Late Onset Post-Pneumonectomy Empyema: An Uncommon Complication In A Brazilian Amazon Man.

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Abstract

Post-pneumonectomy empyema (PPE) is an uncommon but possibly life-threatening condition. It has a strong association with bronchopleural fistula (BPF), which acts as a continued source of infection into the thoracic cavity and increases mortality. We describe the case of a Brazilian Amazon man that evolved empyema caused by Escherichia coli in the thoracic cavity associated with bronchopleural fistula 19 years after pneumonectomy. This case reinforces the importance of an early suspicion of PPE to avoid diagnostic delay and improve outcomes.

INTRODUCTION

Pulmonary complications after pneumonectomy are frequently cited as major causes of both morbidity and mortality. The most mentioned pathologic processes involved with worst outcomes in the post-pneumonectomy state are known to arise at the early postoperative period and include pneumonia, atelectasis, respiratory failure and prolonged mechanical ventilation[$_{123456}$]. Post-pneumonectomy empyema (PPE) is an uncommon but devastating complication with incidence reported to range from 0.8% to 15% in recent series, depending upon duration of postoperative follow-up[$_{78910}$]. It presents a high mortality rate (16.4%-71.2%) especially when associated with a large bronchopleural fistula[$_{711121314 15}$].

The aim of the present report is to describe the case of a Brazilian Amazon man that evolved empyema in the thoracic cavity associated with bronchopleural fistula 19 years after pneumonectomy.

CASE REPORT

A 55-years old man, born and residing in the Brazilian Amazonia, was admitted presenting a 3-weeks history of fever and chronic cough with purulent and fetid sputum in association with progressive dyspnea and right hemithorax pain. His past medical history was remarkable for a right pneumonectomy performed 19 years before the beginning of current symptoms due to massive hemoptysis secondary to pulmonary tuberculosis (Figure 1).

{image:1}

On general clinical assessment, the patient was febril, tachypneic, tachycardic and with muco-cutaneous paleness. Physical examination of the respiratory system revealed absence of pulmonary murmur and dullness during percussion on the right hemithorax and vicariance of pulmonary murmur on the left hemithorax. Blood laboratory exams showed leukocytosis with neutrophilia. Chest radiography suggested the presence of a fluid collection on the right hemithorax (Figure 2).

{image:2}

Diagnostic thoracosentesis revealed a purulent material that was sent bacteriologic culture. As no other structural abnormality was identified, a diagnosis of post-peumonectomy empyema (PPE) was made and the symptoms were attributed to it. Based on this diagnosis, right chest tube drainage was immediately instituted with evacuation of thepurulent material. Empiric systemic antibiotic therapy was initiated with ceftazidime 6g/day in three divided doses and clindamycin 1.8g/day in three divided doses and was maintained during 21 days. Culture of the purulent material obtained during thoracosentesis yielded Escherichia coli as the causative agent sensitive to ceftazidime, cefotaxime, ciprofloxacin and gentamicin. After

clinical stabilization of the patient, broncoscopy was performed and showed a partial dehiscence of the surgical suture on the right bronchus resulting in a small bronchopleural fistula. Open-window thoracostomy was then performed using the Eloesser technique without complication (Figure 3).

{image:3}

Two weeks later, a new broncoscopy revealed no BPF. The patient had an uneventful recovery and was discharged in good clinical conditions.

DISCUSSION

Since the German surgeon Rudolph Nissen described the first successful pneumonectomy for benign disease performed in 1931[1617], empyema and bronchopleural fistula (BPF) after pneumonectomy have continued to represent a diagnostic and therapeutic challenge for the pneumologist and thoracic surgeon. Post-pneumonectomy empyema (PPE) is an uncommon but possibly life-threatening condition with incidence reported to range from 0.8% to 15% in recent series, depending upon duration of postoperative follow-up[78910]. It presents a high mortality rate (16.4%-71.2%) especially when associated with a large BPF[71112131415]. Because the symptoms of PPE are nonspecific, and tests are often insensitive, clinicians must have a high level of suspicion, especially regarding late-onset empyema.

Late-onset PPE can evolve from several mechanisms. It usually develops as a result of hematogenous dissemination from a distant source, such as infected teethes, pneumonia, appendicitis and dental work[181920]. However, it also can occur following direct contamination of the pleural cavity secondary to bronchopleural or esophagopleural fistulas[1821]. According to Ng et al (2005)[22], PPE has a strong association with BPF, which increases significantly the mortality rate. Therefore, broncoscopy should be routinely performed to identify any BPF and estimate its size. In our patient, broncoscopy revealed a partial dehiscence of the surgical suture on the right bronchus resulting in a small BPF. However, a second broncoscopy carried out after clinical and surgical stabilization of the patient revealed no BPF. We believe that a spontaneous closure of the fistula occurred.

Clinically, PPE can present in days to years after the initial surgery, however late-onset empyema may be arbitrarily defined as one which first produces any clinical manifestation more than three months after the resection in a patient whose immediate postoperative course was uneventful[18]. A high index of suspicion is needed when diagnosing PPE at its late presentation because signs and symptoms associated with it are usually nonspecific (eg, weight loss, anorexia, weakness, and low-grade fever), making the diagnosis more difficult[23]. Imaging studies can often be helpful in suggesting the diagnosis, however aspiration of the purulent material from the pleural cavity is frequently necessary to confirm the clinical suspicion[2123]. In the present report, the patient referred fever and chronic cough with purulent sputum in association with progressive dyspnea and right hemithorax pain. Chest radiography showed a right fluid collection and aspiration revealed a purulent material. The clinical manifestation started only 19-years after pneumonectomy.

The most common organisms causing PPE are Staphylococcus aureus and Pseudomonas aeruginosas[2324]. Pairolero et al (1990)[25] founded multiple organisms infection in 49% of the patients. In our case, purulent material obtained by diagnostic thoracosentesis yielded Escherichia coli as the causative agent sensitive to ceftazidime, cefotaxime, ciprofloxacin and gentamicin.

Once PPE is diagnosed, immediate drainage of the post-pneumonectomy space and empiric broad-spectrum systemic antibiotics are frequently the initial therapeutic approach[23]. Further treatment depends on whether a fistula is present, the overall medical condition of the patient, the organism detected and the surgeon experience[2223]. In the present report, it was first performed close drainage for evacuation of the purulent material associated with systemic antibiotics (ceftazidime 6g/day in three divided doses and clindamycin 1.8g/day in three divided doses) that were maintained during 21 days. After clinical stabilization of the patient, open-window thoracostomy was performed using the Eloesser technique. The patient had an uneventful recovery.

In conclusion, the present report reinforces the importance of an early suspicion of PPE to avoid diagnostic delay and improve outcomes. We also highlight that, although infrequently seen in association with PPE, E. coli is a possible agent responsible to the infectious process and must be considered when choosing an empiric antibiotic scheme.

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