Fulminant Fatal Bacteremic Pneumonia due to *Aeromonas hydrophila* in a Non-Immunocompromised Woman

Kazuma Nagata¹, Yoshimi Takeshima¹, Keisuke Tomii¹ and Yukihiro Imai²

Abstract

A 75-year-old woman became ill suddenly with pneumonia two weeks after operation for colon cancer. Despite intensive support measures in the intensive care unit she died six hours after admission and 12 hours after her first symptom. Autopsy showed necrotizing pneumonia. *Aeromonas hydrophila* was isolated from a blood culture taken at admission and from the lung at autopsy. In patients who develop a fulminant disease of pneumonia, particularly those who have underlying medical conditions, *Aeromonas hydrophila* infection, though rare, should be considered.

Key words: pneumonia, *Aeromonas hydrophila*, non-immunocompromised


Introduction

*Aeromonas hydrophila* is an anaerobic Gram negative bacillus found in fresh water and soil habitats (1). Most cases of this infection have occurred in immunologically compromised hosts, so this organism has been recognized as an opportunistic pathogen (2). However, infections in apparently healthy people have been described. These were patients with gastroenteritis, meningitis, wounds, and respiratory tract disease (3). However, pneumonia due to this organism is quite rare, especially in an apparently healthy person. We describe fulminant fatal bacteremic pneumonia due to *Aeromonas hydrophila* in a postoperative but apparently healthy woman.

Case Report

A 75-year-old woman presented with general fatigue and dyspnea after vomiting. She had undergone the laparoscopic right colectomy for colon cancer two weeks before admission. Postoperative histological examination showed poorly-differentiated adenocarcinoma of the colon pT3 N1 M0, stage IIIb. After the operation, she had been in good health. On the evening of admission she suddenly vomited several times after a meal and experienced dyspnea.

On admission, she was alert and in severe respiratory distress. Her pulse rate was 100 beats/min, respiratory rate 20/min, temperature was 36.4°C, and blood pressure 100/50 mmHg. Coarse crackles were remarkable throughout the entire lung field. Plain chest film on arrival showed pulmonary infiltration in the lower field of the right lung (Fig. 1). Chest CT showed consolidation in the right lower lobe (Fig. 2). Laboratory findings on admission were as follows: white blood cell (WBC) count was 2,500/mm³; total bilirubin was 0.5 mg/dL; aspartate aminotransferase (AST) was 24 IU/L; alanine aminotransferase (ALT) was 13 IU/L; lactic dehydrogenase (LDH) was 287 IU/L; creatine kinase (CK) was 56 IU/L; serum creatinine (Cre) was 1.39 mg/dL; serum urea nitrogen (BUN) was 19 mg/dL; C-reactive protein (CRP) was 4.9 mg/dL; prothrombin time international normalized ratio (PT-INR) was 1.2; and D-dimer was 6.2 μg/mL. Arterial blood gas analysis revealed pH 7.214, PaO₂ 31.9 mmHg, PaCO₂ 54.5 mmHg, and HCO₃⁻ 21.2 mEq/L with the patient breathing room air.

The patient received initial treatments with sulbactam/ampicillin, glucocorticoid, and oxygen six hours after her first symptom. Three hours after admission, she suddenly developed shock. Resuscitative efforts, including assisted ventilation, were begun, but about 500 mL of bright red blood
flowed from the endotracheal tube. Despite intensive supportive efforts, the patient died six hours after admission.

Autopsy was performed four hours after death. The lungs were heavy, with the left lung weighing 800 g and the right 1,120 g. Bloody pleural effusion (250 mL) was noted in each pleural cavity. Microscopically the alveoli were filled with erythrocytes and leucocytes. Alveolar septa and vessels were necrotic with loss of nuclear hematoxylin staining. Many small Gram negative bacilli were observed in the alveolar exudation into the necrotic alveolar wall and vascular lumina (Fig. 3). No aspirated foreign objects were seen. The ileocolic anastomosis was crank shaped and the ileum was mildly dilated. There was no leak or necrosis at the anastomosis but there was a colony of Gram negative bacilli which seemed to be the same as in the lung. No prominent abnormality was observed in other organs.

Cultures from the bloodstream and postmortem lungs yielded *Aeromonas hydrophila*. The organism was resistant to ampicillin and cefazolin, and sensitive to gentamicin, amikacin, cefotaxime, cefmetazole, imipenem, minocycline, and levofloxacin.

Discussion

*Aeromonas hydrophila* has become an increasingly important pathogen in humans in the past three decades (1). *Aeromonas hydrophila* has for some time been recognized as an opportunistic pathogen in hosts with impaired local or general defense mechanisms. However, reports of acute diarrheal disease caused by this organism in apparently healthy individuals are increasing in frequency (3).

Pneumonia caused by *Aeromonas hydrophila* is quite rare. Nevertheless, in recent years, 20 cases of pneumonia due to this organism have been described in the literature (2, 4-10). In 11 cases, the patients had comorbidity related to immunosuppression, alcoholism, renal failure, liver cirrhosis, bronchiectasis, lymphoma, and cerebrovascular accident. In eight cases, the infection was attributed to near drowning in contaminated water, with one of the 8 having a comorbidity. Only two other cases described in the literature had no predisposing factor.

In the present case, no predisposing factor was identified, with the only relevant factor being her recent operation. However, pneumonia is a rare complication more than a week after operation, as Garibaldi et al reported (11). Moreover since the patient had been in good health after the surgery, it is not rational to consider that the operation caused her pneumonia.

There are two possibilities as to the cause when the primary portal of entry is considered. Her pneumonia might have occurred by hematogenous dissemination from the gastrointestinal tract to the lung. Otherwise it might have resulted from aspiration of vomitus that contained *Aeromonas hydrophila*. The autopsy findings showed that the organism had penetrated from alveoli into the vessels. Also, there was only a small amount of *Aeromonas hydrophila* in the vessels of organs other than the lung. Furthermore, she had been apparently in good health before vomiting. Although no aspirated foreign objects were seen in her lung, we concluded...
that the primary portal of entry was the respiratory tract. However, it cannot be denied that the entry site could be the patient’s gastrointestinal tract. She could be a colonizer of *Aeromonas hydrophila*, and she may have developed this fatal bacteremia with necrotizing pneumonia due to the surgery. Or during the hospitalization, the patient may have been exposed to this organism through the hospital water supply, and then developed the disease after discharge.

Although *Aeromonas hydrophila* is a rare cause of pneumonia, it does occur occasionally not only in patients with underlying conditions but also in apparently healthy patients. Moreover, it can occur as a fulminant type of pneumonia. The cause of its extremely rapid clinical course is still unknown although early treatment with adequate antibacterial chemotherapy is the only possible means for a cure.

The authors state that they have no Conflict of Interest (COI).

**References**