

Lung abscess

A lung abscess is a membrane-bounded deposit in lung tissue **greater than 2 cm** where lung tissue **necrosis** occurs as a result of a purulent inflammatory process.

Epidemiology

The finding of a pulmonary abscess in a patient may indicate his overall poor health.

Risk patients

1. Elderly polymorbid patients;
2. long-term sick patients;
3. patients on artificial lung ventilation;
4. patients with impaired consciousness, swallowing disorders (including alcoholics);
5. immunocompromised patients (transplant patients, cancer patients, HIV positive, drug addicts).

Etiology

The causes of abscess

- **Aspiration** – the most common cause is the **aspiration of pathogenic material**;
 - materials from the oral cavity, upper respiratory tract;
 1. tooth aspiration, parts of prosthesis;
 2. aspiration of part of the tonsils;
 3. esophageal diverticulum content aspiration;
 4. aspiration of a portion of the disintegrating tumor from the oral cavity, esophagus or upper respiratory tract;
 - from the stomach;
 1. aspiration of gastric contents during vomiting (unconscious patients, alcoholics);
 - food aspiration (common in infants).
- **Pneumonia complications** – abscess formation is a serious complication of ongoing pneumonia. This occurs when infection therapy is underestimated or in some types of patients (immunocompromised, polymorbid)
- **Hematogenous spread** – septic embolism, typically in sepsis, bacterial endocarditis, thrombophlebitis. There may be multiple abscesses in the lungs.
- **Bronchial obstruction** – abscess can develop in the area for any bronchial obstruction (foreign body, mucus plugs, bronchus cancer).
- **Metapneumonic abscess** – a complication of a pulmonary infarction, in which there is a secondary infection of necrotic lung tissue.
- **Transition from neighboring organs** – passage of inflammation from the esophagus, mediastinum, subphrenic abscess (across the diaphragm).
- **Trauma** – introduction of infection in penetrating chest injuries.

Infectious agents

- Bacteria:
 1. aerobes (*Staphylococcus aureus*, *Klebsiella*, *Pseudomonas aeruginosa*, *Streptococcus milleri*, *Streptococcus pneumoniae*, *Escherichia coli*)
 2. anaerobes (*Fusobacterium*, *Porphyromonas*);
- mold;
- amoeba;
- echinococcus.

Clinical symptoms

The symptoms of a lung abscess are generally non-specific. These are mainly **febrile, cough with expectoration of purulent sputum, hemoptysis, pleural pain, vomiting**. The course of the disease may be chronic, with few symptoms, gradual deterioration of the patient's general condition (eg. after aspiration of material from the oral cavity), or it may have an acute violent course, which may result in the patient's death (septic embolism).

Diagnostics and inspection

History

It is necessary to purposefully search for **previous diseases** (infectious lung disease, chronic lung disease), **trauma** , previous **pulmonary embolism**, the possibility of reduced immunity (cytostatic therapy , corticoids), the possibility of cancer (family history, smoker).

Physical examination

There **may be no** physical findings (unless the abscess itself is pneumonia). In the case of an extensive process, it is possible to detect crunches, percussion darkening.

X-ray and CT

- Chest X-ray is a basic examination and should be performed in two projections (anterior and lateral). The appearance of the abscess on X-ray differs according to its stage (homogeneous sharply **demarcated** deposit, later sharply **demarcated cavity with a surface** - the so-called "hydroaeric image"). **Pleural effusion** is also present at the same time .
- CT examination using a contrast agent (which is given into the bloodstream) serves to **image the pyogenic membrane of the abscess** and thus to distinguish it from a foci of other etiology (tumor, metastasis, empyema).



Pulmonary abscess (X-ray, anterior anterior image) : abscesses are visible in the left lung (blurred spherical lesions in the left lower quadrant above the heart shadow, another finding: bilateral pneumonia, patient: male 37 years)

Bronchoscopy

Bronchoscopy is used to rule out bronchogenic carcinoma , culture samples or histological examination.

Transparietal puncture

Puncture is performed with a needle under CT control, so we obtain the content of the abscess for microbiological examination. The possibility of performing this procedure depends on the location of the abscess.

Laboratory and culture

Microbiological examination is the basis for determining the pathogen and appropriate therapy. The laboratory finding will include leukocytosis and elevated CRP.

Differential diagnosis

During diagnosis, it is necessary to exclude all focal lung processes that have the property of forming caverns or thus affecting X-rays:

1. cancer – bronchogenic carcinoma tends to form caverns (Jores cavern);
2. tuberculosis (cavern);
3. bronchiectasis;
4. emphysema;
5. cyst;
6. mycetoma (aspergilloma - *Aspergillus* tends to occupy the cavity, i.e., the first cavity being, later colonized by *Aspergillus*);
7. necrosis or gangrene of lung tissue.

Complications

1. Perforation of the abscess into the mediastinum (mediastinitis) or into the pleural cavity (pyothorax);
2. vascular erosion and subsequent hemoptysis.

Therapy

Pharmacotherapy

Due to the severity of the disease, the results of cultivation are not expected with the initiation of ATB therapy and the patient is given high doses of broad-spectrum antibiotics without delay. The possibility of anaerobic infection must be considered.

1. penicillin or clindamycin in combination with metronidazole
2. aminopenicillins in combination with beta-lactamase inhibitors.

Once the agent is identified, the treatment is refined.

Puncture and drainage under CT guidance

Puncture and drainage are performed in a large abscess that responds slowly to ATB therapy. It is performed under X-ray / CT control percutaneously.

Surgical treatment

Resection of the abscess cavity (atypical resection) when the abscess does not heal completely and a chronic abscess is created.

References

Related articles

- Absces
- Empyém
- RDG vyšetření hrudníku
- RDG vyšetření u zánětů dolních cest dýchacích

References

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