Pulmonary Gangrene Secondary to Pneumococcal Pneumonia in a Patient with AIDS

Pulmonary gangrene (PG) is a rare entity that is usually associated with bacterial infections [1]. In an extensive review of the literature, we found only one case report of PG associated with HIV infection [2]. We describe a patient with AIDS who developed PG during the course of recurrent pneumococcal pneumonia.

A 35-year-old woman was admitted to the hospital because of fever, cough, and dyspnea of 4 days' duration. She had had esophageal candidiasis and pulmonary tuberculosis 6 years before this admission, and she had had pneumococcal pneumonia in the left lower lobe 4 years earlier. Bacteremic pneumococcal pneumonia had been diagnosed in the right upper lobe 4 weeks before admission. The MIC of penicillin for the isolate was 0.12 μg/mL; the patient had been successfully treated with ceftriaxone. Her CD4+ cell count was 5/μL. Three cultures of blood obtained on admission yielded Streptococcus pneumoniae; the MIC of penicillin for this isolate was the same as that for the previous isolate. Both isolates were characterized as being serotype 9.

A chest radiograph obtained on admission revealed an infiltrate without signs of cavitation in the upper left lobe. Ten days later, another radiograph revealed a cavity with an air crescent sign in the upper zone of the infiltrate. A CT scan (figure 1) showed lung tissue within the cavity, a finding typical of PG. The patient was treated with ceftriaxone (2 g/d), and her condition improved. The infiltrate disappeared slowly, and 10 weeks later a radiograph revealed that a large, thin-walled cavity was the only remaining lesion.

The microorganisms most frequently involved in PG are Klebsiella pneumoniae (in more than one-half of the cases) and S. pneumoniae [1, 3]. Other pathogens have also been involved, including other gram-negative bacilli, Mycobacterium tuberculosis, and anaerobes; however, the role of anaerobes in this condition is controversial [1, 4, 5]. Underlying conditions such as alcoholism, diabetes, and chronic respiratory disease have been present in most cases of PG, and the associated mortality rate is high [1, 3, 5].

PG is characterized by the presence of lung tissue within a cavity, which is the result of vascular thrombosis of small and large arteries and secondary pulmonary infarction [1, 2, 4]. Microscopic examination reveals normal lung tissue and vasculitis of the bronchial and pulmonary arteries [1, 4], a finding suggesting that vasculitis is the underlying pathogenetic mechanism; however, another possible mechanism could be the increased procoagulant activity in endothelial cells that is induced by gram-negative organisms (this property has also been described for pneumococci [6]). PG occurs in the upper lobes in 80% of cases [1, 5]. The air crescent sign that was present on our patient’s radiograph has been reported as typical of PG [2]. However, the most useful diagnostic procedure is CT, which shows the presence of lung tissue within the cavity; some authors consider this finding pathognomonic [5].

To our knowledge, only one case of PG in an HIV-infected patient has been reported to date; this case was caused by Pseudomonas aeruginosa [2]. The patient underwent surgical lobectomy and died of postoperative empyema. It is of interest that no cases of pneumococcal PG in patients with AIDS have been reported despite the common occurrence of invasive and recurrent pneumococcal disease in these patients [7]. On the other hand, recurrent disease caused by the same pneumococcal strain is thought to be a rare event [8].

The mortality rate associated with PG is high [1, 5], and the optimal management strategy is unclear. Although early surgical intervention has been advocated [5], other investigators believe that surgery should be reserved for the patients in whom medical treatment has failed [1]. Our patient was not considered a good candidate for surgery, and despite the presence of severe immunosuppression, she was successfully treated with antibiotics alone.

An interesting aspect of the present case is the fact that PG developed during the third episode of pneumococcal pneumonia; the second episode occurred only 4 weeks earlier. To our knowledge, this finding has not been reported before, and the reason that PG developed only during this episode is unknown. Repeated damage to the same area of the lung cannot be considered the cause, as all of the infiltrates developed in different lobes. On the other hand, both the susceptibility pattern and serotype of the pneumococcal isolates suggest that the two strains were the same. Furthermore, when our local prevalence of serotypes [9] is taken into account, the probability that two different pneumococcal

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strains belonging to serotype 9 were involved in two consecutive infections is <1%. Consequently, differences in the virulence of the pathogens are an unlikely explanation in this case. Moreover, serotype 9 pneumococcus does not appear to be one of the most virulent serotypes [10].

Finally, the short period between the last two pneumonic episodes makes it unlikely that there was a substantial change in the immune status of the host. Thus, no factors related to either the pathogen or to our patient seem to satisfactorily explain the cause of this case of PG. We conclude that PG should be added to the growing list of uncommon complications that afflict patients with AIDS.

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References

Use of Telephone Medicine for the Care of Patients with Human Immunodeficiency Virus Infection or AIDS: Comparison of a Private Infectious Disease Practice with a University Clinic Practice

Gathering information on a patient, interpreting the data, determining the urgency of the patient’s problem, ascertaining the need for medical intervention, and providing medical advice or prescriptions via the telephone are defined as telephone medicine. Telephone contact between patients and their health care providers is an important method of cost-effective care. When a patient calls a physician and medical advice is given by anyone in the office, a binding physician-patient relationship is formed.

Telephone medicine is described in literature on pediatrics and family medicine, but few articles have appeared in internal medicine or infectious diseases journals even though ≈27% of physician-patient contacts that involve internists occur over the telephone [1, 2]. Callers to general internal medicine physicians are usually >50 years old; the majority are female; and 22% of the calls result in a new prescription, most commonly an antibiotic [3–5]. In one report, most physicians were described as being unsatisfied with telephone practices in their offices [6]; however, formal training can improve the effectiveness of telephone activities [7, 8].


We used SAS descriptive statistics (SAS Institute, Cary, NC) to analyze the content of 109 consecutive patient calls made during office hours to our multidisciplinary, university HIV/AIDS clinic and to analyze the content of 67 calls (of 125 patient calls) related to the care of HIV-infected patients made during office hours to a single-physician infectious diseases private practice.

The staff of the clinic includes eight physicians, four registered nurses, and one nurse practitioner. Physicians serve in the clinic part-time but are available at all times during regular clinic hours. Seventy-nine percent of the patients use Medicaid or are self-paying. The average patient is 34 years of age.

The private-practice staff includes one infectious disease physician who is available 24 hours a day and an experienced registered medical laboratory technician who performs telephone triage during regular office hours, 5 days per week. Patients see her working in proximity to the physician in the office and feel comfortable relating their problems to her on the telephone. These patients primarily use third-party fee-for-service payment plans, although 3% of the patients use Medicaid or are self-paying. The average age of patients with HIV infection or AIDS is 40 years of age.

Seventy-five percent of the calls to the clinician and 51% of the calls to the private practice were originated by the patients. Sixteen percent of the calls made to the private practice and 4% of the calls to the clinic were made by family members. Home health personnel made 21% of the calls to the clinic but only 9.6% of the calls to the private practice. Twelve percent of the calls to the private practice were made by pharmacy personnel, whereas the clinic received no such calls. Seventy-nine percent of the calls to the private practice and 83% of the calls to the clinic were made by men, which probably reflects the greater proportion of male HIV-infected patients at the time of this study.

Medication-related requests made up the majority of calls to both the private practice and the clinic (36% and 52%, respectively). Eighteen percent of the calls to the clinic and 4% of the calls to the private practice were requests for laboratory results,