BENIGN EMPTYING OF THE POST-PNEUMONECTOMY SPACE: WHERE DID THE FLUID GO?

ESVAZIAMENTO BENIGNO DO ESPAÇO PÓS-PNEUMONECTOMIA: PARA ONDE FOI O FLUIDO?

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ABSTRACT

The authors present the case of a patient submitted to a left pneumonectomy, with a sudden postoperative drop in the normal intrapleural effusion, while no other clinical features, and with no fistula identified. This rare entity described as a benign emptying of the post-pneumonectomy space (BEPS) has a not well-established aetiology and is suspected to be caused by either a lesion in the diaphragm or chest wall, or a microbronchopleural fistula. Given its benign course, a close monitoring and a high level of suspicion is warranted to avoid unnecessary and invasive interventions.

Keywords: *BEPS, post-pneumonectomy, pleural effusion.*

RESUMO

Os autores apresentam o caso de um doente submetido a pneumectomia esquerda, com uma súbita redução do normal nível hidroaéreo intrapleural, sem outras alterações clínicas e sem fístula identificada. Esta entidade descrita como esvaziamento benigno do espaço pós-pneumectomia (BEPS) não tem uma etiologia bem estabelecida, suspeitando-se de uma possível lesão diafragmática, da parede torácica ou de uma micro-fistula broncopleural. Dado a curso benigno desta entidade, uma monitorização apertada e um elevado nível de suspeição são necessários, de forma a evitar intervenções invasivas desnecessárias.

Palavras-chave: *drenagem, pós-pneumonectomia, derrame pleural.*

INTRODUCTION

Whenever a sudden drop in intrapleural effusion occurs after a major pulmonary resection, a bronchopleural fistula is suspected. It often presents with a productive cough due to oral expulsion of pleural fluid as the fistula allows direct communication between the thoracic space and bronchus. An empyema usually follows due to contamination of bacterial flora from the bronchus into the usually aseptic pleural space.[1] Still, sometimes a sudden drop in the pleural fluid

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occurs in a clinically stable patient, with a usually benign evolution.

CASE REPORT

A 67-year-old man with an adenocarcinoma of the left upper lobe, staged as a cT2,N2,Mx, was submitted to a left pneumonectomy due to an invasion of the lower lobe and the proximity to the hilum, which made isolation of the lobar vessels impossible.

The patient made an uneventful recovery, but on the 13th postoperative day, he presented with a sudden respiratory failure with need for invasive ventilation, but hemodynamically stable.

Sputum cultures were positive for *Klebsiella pneumonia* and chest x-ray and CT-scan (figure 1, figure 3) showed a pneumonia spanning the entire right upper and lower lobes.

On a routine chest x-ray on the 15th postoperative day a sudden drop on the left pleural effusion level was noted (figure 2), with no worsening of the ventilatory or hemodynamic status and no visible loses. No fistula of the bronchial stump was identified on bronchoscopy, and CT-scan showed only an empty left pleural cavity (figure 4).

The patient's condition gradually worsened, with an inability to wean from the ventilator, no clinical or analytical improvement and the patient died on the 63rd postoperative day.

Figure 1 – **Postoperative chest x-ray showing a normal pleural effusion after pneumonectomy.**

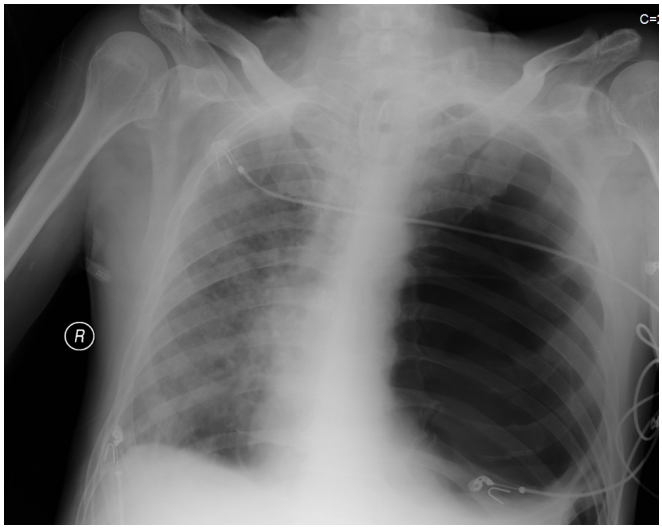

Figure 2 – **Abnormal chest x-ray after pneumonectomy, with no pleural effusion, in an asymptomatic patient.**

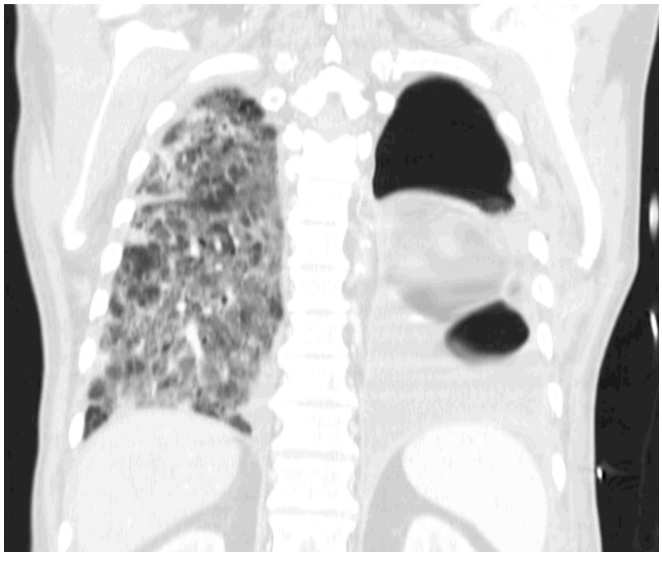

Figure 3 – **Due to a pneumonia with respiratory failure a chest CT was performed, showing the remaining lung with an extensive pneumonia and a left pleural effusion.**

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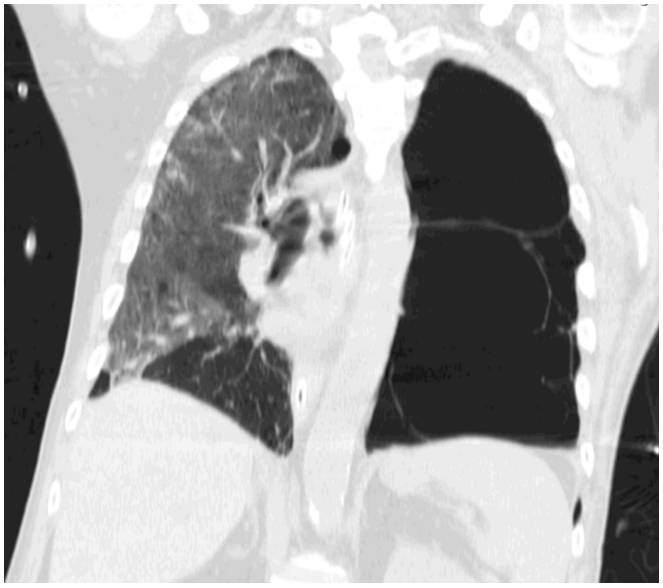

Figure 4 – **After the chest x-ray showed no left pleural effusion and as a follow-up a new chest CT scan was performed, showing the ongoing pneumonia, and an empty left pleural cavity.**

DISCUSSION

This rare entity was first described in 2011 by Merritt et al. in a subset of patients who presented inconsistently with a sudden drop in the pleural fluid level following pneumonectomy[2] and coined the term benign emptying of the post-pneumonectomy space (BEPS). These same authors presented the largest series of confirmed BEPS, with seven cases, with, to the best of our knowledge, no more than 20 cases described.

Several mechanisms were proposed to explain this entity. Kanakis et al. theorised the existence of a transient bronchopleural fistula that closes spontaneously. This causes the negative pleural pressure to equalize that of the atmosphere, the hydrostatic balance to be reversed and fluid to be absorbed through the parietal pleura. Another possible explanation is a defect in the diaphragm, either congenital, a porous diaphragm syndrome[3], or created at the time of the surgery, being more likely when an extrapleural pneumonectomy is performed.[2,4].

Similarly, a less-than-watertight chest wall closure, would allow the fluid to enter the soft tissues of the chest wall.[2,4] Finally, Gelvez-Zapata et al. described a case of a drop in air–fluid level likely due to severe dehydration.[5]

Given the case of a septic patient with a sudden drop in the intrapleural effusion level, and even in the setting of a contralateral pneumonia, the hypothesis of a bronchopleural fistula could not be warded of. Still, upon review, the patient was stable, ventilating well and had had no vomits. Bronchoscopy and CT scan showed no fistula, and the surgical team had not seen or caused any diaphragmatic lesion.

The question that should be asked is at what point is a wait and watch approach valid?

The authors believe that even though BEPS is a diagnosis of exclusion, this point is just before a surgical reexploration.

CONCLUSION

BEPS is characterized by a sudden drop in the pleural fluid following pneumonectomy, in an otherwise clinically stable patient.

It is a diagnosis of exclusion and when suspected a wait and watch approach is valid, given the usually benign evolution.

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