



Peritonitis

**SUPPURATIVE DISEASES OF
SEROUS CAVITY**

peritonitis

- A special feature of peritonitis is the spread of infection and the intensive absorption by the peritoneum of toxic products - bacterial toxins, and products of tissue disintegration.
- The development of peritonitis is accompanied by the paralysis of the gastrointestinal tract.

Pathogenesis

- Purulent peritonitis is normally a secondary disease caused by the spread of infection from any organ in the abdominal cavity onto the visceral and parietal peritoneum.
- Peritonitis may be attributed of the following causes:
 - acute appendicitis,
 - acute cholecystitis,
 - perforated stomach and duodenal ulcers,
 - intestinal obstructions,
 - acute pancreatitis,
 - trauma to the abdominal organs
 - pelvic inflammatory diseases (the internal female genital organs).
 - Peritonitis can also result from surgery (postoperative peritonitis) when contamination of the peritoneum occurs accidentally during operation or as a result of the breakdown of anastomosis after the operation.

complain

- Patients complain of pains in the stomach, which are intense and an initially located at the source of peritonitis , the pain later spreads to adjacent organ and involve half or even the whole abdomen
- General clinical symptoms include a rise In body temperature up to 38 *C and above, tachycardia.

Examination

- The face is initially flushed, then becomes pale.
- The abdomen is retracted or slightly distended; the abdominal wall or half of it is not involved in the act of breathing.
- On palpation the patient demonstrates severe tenderness and tensing of all the abdominal muscles depending on the spread of the process along the peritoneum.
- Bowels sounds are absent on auscultation.
- laboratory blood analyses show leukocytosis with a shift of the leukocyte formula to the left.

character and location of pain

- Patients with peritonitis complain of abdominal pains, thirst, weakness, vomiting and dyspnea.
- pain can increase gradually (when an organ is Inflamed) or suddenly and become intense when hollow viscus perforates, as in stomach and duodenum ulcer.
- The character and location of pain depend on the main (original) disease: for example In acute cholecystitis the pain is located in the right hypochondria
- Pain is persistent and the location differs according to the source of infection at the onset of the disease, then the pain spreads to half or the entire abdomen.
- When the infection spreads to the peritoneum from an inflamed abdominal organ the signs of peritonitis add to the signs of the originally infected organ that happened be the cause of infection.
- Subsequently when the process spreads and moves into the next phase, it becomes difficult to establish the original source of infection.
- When fluid accumulates in the subphrenic space, the pain can radiate to the shoulders, scapula; and if it accumulates in the pelvis - there is pain in the rectum and perineum,

Percussion and auscultation

- A high tympanic sound is heard on percussion, it is dull over the areas of fluid accumulation
- Peristaltic bowel sounds are absent at the toxic and terminal phases on auscultation

abdominal guarding

- One of the vital symptoms of peritonitis is abdominal guarding.
- To elicit this symptom both hands are used to palpate the abdomen gently, placing the palms over two symmetrical areas of the abdominal wall.
- Moving the hands over the abdominal wall with minimal pressure the amount of resistance from the muscles on both sides is compared: tensing of the abdominal wall and resistance from it indicate the presence of muscular rigidity.

Shotkin-Blumberg's sign

- The cause of guarding is resistance, reflex reaction of the abdominal wall caused by pain.
- Together with abdominal guarding a constant feature of peritonitis is rebound tenderness, the Shotkin-Blumberg's sign.
- This sign is based on the increase in pain on shaking the peritoneum.
- To elicit this sign the abdominal wall is pressed deeply and gently using the finger and then the pressure quickly released.
- The resulting irritation of the peritoneum causes severe pain at affected area which is a sign of peritoneum inflammation.

Investigations

- Laboratory blood tests show leukocytosis, which can reach up to $15-20 \times 10^9/l$ with a shift of the leukocyte formula to the left, anemia; HSR is high; protein and cylinders are present in the urine.
- abdominal x-rays can show free gas if peritonitis resulted from a perforated viscus; in ileus, there are distended intestinal loops with fluid accumulation in them.

diagnosis

- To establish the diagnosis of peritonitis, several symptoms have to be present of which the most reliable are:
 - abdominal pains,
 - tenderness on palpation,
 - guarding or rigidity of the abdominal wall muscle,
 - Shotkin-Blumberg's sign,
 - dry tongue, rapid pulse,
 - high body temperature,
 - deficit of pulse versus temperature,
 - high leukocytosis with a shift to the left, the presence of free gas in the abdominal cavity.
- To confirm the diagnosis in unclear situations and to establish the source of infection, laparoscopy is done.
- After the diagnosis has been established the spread of peritonitis as well as its phase of development are determined.

preoperative assessment

- The preoperative assessment must be short - not more than 2 hours and limited at the restoration of blood circulation, improvement of water-electrolyte imbalance and restoration of the circulating blood volume
- Evaluation of the cardiovascular system during the preoperative period is especially important in elderly patients

Treatment

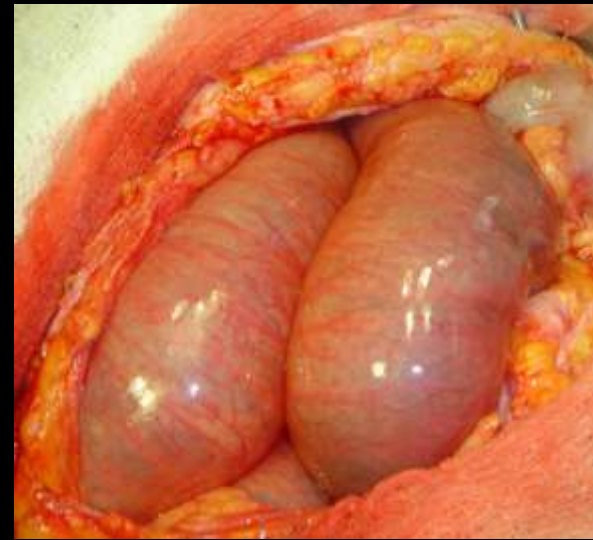
- Purulent peritonitis is an indication for emergency operation.
- The objective of surgery is to liquidate the source of infection, sanitation of the abdominal cavity and evacuation of the purulent exudate in the abdominal cavity or the contents of the gastrointestinal tract in case of perforated viscus.
- Drainage of the abdominal cavity for the evacuation of exudate.

Surgical treatment

- In spreading peritonitis the best surgical approach is the mid-line laparotomy.
- Liquidation of the source of infection involves the excision of the affected organ (appendectomy, cholecystectomy, removal of fallopian tubes, resection of the intestine etc.), closure of the perforation in case of stomach ulcer.
- Sanitation of the abdominal cavity is aimed at evacuation of the exudate with the help of electric suction machine or dry cleaning the abdominal cavity with gauze swabs, removal of the fibrin deposits, washing the abdominal cavity with antiseptic solutions (dioxidin, sodium hypochloride. ultrasonic cavitation).

decompression of the intestine

- To combat the intestinal paresis the intestines are decompressed.
- In intestinal resection decompression is done through the open ends of the bowel: the bowel is brought out of the abdominal cavity and by pressing down the bowel contents and gas are emptied.
- In case one or both ends of the bowel are brought out in the form of a fistula, decompression will be achieved after the operation through this fistula (enterostomy or colostomy).



small- intestinal tubes



- Where the source of peritonitis is liquidated without opening the lumen of the intestines (appendectomy, cholecystectomy, closure of a perforation), then decompression of the intestine during and after the operation is achieved by using long small-intestinal tubes with lots of holes on the sides which are passed through the nose, esophagus, stomach and into the small intestine at the time of operation.
- This tube can be pushed into the small intestine during laparotomy; through it the intestinal contents are evacuated and leave for long decompression during the postoperative period.
- Decompression, which is continued into the postoperative period is aimed at evacuating the intestinal contents in order to prevent them from being absorbed into the organism and to prevent intoxication, as well as to reduce the extent of circulatory and nutritional imbalance in the intestinal walls that have been overstretched by gas.

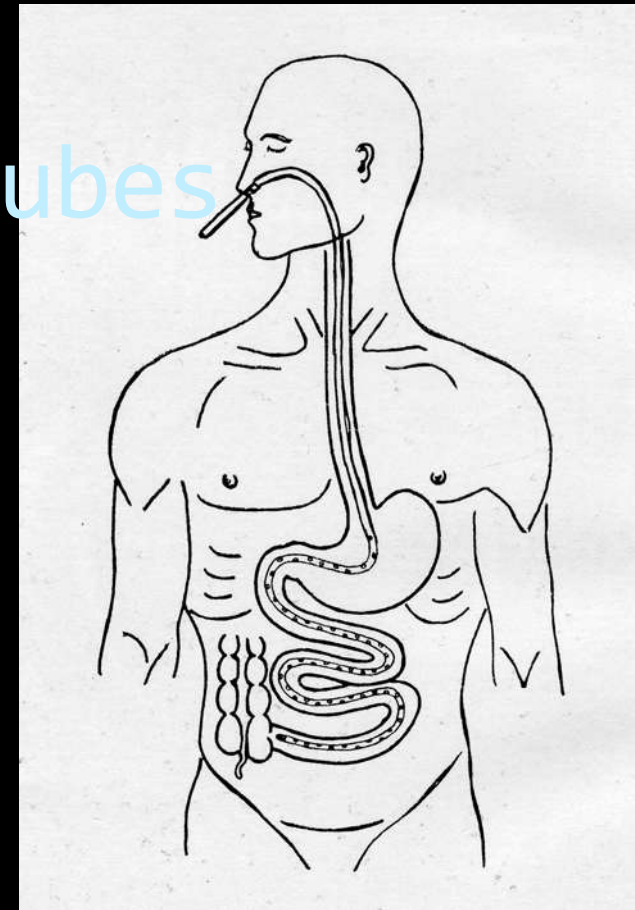


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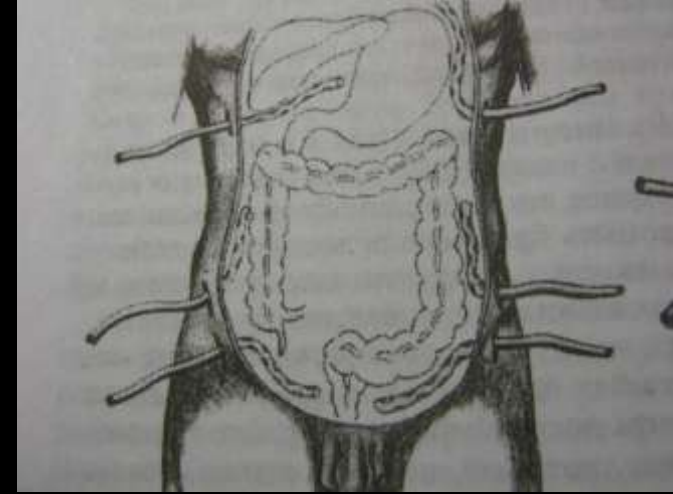
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drainage

- The operation is completed by abdominal drainage.
- Vinyl chloride or silicone drainage tube are passed through separate puncture in the abdominal wall



Laparostomy



- Repeated toileting of the abdominal cavity in generalized peritonitis can be done by means of laparostomy.
- To do this, the operation is completed by suturing a zipper along the wound edges.
- After the operation the zipper is periodically opened, the exudate is aspirated, the abdominal cavity is washed with antiseptic solutions.
- This procedure is continued till complete eradication of inflammation in the abdominal cavity, the zipper is then removed and the wound is sutured.

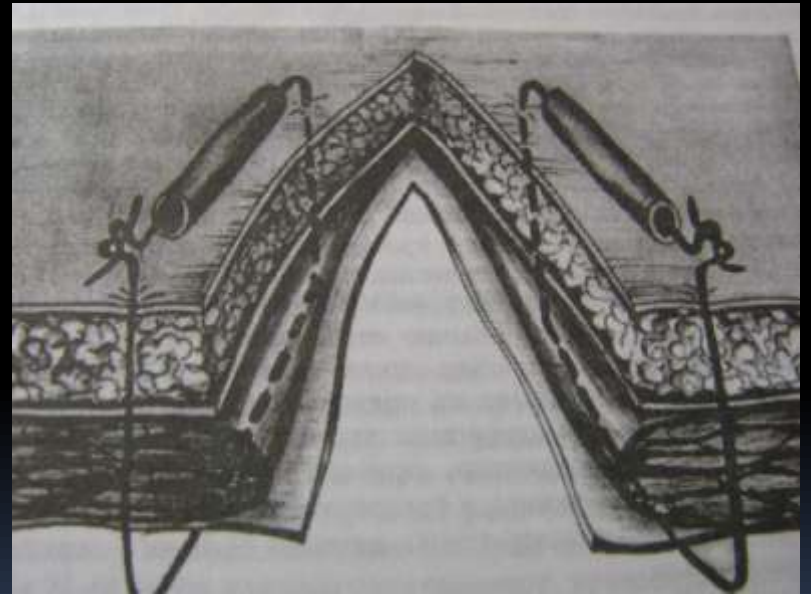





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Laparostomy with fast-removable suture





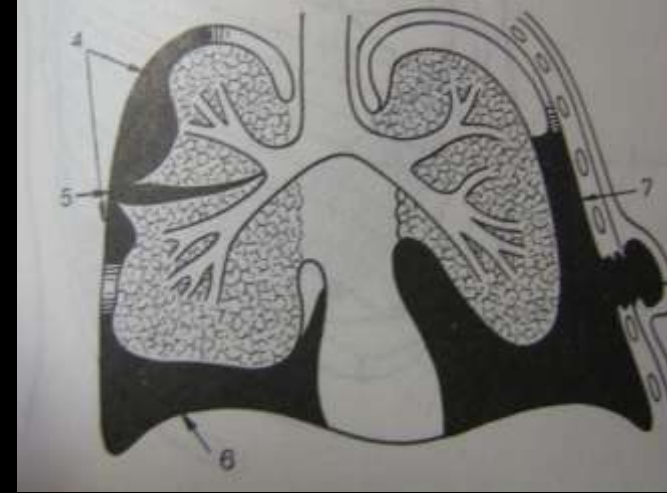
SUPPURATIVE PLEURISY

Suppurative pleurisy is the suppurative inflammation of the parietal and visceral pleura that is associated with local changes and intoxication.



Classification

- Acute suppurative pleurisy is divided due to ethyology:
 - primary and secondary
- according to the pus distribution —
 - free (total, average, minimal),
 - encapsulated - single or multiple chambered (basal, interlobar, and apical);
- according to the character of the exudates
 - purulent and ichorous.



clinical signs

- The clinical signs of the disease features:
- 1) symptoms of the main disease that gave rise to pleurisy;
- 2) signs of suppurative intoxication:
- 3) symptoms resulting from the accumulation of fluid into the pleural cavity.

examination

- General examination of the patient reveals pallor, dyspnea, and uncomfortable position in bed - half-sitting or on the side. Sometimes the patient is found to be pressing on the side, which reduces the pain on inhalation.
- Breathing rate increases to 20- 25 and in extreme cases to 30-40 per min.
- Inspection of the chest reveals limitations in the breathing excursion of the chest with the sick side impaired or even not taking part in the process.
- When large amounts of fluid are accumulated in the pleural cavity, swelling in the posterior lower parts of the chest is found and the intercostal spaces are filled up.

Palpation

- Palpation of the intercostal spaces causes some tenderness.
- Tactile fremitus on the affected side is reduced.

Percussion

- Percussion of the chest reveals dullness in the percussion note over the areas of accumulation
- In total pleural empyema there is dullness over the whole half of the chest
- In case of large amounts of accumulation, the upper level of dullness is located at the C-shaped Ellis-Damoiseau's line. In this situation the Garland's triangle is determined.
- Percussion also reveals the shift of the mid dullness towards the healthy side, which indicates the shift of the mediastinum exerted by the accumulated fluid in the pleural cavity.

Auscultation

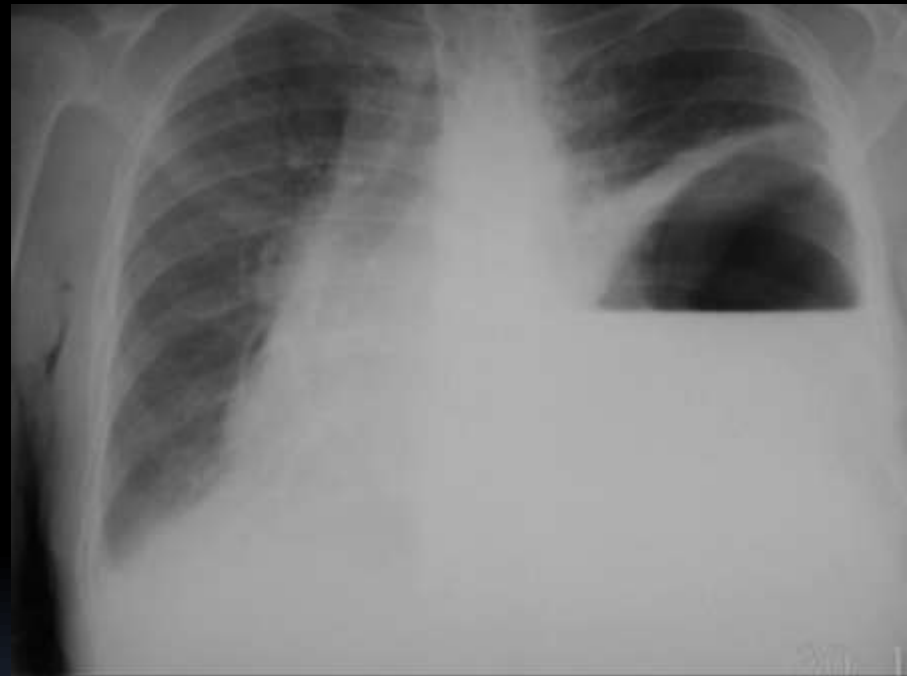
- Auscultation reveals a marked decrease in breath sounds or their total absence over the areas of accumulation

X-ray

- X-ray examination is done to determine the presence of fluid in the pleural cavity. The x-ray shows the amount and location of the fluid.
- At the beginning of the disease fluid accumulation is at the posterior lower part of the pleural cavity - in the costo-diaphragm sinus, as the fluid increases, the shadow over the lung field increases as well.
- In hydrothorax, the fluid accumulation in a pleural cavity has a C-shaped border and never assumes a horizontal level.

pyopneumothorax

- In pyopneumothorax a layer of gas is evident over the horizontal level of fluid in the pleural cavity.



Treatment

- Treatment of suppurative pleurisy involves the evacuation of pus, fighting the infection, detoxication therapy and the restoration of impaired organ functions.
- The prompt eradication of foci of suppurative pleural infection and the expansion of collapsed lungs helps to achieve the main aim of treatment - restoration of the close contact between the visceral and parietal pleura and their union

method of treatment

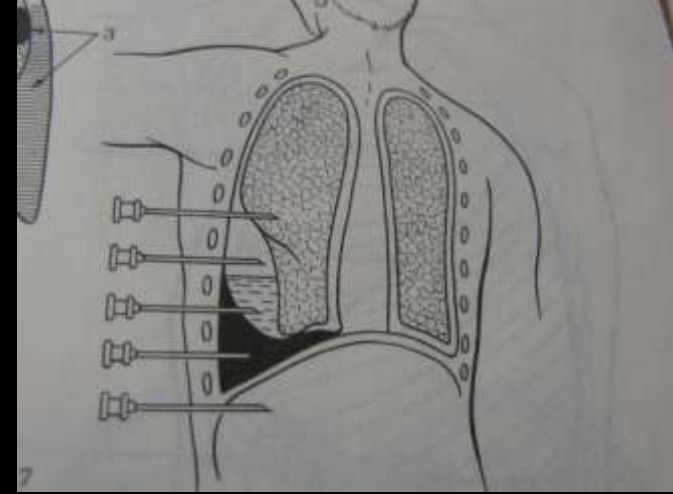
- The main method used to treat a pleural empyema is the closed method, during which the pleural cavity is not opened.
- in the open method the chest is opened through a wide incision for the evacuation of pus and fibrin deposits and plaques (decortication).
- The closed method of treatment of pleural empyema includes therapeutic puncture and drainage of the pleural cavity by way of pleural taps through the chest drainage tube.

puncture

- The *point for puncture*

is chosen at the area of maximum tenderness, a typical point is in the eighth or ninth intercostal space in-between the scapular and posterior axillary lines.

- In limited and encapsulated pleurisy, small amounts of fluid accumulations, the puncture point is determined together with the radiologist during the roentgenoscopy investigation.

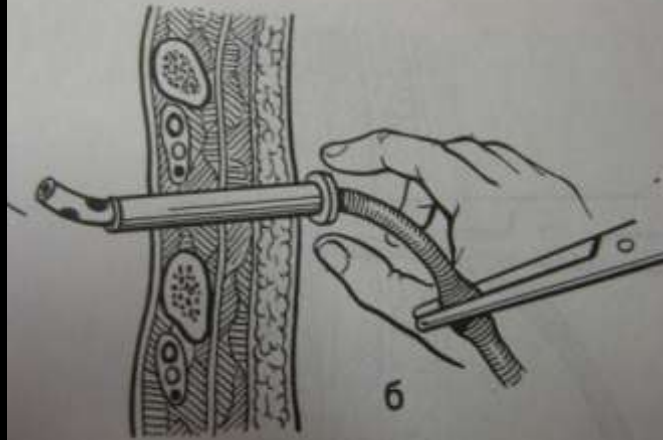


drainage

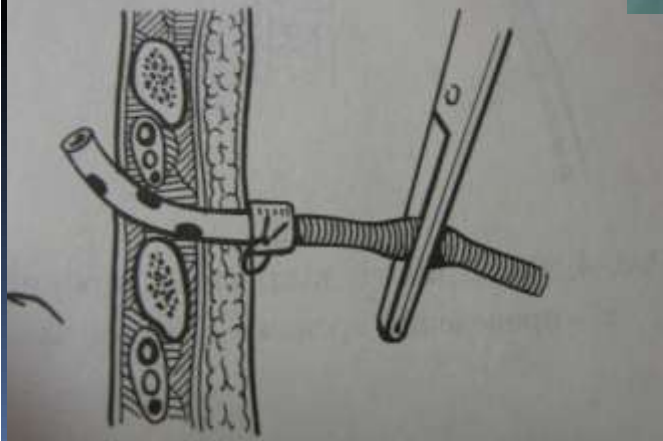
- Pleural drainage is completed by the infusion into the cavity of proteolytic enzymes. Puncture is repeated daily.
- When the first puncture is not successful active constant aspiration or pus from the pleural cavity can be employed. Permanent drainage tubes are placed into the pleural cavity.



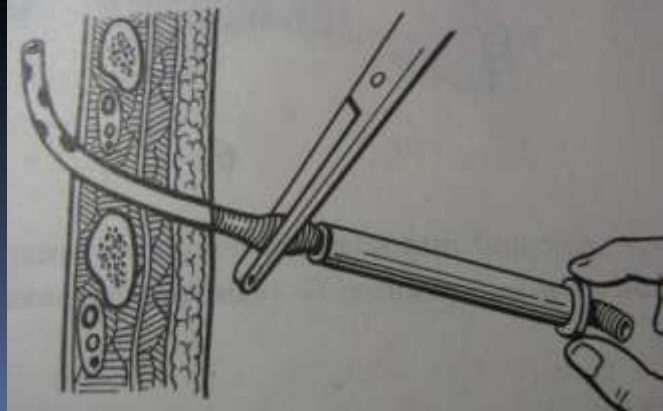
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