



(CASE REPORT)



Erwinia aphidicola: An unusual cause of septicemia, Morocco, 2024

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Abstract

This case report describes a rare and potentially fatal human infection caused by Septic Shock associated with *Erwinia aphidicola*, a bacterium traditionally recognized as an insect and plant-associated microorganism with poorly understood pathogenicity in humans. We report the case of a 2-month-old infant admitted for severe abdominal trauma and intestinal evisceration following a dog bite. Surgical exploration revealed multiple gastrointestinal perforations and extensive intestinal necrosis requiring bowel resection and anastomosis. Despite intensive postoperative care, the patient developed persistent fever, disseminated edema, thrombocytopenia, renal failure, metabolic acidosis, and progressive hemodynamic instability. Blood cultures collected on the tenth day of hospitalization yielded *Erwinia aphidicola*, identified twice by MALDI-TOF mass spectrometry, while urine and bronchial cultures were positive for *Candida albicans*. Broad-spectrum antimicrobial therapy, including imipenem, levofloxacin, trimethoprim/sulfamethoxazole, fluconazole, and vancomycin, failed to improve the patient's condition, which ultimately evolved to refractory septic shock and death. This report highlights the emerging opportunistic potential of *Erwinia aphidicola* in critically ill patients and emphasizes the importance of advanced microbiological identification techniques in recognizing rare pathogens. To our knowledge, this is the first documented case of human septicemia attributed to *Erwinia aphidicola*, underscoring the need for further investigation into its pathogenic mechanisms, antimicrobial susceptibility, and clinical significance in human infections.

Keywords: *Erwinia aphidicola*; Bacteremia; Pediatric sepsis; Dog bite; MALDI-TOF mass spectrometry

1. Introduction

Erwinia aphidicola is a bacteria with the general characteristics of Enterobacteriaceae family that is commonly found in insects, such as aphids. Its pathogenicity in humans is still not well known and only a few cases of *Erwinia* spp strains have been found in urinary tract infection, lymphadenitis, and septic arthritis [1-5]. We're describing herein the first case, to our knowledge, of septicemia suspected to be caused by *Erwinia aphidicola*, a rarely involved pathogen in human infections.

2. Case report

A 2 months infant with unknown medical history has been referred to our hospital for a traumatic evisceration caused by an errand dog's bite 2 days prior the present hospitalization. The initial examination showed a febrile laceration of 6cm in the left hypochondriac region with intestine evisceration and necrotic tissues. Anti-Rabies vaccination protocol has been started on first day of admission following a 4 doses protocol of 0.5ml vaccine, 2 injections on day 0, and one on day 7 and 21.

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A CT-scan has objectified perforations of stomach, transverse colon, and small intestines with necrotic areas of 40 cm. Surgery consisted of an adjunction of the edges of the gastric and transverse colon perforations and small bowel resection of almost 1 m, followed by a surgical anastomosis.

During the procedure the patient showed signs of shock with hemodynamic instability, with a mean arterial pressure at 35mmhg and pulse at 115bpm, that were managed successfully with IV fluids and adrenaline bolus.

During post-op the patient was sedated and intubated. He had a fever at 39°C with sclerema of all four limbs. Biological lab tests at this time confirmed a high Procalcitonin at 18.6mg/L despite a normal white blood cell count (9490/ml), and a macrocytic normochromic anemia at 5g/dl with a severe thrombocytopenia at 1.3×10^4 /ml for which he was transfused with O positive RBC and platelets. The CBC control has showed a correction of the anemia with a hemoglobin at 14.7(g/dl) and a persistence of the thrombocytopenia at 2.7×10^4 /ml. Initially, the patient had a PT at 16% thus injecting vitK and transfusion of FFP rechecked at 61.3% then 75.4%. The patient's state was complicated with a renal failure, GFR of 25.7 ml/min, with preserved urine output at 1.3cc/kg/h under lasilix. The pRIFLE score was at 2 and KDIGO score at 3.

At day 10 of hospitalization, microbiological tests have been performed and showed 2 positive hemocultures to *Erwinia aphidicola*. In addition, cultured urine (leucocyturia at 40000) and bronchial aspiration showed positive to *Candida Albicans*. Otherwise, Viral serologies for HIV, type B and C Hepatitis and were negative.

The patient was first put on Levofloxacin, Trimethoprim/sulfamethoxazole, Imipenem and Fluconazole with no improvement of his condition, with clinical persistence of fever and general edema, biologically; he went into uncompensated metabolic acidosis a decrease of his GFR to 18.61ml/min, high WBC at 14720 with 10790 neutrophils. Vancomycin was thus added but the patient's condition deteriorated and he died of septic shock.

2.1. Microbiological characteristics

- Direct examination with gram stain of the blood specimen observed at x100 magnification optic microscopy showed strains of GNB.
- The specimen's culture showed, after 3 days incubation at 37°C, growth of bacterial small grey colonies of Gram-negative Bacilli that were confirmed two times to be *Erwinia aphidicola* by Mass Spectrophotometria (Maldi-Tof). (figure 1-2)
- Antibiotic screen showed strains that were sensitive to 3th generation Cephalosporin.

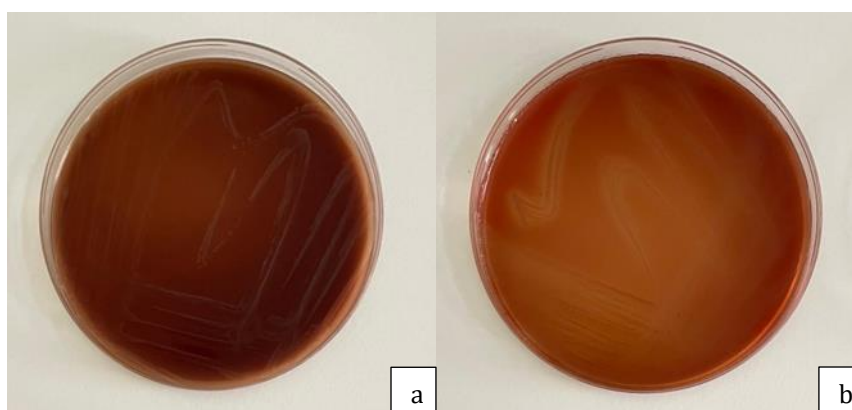


Figure 1 Bacterial growth on Petri plates with Chocolate Agar (a) and Blood Agar medium (b)

3. Discussion

Erwinia species are a group of bacteria that are commonly found in soil and plants. Some species within this group are known to be plant pathogens, causing diseases such as soft rot in vegetables and fruits, or to be in cause of aphid mortality. *Erwinia spp* are known to exhibit the same biochemical characteristics of the Enterobacteriaceae family. They are Gram-negative, oxidase-negative, catalase-positive, facultatively anaerobic, fermentative, rod-shaped bacteria that are motile by peritrichous flagella. Their colonies can be ivory in the case of *Erwinia aphidicola* or produce a yellow

pigment for some species like *Erwinia herbicola*. No growth factors are required since colonies are able to grow on nutrient agar and common laboratory media. These microorganisms do grow well at 25, 30 and 35°C [4-8].

Erwinia aphidicola has first been isolated and identified from aphid guts, in 1997. Biochemical tests have showed its close relation to *Er. herbicola* and *P. agglomerans* and has been supported by molecular phylogeny tests. As opposed to the Enterobacteriaceae family, *Erwinia aphidicola* is distinguished from the members of the genus *Enterobacter* by its negative reaction in ornithine decarboxylase, from members of the genus *Serratia* by its negative reaction in gelatin liquefaction, and from members of the genus *Klebsiella* by its negative reaction in urease [4,6,8].

Erwinia species are known to cause infections in plants, but are not considered significant pathogens for humans. Clinical isolates of *Erwinia* spp. in humans are rare, and only a few strains have been studied for their bacterial characteristics and genome sequencing [9-13]. Furthermore, infections caused by *Erwinia* species in humans are typically opportunistic, occurring primarily in immunocompromised individuals. These infections are commonly associated with wound infections, bacteremia [14], and soft tissue infections [15], as observed in our case. There have been other reported cases of *Erwinia persicina* isolated from the urine of a woman with a urinary tract infection [16], and *Er. Tasmaniensis* found in a biopsy tissue sample of cervical lymphadenitis [17].

As for the treatment, it usually involves antibiotics, although the choice of antibiotics may vary depending on the specific *Erwinia* species involved and its susceptibility to different drugs.

4. Conclusion

In summary, although *Erwinia* species are known to cause infections in plants and aphids, occurrences of clinical isolates in humans are infrequent and typically opportunistic, often associated with wound infections, bacteremia, and soft tissue infections. While there have been reported cases of *Erwinia* species being isolated from human clinical samples, such as urine and biopsy tissue, these occurrences are relatively rare. To the best of our knowledge, this is the first reported case of human infection caused by *Erwinia aphidicola* in the scientific literature. Further research and understanding of the pathogenicity of *Erwinia* species in humans are necessary to comprehensively gain better insights into their role as opportunistic pathogens and to develop appropriate management strategies, particularly for individuals with compromised immune systems.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] O'Hara CM, Steigerwalt AG, Hill BC, Miller JM, Brenner DJ. First report of a human isolate of *Erwinia persicina*. J Clin Microbiol. 1998 Jan;36(1):248-50. doi: 10.1128/JCM.36.1.248-250.1998. PMID: 9431957; PMCID: PMC124844.
- [2] Shin SY, Lee MY, Song JH, Ko KS. New *Erwinia*-like organism causing cervical lymphadenitis. J Clin Microbiol 2008;46:3156-8.
- [3] Isabelle Bonnet, Baptiste Bozzi, Eric Fourniols, Stéphane Mitrovic, Olivia Soulier-Escrihuella, et al.. *Erwinia billingiae* as Unusual Cause of Septic Arthritis, France, 2017. Emerging Infectious Diseases, 2019, 25 (8), pp.1587-1589. 10.3201/eid2508.181073. hal-03127489.
- [4] Harada H, Oyaizu H, Kosako Y, Ishikawa H. *Erwinia aphidicola*, a new species isolated from pea aphid, *Acyrtosiphon pisum*. J Gen Appl Microbiol. 1997 Dec;43(6):349-354. doi: 10.2323/jgam.43.349. PMID: 12501306.

- [5] Basset, A.; Khush, R.S.; Braun, A.; Gardan, L.; Boccard, F.; Hoffmann, J.A.; Lemaitre, B. The Phytopathogenic Bacteria *Erwinia carotovora* Infects *Drosophila* and Activates an Immune Response. *Proc. Natl. Acad. Sci. USA* 2000, 97, 3376–3381
- [6] Kang et al. (2017) "Identification and characterization of *Erwinia aphidicola* associated with green peach aphid *Myzus persicae*" *Journal of Microbiology*, 55(2): 121-126
- [7] Mulet et al. (2010) "*Erwinia aphidicola*, a common gut inhabitant of aphids, is frequently found in environmental samples of other insects" *Environmental Microbiology Reports*, 2(2): 181-188.
- [8] Bergey's Manual of Systematics of Archaea and Bacteria, which is a comprehensive reference work on the taxonomy and classification of prokaryotic organisms.
- [9] *DSM 19347, IAM 14479, NBRC 102417* <https://bacdiv.dsmz.de/strain/4403>
- [10] *CIP 106297, IAM 14480, JCM 2123* <https://bacdiv.dsmz.de/strain/136497>
- [11] *CIP 106298, IAM 14481, JCM 21240* <https://bacdiv.dsmz.de/strain/138334>
- [12] *IAM 14482, JCM 212* <https://bacdiv.dsmz.de/strain/163115>
- [13] *IAM 14483, JCM 21242* <https://bacdiv.dsmz.de/strain/163116>
- [14] "*Erwinia carotovora* subsp. *carotovora* Bacteremia in a Diabetic Patient" by Atmatzidis et al. (2004), published in *Journal of Clinical Microbiology*.
- [15] S. Stanley Schneierson & Edward J. Bottone (1973) *Erwinia* Infections in Man, *CRC Critical Reviews in Clinical Laboratory Sciences*, 4:4, 341-355, DOI: 10.3109/10408367309151558 (still not been used)
- [16] O'Hara CM, Steigerwalt AG, Hill BC, Miller JM, Brenner DJ. First report of a human isolate of *Erwinia persicina*. *J Clin Microbiol.* 1998 Jan;36(1):248-50. doi: 10.1128/JCM.36.1.248-250.1998. PMID: 9431957; PMCID: PMC124844.
- [17] New *Erwinia*-Like Organism Causing Cervical Lymphadenitis. Sang Yop Shin¹, Mi Young Lee², Jae-Hoon Song^{2,3}, and Kwan Soo Ko^{2,4,5,*}