Erysipelothrix rhusiopathiae bacteraemia in an immunocompromised host: the unexpected complication of a crustacean altercation

Eben Jones, Peter Burrell, Tony Barnett, David Lyons-Ewing, Elisabeth Nuttall

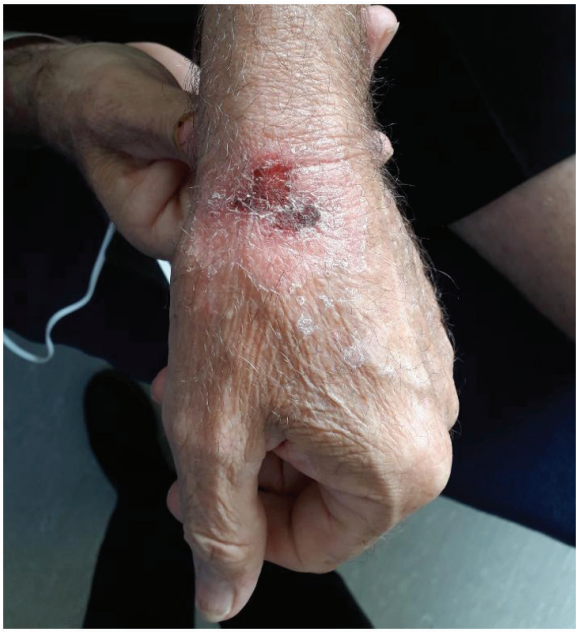
Zoonotic infections are infrequently considered and subsequently under-diagnosed. Here we report a case of *Erysipelothrix rhusiopathiae* infection as a means of highlighting the importance of both considering and investigating for zoonotic infections in patients presenting with infective symptoms.

Case report

A retired 57-year-old man presented to Nelson Hospital with a three-day history of fevers, nausea, headaches, myalgia and lethargy. History revealed no localising symptoms of infection, and he reported no recent foreign travel. His past medical history included psoriatic arthritis and diabetes mellitus. His medications included prednisone, methotrexate and etanercept.

On examination, his temperature was 35.7°C, blood pressure was 80/60mmHg, and he was noted to have a 5x7cm, purple, crusted lesion on the dorsum of his left wrist (Figure 1). The lesion was not cellulitic. The patient had no murmur or peripheral stigmata of infective endocarditis.

Figure 1: Skin lesion on the patient's wrist.



ISSN 1175-8716

Table 1: Initial investigations.

	Admission value	**Reference ranges**
Haematology		
Haemoglobin	144	130–175g/L
White cell count	**13.2**	4.0–11.0x10^9/L
Neutrophil count	**11.5**	1.9–7.5x10^9/L
Lymphocyte count	**0.6**	1.0–4.0x10^9/L
Biochemistry		
Sodium	**136**	135–145mmol/L
Potassium	**5.7**	3.5–5.2mmol/L
Lactate	**2.73**	0.5–1.6mmol/L
CRP	**124**	0-5mg/L
Imaging		
Chest x-ray	No focal consolidation	
Microbiology		
Blood cultures	Sent prior to the administration of antibiotics	
Urine microscopy	Leucocytes: 21–50x10^6/L Red cells: <10x10^6/L	

The working diagnosis of sepsis of unknown source with associated adrenal insufficiency was treated with 4L of IV crystalloid, IV ceftriaxone and IV hydrocortisone.

Following 20 hours of incubation the anaerobic blood cultures were reported to be growing fine Gram-negative bacilli (Figure 2). Two days later, the organism was identified as *E. rhusiopathiae* by MALDI-TOF mass spectrometry.

Figure 2: An example of the Gram-variable nature of *E. rhusiopathiae*.[1]

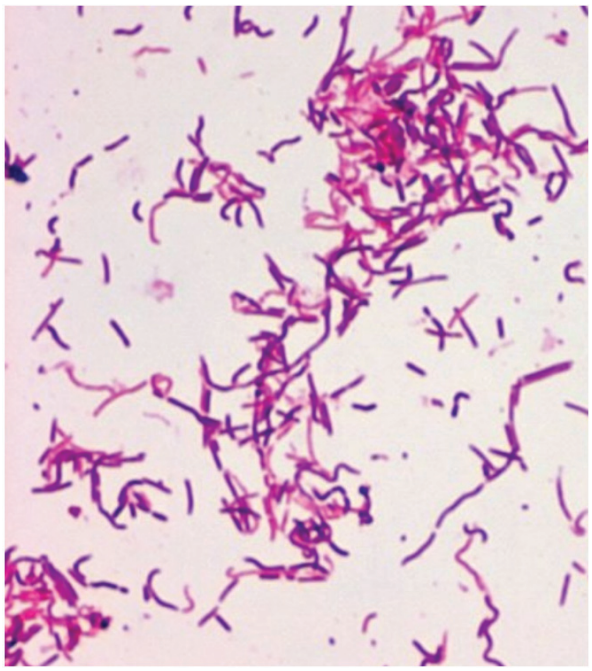


Figure 3: The culprit crustacean.

Further questioning revealed that the patient had suffered small puncture wounds to his left wrist while handling salt-water crayfish in Kaikoura five days prior to the onset of symptoms (Figure 3). His family also kept sheep and chickens, but he denied recent contact with these animals.

Considering this bacterium's association with infective endocarditis, a trans-thoracic echocardiogram was performed, which demonstrated no vegetations. Due to the patient's rapid clinical recovery, subsequent negative blood cultures and lack of stigmata of endocarditis, a trans-oesophageal echocardiogram was not performed. The antibiotic regimen was rationalised to a seven-day course of oral amoxicillin. At follow-up, the patient was asymptomatic and felt that he had made a full recovery.

Discussion

Erysipelothrix rhusiopathiae is a facultatively anaerobic non-spore-forming Gram-positive bacillus. It has Greek etymology, and combines the terms *erythros* (red), *pella* (skin) and *thrix* (thread-like). It was first isolated by Robert Koch in 1876, and is recognised as a zoonotic pathogen in humans.[2]

E. rhusiopathiae is hosted by a range of wild and domesticated mammals, birds, amphibians and marine species, including crayfish.[3] Human infection is associated with occupational and recreational exposures to animals and their excretions, with case reports clustered among farmers, butchers and fish-handlers.[4–6] In this case, the likely source of infection was a puncture wound sustained while handing a salt-water crayfish. This case underlines the importance of considering zoonotic exposures when confronted with a septic patient with no clear source.

Human disease most commonly presents as a well-defined violaceous lesion (erysipeloid) that normally resolves without treatment.[7] *E. rhusiopathiae* bacteraemia is substantially rarer, but commonly results in a severe clinical illness, associated with endocarditis in over one-third of cases.[8] Specific risk factors for systemic illness in this case included diabetes mellitus and immunosuppression. Additionally, a variety of focal disease has been rarely reported, including central nervous system infection, osteomyelitis, septic arthritis, liver abscess and intra-abdominal abscess.[9]

This case serves to illustrate the potential for opportunistic zoonotic infections in immunocompromised individuals, and some of the pitfalls experienced when diagnosing human disease caused by *E. rhusiopathiae.* Gram-stain may yield a Gram-variable result due to poor retention of the stain.[10] Indeed, the provisional report in this instance was of a Gram-negative organism. Secondly, since many Gram-positive bacilli that grow in blood cultures represent sample contamination, some labs may not proceed to fully characterise these organisms. Combined, these factors may contribute to delayed or under-diagnosis of this clinically significant organism.

Competing interests:
Nil.

Author information:
Eben Jones, Registrar, Department of General Medicine, Nelson Hospital; Honorary Clinical Lecturer, University of Otago; Peter Burrell, House Officer, Department of General Medicine, Nelson Hospital; Tony Barnett, Head Microbiologist, Medlab South; David Lyons-Ewing, Registrar, Department of General Medicine, Nelson Hospital; Honorary Clinical Lecturer, University of Otago; Elisabeth Nuttall, Registrar, Department of General Medicine, Nelson Hospital; Honorary Clinical Lecturer, University of Otago.
Corresponding author:
Dr Eben Jones, General Medicine Nelson Marlborough District Health Board.
ebenjones90@gmail.com

URL:
http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2019/vol-132-no-1504-25-october-2019/8029

REFERENCES:

1. Erysipelothrix rhusiopathiae. microbe-canvas.com [Internet]. Cited 2019 Apr 7. Available from: http://microbe-canvas.com/Bacteria.php?p=918
2. Brooke CJ, Riley TV. Erysipelothrix rhusiopathiae: bacteriology, epidemiology and clinical manifestations of an occupational pathogen. J Med Microbiol. 1999 Sep; 48(9):789–99.
3. Fidalgo SG, Wang Q, Riley TV. Comparison of Methods for Detection of Erysipelothrix spp. and Their Distribution in Some Australasian Seafoods. Appl Environ Microbiol. 2000 May;66(5):2066–2070.
4. Norman B, Kihlstrom E. Erysipelothrix rhusiopathiae septicemia. Scand J Infect Dis. 1985; 17(1):123–4.
5. Hill DC, Ghassemian JN. Erysipelothrix rhusiopathiae endocarditis: Clinical features of an occupational disease. South Med J. 1997 Nov; 90(11):1147–8.
6. Robson JM, McDougall R, van der Valk S, et al. Erysipelothrix rhusiopathiae: An uncommon but ever present zoonosis. Pathology. 1998 Nov; 30(4):391–4.
7. Reboli AC, Farrar WE. Erysipelothrix rhusiopathiae: an occupational pathogen. Clin Microbiol Rev. 1989 Oct; 2(4):354–9.
8. Principe L, Bracco S, Mauri C, et al. Erysipelothrix rhusiopathiae Bacteremia without Endocarditis: Rapid Identification from Positive Blood Culture by MALDI-TOF Mass Spectrometry. A Case Report and Literature Review. Infect Dis Rep. 2016 Mar 21; 8(1):6368.
9. Erysipelothrix rhusiopathiae. Annette C, Reboli MD. antimicrobe.org [Internet]. E-Sun Technologies, Inc. 2010-2014. Cited 2019 Apr 7. Available from: http://www.antimicrobe.org/new/b76.asp
10. Bratcher DF. In: Long SS, editor. Principles and Practice of Pediatric Infectious Diseases. 4th ed. Amsterdam: Elsevier; 2012, p767–771.