

Open window thoracostomy for a chronic calcified pleural empyema in the setting of a closed chest trauma

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Abstract

This case report is a chronic calcified pleural empyema in a patient who suffered a closed chest trauma 30 years ago. The first goal is to demonstrate how the closed chest trauma caused a bronchopleural fistula of the calcified pleural empyema, since the patient began to report continued purulent sputum after his trauma with weight loss and the appearance of an air-fluid level in the chest CT scan (no pleurocutaneous fistula in the clinical examination). The second goal is to reveal the rule and the interest of an open window thoracostomy in the management of chronic calcified pleural empyema, since a decortication remains difficult to perform in cases like this one.

Keywords

Calcified pleural empyema, open window thoracostomy, bronchopleural fistula

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Introduction

Pleural empyema (PE) is defined as the presence of a purulent liquid in the pleural cavity. The etiology is predominated as tuberculosis that remains as an endemic disease in our country.¹ PE is characterized by three stages: an exudative stage, a fibrino-purulent stage, and an organizing or chronic stage. The management of PE is based on the chest tube drainage, antibiotic drugs, and respiratory physiotherapy. In the first two stages, surgery can be avoided if this management is well conducted. Therefore, in the organizing stage, this management is performed to prepare the patient for the surgery done by decortications.² When the surgery is not performed in the chronic stage, the evolution is to become a calcified pleural pocket with intercostal retraction and pleurocutaneous fistula, and the management becomes more difficult and takes time for the patient and the surgeon. In this case report, we present an example of a calcified PE and its management.

Case report

He is a 60-year-old patient, who presented an undocumented right lung problem 30 years ago, and a closed thoracic trauma following a fall from a height of 3 meters with reception on

the left hemithorax causing in him a left hemothorax with fractures of ribs. The patient received posterior thoracic drainage with good clinical progress (Figures 1 and 2). Three months after his trauma, the patient begins to report purulent sputum, which was not present before, with unaccounted weight loss and without any fever or another respiratory signs. The clinical examination found a patient hemodynamically and respiratory stable, with pain on palpation in the posterior left hemithorax in relation to his rib fractures, while on the right side, no pain on palpation and no pleurocutaneous fistula. The patient underwent a chest CT scan which always objectified the calcified PE of the right side, with the appearance of an air-fluid level without flooding of the contralateral lung (Figure 3). The bronchial fibroscopy showed purulent sputum from the lower lobe bronchus without visualization of a bronchopleural fistula.

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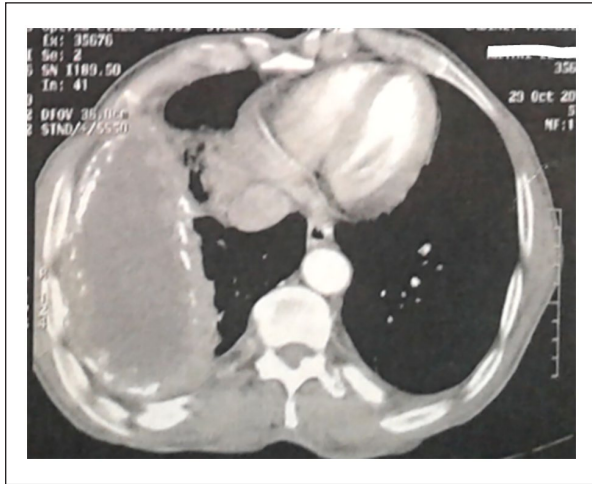


Figure 1. Mediastinal window of thoracic CT (realized after thoracic drainage) showing a calcified pleural empyema without an air-fluid level. Left side without hemothorax.

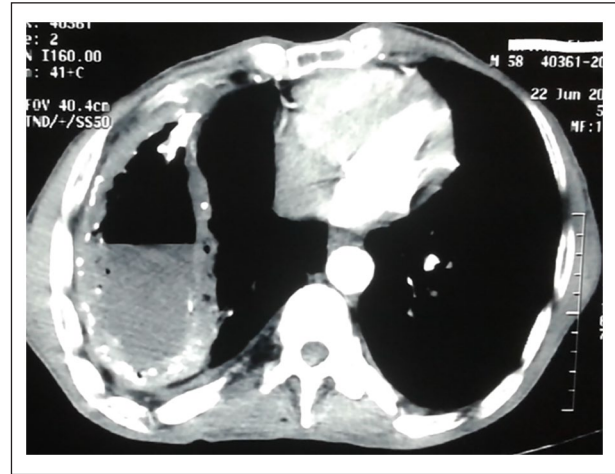


Figure 3. Mediastinal window of thoracic CT showing a calcified pleural empyema with an air-fluid level in favor of a bronchopleural fistula.

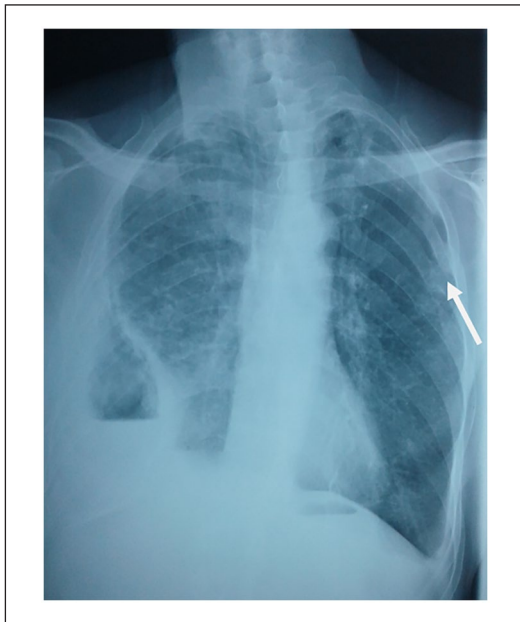


Figure 2. Chest X-ray showing a pleural empyema of the right side with an air-fluid level, associated with rib fractures on the left side (white arrow).

The surgical procedure was an open window thoracotomy (OWT) in the axillary region by resection of the middle arch (6–8 cm) of the fifth, sixth, and seventh rib (Figure 4). A bronchopleural fistula was found. This procedure is finished by suturing the cutaneous layers in the areas of pachypleuritis. The evolution is still now good and the patient does not present any purulent sputum. Three to six month after, we will perform a myoplasty with latissimus dorsi muscle, expecting that the OWT will be small in size and will be completely sterile.

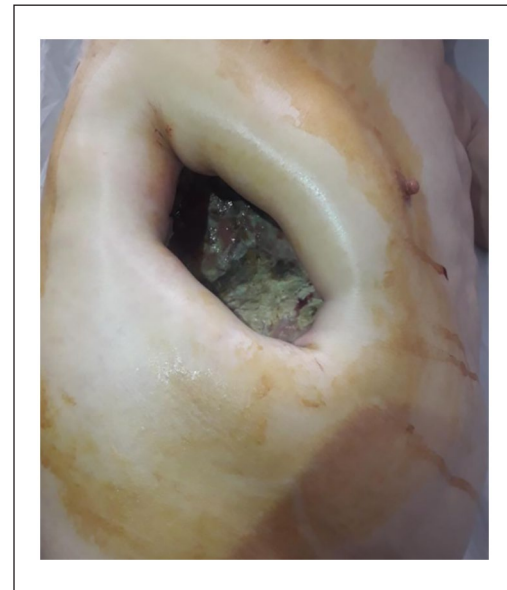


Figure 4. Open window thoracotomy for a calcified pleural empyema.

Discussion

In this case report, the patient has a chronic calcified PE that was asymptomatic before having closed chest trauma (no chest pain, no purulent sputum, no hemoptysis, no weight loss). Three months after his chest trauma, the patient began to report a purulent sputum and weight loss. These signs are explained clinically by the appearance of a bronchopleural fistula, and radiologically by an air-fluid level revealed by the thoracic CT scan (no pleurocutaneous fistula in the clinical examination that can explain the air-fluid level appearance). When we have a chronic and calcified PE in a patient

with advanced age, and no respiratory signs or other symptoms, the approach is only to follow-up the patient, without any surgery because of the surgical risks (high blood loss). Therefore, patients with young age who are symptomatic have the benefit of surgery especially in the presence of bronchopleural fistula. In a general way, decortication is the basic surgical intervention in chronic PE, allowing the release of the underlying lung by removing the thick pachypleuritis in order to have correct ventilation. This surgical procedure is associated with an acceptable blood loss. However, in chronic calcified PE, decortication remains challenging or even impossible to be done, because of the presence of a thick calcified pachypleuritis and the risk of high blood loss.³ So, the only therapeutic option in these cases is an OWT especially in the presence of associated bronchopleural fistula. This surgical procedure allows an effective packing, serial dressing changes, and debridement, until we have a sterile cavity. OWT is also the best therapeutic option in face of post-pneumonectomy empyema associated with a bronchopleural fistula.⁴ The timing for the closure of this OWT varies from 3 weeks to approximately 1 year.⁵ The filling is most often realized by latissimus dorsi muscle that must not be cut when we perform OWT. For that, OWT must be done to patient with a good general condition, and must benefit of a high-protein high-calorie diet after the surgery.

Conclusion

Decortication is the main surgical procedure in front to an organizing PE. However, the best option in face to chronic calcified PE in patients with good general condition remains an OWT, especially when the patient is symptomatic and a bronchopleural fistula is associated.

Author contributions

All the authors contributed substantially to the authorship of this manuscript. I.I., F.Z.L., L.B., M.L., Y.O., and M.S. were directly involved in the patient's care.

Declaration of conflicting interests

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Ethical approval

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 patient for their anonymized information to be published in this article. Also verbal informed consent was obtained from a legally authorized representative for anonymized patient information to be published in this article.

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