Acute Generalized Septic Peritonitis

* **Incidence :** A common serious surgical emergency .
* **Aetiology :**

I) **Secondary peritonitis :** the commonest and it is due to detectable cause.

A) Predisposing factor & route of infection :

a) Local spread of infection:

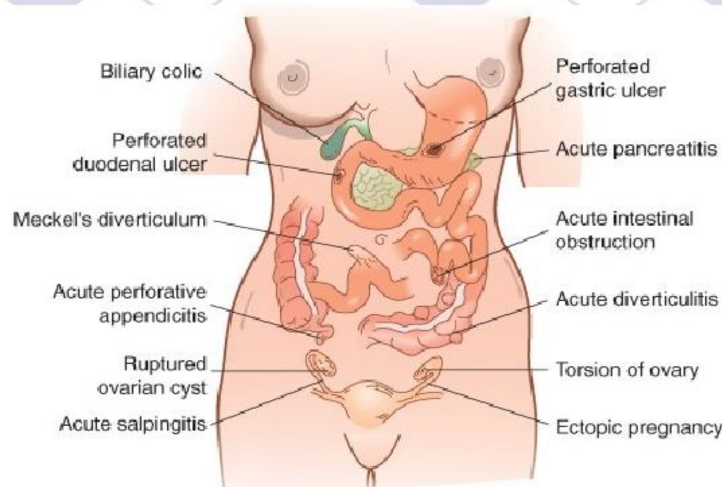
- **Infected organ** : e.g. appendicitis (commonest cause) , cholecystitis ,diverticulistis or salpengitis .
- **Leaking organ**: e.g. perforated PU , perforated diverticulitis , leaking anastomosis , extravasation of urine…..etc
- **Acute intedtinal obstruction** e.g. strangulated hernia and acute mesenteric vascular occlusion .

b) **Direct introduction of infection** e.g. operation or traumatic penetrating wound .

c) **Blood spread** in any bacteraemia , septicaemia or pyaemia .

B) **Organism :** E.coli , staph. , strept. ,bacteroid & pneumococci .

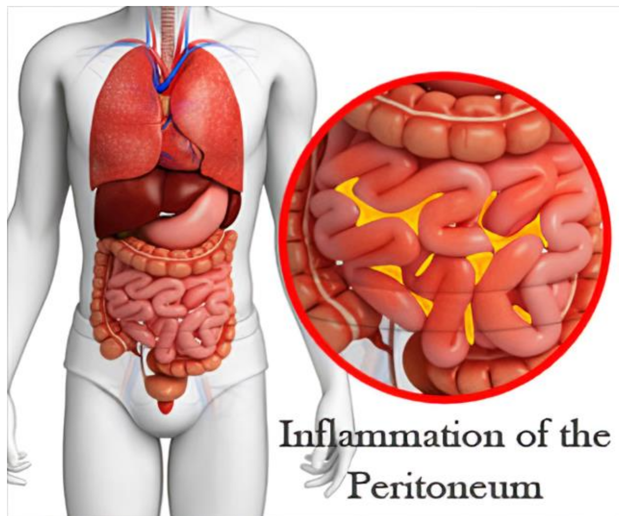
II) **Primary peritonitis :** rare , without detectable cause , usually in **female child** , it may be ascending infection along uterine tube .It may occur due to infected ascites or peritoneal dialysis .

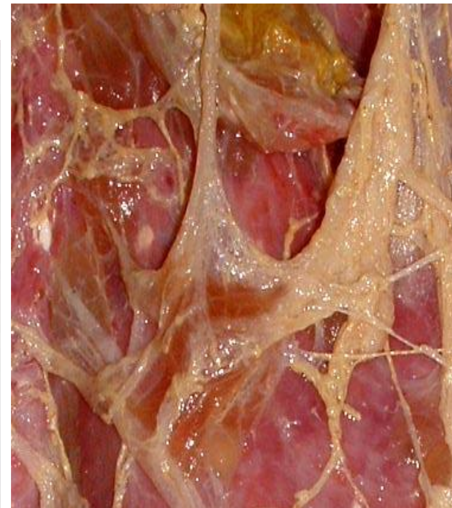


⁕ **Pathology :**

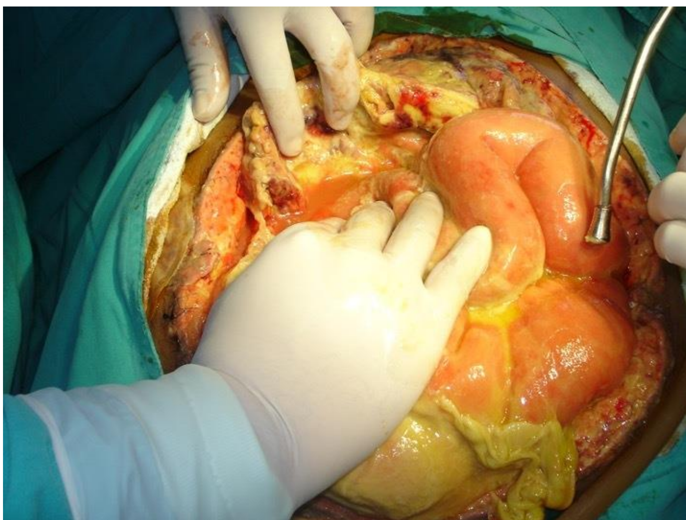
- The peritoneum becomes **opaque with loss of lustre** .
- The peritoneum contains **purulent exudates** .
- Early **fibrinous adhesions** which later on becomes **fibrous adhesions** are formed .
- Local toxins in the peritoneum → **paralytic ileus .**
- **Fate :**
  1) **Resolution :** if the source of infection is removed and the peritoneum is drained .
  2) **Localization and abscess formation :**
     A) **Around the primary septic focus** (e.g. appendicular abscess) due to:
        - Adhesions of intestine & greater omentum around the inflamed organ .
        - Reflex inhibition of intestinal movements
        - Reflex inhibition of movements of the anterior abdominal wall with respiration (rigidity)

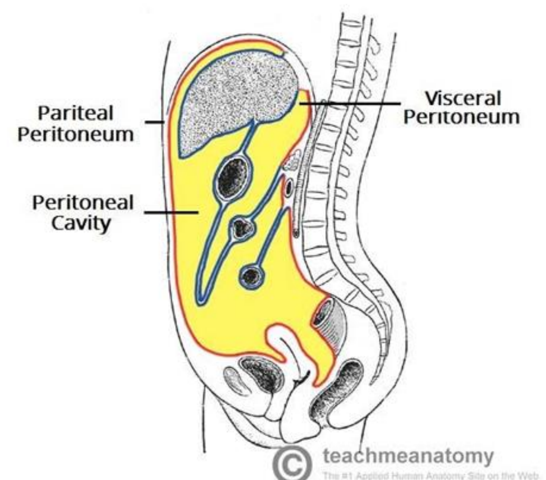
     B) In one of **peritoneal compartments** e.g. subphrenic abscess , iliac or pelvic abscess .
  3) **Flaring up** due to persistent source of infection , sudden perforation , virulent organism , immune suppression e.g. DM or AIDS or children(omentum is small & not well developed)
- **Stages of peritonitis :**
  1) **Initial reactive** stage (first 24 hours)
  2) **Toxic** stage (24-72 hours)
  3) **Terminal** stage (after 72 hours)





Fibrinous adhesions





* **Complications :**

  I)General :

  1- Fluid and electrolyte imbalance due repeated vomiting .
  2- Respiratory complications .
  3- Hypovolaemic followed by septic shock→multiple organ failure

  II) Local : Intestinal obstruction early due to paralytic ileus and later on if the patient survive due to adhesive I.O .

* Clinical picture :

I)Symptoms :

a) Early:

1- Symptoms of the **cause** (e.g. appendicitis) with pain localized to the site of affected organ .

2- Anorexia , nausea and vomiting **once or twice** (reflex)

b) Established peritonitis :

1- **Pain :** becomes more severe , persistent , dull aching , **spreading all over the abdomen** , increased by movements and cough and maximum in the site of the original disease .

2- **Paralytic ileus** : **Persistent effortless vomiting** , generalized abdominal distension and absolute constipation .

II) Signs :

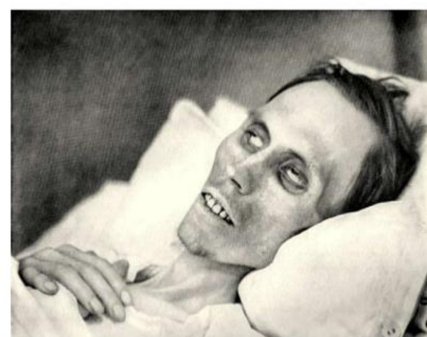
1- Increase severe **toxaemia** with **high fever** , tachycardia and other manifestations of hypovolaemic and septic **shock**.

2- The patient lies **flat in bed** avoiding any movements .

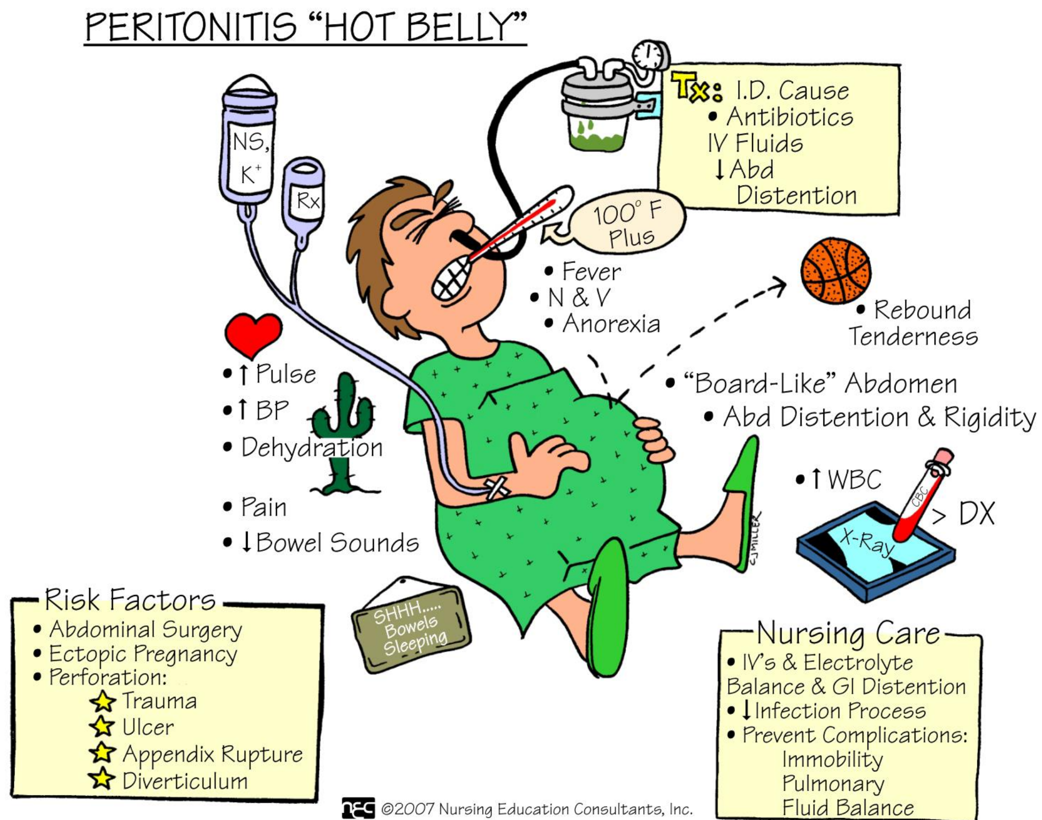
3- **Tenderness** , rebound tenderness , rigidity and limitation of movement of anterior abdominal wall with respiration , maximum & first in the site of the original disease then become **generalized all over the abdomen**.

4- **Auscultation** show dead silent abdomen due to paralytic ileus .

facies Hippocratic



5- In **neglected terminal** cases the patient has sunken eye , temples collapsed, nose is pinched with crusts on the lips, and the forehead is clammy(**Hippocratic face**).



* **Investigations :**(as intestinal obstruction)

1- **Blood picture** :Leucocytosis with shift to the left are always present

2- Blood **chemistry** show acidosis , electrolyte imbalance .

3- **Plain x-ray** : may show the cause as air under the diaphragm in perforated hollow viscus and gas with multiple fluid level in paralytic ileus .

4- **Abdominal U/S & CT** reveals fluid in the peritoneal cavity and to guide **peritoneal aspiration** for analysis and culture and sensitivity .

5- **Diagnostic laparoscopy**

- **Treatment : Emergency** operation after rapid (not more than 2 hours)pre-operative preparation .

  a) **Pre-operative preparation** :(**suck and drip**)

  - Naso-gastric **suction** , **IV fluids** (Ringer's solution) , IV **antibiotics** (ampicillin , aminoglycoside , metronidazole . Antibiotics can be changed after the appearance of the results of culture & sensitivity) , **analgesics** , **Foley's** catheter and **observation** .

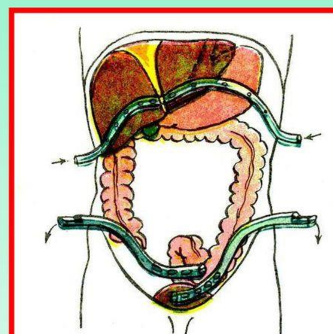
  b) Operation : Exploration laparotomy .

  - Under **general** anaesthesia and through **long midline** incision
  - **Pus** is sampled (for culture and sensitivity) & suctioned out .
  - Treatment of the **cause** e.g. appendicectomy or closure of perforated PU by omental patch .
  - **Peritoneal toilet** : irrigation of peritoneum with saline .
  - **Peritoneal drainage** through separate stabs .
    - Suprapubic drain in the **rectovesical or rectovaginal** pouch .
    - Drain in the right flank to drain **hepato-renal** pouch .
    - Drain in the site of the **cause** .
  - **Subcutaneous drain** because the wound is contaminated .

Drainage of the abdominal cavity

At the local peritonitis – drainage by 1 or 2 drainages

At the diffuse peritonitis – drainage by 2 or 3 drainages



Drainage at the poured peritonitis

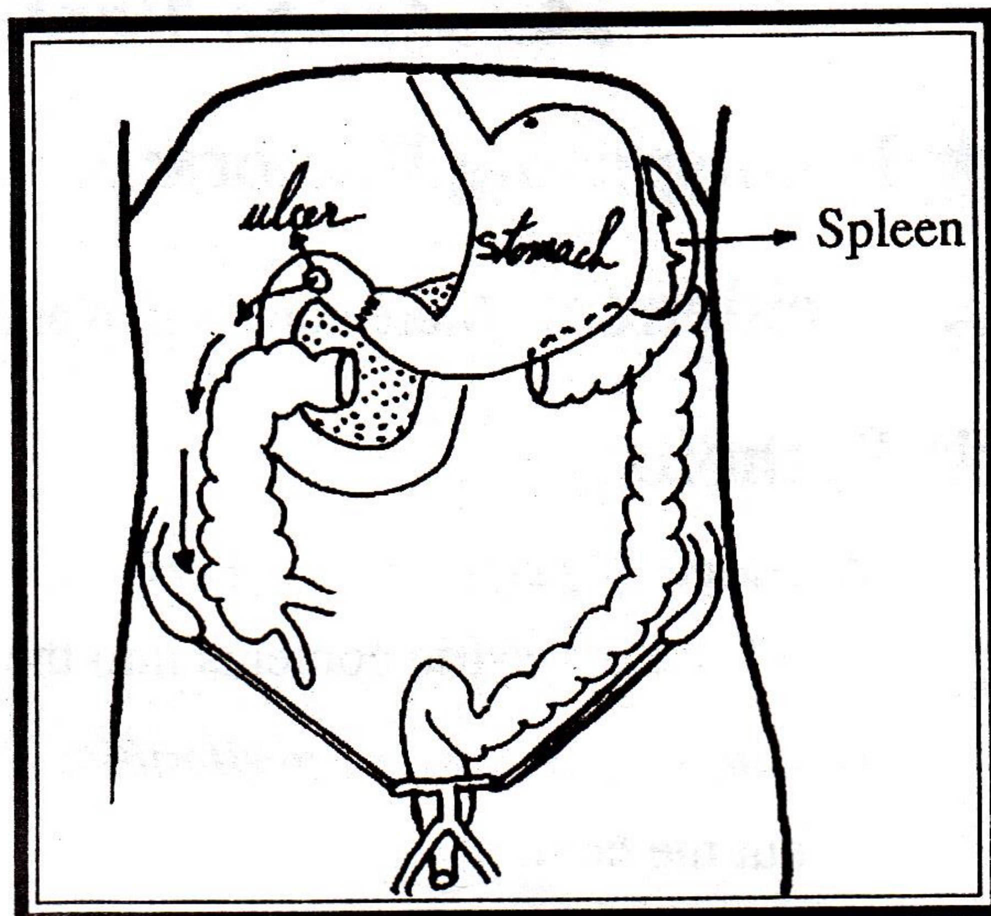
Localized Septic Peritonitis

(Intra-peritoneal Abscess)

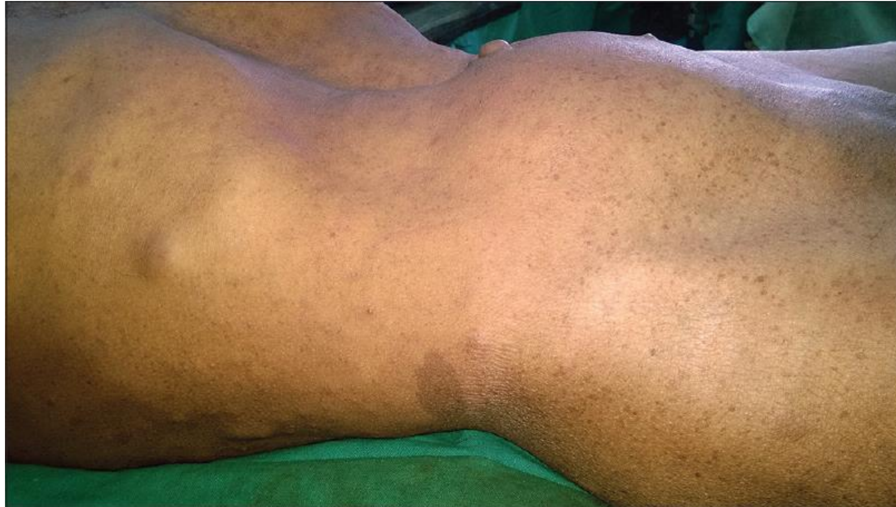
⁎ **Site** :The commonest site for intra-peritoneal abscess are iliac fossae , pelvic and subphrenic spaces .

Iliac Abscess

- **Aetiology :**
  - **On right side** : Acute appendicitis or perforated PU .
  - **On left side** : perorated diverticulitis or carcinoma of sigmoic colon
  - **On both sides** : infections from female genital system or secondary to generalized peritonitis .



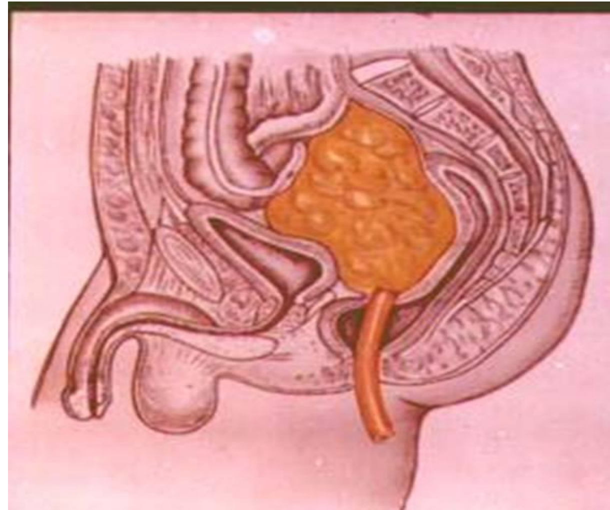
- **Clinical picture :**
  1) History and manifestations of the **cause** .
  2) **Hectic fever** , toxaemia and vomiting .
  3) Severe pain , tenderness and swelling in the **iliac fossa** .



- **Investigations** : For the cause +Blood picture and U/S (as generalized peritonitis)
- **Treatment :**
  - Proper **antibiotics** .
  - Treatment of the **cause** : In acute appendicitis , the appendix is removed in the acute stage and elective interval appendicectomy after 6 months.
  - Open or U/S guided **drainage** .

Pelvic Abscess

- It is collection of pus in the recto-vesical or recto-vaginal pouch (most dependent are in the peritoneal cavity during sitting or standing)
- **Aetiology :** Acute appendicitis , secondary to generalized peritonitis or infection in the female genital system.



- **Clinical picture :**

  1)History and manifestations of the **cause** .

  2)**Hectic** fever ,toxaemia and vomiting .

  3) Severe deep pelvic **pain** , tenderness and swelling in the pelvis which are usually detected by PR exam.

  4) Tenesmus & diarrhoea due to **rectal irritation**.

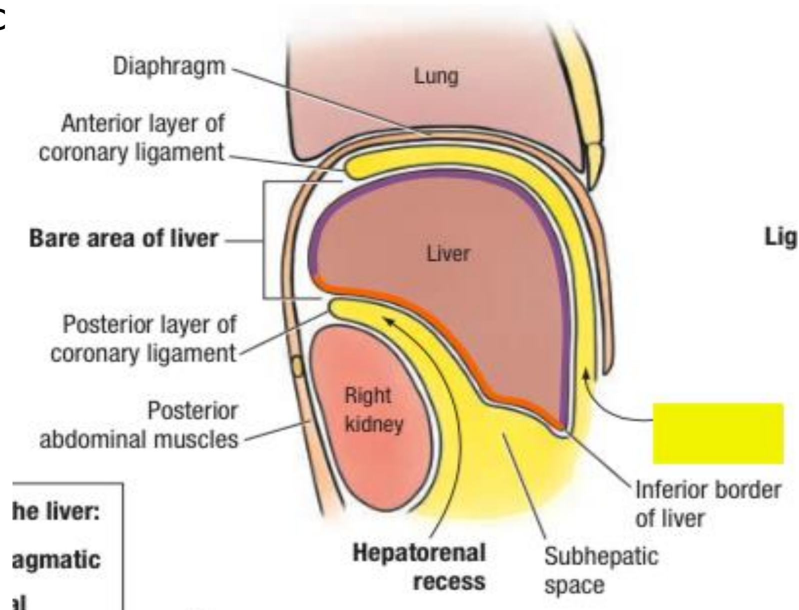
  5) Burning micturation & frequency due to **bladder irritation**.

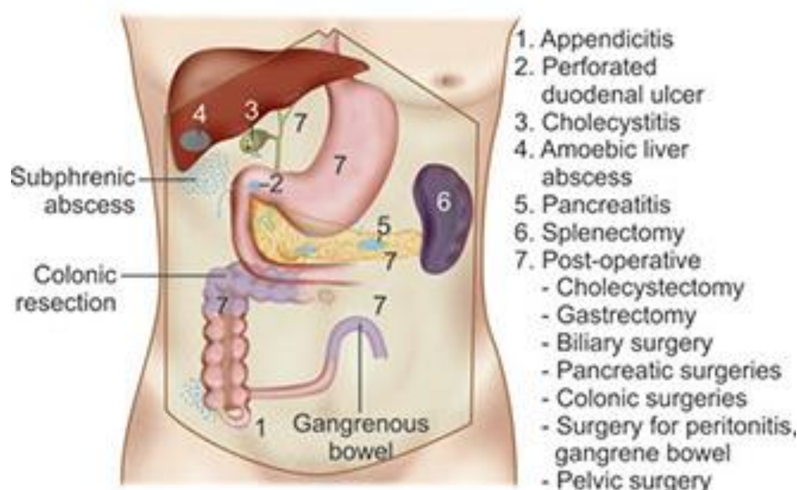
  6) In neglected cases, the abscess **burst** through vagina or rectum

- **Investigations** : For the cause +Blood picture and U/S (as generalized peritonitis)
- **Treatment** :
  - Proper **antibiotics** .
  - Treatment of the **cause**
  - **Drainage** :
    - ♣ Abscess points through **rectum**→ transrectal drainage .
    - ♣ Abscess points through **vaginal** → drainage through posterior fornix .

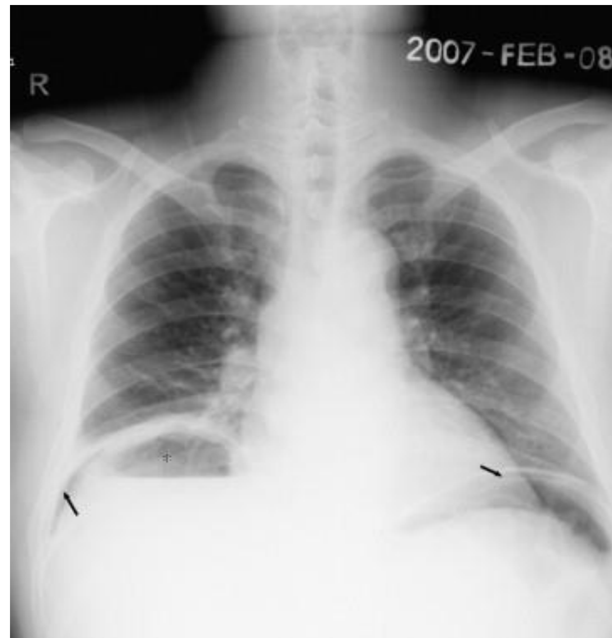
Subphrenic Abscess

- **Definition :** Abscess in the space between the diaphragm and transverse colon .
- **Incidence :** Usually in the hepatorenal pouch(Morrison's pouch) which is the most dependent area of peritoneal cavity when the patient is lying in supine position .
- **Aetiology :**
  - Secondary to **generalized** peritonitis .
  - **Inflamed or perforated** viscera e.g. appendicitis , cholecystitis pancreatitis or perforated PU.
  - **Post-operative** especially after biliary , gastric, splenic or pancreatic





* **Clinical picture :**
  1) **General :** Hectic fever , severe toxaemia , tachycardia , anorexia , vomiting and rarely hiccough .
  2) **Local** manifestation may be totally abscent , **therefore pus somewhere , pus nowhere , means pus under the diaphragm .**
     - **Rarely pain** referred to the shoulder or tenderness in the upper abdomen , over lower ribs and intercostals spaces or below costal margin .
     - **Very rarely swelling** tenderness and rigidity in the upper abdomen .
     - **Chest symptoms** : decrease of chest movement with respiration , decrease air entery and dullness over the base of the lung (collapse & pleural effusion).
* **Investigations** :
  1) **Blood** picture : show leucocytosis with shift to the left .
  2) **Plain chest x-ray** : show
     - Elevated fixed copula of diaphragm .
     - Obliteration of costophrenic angle (pleural effusion) .
     - Air or fluid level under the diaphragm(perforated hollow viscus or infection with gas forming organism) .
  3) **Abdominal U/S & CT** localize the abscess and guide drainage .



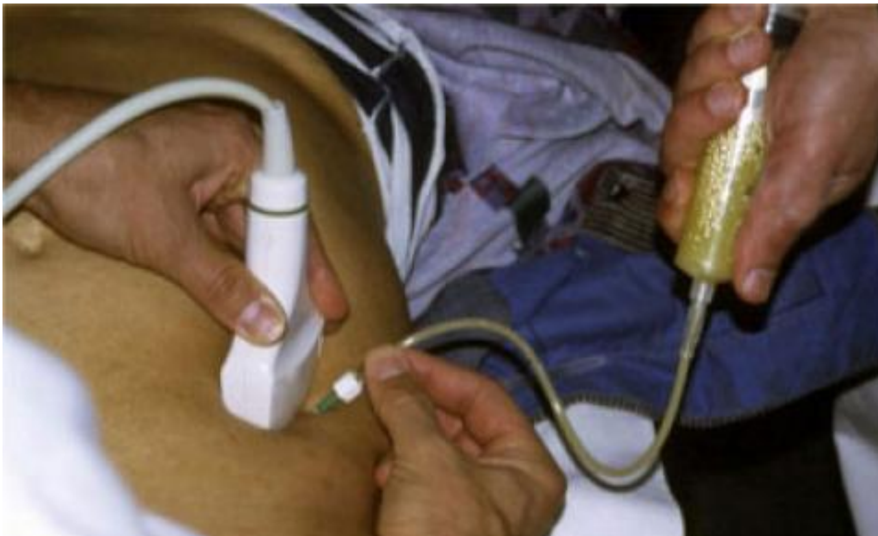
* **Treatment :**

1) **Conservative :** antibiotics for early abscess .

2) **Surgical :** for failure of medical treatment .

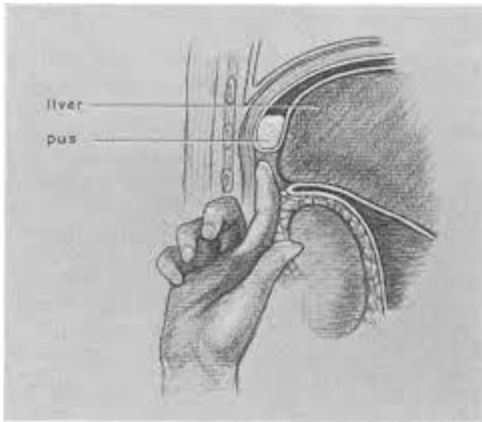
   - **Methods** : Drainage of pus by one of the followings :

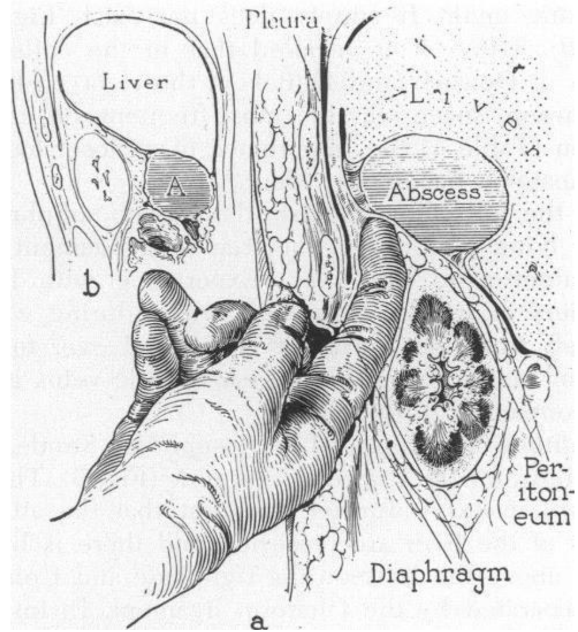
     a- **Percutaneous i**nsertion of a catheter guided by U/S or CT .



     b- **Open surgery** : for thick pus or multilocular abscess.

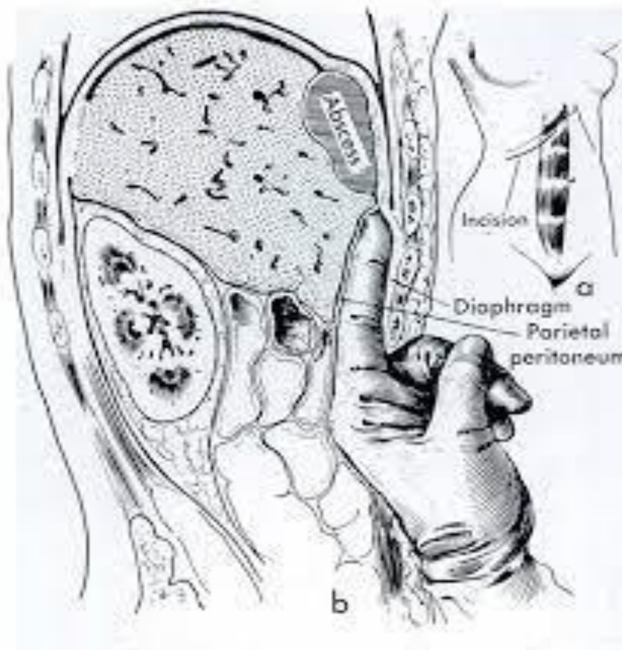
   - **Method :** Extra-serous drainage (subpleural for posterior abscess or extra-peritoneal for anterior abscess) is needed .





Posterior Subpleural Drainage

of Posterior Subphrenic abscess



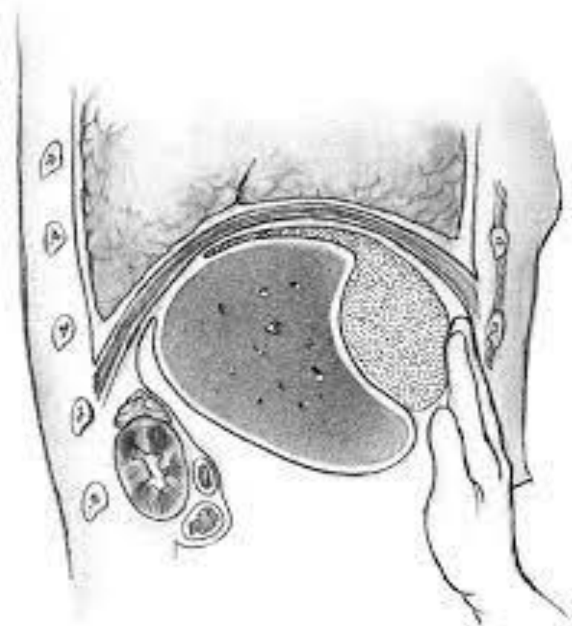


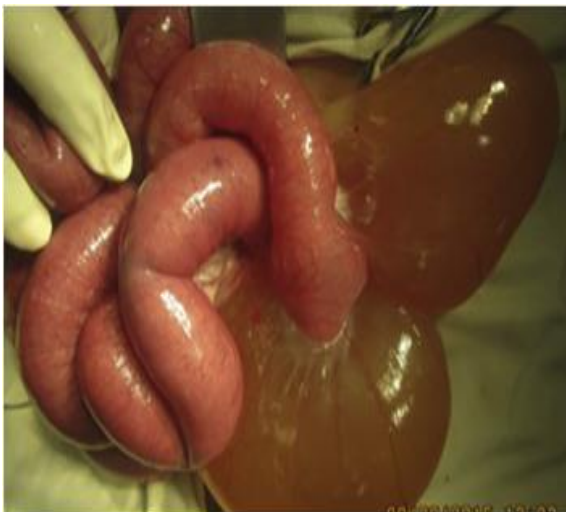
Fig. 96–4

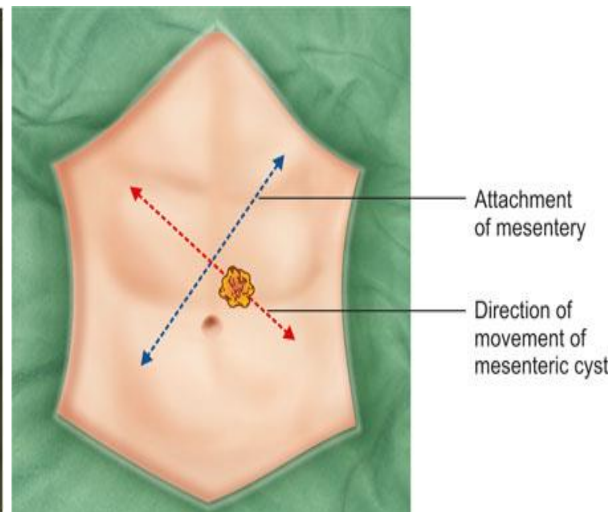
Anterior Extra-peritoneal Drainage

of Aosterior Subphrenic abscess

Meseteric Cysts

* **Incidence : Rare** condition usually appears in **children** and young adults .
* **Pathological types :**
  1) **Chylolymphatic cyst** :The **commonest** , a retension cyst due to **obstruction of lymphatics** .It is lined by endothelium and containing lymph .
  2) **Enterogenous cyst** : has thick wall , lined by intestinal mucosa and contain mucous.
  3) **Teratomatous dermoid cyst** .
  4) **Hydatid cyst .**





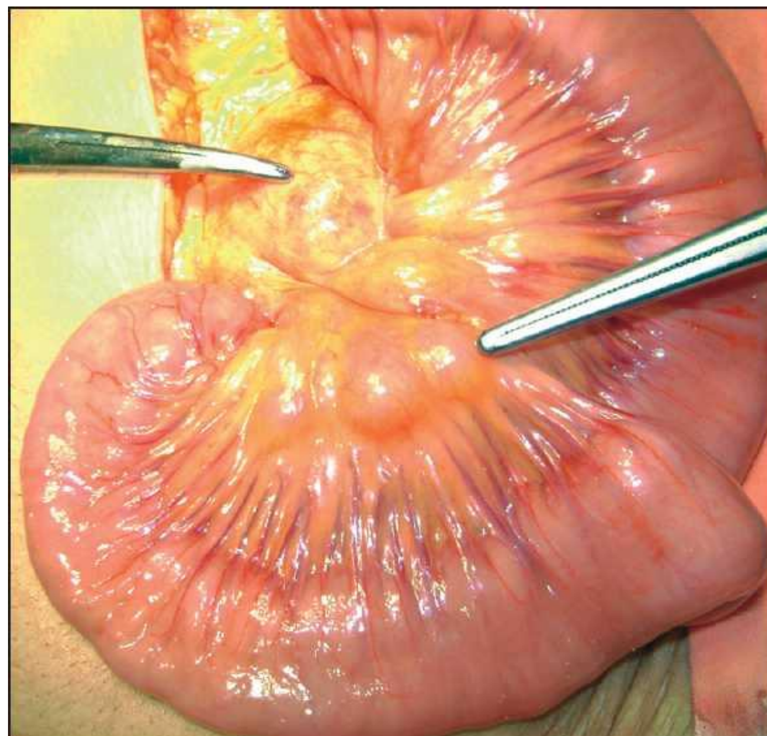
* **Clinical picture :**
  1- Pailess slowly growing abdominal **swelling with dyspepsia** .
  2- **Tillux triad :**
    - Cystic **swelling** near the umbilicus.
    - The swelling **moves across** but not along the root of mesentery .
    - The swelling is **dull** on percussion with **bands of resonance** over and around the swelling (loops of intestine) .
* **Investigations :** U/S & CT are diagnostic .

* **Treatment :** Enucleation is the treatment of mesenteric cysts except enterogenous cyst (treated by excision with resection anastomosis of the related loop of intestine because its blood supply is derived from the same vessels of the related loop of intestine) .

* N.B :**Large abdominal cysts** :
  1) Pancreatic pseudocyst : in the upper abdomen .
  2) Mesenteric cyst : near the umbilicus .
  3) Ovarian cyst : pelvi-abdominal swelling .
  4) Hydronephrosis : extends to renal angle .

Acute Non-specific Mesenteric Lymphadenitis

* **Incidence :** One of the commonest causes of acute abdomen in children .
* **Aetiology :** Unknown but it may be viral infection .
* **Pathology :** Ileocaecal lymph nodes show hyperplasia and enlarged .



⁎ **Clinical picture** :

1) A **child** present by **pain** in the lower right abdomen (D.D acute appendicitis). Pain is coliky , severe , lasts for short time .
2) Anorexia , nausea , vomiting and fever .
3) **Tenderness** and guarding but no rigidity , along the **root of mesentery** .
4) **Shifting tenderness** is characteristic . After the patient lying on the left side for few minutes , the point of maximum tenderness is shifted towards the middle line .

⁎ **D.D : Acute appendicitis**

	Acute Appendicitis	**Acute Non-specific Mesenteric Lymphadenitis**
Pain	Continuous .	Intermittent with periods of freedom
Max. tenderness	McBurney's point.	Above and medial to McBurney's point
Rovsing's sign	Positive	Negative
Shifting tenderness	Negative	Positive

⁎ **Investigations :** CT is diagnostic .

⁎ **Treatment :**

I) If the patient is **properly diagnosed** : analgesics and antibiotics are enough .

II) Most of the patients are opened for appendectomy :

- The mesentery is found congested and contains multiple soft lymph nodes .
- Although the appendix is normal, appendectomy is performed .

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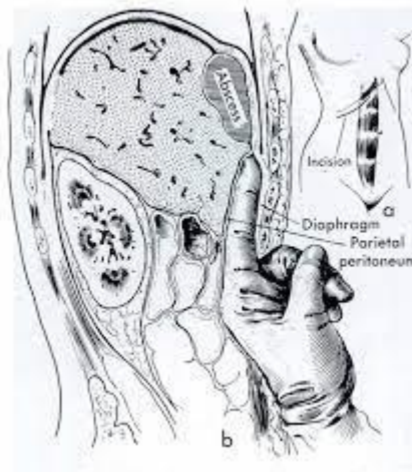
Abscess
Incision
a
Diaphragm
Parietal
peritoneum
b