chronic granulomatous disease and its relative rarity as a pathogen in other patient populations at risk for invasive aspergillosis.

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References


**Fusobacterium nucleatum** Emphyema Necessitans

Emphyema necessitans is a rare complication of pleural space infections that occurs when emphyema fluid spontaneously dissected into the chest wall from the pleural space. Most cases result from inadequate treatment of an emphyema and usually occur following a necrotizing pneumonia or pulmonary abscess. Anaerobic organisms are the predominant pathogens recovered in a majority of cases [1–3]. We describe a patient who presented with an exacerbation of pulmonary symptoms accompanied by a chest mass and was found to have emphyema necessitans due to *Fusobacterium nucleatum*.

A 57-year-old previously healthy white male smoker presented with a 4-week history of shortness of breath, nonproductive cough, and left-sided pleuritic chest pain. The patient had no immediate family and sought medical attention only reluctantly after encouragement by several concerned members of his rural community. On physical examination, the patient appeared malnourished, with poor dentition and digital clubbing. He had diminished breath sounds over the left posterior hemithorax with dullness to percussion and a 12 x 12-cm nonerythematous, fluctuant mass over the left anterior chest. Chest radiography revealed complete opacification of the left hemithorax with mediastinal shift. CT of the chest demonstrated a large, left-sided pleural effusion with multiple loculations, a thickened pleural rind, and dissection of the pleural fluid into the chest wall (figure 1A).

The patient underwent chest tube thoracostomy with drainage of >2 L of malodorous, purulent pus and subsequent collapse of the anterior chest mass. A gram stain showed thin, gram-negative bacilli. Cultures yielded *F. nucleatum* (figure 1B).

At decortication, a copious amount of purulent, thick inflammatory peel was found, rendering the left lung completely immobile. Operative success was limited. The patient was discharged home under treatment with levofloxacin and metronidazole and was doing well at his 6-month follow-up evaluation.

Emphyema remains a serious complication of infection within the pleural space. The evolution of an emphyema can be divided into 3 stages: exudative, fibropurulent, and organization [4]. The organization stage is characterized by the formation of an inelastic membrane, the pleural peel, which may encase the lung and restrict normal ventilatory function. At this stage, if untreated, the fluid may erode and drain spontaneously through the chest wall, termed emphyema necessitans, often leading to sepsis and multiple organ system failure [4].

Chest radiographs with lateral decubitus views are used initially to show the presence and loculation of pleural effusions. When more detailed information is required, CT is the most sensitive modality for differentiating pleural fluid from pleural thickening and for identifying focal pleural or chest wall abnormalities [5].

Anaerobic bacteria are common pleuropulmonary pathogens and are cultured in up to 76% of empyemas, usually the result of oropharyngeal aspiration in patients with periodontal disease [1]. This is a change from the preantibiotic era, when *Streptococcus pneumoniae* accounted for 60%–70% of cases [3]. Among the anaerobic bacteria isolated in 3 combined series examining nontuberculous pleural empyema fluid, *Fusobacterium* species were isolated in 13% of cases [2], with *F. nucleatum* being the dominant form found in lung infections [3].

Treatment of emphyema necessitans involves closed or open drainage of the pleural space to prevent fibrosis and to facilitate expansion of the lung. Appropriate antibiotic therapy is also a mainstay of treatment of emphyema necessitans. Anaerobic pulmonary infections generally respond well to antibiotic treatment combined with adequate drainage of empyemas. Patients with polymicrobial or resistant gram-negative pleural space infections with accompanying severe underlying disease have a
Figure 1.  
A. CT of chest of patient with empyema necessitans due to Fusobacterium nucleatum. B. Gram stain demonstrating typical needle-shaped fusiform gram-negative bacilli consistent with F. nucleatum. Magnification, ×600.
death rate of 40%–70%, whereas the mortality rate among otherwise healthy young patients varies from 2%–15%, depending on the severity and duration of their infection. Patients with inadequately drained empyemas often die [6].

With the advent of antibiotic therapy and advances in surgical technology, the clinical syndrome of empyema necessitans is rarely seen in current clinical practice, usually occurring when patients have limited access to or are reluctant to seek appropriate health care. The morbidity and mortality associated with pleural empyema are affected by the inciting pathogen, host defense capabilities, severity and duration of the infection, and adequacy and urgency of antibiotic therapy and drainage. Delay in diagnosis generally correlates with an adverse outcome [2].

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Acute Rhabdomyolysis during Treatment with Ofloxacin—A Case Report

Fluoroquinolones have an excellent safety record and good tolerability. The main adverse effects involve the gastrointestinal tract (~5%), skin (1%–2%, including phototoxicity), and CNS (<1%) [1]. We report a case of rhabdomyolysis that occurred shortly after the patient began taking ofloxacin.

In April 1998, 9 days after a 2-week stay in Cuba, a 54-year-old woman was admitted with a 1-week history of fever (40°C) and diarrhea (>10 stools daily, without blood or mucus). The day before admission, urine yielded Escherichia coli susceptible to amoxicillin, aminoglycosides, and fluoroquinolones. Intravenous ofloxacin therapy (400 mg/day) was started in the emergency room. She had been taking diltiazem for 9 years and also clonazepam for 2 years.

On admission to our department, she was afebrile, and abdominal palpation showed only mild pain of the left colon. The physical examination was otherwise normal. Measurements made 9 h after the first 200-mg intravenous dose of ofloxacin included the following values: WBC count, 14.0 × 10⁹/L, with 80% segmented neutrophils and no hypereosinophilia; C-reactive protein, 430 mg/L; creatinine, 185 mmol/L; and creatine phosphokinase, 2000 IU (normal, <200 IU). Cultures of blood and urine were negative, as were fecal culture and direct examination for bacterial pathogens and parasites. On the second hospital day, she had marked tenderness, predominantly over her proximal muscles, and complained of muscle weakness; arthralgia and tendonitis were absent. Sensory and motor nerve conduction studies were normal. On the fourth hospital day, her C-reactive protein level fell to 4 mg/L; her WBC count was normal but her creatine phosphokinase level had increased to 24,000 IU. Her lactate dehydrogenase level was 18,000 IU, and her aspartate aminotransferase level was 15 times normal without renal failure.

Ofloxacin was considered as the possible cause of the acute nontraumatic rhabdomyolysis and was withdrawn 4 days after its introduction. We found no other explanation for the rhabdomyolysis, despite thorough infectious, metabolic, and immunologic testing. Axial fast-spin T₂-weighted MRI of the legs showed an increased signal and fluid in both quadriceps, predominantly on the right. Needle electrode examination showed no spontaneous activity except low-amplitude and short-duration motor unit potentials in all muscles, pointing to a myopathic process. A deltoid muscle biopsy performed 1 week after onset showed no congenital or metabolic signs on histo-enzymatic examination and no inflammatory infiltrate or infectious foci on serial paraffin sections. At this time, circulating muscle-enzyme activities had returned to normal, and the myalgia and muscle weakness had disappeared.

Ofloxacin probably played a causative role in the rhabdomyolysis, even though similar reports in the literature are very rare. Other antibiotics, such as trimethoprim-sulfamethoxazole [2], have been incriminated in the onset of rhabdomyolysis. Blain et al. [3] and Fujii et al. [4] reported cases of severe rhabdomyolysis in elderly patients receiving a combination of ciprofibrate and norfloxacin and receiving ciprofloxacin hydrochloride, respectively. The chronological criteria concerning the drug challenge and rechallenge and the clinical and extraclinical semiological criteria were suggestive of the drug-effect rela-

References

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