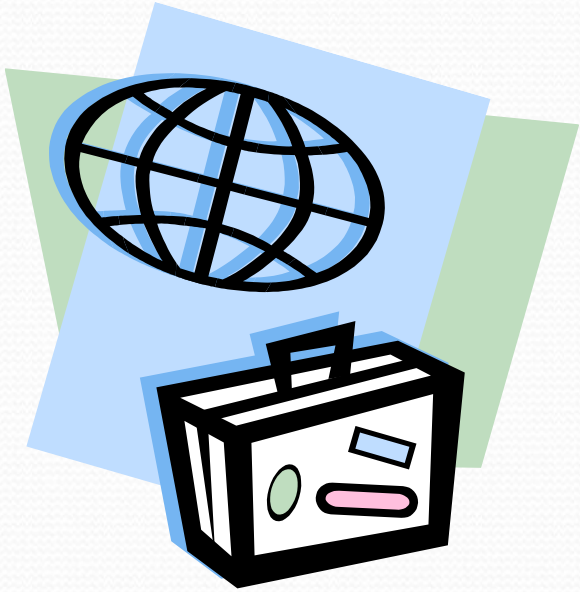
- ***An x-ray film of the abdomen*** may reveal free air, or confirm the presence of dilated gas-filled loops of bowel with multiple fluid levels.

- ***Serum amylase estimation.***

normal until 130
pathogical :- 1000-1500 (pertonitis)

- ***ULSS.***

- ***Aspiration eytology .***



most common cause of Ascitis is Heart failure

Treatment

1. ***Intravenous Fluids***

2. ***A nasogastric tube***

3. ***Antibiotics***

4. ***Surgical correction of the underlying cause*** must not be delayed in appropriate cases, once the patient is fit for operation

Ancillary care :

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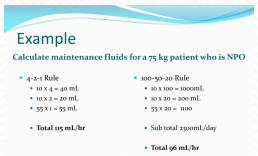
5. ***A fluid balance chart*** must be started at once so that daily output by gastric aspiration and urine are known, losses from the lungs, skin, and in faces are estimated, so that the intake requirements can be calculated and seen to have been administered .



6. ***Intravenous fluids*** are continued after operation until the patient can be fully maintained by oral feeding.

7. ***The patient***, nursed in the sitting-up position, must be relived of pain before and after operation. Morphine may be given, and small doses continued for 48 hours.

Table 25–1

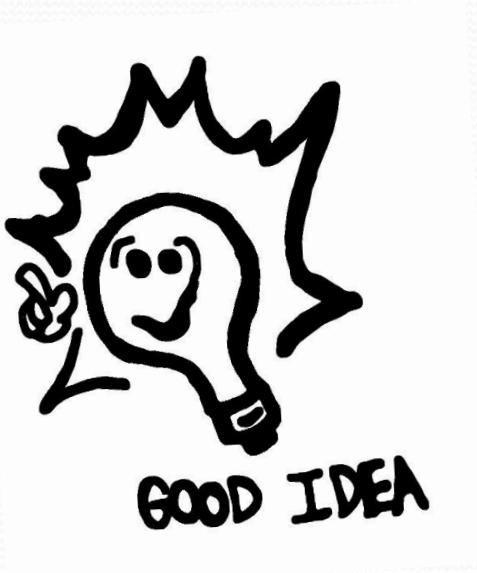
Daily Intake and Output of Water (ml/day)

	Normal	Prolonged, Heavy Exercise
Intake		
Fluids ingested	2100	?
From metabolism	200	200
Total intake	2300	?
Output		
Insensible—skin	350	350
Insensible—lungs	350	650
Sweat	100	5000
Feces	100	100
Urine	1400	500
Total output	2300	6600

Prognosis :

- **With modern treatment diffuse peritonitis carries a mortality of about 10%. The lethal factors are:**

(a) Bacterial toxaemia
(b) Paralytic ileus
(c) Bronchopneumonia
(d) Electrolyte-imbalance.



Investigations

♦ Hb ♦ PCV ♦ WCC ♦ U&Es: dehydration, ARF ♦ LFTs ♦ Amylase ♦ CXR: gas under diaphragm, small pleural effusion ♦ AXR: distended bowel (ileus), local ileus ('sentinel loop' – appendicitis, pancreatitis)

Complications

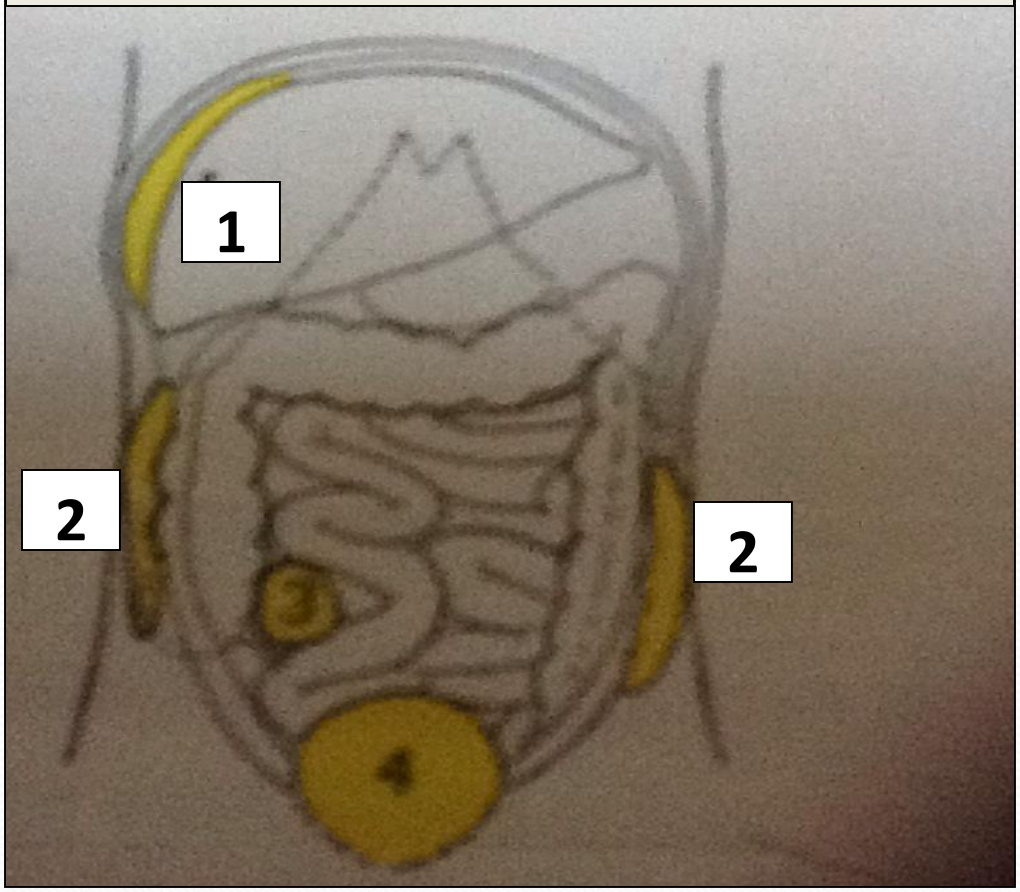
- ***Systemic*** - Hypovolaemic shock, septic shock, ARD, DIC, multiorgan failure, immunological failure.

- ***Local*** - Intraperitoneal sepsis: residual abscesses, e.g subphrenic or pelvic, wound infection, anastomotic breakdown, fistula formation, adhesions.

Common situations for residual abscesses

1. Subphrenic
2. Paracolic
3. Appendix
4. Pelvic (commonest)

Picture



Pelvic Abscess

- The pelvis is the commonest site of an intraperitoneal abscess , because the vermiform appendix is often pelvic in position and also the Fallopian tubes are frequent foci of infection.
- The most characteristic symptoms of pelvic abscess are diarrhoea and the passage of mucus in stools.
- Rectal examination reveals a bulging of the anterior rectal wall which, when the abscess is ripe, becomes softly cystic

Subphrenic Abscess

- ***Anatomy*** – The complicated arrangement of the peritoneum results in the formation of four intraperitoneal and three extraperitoneal spaces in which pus may collect.

- ***Left Anterior intraperitoneal*** – The common cause of an abscess here is following operations on the stomach, the tail of the pancreas, the spleen or the splenic flexure of the colon or in diverticulitis.

- ***Left Posterior intraperitoneal*** – The commonest type of suppuration here is the pancreatic pseudo-cyst.

- ***Right Anterior intraperitoneal*** – Common causes here are perforating cholecystitis, a perforated duodenal ulcer and appendicitis .

- ***Left Posterior intraperitoneal*** – Rutherford Morison's kidney pouch. The space is bounded above by the liver, and below by the transverse colon and hepatic flexure. It is the deepest space of the four and the commonest site of a subphrenic abscess which usually arises from appendicitis , cholecystitis , a perforated duodenal ulcer .

- ***Extraperitoneal*** - There are three of these:

- ***Right and Left*** extraperitoneal which are terms given to perinephric abscess .
- ***Midline extraperitoneal*** which may develop an abscess in amoebic hepatitis (the commonest cause) or it may be a pyogenic liver abscess.

Accessory Investigations

(i) ***Blood Count*** – A relative and absolute leucocytosis the rule

(ii) X-ray – A plain radiograph sometimes demonstrates the presence of gas or a pleural effusion.

(iii) Ultra-sound and scanning have provide contributory.

Post-operative Peritonitis

Bile- Peritonitis

- **The common causes the bile peritonitis are :**

(I) Following biliary surgery-damage to the common bile duct, slipping of a ligature on the cystic duct, leakage from a divided accessory bile duct in the gallbladder bed or dislodgment of a T- tube drain in the early post-operative phase.

(II) Following perforation or gangrene of the gallbladder or leakage from a choledochus cyst.

(III) And following gastro-duodenal surgery.

Pneimococcal Peritonitis

1. **Primary**

2. **Secondary to Pneumonia**

Ascites

- **Ascites**, an excess of serous fluid within the peritoneal cavity, can be recognized clinically only when the amount of fluid present exceeds 1500 ml .

Types of Ascites

- **Type 1 .** Due to Congestive Heart Faliure – This, the commonest of the ascites, is due to chronic venous stasis in the thoracic segment of the inferior vena cava.
- **Type 2 .** Due to Hepatic or Biliary Cirrhosis
- **Type 3 .** Due to Tuberculous Peritonitis .
- **Type 4 .** Secondary Carcinoma of the peritoneum

- **Type 5 .** Chronic Constrictive Pericarditis (***syn. Pick's Disease***)

- **Type 6 .** Due to depletion of the blood protein consequent upon albuminuria or starvation.

- **Type 7 .** Meigs' Syndrome

↳ Ovarian CA + pleural Effusion

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Criteria for analyzing ascitic fluid	Ascites due to portal hypertension (SAAG ≥ 1.1 g/dL) (Previously referred to as transudate)	Ascites due to other causes (SAAG < 1.1 g/dL) (Previously referred to as exudate)
color	Clear, sometimes opalescent	•Cloudy •Bloody •Milky •Dark brown
Cell count and differentiation	• ↓ Cell count	• ↑ Cell count •Neutrophil count > 250/μL
Protein concentration	↕ Protein levels (> 2.5 g/dL) o Right heart failure • ↓ Protein levels (< 2.5 g/dL) o Hepatic cirrhosis	• ↑ Protein levels (> 2.5 g/dL) o Hepatic malignancy o Peritoneal carcinomatosis o Pancreatitis o Chylous ascites o Tuberculosis • ↓ Protein levels (< 2.5 g/dL) o Nephrotic syndrome

• ↓ serum protein Bellow 2.5 → liver Disease / kidney Disease

Note:- ① liver is site for protine syn ② Kidney is site for protine excretion → so Any Defect on them leads to ↓ in protine

Thank you

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