



Case report

Listeria monocytogenes bacteremia one month after contact with raw venison: A case report

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ABSTRACT

Listeria monocytogenes is a gram-positive bacillus that causes food poisoning. Listeriosis causes gastrointestinal infections and occasionally leads to fatal bacteremia in older adults. The symptoms of *Listeria* infections are non-specific and difficult to diagnose. We describe a case of *Listeria* bacteremia in an 82-year-old Japanese woman who had handled raw venison one month prior to becoming ill, but had not consumed any. No other possible sources of infection were identified. She presented with a fever without any focal symptoms. Computed tomography revealed enteritis with mucosal damage. Blood culture revealed bacteria with gram-positive rod morphology, that were confirmed as *L. monocytogenes* using mass spectrometry. The patient was treated with intravenous ampicillin and made a full recovery. This case illustrates the virulence of *L. monocytogenes*, which can cause bacteremia from handling contaminated food, even without consumption.

Introduction

Listeria monocytogenes is a facultative anaerobic, gram-positive, rod-shaped bacterial pathogen that contaminates milk, dairy products, raw meat, and vegetables, and occasionally causes food poisoning outbreaks [1–4].

Listeriosis manifests as gastroenteritis, meningitis, and bacteremia, which may be fatal, particularly in older adults [5,6]. Early diagnosis and treatment are essential; however, patients with bacteremia present with non-specific symptoms, which makes diagnosis difficult [5].

Here, we present a case of bacteremia in an older woman who may have become infected with *L. monocytogenes* by handling raw venison one month prior to the onset.

Case

An 82-year-old Japanese woman who regularly visits our hospital for treatment of chronic obstructive pulmonary disease (COPD), presented to the hospital complaining of a 39 °C fever and dyspnea. On arrival, we could not detect an identifiable source of infection on physical examination. Blood tests revealed no elevated inflammatory markers (Table 1). The patient returned home after blood was taken for culturing. The next day, she returned to the hospital complaining of continuous fever. The blood cultures had grown gram-positive rod-

shaped bacteria, therefore, she was admitted with a diagnosis of bacteremia. On admission, her consciousness was clear, with a temperature of 38.9 °C, heart rate of 121 beats/min with a regular rhythm, blood pressure of 126/89 mmHg, and SpO₂ of 96% breathing 1 L/min supplemental oxygen, administered via a nasal cannula. Blood tests showed an elevated C-reactive protein (CRP) level. Thoracoabdominal computed tomography (CT) without contrast revealed moderate emphysema without pneumonia. The only significant finding was lower rectal wall thickening, suggesting the presence of either an ulcer or inflammation. As the bacteria causing the disease had not been identified, blood was collected for a repeat culture. She was started on a combination of intravenous ceftriaxone (2 g daily) and intravenous clindamycin (0.6 g every 12 h). The next day, gram-positive rod bacteria observed on the blood culture, was confirmed as *L. monocytogenes* by mass spectrometry.

Further probing of the history of the patient's illness to determine a possible source of infection, revealed that she had fed her dog raw venison by hand, one month previously. The dog vomited after eating the meat, so the meat was discarded. She and her family had not consumed any contaminated meat or dairy products. (As far as we investigated). She had constipation the following week. There were no other food poisoning cases reported in her residential area.

The patient was diagnosed with bacteremia due to *L. monocytogenes*, which may have been transmitted by hand to mouth, and subsequently,

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Table 1

The patient's laboratory test results.

	Reference range	First presentation	On admission	Day 4	Day 8	Day 14
WBC (/μL)	40–100	71	72	43	70	63
Neutrophils (%)	37–72	73.3	85.2	51.3	58.1	43.4
Lymphocytes (%)	25–48	9.9	7.2	23.6	22.7	35.0
Hb (g/dL)	11.3–15.1	12.0	12.7	10.8	10.9	11.0
PLT ($\times 10^4/\mu\text{L}$)	15.0–40.0	18.9	17.5	15.4	39.0	31.0
PCT (ng/mL)	0.0–0.05	0.062	...	0.203	0.044	...
CRP (mg/dL)	0–0.5	0.27	5.57	3.02	0.69	0.11
Total protein (g/dL)	6.3–8.2	6.6	6.8	5.8	5.7	6.0
Albumin (g/dL)	3.4–5.0	3.8	3.8	3.1	3.1	3.3
Total bilirubin (mg/dL)	0.2–1.2	0.6	0.5	0.2	0.4	0.5
ALP (U/L)	104–338	88	90	83	81	81
AST (U/L)	7–38	19	25	34	22	15
ALT (U/L)	8–40	8	8	14	14	7
LDH (U/L)	106–211	196	224	250	252	195
BUN (mg/dL)	8.0–21.0	8.5	9.6	4.8	4.1	9.1
CRE(mg/dL)	0.47–0.79	0.56	0.67	0.51	0.49	0.56

ALT, alanine aminotransferase; AST, aspartate aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; CRP, C-reactive protein; Hb, hemoglobin; LDH, lactate dehydrogenase; NTproBNP, N-terminal pro-brain natriuretic peptide; PCT, procalcitonin; Plt, platelet; WBC, white blood cell.

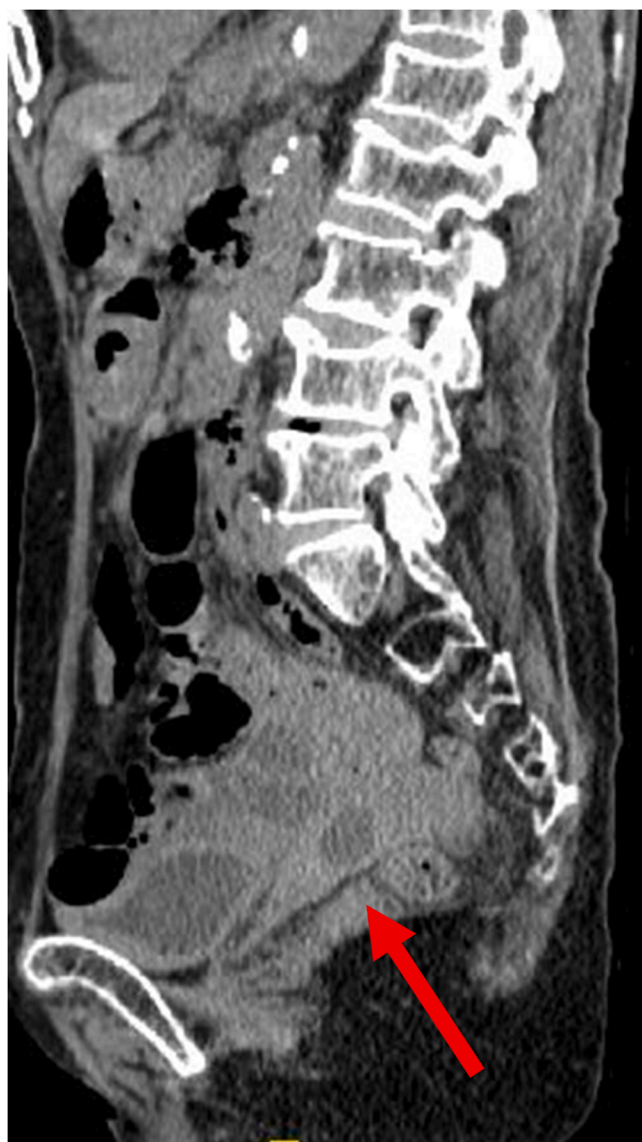


Fig. 1. Thoracoabdominal computed tomography image showing mural thickening in the lower rectum (red arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

from the gastrointestinal tract to the bloodstream. She was treated with 1 g intravenous ampicillin every 8 h for 13 days, which relieved the fever and inflammation. No vegetations were detected on transthoracic echocardiography, and she was discharged without any complications.

Discussion

We encountered a case of *L. monocytogenes* bacteremia in an 82-year-old woman. A notable feature of this case is that the bacteremia started one month after contact with raw venison. We did not identify any other possible sources of the infection. We hypothesize that *L. monocytogenes* was transmitted from the meat to her hands, and then entered her mouth, causing enteritis with mucosal injury, which eventually led to bloodstream infection [6].

Although her hands may have only initially been contaminated with a small amount of bacteria, *L. monocytogenes* has high transmissibility and can survive in the gastrointestinal tract [2,7]. Furthermore, constipation may also have contributed to prolonged enteritis as anaerobic conditions promote listeria growth and cause mucosal injury.

We are not aware of any similar cases of delayed onset *L. monocytogenes* bacteremia after handling contaminated meat. We were unable to obtain a venison sample to confirm the suspected source of the infection, but *L. monocytogenes* has previously been identified on raw venison [8]. Listeria food-poisoning is very rare in Japan, with an average of 83 sporadic cases reported per year [9]. The findings suggest that *L. monocytogenes* can cause bacteremia in immunocompetent older adults even without the consumption of contaminated food. In such cases, the diagnosis is difficult and *Listeria* infection may be overlooked. The incidence of this disease is unclear, and it may be higher than the reported figure [10], thus further investigations are needed. Fig. 1.

Ethical approval

Ethical approval is not required for case reports.

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Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

CRediT authorship contribution statement

Hidenori Takahashi: Conceptualization, Literature search, Writing – original draft, Writing – review & editing, and Submission. **Takayuki Yokozawa:** Writing – review & editing. **Toshimi Oda:** Writing – review & editing.

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Declaration of competing interests

None.

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