



# First Clinical Case of Infectious Pleural Effusion

Free, Non-Loculated Effusion—Minimally Invasive Approach

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We here report the case of a 34-year-old unmarried woman; a non-smoker and an office worker, she was HIV negative. Her medical history was negative. She went to the emergency department because she had been suffering from high fever and cough for 4 days, and in the last 2 days, pain had appeared in the left side of her chest, accentuated with coughing. At home, she was taking only paracetamol.

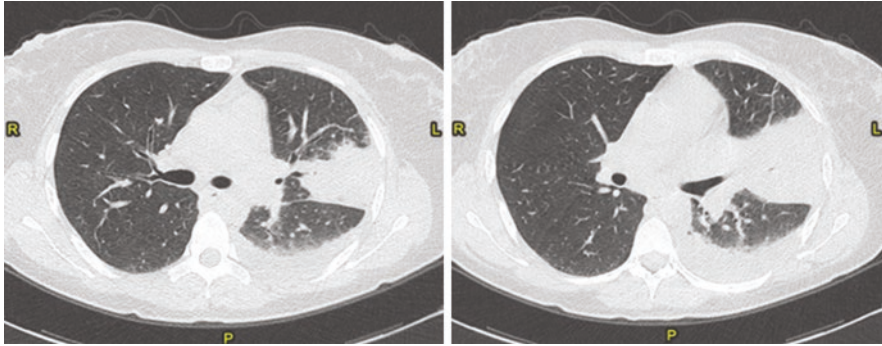
At the Emergency department, a chest X-ray (■ Fig. 8.1) was performed, which showed a left parenchymal opacity associated with pleural effusion. The patient was sent to our ward. Physical examination of the chest revealed left posterior basal dullness with absent fremitus in the lower half of the left thorax and decreased breath sounds.

Blood tests documented marked neutrophilic leukocytosis (WBC: 16,500; neutrophils: 70%), increased ESR: 80. As is routine in these cases, the protocol for suspected pneumonia adopted in our ward was applied, and a positive result for the urinary antigen for pneumococcus was obtained. A chest CT scan was performed (■ Fig. 8.2), which confirmed the presence of extensive parenchymal consolidation of the lingula accompanied by a moderate left pleural effusion.

It was therefore a case of pneumococcal pneumonia with associated parapneumonic pleural effusion, and a correct therapeutic approach was set. The effusion was not abundant, and we had the aetiological diagnosis. Could targeted antibiotic therapy and monitoring of clinical evolution be enough? No!



■ Fig. 8.1 Chest X-ray at the time of admission



■ Fig. 8.2 CT of the chest

The correct approach in the case of an infectious pleural effusion should always be to evaluate whether it is a “simple” or a “complicated” effusion [1, 2] (see flow chart in ■ Fig. 8.1 in the chapter on infectious pleural effusion). For this purpose, it is always essential to perform a thoracentesis. An ultrasound of the chest was performed, which documented the absence of loculations and, again under ultrasound guidance, a left posterior thoracentesis was performed which resulted in the aspiration of manifestly purulent pleural fluid with pH = 6. The final diagnosis was therefore pneumococcal pneumonia complicated by pleural empyema. The thoracentesis was interrupted, and a “pig tail” (14-French) thoracic drain was placed, through which around 500 ml of pus were aspirated. Culture examination of the pleural fluid confirmed the presence of *Diplococcus Pneumoniae* sensitive to piperacillin.

Systemic antibiotic therapy was started with 4 g of piperacillin/0.5 g of tazobactam administered every 8 h; the following day, intrapleural therapy was started with Urokinase 100,000 IU diluted in 100 ml of saline solution for 3 days through the pleural drain. In accordance with the protocol, in the morning, the Urokinase was instilled in the pleural cavity, and the drain was closed for 2 h; it was then reopened and washing with saline solution was performed; lastly, the drain was connected to underwater seal suction with a negative pressure of 20 cmH<sub>2</sub>O. Another 600 ml of pus were aspirated.

On the 4th day from the start of therapy, the fever disappeared. After 6 days, at ultrasound, there was no pleural effusion, and no further fluid was drained, and so the drain was removed. The clinical picture rapidly improved, also from the subjective point of view, with the disappearance of the cough. On the 12th day from admission, a chest X-ray was performed (■ Fig. 8.3), and the patient was discharged with a therapy involving amoxicillin/clavulanic acid every 8 h.



■ Fig. 8.3 Chest X-ray at discharge



■ Fig. 8.4 Chest X-ray 1 week after discharge – complete resolution of the radiological picture

A chest X-ray was performed 1 week after discharge (■ Fig. 8.4), which documented the complete resolution of the radiological picture. Antibiotic therapy was stopped.

We would like to emphasize that no cortisone therapy was performed, since it is useless in these clinical pictures and not

recommended by any guidelines! If thoracentesis had not been performed, leading to the correct diagnosis of empyema, the consequent intrapleural medical therapy with fibrinolytic therapy would not have been performed, and the clinical course would have been longer; hence, there would have been an unacceptable negative pleural outcome in a woman as young as 34! Early and correct treatment of pleural empyema avoids the need for surgical therapy.

### Conclusive Comments

- Parapneumonic effusion is a common and important complication of pneumonia, which worsens the prognosis.
- It was not a simple pleural effusion but a pleural empyema, and only the prompt thoracentesis followed by the positioning of the drain allowed for a correct diagnostic classification and the consequent treatment.
- Intrapleural therapy with Urokinase, started without delay, allowed for the complete resolution of the clinical-radiological picture.

## References

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1. Chan KP, Fitzgerald DB, Lee YCG. Emerging concepts in pleural infection. *Curr Opin Pulm Med*. 2018;24(4):367–73.
2. Dean NC, Griffith PP, Sorensen JS, McCauley L, Jones BE, Lee YC. Pleural effusions at first ED encounter predict worse clinical outcomes in patients with pneumonia. *Chest*. 2016;149(6):1509–15.