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Difficulties of mediastinitis diagnostics: A case report

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Abstract

We report a case of mediastinitis complicating an otolaryngological infection in a 38-year-old female. Hospitalized as severe pneumonia the patient had inadequate cardiac, consciousness lesions and no answer on standard antibacterial treatment. Computer tomography was useful to diagnose the mediastinitis. Despite drainage of the thorax and the administration of systemic antibiotics, her localized neck abscess after tonsillitis extended to involve the pericardial and pleural cavities. Drainage procedures and thoracotomies were required to treat the empyema and purulent pericarditis but were unsuccessfully.

Keywords: Mediastinitis, tonsillogenic mediastinitis, diagnostics, case report

Introduction

Acute mediastinitis is a life-threatening infection involving the mediastinal connective tissue that fills the interpleural space and surrounds the adjacent thoracic organs ^[1]. The majority of cases result from oesophageal perforation, or as a consequence of a post-operative infection after sternotomy.

Acute purulent mediastinitis is a rare complication of oropharyngeal infection in which case it is termed descending necrotising mediastinitis (DNM). Despite the presently available broad-spectrum antibiotic therapy, DNM remains a very serious disease with a reported 40–50% mortality rate ^[2].

Several factors contribute to this high mortality, including the rapid spread of the infection, delay in making the diagnosis, poor general health, generalized sepsis and major respiratory and cardiac complications ^[3].

Significant clinical and roentgenological signs become too late, that is why this disease has diagnostic difficulties on first stages, when treatment could help to survive.

The end of the disease depends on early and adequate surgical help. Proper mediastinal drainage, aggressive long-term combination antibiotics and adequate nutritional support constitute the cornerstones of management ^[4].

A 38-year-old female was admitted with a diagnosis of severe community-acquired pneumonia (CAP), as a complication of acute tonsillitis. She was hospitalized with complaints of febrile temperature, pain in the chest, more severe on the right in the lower departments and under the shoulder angle, dyspnea at rest, severe weakness.

From the anamnesis it is known that the patient is sick for more than a week, when the temperature rose up to 39 °C, pain when swallowing (acute tonsillitis). Because of tonsillitis she did intramuscular injections with ceftriaxone for her own at home (dose and duration she does not remember). In some days she got voice violations and there was swelling of the neck and right cheek, the next day there was pain in the chest.

After chest X-ray (Figure 1) CAP was diagnosed because of darkness in the lower departments above lungs and the patient was admitted to the therapy department.

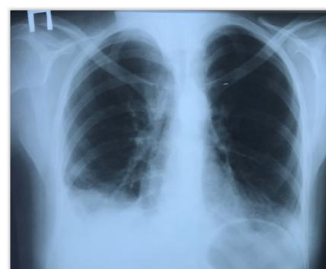


Fig 1: Chest X-ray on the moment of hospitalization

During hospitalization the patient's state was of moderate severity closer to the severe one; consciousness contact are present, but she is languid and inhibited. Skin was pale, warm, clean, the temperature was 37.6 °C.

Thorax had usual shape, above the lungs during auscultation there was weakened respiration below the edge of the scapula from both sides, more intensive on the right side, and breathing rate (BR) was 26 per minute, saturation (SaO₂) was 92%. The heart sounds were muffled, heart rate (HR) equal to pulse was 165 per minute, blood pressure (BP) was 110/70 mmHg.

One more detail that she had some dense edema on the anterior part of the neck (Figure 2), it looked like enlarged lymph nodes in the submaxillary region or thyroid gland increasing, it was slightly painful with unchanged skin above it; otolaryngologist recommended consultation of the maxillofacial surgeon.



Fig 2: Patient's neck on the moment of hospitalization

Diagnosis CAP was put and antibacterial therapy (ABT) was prescribed – levofloxacin 750 mg intravenously once per day because she used cephalosporins for her own before hospitalization.

The next day against the ABT the condition of the patient was without significant dynamics: pain in the chest, dyspnea, discomfort in the submaxillary region and on the front surface of the neck during swallowing were present.

At examination the patient languidly braked, constantly falls asleep. The position is mainly on the right side. BR was 22

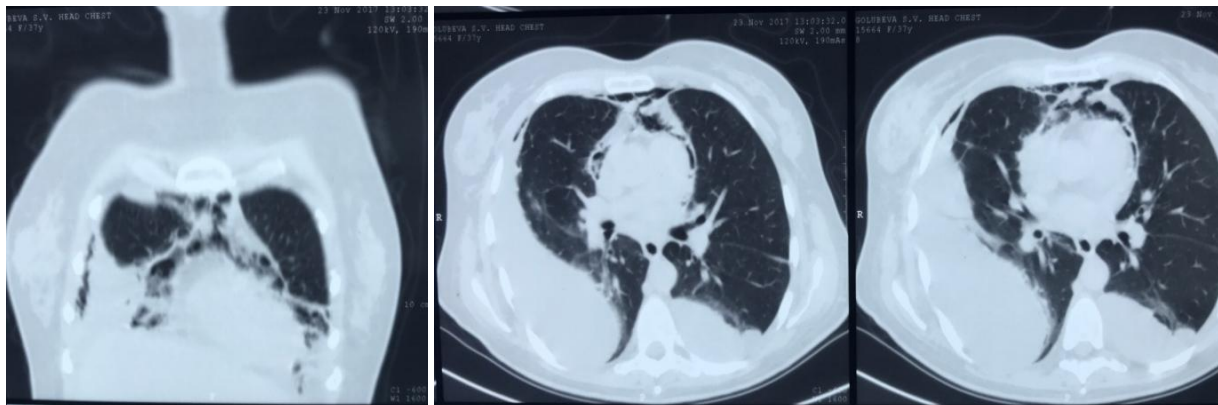


Fig 3: Chest CT of the patient on the third day after hospitalization: signs of air in the mediastinum, pleural and pericardial effusion

The next day the patient was transferred to the thoracic department for urgent thoracotomy on the right and left, drainage of pleural cavities, deep incisions, neck drainage. But after operation she was hospitalized to the ICU because of septic shock, unstable hemodynamics and need in artificial ventilation.

per 1 minute. BP was 100/60 mm Hg, SaO₂ was 96% without oxygenation, HR was 98 per 1 minute, and temperature was 37.4 °C. When examined the soft tissue of the submandibular region and the front surface of the neck more to the right were determined with a slight soreness in palpation. The patient spares the right half during breathing. At auscultation the breath was extremely weakened on the right. Crackles and rales were absent. Complete blood count (CBC) found leukocytosis (10.2 x 10⁹ cells per liter), neutrophilic shift to the left (14% of stab forms).

On this phase several questions have appeared.

- Is the place of treatment was selected correctly? Does patient need in the transfer to the intensive care unit (ICU)?
- What could be the reason of such retardation and drowsiness?
- What additional methods could help to verify the diagnosis and complications?
- Does the patient need in ABT changing or the appointment of another therapy could be useful?

The severity of the patient could be because of intoxication, signs of central nervous system damage, effects of some medication or drugs, inflammatory (suppurative) process of the tissues of the neck or mediastinum.

The patient needed several additional investigations:

- 1) consultation of the neurologist, the result of which was encephalopathy due to intoxication;
- 2) consultation of otolaryngologist in dynamic, which was absent;
- 3) surgeon survey, which did not found surgical pathology;
- 4) neck ultrasound, which was unavailable in this hospital;
- 5) computer tomography (CT) of the neck, which was unavailable because this method could be done only with the contrast, but the level of patient's creatinine (299 mmol/liter) was the contraindication to it;

In two days it was made a decision to do chest CT (Figure 3) because the condition of the patient was stable severe but her several creatinine tests did not allow to do neck CT with the contrast.

After stabilization of the patient's condition she was extubated, she breathed on her own (with oxygen supply through the mask SaO₂ was 98). Condition was still severe, chest X-ray showed negative % dynamic and free gas in mediastinum (Figure 4), in CBC there was also negative dynamic (leukocytosis 15.7 x 10⁹ cells per liter, stab 24%).

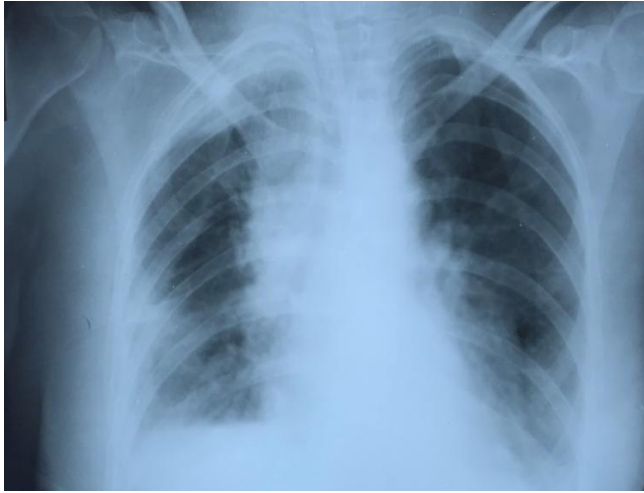


Fig 4: Chest X-ray on the 5th day of hospitalization

The next day cardiac activity stopped. Resuscitation was during 3 minutes with successful restoration of cardiac activity and ventilation. But the next day cardiac activity stopped repeatedly, reanimation was unsuccessful.

Final clinical diagnosis

Tonsilogenic mediastinitis: phlegmon of soft tissues of the neck, mediastinum, empyema on the right and left, pericarditis;

Diagnosis after autopsy

Mediastinitis, purulent melting of the soft tissues of the neck, mediastinal tissue, right and left empyema, fibrinous pleuritis, polysegmental pneumonia, fibrinous pericarditis, myocardial dystrophy, cerebral edema, fatty hepatosis.

Discussion

This clinical case demonstrates:

- 1) too late appeal for medical help;
- 2) negligent attitudes to the designates treatment of acute pharyngitis and tonsillitis;
- 3) non-compliance of medical regiment;
- 4) absence of watchfulness to complications of acute tonsillitis and discussion of them with out-patient doctors;
- 5) wrong conclusion of the primary chest X-ray, where there was air in the mediastinum.

Retrospectively analysis of this fatal case allows suspecting the presence of mediastinitis at earlier stages.

Presence of such signs had to alert doctors at the first stage:

- Swelling of the neck and submandibular area (our patient had it together with hoarse voice, but it wasn't diagnosed);
- Chest pain presents all the time, but it is not pathognomonic only for mediastinitis (our patient had persistent and very severe chest pain in the middle of the chest, it didn't improve during laying on some side);
- Retardation, lethargy, drowsiness (our patient had them from the first day of hospitalization, but it was regarded as intoxication, despite it is central nervous system lesion and heart compression).

Conclusions

1. Acute purulent mediastinitis – is the disease with high lethality (till 70% at fulminant form)

2. At purulent disease of head and neck it is necessary to remember about mediastinitis as a complication which is not frequent but very severe.
3. Fatal end in this case was unavoidable because of too late appeal for medical help and severe purulent process.

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