Multiple lung abscesses secondary to a uterine empyema caused by an intrauterine device

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Figs. 1, 2 Computed tomography of the thorax showing consolidations in the lung parenchyma with some cavitation, leading to a suspicion of abscesses

Fig. 3 Computed tomography of the abdomen showing an empyema in the cavum uteri

Lung abscesses as a complication of pelvic inflammatory disease (PID) caused by an intrauterine device (IUD) have been described previously but are rare. Geddes et al. reported on a 31-year old woman with an copper IUD who developed septicemia with lung abscesses and encephalopathy caused by genital tract infection with *Staphylococcus aureus*. A vaginal swab and culture from the coil showed a similar antibiogram to that of the *S. aureus* cultured from the blood [1]. Systemic infection through the hematogenic spread of a microorganism caused by an IUD was previously described, with *Actinomyces* as the infectious organism [2, 3]. Multiple hepatic abscesses caused by *Streptococcus milleri* in association with an intrauterine device have also been described [4].

We report a case of a patient with multiple lung abscesses secondary to a uterine empyema caused by an intrauterine device with *S. milleri* as the causative agent.

An otherwise healthy, 29-year old woman visited the emergency room of our hospital with complaints of dyspnea and chest pain. The week before presentation she had flu-like symptoms with fever, a nonproductive cough and myalgia. Since then she experienced shortness of breath,

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orthopnea, and a sharp right-sided chest pain that worsened on breathing. She had an administrative job and smoked ten cigarettes a day. There were no known allergies aside from hayfever. She had not been abroad, had no pets, and no known tuberculosis contacts. There were no complaints of weight loss, joint pains, skin lesions or night sweats. Nobody in the community was sick.

The patient did not appear ill on physical examination. Blood pressure was 119/70 mmHg, pulse was 106 beats/min, oxygen saturation was 99% with room air, and temperature was 37.2°C (99.0°F). She had no lymphadenopathy and no signs of gingivitis. Cardiac examination revealed no heart murmurs, and breath sounds were normal without wheezing or rhonchi. Palpation and percussion of the thorax was not painful and was unremarkable. Examination of the abdomen and extremities showed no abnormalities. A pelvic exam was not performed.

Laboratory findings showed a CRP of 150 mg/l (normal 0–10 mg/l), leukocytosis $29 \times 10^9/\text{L}$ (normal $4\text{--}10 \times 10^9/\text{L}$), hemoglobin 6.9 mmol/L (normal 7.5–10 mmol/L), and a platelet count of $735 \times 10^9/\text{L}$ (normal $150\text{--}400 \times 10^9/\text{L}$). Creatinine, BUN, electrolytes and liver function tests were within their normal ranges. A chest radiograph taken on admission showed bilateral diffuse small consolidations and a small amount of pleural effusion on the right side. CT scan of the thorax showed consolidations in the lung parenchyma with some cavitation, leading to a suspicion of abscesses (see Figs. 1, 2). Blood cultures were taken and the patient was hospitalized. Bronchoscopy showed no endobronchial abnormalities. Gram stain of the bronchial secretion showed Gram-negative rods and Gram-positive rods and cocci. Because the patient developed fever, broad spectrum antibiotics (amoxicillin/clavulanic acid) were started. A transthoracic echocardiogram (TTE) showed no vegetations on the cardiac valves. Further anamnesis revealed that she had a faint pain in her lower abdomen and had experienced an increase in vaginal discharge for some time. She reported that she had an intrauterine device in situ for at least 9 years. A CT scan of the abdomen was made. An empyema was visible in the cavum uteri with the IUD still in place (see Fig. 3). The gynaecologist was consulted and transcervical curettage with removal of the IUD was performed. Macroscopically there was purulent discharge with necrosis. Finally, the blood cultures revealed *Streptococcus intermedius* (milleri group), and the genital cultures and bronchial secretions revealed *Streptococcus milleri*. Antibiotics were switched to amoxicillin. A PCR performed on a genital smear revealed the presence of *Chlamydia trachomatis* DNA. A new CT scan of the thorax and abdomen was performed. There were no other infectious or venous thromboembolic foci in the abdomen, and the intrapulmonary abscesses had not changed. The patient was discharged from hospital, and the antibiotics

were continued for a total of 4 weeks. After 6 weeks, at a control visit, the patient had recovered completely, and a control chest X-ray showed no infiltrative lesions.

Lung abscesses mostly occur as a complication of aspiration pneumonia, especially in patients with compromised consciousness, dysphagia or periodontal diseases like gingivitis [5, 6]. Bacteria are the most common pathogens—usually anaerobes found in the gingival crevices [6–8].

The most common aerobic bacteria that cause lung abscesses are *S. milleri* [9, 10].

The *Streptococcus milleri* group refers to a heterogeneous group of streptococci that consist of *Streptococcus anginosus*, *Streptococcus constellatus* and *Streptococcus intermedius* [9, 10]. They are widely distributed commensals, and are normally found in the mouth, upper respiratory tract, gastrointestinal tract and vagina [9, 11]. They are not only a well-known cause of lung abscesses and empyema; they cause similar lesions at other sites too. It is considered rare for them to spread to the lungs from the vagina [9]. A pulmonary infection with this microorganism may result in considerable morbidity and mortality [9]. Clinical manifestations of a pulmonary infection with *S. milleri* can range from indolent disease to rapid onset and progression with severe toxic symptoms [9].

Modern intrauterine devices cause little, if any, increased risk for PID. Pelvic inflammatory disease due to an intrauterine device is most strongly associated with the insertion process and with the patient's risk of acquiring a sexually transmitted disease (STD) [12].

The risk of infection is greatest in the first three weeks after insertion, and is uncommon thereafter [12–14], and does not increase with prolonged IUD use [12]. However, IUDs which have been in the uterus for a prolonged time have been associated with pelvic actinomyces [15].

Ninety percent of patients with lung abscesses can be cured using antibiotics [16]. However, mortality rates are about 75% in patients with underlying disease [17].

To our knowledge there has never been a report on a case of lung abscesses due to distant hematogenic spread from an IUD-related uterine empyema with *S. milleri*. This case illustrates that taking the patient's history and a review of systems is an important medical tool, and remains the cornerstone of practice.

Conflict of interest None.

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