Second Clinical Case of Infectious Pleural Effusion

Loculated Effusion—Thoracoscopic Approach

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Contents

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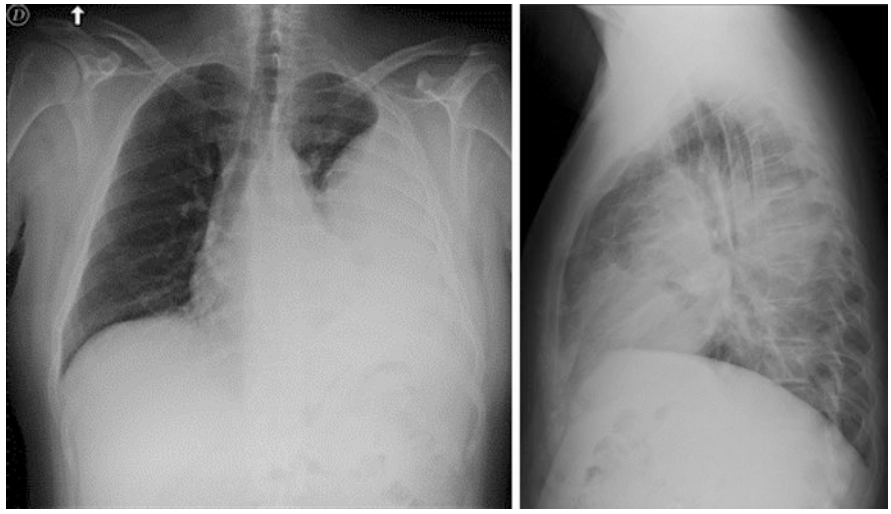
Here, we present the case history of a 51-year-old male non-smoking labourer, an asthmatic and a diabetic on insulin therapy; 5 days before admission, he developed a high fever (39 °C) and cough. The general practitioner prescribed antibiotic therapy with levofloxacin; in the following days, the patient also presented left chest pain and dyspnoea; the fever persisted and the patient was sent to the emergency department, where a chest X-ray was performed (◘ Fig. 9.1), which highlighted an opacification of the left hemithorax from pleural effusion. The patient was transferred to our ward.

On the patient's admission to our ward, physical chest examination confirmed dullness to percussion with absent fremitus and no breath sounds on the left; urgent blood tests were requested, and a chest CT scan was promptly performed (◘ Fig. 9.2), which documented the presence of a large and loculated left pleural effusion without associated parenchymal lesions. See the flow chart in ◘ Fig. 9.1 in the chapter on infectious pleural effusion.

Haematological tests showed neutrophilic leukocytosis. Antibiotic therapy was initiated with 4 g of piperacillin/0.5 g of tazobactam administered every 8 hours.

The following morning, the patient was taken to the endoscopic room for thoracentesis. An ultrasound of the chest was performed which confirmed the presence of a complex, corpuscular and partially multi-loculated pleural effusion. Under ultrasound guidance, an exploratory puncture was performed with aspiration of pus and the ensuing confirmation of pleural empyema. It was therefore a case of 'primary empyema'. The



◘ **Fig. 9.1** Chest X-ray at the time of admission to the emergency department

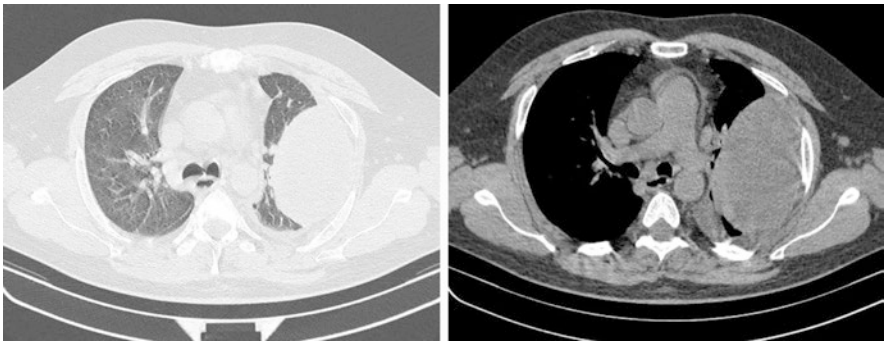


Fig. 9.2 CT scan of the chest: loculated left pleural effusion

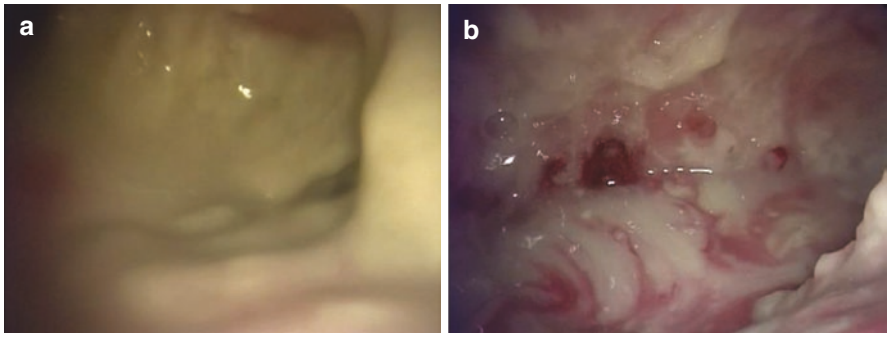


Fig. 9.3 (**a**) On the left, endoscopic picture at the start of thoracoscopy and (**b**) On the right, after repeated washing with Urokinase and saline solution and aspirations

thoracentesis was interrupted, and we immediately proceeded to a medical thoracoscopy. Medical thoracoscopy was carried out in the endoscopy suite; the patient was placed on his healthy side under local anaesthesia with 2% lidocaine and moderate sedation using midazolam, according to the technique described by Boutin [1] using a rigid 7-mm trocar (Wolf).

The endoscopic picture was characterised by the presence in the pleural cavity of abundant dense pus, which created multiple loculations (Fig. 9.3a). Repeated aspirations and lavages were performed with Urokinase diluted in saline solution, and large clusters of pus were mechanically removed with forceps. These endoscopic manoeuvres took time and patience, but in the end, we obtained a fairly good cleaning of the pleural cavity and were able to explore fairly well the pleural cavity and the parietal pleura, which showed as being markedly thickened, partially covered with a non-removable pus layer and of a clearly inflammatory appearance (Fig. 9.3b). At the end of the cleaning procedure, biopsies

of the parietal pleura were performed, which confirmed the diagnosis of suppurative inflammation. Boutin [2] reports that in 1 out of 188 cases of malignant pleural mesothelioma the clinical onset was an empyema, and therefore, the execution of pleural biopsies is always mandatory in these situations. At the end of the examination, the instrument was removed, and a 24-French drain was inserted and connected to underwater seal suction with a negative pressure suction of 20 cm H_2O, and medication was performed. The patient had no complications resulting from thoracoscopy.

The cytological examination of the pleural fluid revealed that it was highly neutrophil-predominant. The microbiological examination of the pleural fluid led to the isolation of *Streptococcus gordonii* sensitive to piperacillin. It is a Gram-positive, facultatively anaerobic bacterium, which belongs to viridans streptococci, and is generally an opportunist frequently present as a saprophyte in the oral flora and may be responsible for bacterial endocarditis [3]. On the basis of this datum, we subjected the patient to an echocardiography, which resulted negative; a dental examination and an orthopantomography were also performed, which were negative.

Since there was no parenchymal involvement, we hypothesised that the pleural infection had occurred by a haematogenous route, although blood culture performed three times was negative. Antibiotic therapy initiated on an empirical basis was confirmed.

Few cases of pleural empyema caused by Streptococcus Gordonii have been reported in the literature [4, 5].

The day after the thoracoscopy, a three-day course of intrapleural therapy with Urokinase 100,000 IU was started, followed each time by washing with saline solution. Since, after the usual three days of therapy in accordance with our protocol, the radiological and ultrasound picture was still not satisfactory, and since with the lavages purulent-looking fluid continued to come out, intrapleural therapy with Urokinase was continued for another 3 days.

On the fourth day from the start of the antibiotic therapy, the patient was completely fever-free. The second cycle of Urokinase therapy was completed.

Fifteen days from admission, the drain was removed and the patient was discharged in excellent clinical condition with the radiological picture below (◘ Fig. 9.4).

At a subsequent clinical follow-up 30 days after the discharge, the patient was well.

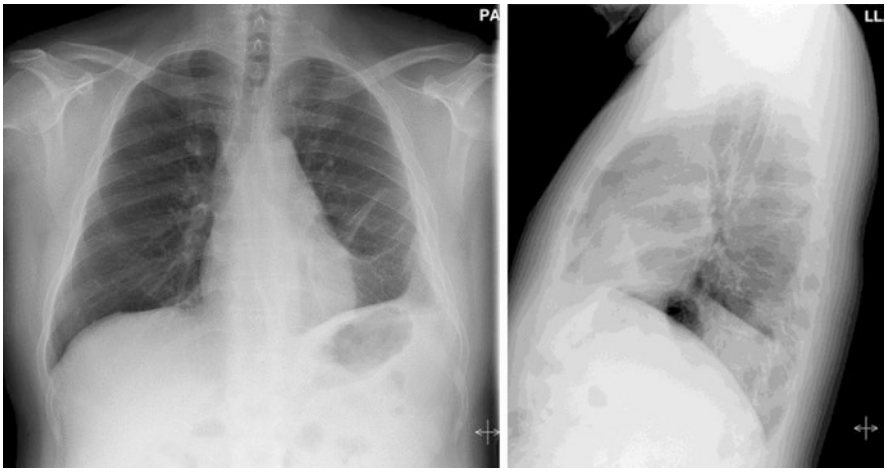


Fig. 9.4 Chest X-ray of the patient at the time of discharge

Conclusive Comments

- The presence of a complicated effusion and/or an empyema requires an urgent therapeutic strategy and a dedicated diagnostic-therapeutic path to be strictly followed.
- The Pulmonologist who manages a patient with infectious pleural effusion must have important skills in the field of Interventional Pulmonology.
- Chest ultrasound is an indispensable tool.
- The presence of multi-loculated effusion at the ultrasound prompted us to perform an immediate Medical Thoracoscopy, which allowed for a good cleaning of the pleural cavity.
- Interventional Pneumology provides all the tools to manage this type of patient correctly; in particular through Medical Thoracoscopy, used without hesitation at the outset, it is possible to successfully treat even severe cases.
- Correct antibiotic therapy is essential! What was the rationale for starting antibiotic treatment with levofloxacin? (See the chapter "Infectious pleural effusion": antibiotic therapy).
- The use of a fibrinolytic associated with pleural washings, preferably used at the initial stages of the empyema, accelerates the resolution of the picture and allows for healing without negative pleural outcomes (e.g. pleural thickening).

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