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Case Report

Pleural Empyema Associated to Mediastinal Collection: Tips for Perfect Chest Tube Drainage

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Abstract

Summary: Association of pleural empyema and mediastinitis is not exceptional and the etiologies can be multiple. The most frequent etiologies in our setting is pleural tuberculosis and pulmonary hydatid cysts ruptured in the pleural space. Concerning mediastinitis, the etiology is predominated by sternotomy after cardia surgery. The management is based on the antibiotic therapy, chest tube drainage and respiratory physiotherapy. The normal procedure in this association of diseases is to perform chest tube drainage for pleural empyema and mediastinal drainage for mediastinitis if there is a collection. In this case report, he was a patient of 20 years old who presents a pleural empyema associated to mediastinitis treated only by antibiotic therapy and chest tube drainage placed at the level of 8th intercostals right space, with added holes in the tube in order to raise the efficiency of this drainage.

Keywords: *Pleural Empyema; Mediastinitis; Drainage; Odontogenic Infection*

Introduction

Pleural empyema is still frequent in Morocco because of pulmonary tuberculosis and hydatidosis recorded as endemic diseases [1,2]. The cornerstones of management are antibiotic therapy, chest tube drainage, and respiratory physiotherapy. These procedures are performed in order to avoid the chronic stage of pleural empyema and to get a good ventilation of underlying lung. sternotomy for cardiac surgery remains the most frequent etiology of mediastinitis. However, cervical descending infection or abdominal ascending infection can be an origin of mediastinitis. The management of this disease is firstly by antibiotherapy and mediastinal drainage, and the surgical approach is indicated after the failure of medical treatment. In our case, we describe a patient who had a pleural empyema associated to descending necroziting mediastinitis treated only by antibiotherapy and thoracic drainage.

Case Report

This is a 20-year-old patient, who has smoked for 5 years, and who consults the emergency room for chest pain with dyspnea, associated with a fever with deterioration of his general condition. The patient benefited a week before this consultation from a tooth extraction. The clinical examination revealed subcutaneous cervical emphysema, with a distended right hemithorax, without any vesicular breath sounds in auscultation. The infectious assessment objectified a C-reactive protein at 389 mg/l and white blood cells at 19880/mm^3 with polynuclear neutrophils at 17000/mm^3. The chest x-ray showed right basithoracic opacity with a pretracheal level (Figure 1). The patient

subsequently underwent a cervico-thoracic CT scan showing subcutaneous cervical emphysema with pleural empyema sitting on an anterior mediastinal abscess (Figure 2). The patient was hospitalized in a pulmonology department and put on broad-spectrum antibiotic therapy. The decision is to drain the patient in on the right side in order to evacuate the right pleural empyema, and after bring the patient to the operating room for surgical drainage of his mediastinal abscess. This chest tube drainage (Figure 3) was carefully introduced at the level of the 8th intercostal space, on the anterior axillary line, bringing back 3 liters of purulent fluid. The evolution was marked by the total disappearance of the right pleural empyema and mediastinal abscess on the chest X-ray (Figure 4). The decision was to complete with a thoracic CT scan to be reassured of the absence of mediastinal collection (Figure 5). The follow-up of the patient was marked by a good clinical and radiological evolution.

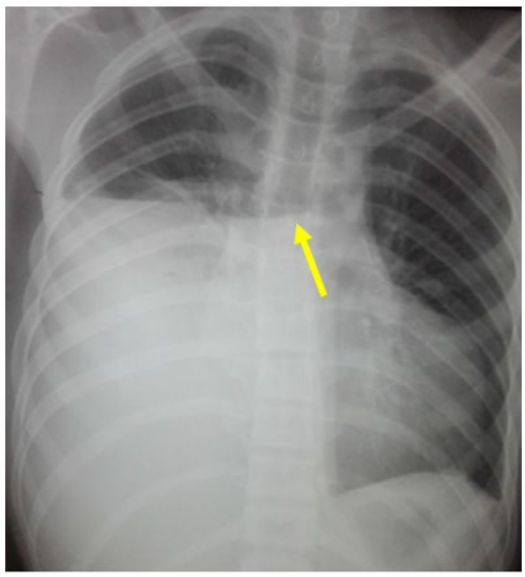

Figure 1: *Chest X-ray showing right basithoracic opacity with a pretracheal level (yellow arrow).*

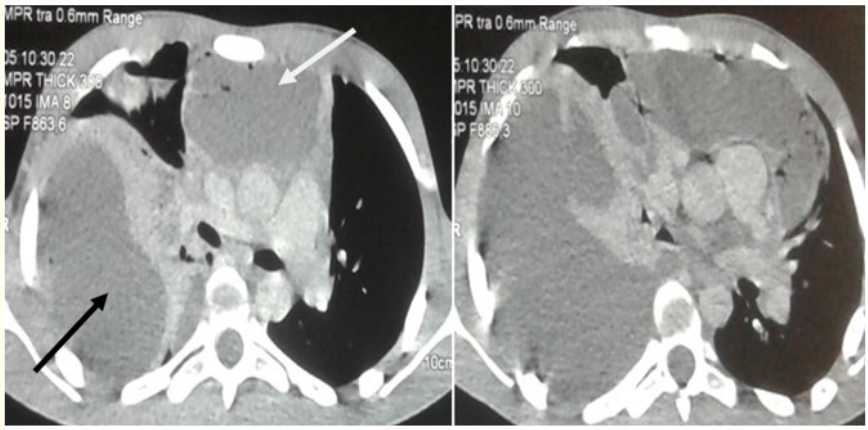

Figure 2: *Thoracic CT showing a right pleural empyema (black arrow) associated with an anterior mediastinal abscess (white arrow).*

Figure 3: *Chest tube drainage performed below the nipple line (yellow arrow).*

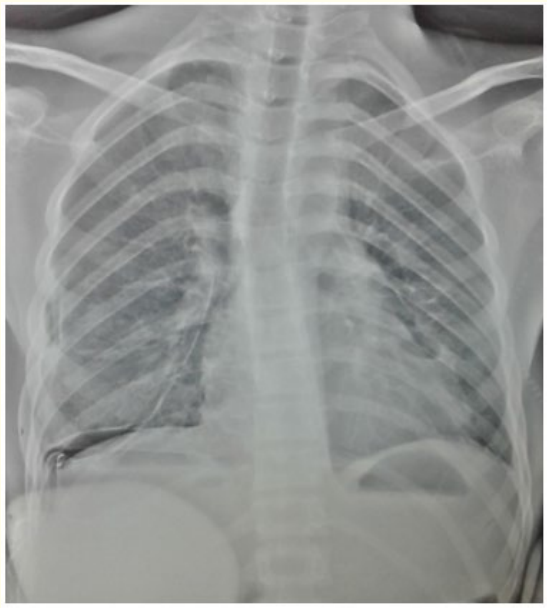

Figure 4: *Chest X-ray after drainage showing the disappearance of the right pleural empyema and the pretracheal level.*

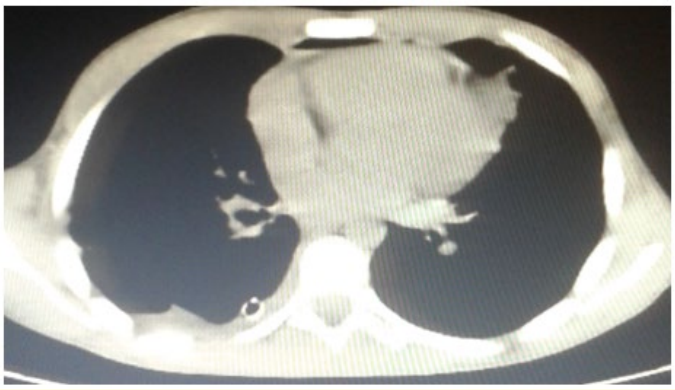

Figure 5: *Thoracic CT after chest tube drainage showing the disappearance of pleural empyema and the anterior mediastinal abscess.*

Discussion

Pleural empyema defined by the presence of purulent fluid in the pleural space has multiple etiologies. In our setting, tuberculosis and hydatidosis are the predominant etiologies. The management is based on the chest tube drainage, respiratory physiotherapy and antibiotherapy. The goal of this management is to avoid the evolution to chronic stage of pleural empyema where the surgery by decortication is the only treatment to have a perfect ventilation of the underlying lung [3,4]. In other side, mediastinitis is caused essentially by three etiologies: mediastinitis after sternotomy, cervical origin (descending necroziting mediastinitis), and rarely ascending necroziting mediastinitis. Despite the intensive care management, mediastinitis remains associated to high rate of mortality and morbidity [5]. The cornerstones of therapy are an effective antibiotherapy and mediastinal drainage. The surgery is discussed after failure of this medical management.

Our case report discusses pleural empyema associated to mediastinitis secondary to odontogenic infection. The first approach after performing thoracic CT scan is to drain the pleural empyema, and after drain the mediastinal abscess in operating room. However, after chest tube drainage, the evolution was marked by disappearance of this mediastinal collection and the transcervical drainage in the operating room was avoided, which means that this collection was connecting with pleural empyema.

The normal chest tube drainage is performed into the triangle limited by the anterior and posterior axillary lines, and below by the line passing at the level of nipples corresponding to the fourth intercostals space where the diaphragm can be arrived at expiration [6]. As a result, the chest tube drainage below this level can be complicated by touching the diaphragm. For this reason, and because the pleural empyema of this patient achieves the basi-thoracic region, the chest tube drainage was performed by a thoracic surgeon in order to drain the patient below the nipple line in order to get a perfect drainage. In addition, add others holes in the tube allow raising the volume of drained liquid [7].

Conclusion

The essential messages of this case report are:

- Odontogenic infection is not exceptional etiology of mediastinitis and must be taken into consideration.
- Begin always by chest tube drainage in front of pleural empyema associated to mediastinal collection.

- Chest tube drainage must be performed preferably by a thoracic surgeon that can drain at any place in thoracic region, even below the fourth intercostal space (corresponding to the nipple line).
- Add mores holes in the tube of drainage allow raising the volume of evacuated liquid.

Conflict of Interest

The authors declare that they have no conflict of interest with this manuscript.

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Author Contributions

All the authors contributed substantially to the authorship of this manuscript.

Ethics

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent

Written informed consent was obtained from the patients for publication of this manuscript and any accompanying images.

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