

Postoperative deep wound dehiscence of thoracotomy with isolation of *Corynebacterium tuberculo- stearicum*: surgical site infection or colonization?

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Abstract. – OBJECTIVE: Infections with *Corynebacterium tuberculo-
stearicum* are very rare as in most of the cases its isolation is associated with tissue colonization rather than infection.

CASE REPORT: An 80-year old female patient was sent to the consultation hour of thoracic surgery for evaluation of a symptomatic persistent unilateral pleural effusion of her right lung. The differential diagnosis included either the presence of a chronic pleural empyema or the presence of malignancy. After excluding a malignancy, a decortication of the middle and lower lobe was performed, as the two lobes could not significantly re-expand. The course was further complicated by the presence of two-times deep wound dehiscence, which made necessary a re-thoracotomy. The microbiologic results of the biopsies revealed the presence of only *Corynebacterium tuberculo-
stearicum* with an initially questionable clinical relevance. As soon as the antibiotic treatment for *Corynebacterium tuberculo-
stearicum* began, together with the use of vacuum-assisted therapy (VAC), the closure of the thoracotomy was accelerated.

CONCLUSIONS: Clinically relevant surgical site infections with *Corynebacterium* species in thoracic surgery are difficult to distinguish. Nevertheless, its combined surgical and antibiotic treatment is warranted when its relevance is questionable due to its resistance to broad-spectrum antibiotics as well as to its potential for the complicated clinical course.

Key Words:

*Corynebacterium tuberculo-
stearicum*, Surgical site infection, Pleural empyema, VAC therapy.

Introduction

Infections with *Corynebacterium tuberculo-
stearicum* are very rare. We describe the case of a patient with isolation of *Corynebacterium tuberculo-
stearicum* with initially questionable clinical relevance to a surgical site infection.

Case Report

An 80-year old female patient was sent to the consultation hour of thoracic surgery for evaluation of a symptomatic persistent unilateral pleural effusion (Figure 1) of her right lung. The patient was hospitalized 2.5 months before the present consultation because of left lower extremity acute ischemia due to embolic occlusion of the left popliteal artery after diagnosed atrial fibrillation. The patient had a diagnosed factor V Leiden mutation and the course was further complicated after she had suffered a bilateral pulmonary embolism and a post-infarct pneumonia in the lower lobe of her right lung. Moreover, the patient was hospitalized in the Intensive Care Unit after experiencing an acute biventricular decompensated heart failure. Control chest X-ray showed bilateral pleural effusions, which, however, were not dignified as imperative to drain and were subsequently imputed more to the heart failure. The patient received broad-spectrum antibiotics, a therapy for heart failure. She was therapeutically anti-coagulated and later discharged. Under diuretic therapy, the

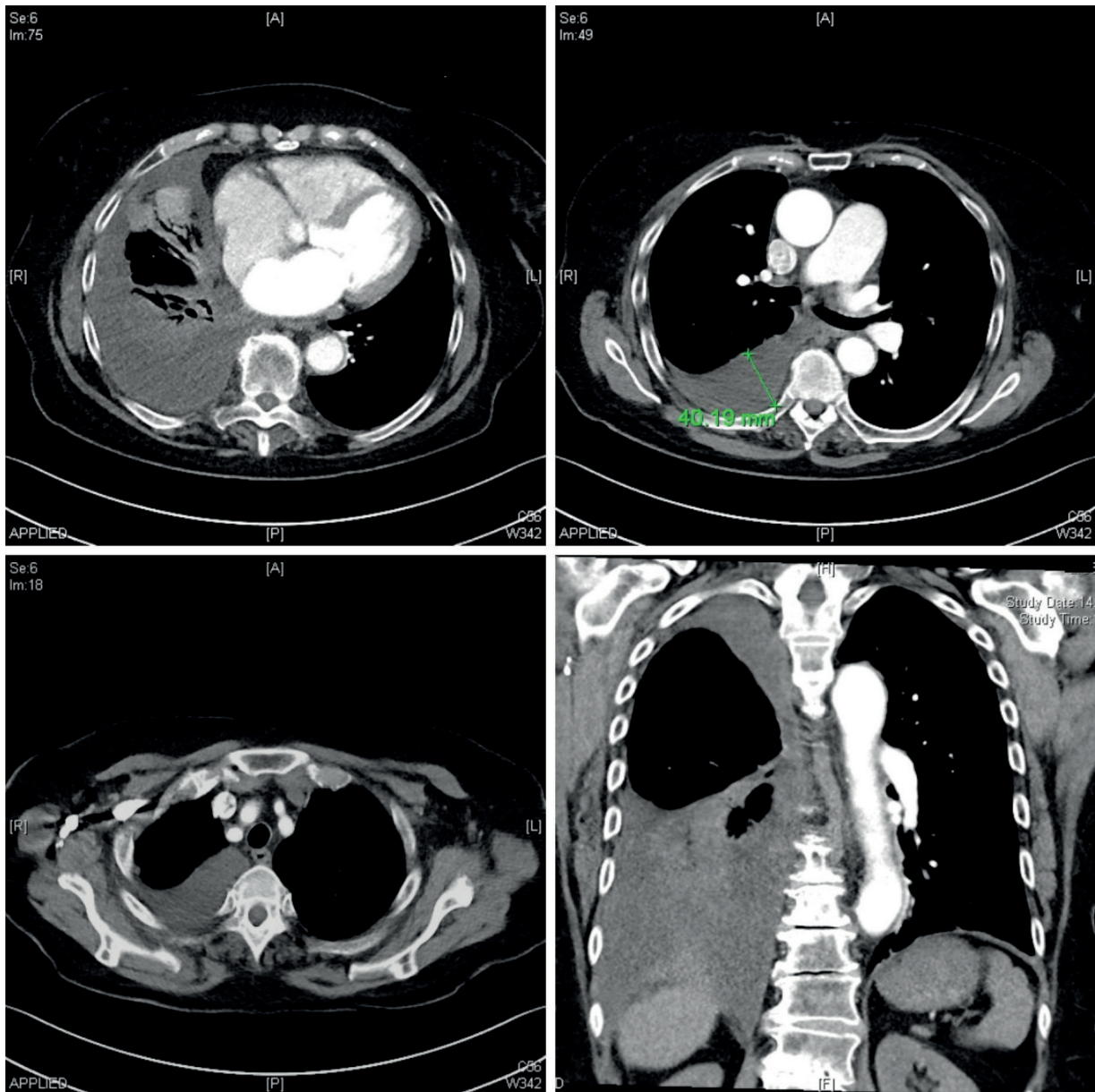


Figure 1. Illustrated pleural effusion in axial and coronal planes.

left pleural effusion reduced significantly until it was gone, but the right pleural effusion remained and it partially had slightly increased. As the transthoracic echocardiography course showed a normal pump function of the heart, the patient was discharged; however, she was still experiencing a remaining dyspnea (New York heart Association Stage II) and she was sent to our consultation hour.

CT scan was performed and revealed a consolidation of the right lung that was compatible

to the history of post-infarct pneumonia. The differential diagnosis included mainly either the presence of a chronic pleural empyema or the presence of malignancy. In the context of the dyspnea, the patient was offered a right video assisted thoracoscopy (VATS) for the evacuation of the effusion and for further diagnostic purposes. Intraoperatively, the right lung could not re-expand due to extensive fibrosis and less due to liquid collection. Moreover, inspection suggested ischemic changes of the middle and

lower lobe. Multiple biopsies revealed the presence of fibrotic tissue with inflammatory changes but excluded malignancy. Thereafter, a decortication was performed. By suspicion of a chronic pleural empyema grade III the patient was treated empirically with intravenous ampicillin/clavulanic. However, the microbiologic results of the biopsies did not reveal specific findings. Six days later, a complete wound dehiscence of the thoracotomy occurred and a rethoracotomy was performed. Extended fibrin collection was presented intra- and extra thoracic. The microbiologic results (intra- and extra thoracic biopsies) after the wound dehiscence revealed only the presence of *Corynebacterium tuberculostearicum* that demonstrated resistance to penicillin, ceftriaxon, meropenem and erythromycin but was, however, sensible to vancomycin, gentamicin, linezolid and daptomycin. The presence of *Corynebacterium tuberculostearicum* was attributed at first to colonization. After the wound dehiscence, the antibiotic therapy was escalated to piperacillin/tazobactam to cover the usual spectrum of the pleural empyema, but a second deep wound dehiscence was manifested. The patient was treated additionally with vancomycin to cover the *Corynebacterium* spectrum. Based on the extended presence of fibrin, a closure of the thoracotomy was denied and a VAC (vacuum assisted closure)-treatment was applied intra-thoracically and extra-thoracically for one week. Thereafter, a closure of the thoracotomy was definitively performed and twenty-seven days after the first wound dehiscence, the patient was discharged.

Discussion

Corynebacterium species colonize normally the skin and mucosal surfaces. In the literature little evidence is provided about their clinical relevance to surgical infections. Hinic et al¹ described the isolation of *Corynebacterium tuberculostearicum* in a retrospective analysis of 18 patients. These organisms were multiresistant to at least one antimicrobial agent in different categories but were, however, susceptible to Vancomycin. These patients were previously treated with broad-spectrum antimicrobial agents, but only in seven of them there was a clinically relevant infection according to the CDC criteria². Fifteen out of eighteen

patients had a history of extensive surgery, and only seven of them had a clinic relevant surgical site infection according to the criteria described.

Regarding the present patient, at first, it was unclear if the deep wound dehiscence could be attributed to a relevant deep surgical wound infection with *Corynebacterium tuberculostearicum* or to a persistent typical pleural empyema. The common microbiological spectrum of a pleural empyema includes *streptococcus pneumoniae*, *streptococcus anginosus* group (anginosus, constellatus, intermedius), other *streptococci*, *staphylococcus aureus* and lastly anaerobic and gram negative, which are often difficult to identify in pleural cultures to a rate of 40%; therefore, an empirical treatment is warranted³. The repeated biopsies however, revealed only *Corynebacterium tuberculostearicum*. The isolation of *Corynebacterium* could be clinically relevant to the deep surgical infection. On the other hand, according to the data presented above, its colonization would be also compatible to the patient's profile that received for a longer period of time antibiotics due to her first hospitalization after suffering acute lower extremity ischemia and post-infarct pneumonia, as well as during her second hospitalization after undergoing extensive decortication. The patient received empiric antibiotics for a pleural empyema, which were further escalated after the first wound dehiscence, but she manifested a second deep wound dehiscence despite the escalation of antibiotics. Only after the initiation of vancomycin and the VAC therapy, the closure of thoracotomy was successful. Based on these facts, it is alleged that the presence of *Corynebacterium tuberculostearicum* was clinically relevant.

The use of VAC treatment has been described for critical ill patients with pleural empyema grade II and III. Sziklavari et al⁴ compared in a retrospective series of 43 patients (Karnofsky index <50% with multimorbidity >3 diseases) the use of VAC therapy vs. the creation of an open thoracostomy and use of VAC for its closure for patients developing a pleural empyema. The researchers demonstrated high rates of chest wall closure using VAC during the same hospitalization. Moreover, the quality of life presents to be better and the re-infection rate might be lower. Concerning the present patient, the use of VAC-therapy accelerated the closure of the thoracotomy, suggesting that in such cases the use of VAC therapy is warranted.

Conclusions

Clinically relevant surgical site infections with *Corynebacterium* species in thoracic surgery are difficult to distinguish due to their possible colonization in patients treated long with broad-spectrum antibiotics. Nevertheless, the antibiotic treatment for these infections are resistant to broad-spectrum antibiotics microorganisms in unclear cases of questionable surgical site infections, and a combination with surgical therapy is warranted.

Conflict of interest

The authors declare no conflicts of interest.

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