

Case Report

An Unusual Case of Spontaneous Bacterial Empyema Caused by *Aeromonas hydrophila*

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Abstract

Aeromonas is a known pathogen causing diarrhoeal disease and the most common clinical manifestation is acute gastroenteritis. Extra-intestinal infections by *Aeromonas* species, such as empyema, are rare. We describe a case of spontaneous bacterial empyema in an immunocompetent male who recovered after antibiotic therapy and drainage. [Indian J Chest Dis Allied Sci 2017;59:33-34]

Key words: *Aeromonas hydrophila*, Spontaneous, Bacterial empyema.

Introduction

Aeromonads are ubiquitous inhabitants of fresh and brackish water. These have also been recovered from chlorinated tap water including hospital water supplies. These occasionally cause soft tissue infections and sepsis in immunocompromised hosts. These have been associated with diarrhoeal disease.¹ Infrequent human infections, such as, bacteremia, peritonitis, septicaemia, osteomyelitis may occur due to aeromonads. The clinical syndromes caused by this ubiquitous organism continue to expand with newer descriptions.² Empyema caused by *Aeromonas* spp has been rarely described. However, a few case reports have shown an association of empyema and *Aeromonas* spp.³⁻⁶ We report here a case of an immunocompetent male developing bacterial empyema caused by *Aeromonas hydrophila*.

Case Report

A 70-year-old male, occasional alcoholic, presented with fever, right-sided chest pain; more on inspiration and difficulty in breathing for the last one month. He had past history of recurrent pleural effusions. There was no past history of tuberculosis and chest trauma.

Physical examination was normal except pallor and bilateral crepitations. He was a known hypertensive on treatment with amlodipine. Serology for human immunodeficiency virus (HIV) and hepatitis-B were non-reactive. Laboratory investigations revealed: haemoglobin 7.9 g/dL; total leucocyte count 15500/mm³; erythrocyte sedimentation rate (ESR) was elevated at 122 mm/hr, elevated alkaline phosphatase 302U/L (normal value: 40-130U/L) and GGT125U/L (normal value: 10-71U/L). Chest radiograph (postero-

anterior view) showed right-sided pleural effusion (Figure). Ultrasonography of abdomen revealed hepatomegaly with fatty liver changes but no free fluid in the peritoneum.

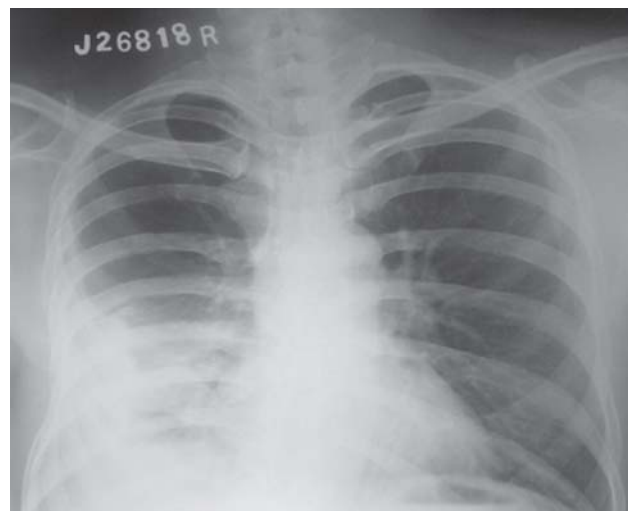


Figure. Chest radiograph (postero-anterior view) shows loculated pleural effusion in the right lower zone.

An intercostal drainage via a pigtail catheter was inserted and pleural fluid analysis was done. Gram stain revealed numerous pus cells but no bacteria. Microscopy by Zeihl-Neelsen stain was negative for acid-fast bacilli and there was no growth on Lowenstein-Jensen medium. Bacterial culture grew pure growth of *Aeromonas hydrophila* susceptible to amikacin, gentamicin, ciprofloxacin, cotrimoxazole, piperacillin-tazobactam, cefoperazone-sulbactam, cefotaxime, ceftazidime and imipenem. The organism

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was identified as *Aeromonas hydrophila* based on biochemical reactions demonstrating catalase positive and oxidase positive, motile organism. The given isolate fermented arabinose and hydrolysed esculin whereas *Aeromonas veroni* does not ferment arabinose; although it hydrolyses esculin. Hence, the isolate was phenotypically identified as *Aeromonas hydrophila*. Blood culture done by Bac T Alert system did not yield any microbial growth.

A provisional diagnosis of spontaneous bacterial empyema was made based on: (i) clinical evidence of fever or shock; (ii) positive pleural fluid culture or, if negative, a pleural fluid neutrophil count greater than 500 cells/mm³; (iii) no evidence of pneumonia on chest radiology; and (iv) pre-existing hepatic hydrothorax.

The patient was treated with clindamycin and piperacillin-tazobactam for a week and later with imipenem for 20 days. The pigtail drainage was removed and patient recovered uneventfully after a month. The patient was prescribed ciprofloxacin and metronidazole for a week at the time of discharge.

Discussion

Spontaneous bacterial empyema is defined as the spontaneous infection of pleural cavity, and this could develop in 13% to 30% of patients with hepatic hydrothorax.⁷ Findings of our report correlates with the diagnostic criteria of spontaneous bacterial empyema of Xiol *et al.*⁸

Spontaneous bacterial empyema may occur as a result of the direct translocation of bacteria from the peritoneal cavity or transient bacteraemia. This may also occur either with spontaneous bacterial peritonitis (SBP), through transdiaphragmatic spread, or without SBP, through hematogenous spread.^{9,10} The most common microbiological pathogens include *Escherichia coli*, *Streptococcus species*, *Enterococci*, and *Klebsiella pneumoniae*.⁹ Empyema caused by *Aeromonas* spp has been described rarely.

Some studies suggested that the development of hepatic hydrothorax is secondary to passage of ascites from the abdomen to the pleural space via defects in the diaphragm.^{11,12} It has been reported that hepatic hydrothorax may have occurred in patients with no demonstrable ascites.^{13,14} The ascites may be drawn into the chest preferentially through the defects because of the negative intra-thoracic pressure.

In the present case, there was no bacteraemia and no ascites. However, the patient had alcoholic liver disease with recurrent pleural effusion and without pneumonia, favouring the definition of spontaneous bacterial empyema.

Aeromonas sp. is a known cause of diarrhoea and soft tissue infections. Trauma followed by exposure to contaminated water commonly but not invariably precedes the infection.¹⁵ In the present case, patient had no diarrhoea, no history of chest trauma and the probable source of infection could not be traced.

In our report, *Aeromonas* spp was susceptible to aminoglycosides, ciprofloxacin, third-generation cephalosporins, similar to the findings of study by Chao *et al.*¹⁶ Our patient was cured with antibiotic treatment and drainage, which was similar to reported cases with negative blood culture that had survived the episodes of spontaneous bacterial empyema caused by *Aeromonas* spp.¹⁶

In conclusion, *Aeromonas* species should be considered as one of the aetiological agents in cases of empyema in the relevant clinical setting.

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