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Case Report

Non-Typhoidal *Salmonella* Sepsis in a Systemic Lupus Erythematosus Patient

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SUMMARY

Non-typhoidal *Salmonella* (NTS) is a common pathogen causative of gastrointestinal infections. However, it can also lead to extra-intestinal infections, such as urinary tract infections or bacteremia, in some specific patient groups, including HIV-infected patients, patients receiving immunosuppressive agents, or those with urological malignancy, while there are few cases with both underlying autoimmune disease and hematologic malignancy. NTS-related sepsis may lead to higher mortality and complication rates in these patients. Here, we report the case of a 62-year-old woman who presented to our hospital with suspected left uterovesical junction stone with hydronephrosis complicated by urinary tract infection. After an episode of urosepsis, the patient was admitted to the intensive care unit and received intravenous antibiotic treatment with ertapenem, which improved her vital signs. A double-J stent was inserted in the left ureter to prevent obstruction by an abdominal tumor. Furthermore, blood and urine cultures identified *Salmonella enterica* group D. The tumor was diagnosed as diffuse large B-cell lymphoma. We report the rare case of a patient with NTS bacteriuria and bacteremia, underlying systemic lupus erythematosus (SLE), and diffuse large B-cell lymphoma. Prolonged antibiotic treatment is required in SLE patients with NTS, bacteriuria, and bacteremia.

1. Introduction

Salmonella spp., a gram-negative bacterium of the *Enterobacteriaceae* family, often causes gastrointestinal diseases. Both typhoid and non-typhoid *Salmonella* can have similar presentation. The classification of typhoid and non-typhoid *Salmonella* (NTS) is based on host difference.[1] Since NTS exists in the gastrointestinal tract of almost every animal, people can be infected by consuming contaminated food, such as eggs, meat, and milk. Antibiotic treatment has not been previously suggested for NTS gastrointestinal infections; however, patients with extra-intestinal infections might progress to a critical condition owing to an underlying disease if the appropriate antibiotics are not initially administered.[2] The following report presents a rare case of NTS extra-intestinal infection, as well as several possible mechanisms to explain susceptibility to NTS. Furthermore, we suggest a prolonged antibiotic treatment for this condition — even for more than 14 days.

2. Case report

A 62-year-old woman presented to our emergency room (ER) with fever, chills, left flank pain, and gross hematuria in the morning. Notably, her medical history revealed systemic lupus erythematosus (SLE), which had been treated with azathioprine, and right renal incomplete staghorn stones from three years prior. Complications associated with SLE included thrombocytopenia and splenomegaly. There was no family history of cancer or cardiac, renal, or hematological disease.

When she arrived at the emergency room, her temperature was 37.6 °C, blood pressure was 112/52 mmHg, heart rate was 116 BPM, and respiratory rate was 25 breaths/min. Further clinical examination revealed left costovertebral (CV) angle knocking pain, splenomegaly, and hepatomegaly.

Her white blood count was 1440/μL, hemoglobin level was 7.7 g/dL, platelet count was 101,000/μL, and C-reactive protein was 2.3 mg/dL. Furthermore, urine analysis revealed the presence of pyuria and bacteriuria, while kidney ultrasonography showed left-sided moderate hydronephrosis, but no obvious renal stones. Therefore, under the suspicion of a left uterovesical junction stone with hydronephrosis complicated by a urinary tract infection (UTI), the patient was admitted to our ward for antibiotic treatment with levofloxacin.

On the day of admission, an episode of urosepsis occurred at night; she was subsequently transferred to the intensive care unit (ICU) because of her critical condition. During her ICU course, her vital signs gradually stabilized after intravenous antibiotic treatment with ertapenem. Once her clinical condition stabilized, on the fourth hospital day, we performed a ureteroscopy for hydronephrosis. While there was no visible ureteral stone, severe angulation of the left upper ureter was observed during the operation. Considering that her previous abdominal computed tomography (CT) scan showed one 4.7 cm tumor in the left para-aortic region seven months prior, external compression of the left ureter was highly suspected. Therefore, a double-J stent was inserted in the left ureter to prevent obstruction. On the same day, blood and urine cultures revealed the same pathogen as *Salmonella* group D (Table 1).

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Table 1
Blood culture and urine culture tests.

	Salmonella serogroup D
Ampicillin	Sensitive
Ceftriaxone	Sensitive
Ciprofloxacin	Sensitive
Chloramphenicol	Sensitive
Sulfamethoxazole	Sensitive

For persistent pancytopenia, differential diagnoses such as SLE, drug-induced, or sepsis were considered; to this end, we re-checked the patient's autoimmune profile. Elevated levels of anticardiolipin IgG, IgM, and anti-dsDNA were noted, and her C3 level was 66.4 mg/dL; thus, SLE could not be excluded from the differential diagnoses. Regarding her abdominal tumor, an abdominal CT scan revealed that the abdominal tumor had progressed from 4.70 cm to 10.75 cm in the para-aortic region in seven months (Figure 1); furthermore, several hypo-enhanced lesions in the spleen and liver, cardiomegaly, hepatomegaly, and splenomegaly were observed. Next, the patient underwent CT-guided biopsy.

The tumor was diagnosed as diffuse large B-cell lymphoma. After completion of 10 days of intravenous antibiotic treatment, the patient was discharged and referred to an oncologist for lymphoma management.

She provided written consent for the publication of this case and the associated images.

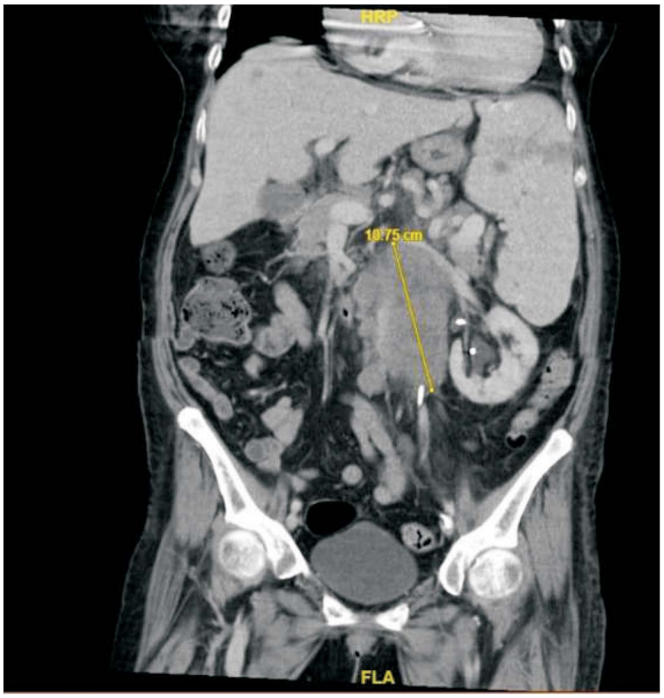

Figure 1. Abdominal CT scan revealed one heterogenous and hypo-enhanced para-aortic mass, which progressed from 4.70 cm to 10.75 cm in seven months. This mass resulted in left ureteral obstruction and hydronephrosis.

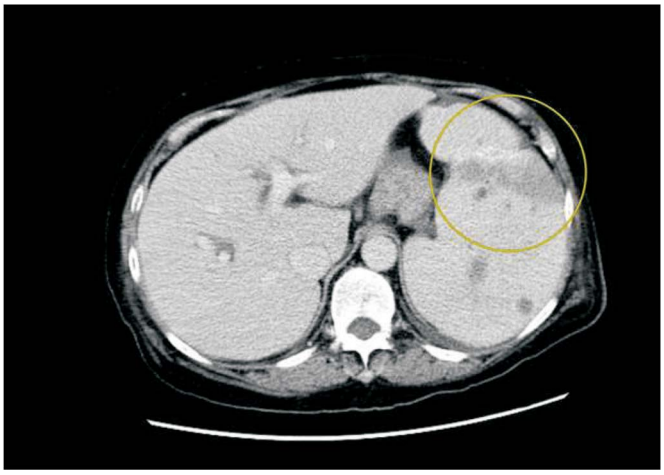

Figure 2. Abdominal CT scan revealed splenomegaly, multiple poorly enhanced lesions, and a wedge-shaped hypo-enhanced area in the spleen. Splenic infarction was suspected. These were noted to be risk factors for the increased susceptibility to *Salmonella* infection.

3. Discussion

There are several reasons for susceptibility to invasive NTS, including complement deficiency, immunosuppressive agent usage, decreased efficiency of IgG immune complex clearance, and relatively weak reticuloendothelial system function.[3] In our patient, decreased C3 level, azathioprine usage, pancytopenia, splenomegaly, and several splenic infarctions were noted during the hospital course (Figure 2). Since it is known that *Salmonella* is an intracellular pathogen, while the reticuloendothelial system is responsible for phagocytosis, the patient could have been more susceptible to *Salmonella* infection.[4] Although NTS rarely colonizes the urinary tract and causes associated symptoms, the possibility of NTS UTI and bacteremia in this clinical condition is higher than in other patients.[5] The ascending route and hematogenous infection route should be considered, although the former is the most common.[6]

Salmonella is the second most common pathogen found in the bacterial profile of UTIs in SLE patients, causing a higher percentage of bacteremia than other organisms in SLE patients.[7] Consequently, clinicians need to be aware of the relatively high risk of NTS-related UTI and bacteremia in patients with SLE.

It has been suggested that 10–14 days of intravenous antibiotic treatment, such as ceftriaxone, is suitable for NTS bacteremia. However, because of the high recurrence rate and poor prognosis, patients with *Salmonella* bacteriuria or bacteremia require more prolonged intravenous antibiotic treatment than non-SLE patients do.[6]

In summary, we present a case of NTS bacteriuria and bacteremia with underlying SLE and diffuse large B-cell lymphoma, while discussing several mechanisms that might explain the susceptibility of our patient to *Salmonella*. In conclusion, prolonged antibiotic treatment is required in SLE patients with NTS, bacteriuria, and bacteremia.

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Conflicts of interest

There are no potential financial or non-financial conflicts of interests.

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