



Case report

Salmonella neck abscess in a diabetic

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ABSTRACT

Salmonella is known to cause invasive illness. However, head and neck abscesses are an unusual presentation of extra-intestinal infection with this organism. We describe a case of *Salmonella* neck abscess in a diabetic patient. An 18 year old diabetic male was admitted with increasing left sided neck pain and swelling approximately four weeks after gastrointestinal illness. Imaging revealed a left sided neck abscess. Surgical drainage was undertaken. Cultures grew non-typhoid *Salmonella* species. He was treated with intravenous antibiotics and did well clinically. *Salmonella* infection should be considered in the differential diagnosis of patients with immunocompromising conditions presenting with neck abscess of unclear etiology.

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Case report

An 18-year-old white man with type 1 diabetes diagnosed at age 11 was admitted with left-sided neck swelling, pain, stiffness, redness, and fever. One month prior he had his first episode of diabetic ketoacidosis (DKA), which was preceded by a 1-day history of profuse nausea and vomiting. He did not recall eating any unusual foods or dining out prior to that illness. He had no sick contacts. Of note, he was a university student studying herpetology with significant reptile exposure. The day after this episode he awoke feeling very poorly and his mother took him to the local Emergency Department. He was admitted to that facility after being found to be in DKA and was treated with intravenous insulin and crystalloids. His DKA resolved and he was released home. A few days later the patient developed left-sided neck pain, swelling, and stiffness. He sought evaluation at a local urgent care and was diagnosed clinically with mononucleosis and was subsequently given a prednisone taper. He took this for approximately one week.

His neck pain worsened, and he subsequently developed increasing left neck swelling, redness, and fevers. He presented back to the local Emergency Department and was found to have an elevated white blood cell count of 15,000/uL (normal 3.5–11.0 × 10³/uL) with 81% neutrophils as well as an elevated C-reactive protein of 149.1 mg/L (normal <= 8.0 mg/L). His blood glucose was over 300 mg/dL (normal 65–139 mg/dL) and hemoglobin A1c was 12.1% (normal 4–6%), but the remainder of his

laboratory studies, including a fourth-generation human immunodeficiency virus (HIV) screen, were unremarkable. Computed tomography (CT) scan was obtained and revealed a large, 5.5 × 5.3 cm left sided lymph node along the sternocleidomastoid muscle containing a 4 cm ill-defined rim-enhancing fluid collection (Fig. 1). He was then transferred to our facility for further care. He was evaluated by otolaryngology and underwent left neck incision and drainage. Fluid obtained was sent for culture. *Salmonella* species was isolated and produced medium sized, grey, smooth colonies on sheep blood agar (Fig. 2). Inoculation on triple sugar iron agar (TSI) produced alkaline slant (Fig. 3). The isolate was sent to the state microbiology laboratory and was subsequently identified as *Salmonella* species IIIa (51:Z4,Z23).

Discussion

Salmonella is a non-encapsulated, gram-negative facultative anaerobic rod [1–3]. It can be distinguished from other microbes by motility, hydrogen sulfide production, and non-lactose fermentation in addition to other metabolic traits [4]. There are two species of *Salmonella*: *S. enterica* and *S. bongori*. However, there are more than 2500 serotypes differentiated by antigenic presentation [5]. Salmonellosis is a well described disease with many manifestations [5,6]. Most commonly, it causes gastrointestinal infections and bacteremia. Worldwide disease due to non-typhoidal *Salmonella* is quite common and has been estimated to affect more than 2 million people each year [6]. Extra-intestinal illness occurs in a small minority of patients [5–7].

The typically route of infection is via the gastrointestinal tract with subsequent blood stream invasion [1–11]. Distant metastasis is then possible through hematogenous spread. Soft tissue

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Fig. 1. CT neck demonstrating rim-enhancing fluid collection.



Fig. 2. *Salmonella* colony growth on blood agar.

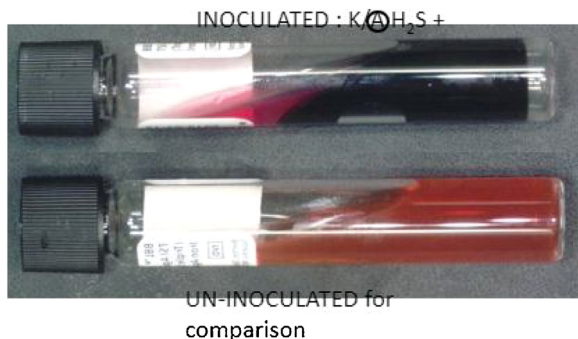


Fig. 3. Alkaline slant consistent with *Salmonella* growth on triple sugar iron agar.

infections are relatively uncommon [8]. Common animal reservoirs for infection include reptiles, amphibians, and poultry [5]. A large review of 19 patients with *Salmonella* neck abscesses was published by Su et al. Of the 15 adults included in this study, 9 had underlying diabetes [7].

Our patient was a type 1 diabetic who also had routine exposure to reptiles as he was studying herpetology in college and spent a substantial amount of time handling reptiles. We hypothesized that he acquired the organism via that exposure with abscess formation either by direct spread of the bacteria from the oropharyngeal space to the lymph node or more likely hematogenous seeding of the node. His initial DKA episode may have been the result of gastroenteritis due to *Salmonella* which then entered his blood stream and seeded lymph nodes in his neck. Fortunately, the organism was sensitive to most antibacterial agents and was very amenable to treatment. He had initially been placed on ampicillin-sulbactam. Infectious diseases service was asked to assist with care, and he was transitioned to ceftriaxone. He developed a rash on ceftriaxone and therapy was then changed to ciprofloxacin. He did well clinically and was released home with his family in good condition.

Our case highlights this unusual presentation of *Salmonellosis*. Although, a rare presentation, this organism should be considered in the differential of causative microbes in any patient with known risk factors for infection such as immunocompromise and exposure to animal reservoirs.

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