CASE REPORT

Fever of unknown origin in a patient initially presenting with traveller's diarrhoea

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SUMMARY

A 17-year-old male presented with diarrhoea and malaise following his return from Kenya and Tunisia. He was managed as a case of traveller's diarrhoea. Stool cultures were negative for pathogenic bacterial growth. Two weeks later he presented with worsening lower back pain. MRI of lumbosacral spine suggested L1 osteomyelitis. CT-guided spinal aspirate grew no organisms and repeat viral serology and blood cultures (including tuberculosis screening) were negative. He was treated with a 6-week course of ceftriaxone. Back pain did not improve and a repeat MRI scan 8 weeks after his antibiotic course indicated progressive changes in L1 extending to L2 with an intradiscal abscess. Repeat CT-guided spinal aspirate grew *Salmonella arizonae* sensitive to cotrimoxazole and ceftriaxone. He was treated with intravenous ceftriaxone and cotrimoxazole for 12 weeks. A 4-month follow-up MRI scan showed progressive improvement of the L1/L2 discitis with resolution of intradiscal fluid.

BACKGROUND

Traveller's diarrhoea is a very common presentation in the emergency department and primary care, being defined as an increase in the frequency of bowel movements to three or more loose stools per day during a trip abroad, usually to less economically developed regions. It is a common problem affecting 20–60% of travellers,¹ although it is usually an acute, self-limiting condition and is rarely life threatening.

The underlying organism is often not identified due to delayed presentation, a delay in obtaining samples for culture and the low sensitivity of laboratory investigations.

Enterotoxigenic *Escherichia coli*, enteroaggregative *E. coli*, *Campylobacter*, *Salmonella* and *Shigella* bacteria are common causes of traveller's diarrhoea, while viruses and parasites are less common causes.²

A rare complication of traveller's diarrhoea is intervertebral disc infection, which can be associated with *Salmonella* and *Tuberculosis* bacterial infections: differentiation of these organisms is essential, as each requires a different treatment strategy and choice of antibiotic.

CASE PRESENTATION

A 17-year-old male presented to the Acute Medical Unit (AMU) in a District General Hospital with diarrhoea and malaise. He had returned from overseas travel to Kenya and Tunisia 8 weeks prior to his admission. Clinical examination did not elicit positive signs; chest X-ray was normal and white

cell count and C reactive protein (CRP) were within normal limits. He was diagnosed with traveller's diarrhoea, treated with intravenous fluids for 24 hours and discharged. Stool and urine cultures returned without significant bacterial growth.

One week later, he again presented to AMU with non-specific symptoms of malaise and backache. There was no history of trauma or medical history of back pain. Clinical examination was again unremarkable, and a repeat chest X-ray and inflammatory markers were within normal limits. Initial blood cultures did not reveal growth of any organisms. A diagnosis of non-specific viral illness and likely musculoskeletal back pain was made and he was again discharged home.

The patient was readmitted 2 weeks later with worsening lower back pain. Clinical examination and routine laboratory investigations including neutrophils, lymphocytes, eosinophils and CRP were within normal limits, although erythrocyte sedimentation rate was 44. MRI of the lumbosacral spine suggested L1 osteomyelitis (figure 1) and the patient underwent a CT-guided biopsy. Culture of the spinal aspirate did not grow any organisms and repeat sepsis screening with viral serology and blood cultures (including acid-fast bacillus staining and PCR screening for tuberculosis infection) were negative.

The patient was given a 6-week course of once daily ceftriaxone via a peripherally inserted central catheter as an outpatient following microbiology advice and local trust guidance. His back pain did not improve and a repeat MRI scan 8 weeks after his antibiotic course indicated progressive changes in L1 extending to L2 with an intradiscal abscess (figure 2). No red flag symptoms were elicited and re-examination revealed no neurology in the lower limbs. Further blood cultures specifically looking for tuberculosis were again negative. Inflammatory markers remained normal. No underlying immunocompromised state (including HIV testing) was identified and immunoglobulin levels were normal. A repeat CT-guided biopsy of the lumbar spine was therefore organised and culture of this aspirate grew *Salmonella arizonae* sensitive to cotrimoxazole and ceftriaxone.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis of discitis includes:

1. Spinal tuberculosis;
2. *Staphylococcus* infection;
3. *Salmonella* infection;
4. Parasite infection;
5. Malignancy.

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Figure 1 L1 vertebral body with a tiny focus of non-enhancement (arrow) within the subcortical fluid signal focus seen on T2-weighted images, in the extreme posterior and inferior corner of the vertebral body.

TREATMENT

Following spinal multidisciplinary team discussion, the patient was treated with intravenous ceftriaxone 2 g once daily and cotrimoxazole 960 mg two times per day for 12 weeks.

OUTCOME AND FOLLOW-UP

A 4-month follow-up MRI scan showed progressive improvement of the L1/L2 discitis with reduced subchondral oedema but near complete obliteration of intradiscal fluid.

DISCUSSION

To the best of our knowledge, this is the first confirmed case of discitis secondary to *S. arizonae* in the literature.

Septic discitis is rare, accounting for <0.01% cases of back pain.³ *S. aureus* and *S. epidermidis* account for 60% and Enterobacteriaceae for 30% of the causative organisms.⁴ A high level of suspicion, prompt investigation, early institution of appropriate antibiotic therapy and timely surgical intervention is mandatory for the successful management of spinal infection.

Salmonella is a facultative anaerobic Gram-negative bacillus of the family Enterobacteriaceae. There are two medically recognised species of *Salmonella* (*S. enterica* and *S. bongori*); *S. arizonae* is a subspecies of *S. enterica*. *S. arizonae* is known to cause infection in reptiles and other animals but is an uncommon enteric pathogen in humans.⁵ *S. enteritis* has been described in patients from Asia, Africa, the southern states of the USA and Mexico, while in Europe, it is an uncommon occurrence.⁶ The majority of reported cases occur in immunocompromised patients, notably those using rattlesnake capsules

Figure 2 Progression of inferior endplate inflammatory change within L1, which has extended into the L2 vertebral body with an associated intradiscal L1/L2 abscess.

as a remedy for connective tissue disease.^{7–10} The portal of entry for the bacteria into a human host is the gastrointestinal tract, and the bacteria subsequently disseminate through the blood and lymphatics. *S. arizonae* has been isolated from a variety of biological fluids and tissue, including blood, urine and stool, but we report the first case of its diagnosis on spinal biopsy cultures. As our patient presented with a brief episode of diarrhoea and no history of an underlying immunocompromised state, the initial presentation of gastrointestinal symptoms most likely represented *S. enteritis* with subsequent dissemination of the organism to the spine. *S. arizonae* should be susceptible to commonly prescribed antibiotics including cotrimoxazole, ampicillin, quinolones and most second-generation and third-generation cephalosporins; prolonged courses have been used to prevent recurrence of infection.^{5 10} Our patient denied any history of ingestion of complementary medicines or contact with reptiles and therefore we suspect that the likely source of infection was contaminated food or water.

Identification of discitis in this case suggested possible tuberculosis. Diagnostic confusion due to radiological similarities between *Salmonella* spondylitis and tuberculous spondylitis is well documented.¹¹ Both organisms share similar epidemiology and demographics, and cause discitis following systemic infection. Plain radiographs and MRI do not differentiate between the two conditions and the key to diagnosis is the recovery of the organism from bone or blood cultures. Establishing the underlying aetiology of discitis is crucial, as it determines the duration of treatment and choice of antimicrobial agents used to treat the condition. Antibiotics are the main stay of treatment, but surgical intervention may be indicated to obtain tissue for diagnosis, when bony instability occurs, or if a neurological deficit is present.

Learning points

Several important lessons can be learnt from this case.

- ▶ A detailed travel history, contact with animals and the use of local folk remedies are essential in determining the cause of fever in a returning traveller. Regular follow-up, serial blood cultures and focused imaging according to symptoms are paramount if symptoms persist due to the possibility of disseminating infection.
- ▶ Our case highlights the importance of follow-up imaging of the spine in the treatment of discitis after an empirical course of antibiotics when no organism has been identified.
- ▶ Both *Tuberculosis* and *Salmonella* can infect the intervertebral disc and share the same epidemiological distribution. Identification of which organism is the cause of a discitis is essential to determine appropriate selection and duration of antibiotic treatment.
- ▶ *S. arizonae* should be included in the differential diagnosis of traveller's diarrhoea when the patient has a travel history to the endemic area (Asia, Africa, the southern states of the USA and Mexico), with a low threshold for imaging of the spine should the patient develop any symptoms consistent with discitis.

Contributors MAH has written the initial draft and performed the literature search. He is one of the treating physicians. TR reviewed the initial draft and significantly

contributed in writing the discussion section. He is also one of the treating physicians. AB reviewed the initial and then final draft. AB performed the literature search and is also one of the treating physicians.

Competing interests None declared.

Patient consent Obtained.

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REFERENCES

- 1 Barrett J, Brown M. Travellers' diarrhoea. *BMJ* 2016;353:i1937.
- 2 Yates J. Traveler's diarrhea. *Am Fam Physician* 2005;71:2095–100.
- 3 Carragee EJ. Pyogenic vertebral osteomyelitis. *J Bone Joint Surg Am* 1997;79:874–80.
- 4 Waldvogel FA, Papageorgiou PS. Osteomyelitis: the past decade. *N Engl J Med* 1980;303:360–70.
- 5 Bhatt BD, Zuckerman MJ, Foland JA, et al. Disseminated *Salmonella arizonae* infection associated with rattlesnake meat ingestion. *Am J Gastroenterol* 1989;84:433–5.
- 6 Catani M, De Milito R, Intrieri F, et al. [Systemic *Salmonella arizonae* infection: description of a rare surgical case]. *Minerva Chir* 2004;59:75–8. Review. Italian.
- 7 Waterman SH, Juarez G, Carr SJ, et al. *Salmonella arizonae* infections in Latinos associated with rattlesnake folk medicine. *Am J Public Health* 1990;80:286–9.
- 8 Riley KB, Antoniskis D, Maris R, et al. Rattlesnake capsule-associated *Salmonella arizonae* infections. *Arch Intern Med* 1988;148:1207–10.
- 9 Kraus A, Guerra-Bautista G, Alarcón-Segovia D. *Salmonella arizonae* arthritis and septicemia associated with rattlesnake ingestion by patients with connective tissue diseases. A dangerous complication of folk medicine. *J Rheumatol* 1991;18:1328–31.
- 10 Hoag JB, Sessler CN. A comprehensive review of disseminated *Salmonella arizonae* infection with an illustrative case. *South Med J* 2005;98:1123–9.
- 11 Amritanand R, Venkatesh K, Sundararaj GD. *Salmonella* spondylodiscitis in the immunocompetent: our experience with eleven patients. *Spine (Phila Pa 1976)* 2010;35:E1317–21.

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