**Salmonella typhi: a rare cause of neck abscess**

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Abstract

Salmonella typhi neck abscess represents a rare cause of focal salmonellosis. Most of the cases in the literature reviews were reported in immunosuppression adults; just two of them were in children. Herein we report a case of 7-year old healthy girl with a neck abscess caused by S. typhi. The patient was diagnosed according to serological and radiological findings. Incision and drainage of the abscess accompanied by broad-spectrum antibiotics were performed for treatments. S. typhi should be kept in mind as a cause of neck abscesses.

INTRODUCTION

Neck abscess in children is a rare disease resulting from upper respiratory tract infection, contiguous infection or trauma. It is usually caused by Streptococcus, Staphylococcus or other anaerobic species [1]. Salmonella typhi infection as a cause of neck abscess is extremely rare. Patients with systemic illnesses (HIV, diabetes and malignancy) or patients treated with immunosuppressive therapy are at increased risk for the development of focal infection [2].

S. typhi is a gram-negative bacilli organism mediated mainly through the fecal-oral route [3]. The clinical manifestations of S. typhi vary from asymptomatic infections to severe illnesses. Mild gastroenteritis (nausea, vomiting, abdominal pain and bloody diarrhea) is the most common clinical presentation of S. typhi infections [4]. It rarely causes focal infections like neck abscess, lung abscess or bone infection, especially in immunocompromised patients. The focal infection of Salmonella may occur without gastrointestinal symptoms [3].

In the literature review, no more than 20 cases of neck abscesses with soft-tissue involvement by S. typhi were reported worldwide; only two of them were in healthy children.

CASE REPORT

A 7-year-old girl was referred with a complaint of fever measured at 39–40°C at a rate of one to two times daily, partly controlled with antipyretic, associated with painful swelling involving the right neck and determine in the neck movement for 13 days. Although she was treated with various antibiotics and non-steroidal anti-inflammatory drugs (NSAIDs), the fever and the swelling did not relieve. Her past and familial medical histories were unremarkable.

On admission, the patient was febrile with a body temperature of 39°C with stable vital signs. There was edema involving the right neck and shoulder of which the size was 5 cm × 5 cm, with local inflammation signs (local heat, overlying skin appeared redness). The neck revealed restricted rotations and there was obvious tenderness on her shoulders.

Laboratory investigation reports were as in Table 1. Widal test was positive (Typhi: (O: 1/180), (H: 1/180)), while Wright test was negative (Paratyphi: A(H): 1/80), (B(H): 1/80)).

The chest X-ray was normal with swelling in the right neck (Fig. 1). Cardiac echography (ECG) was normal. On neck ultrasound (US), there was gross cellulitis with soft tissue edema measuring 40 mm × 40mm with associated lymphadenopathy in the neck and sup-cervical. The abdominal US showed an enlarged spleen of 11 cm with an extra-spleen of 1.5 cm. Chest computed tomography (CT) showed a large cystic mass (6.5 × 4 cm and length of 10 cm) that secreted contrast material with a thick wall in the right side of the vertebrae extending from the first cervical vertebra to the entrance of the chest (Fig. 2). A large lymph node behind the right lower jaw angel about 10 cm and bilateral behind the Sternocleidomastoid muscle (the right 11 mm, left 13 mm).

Incision and drainage of the abscess were performed under local anesthesia and the patient was empirically started on intravenous Metronidazole and Ceftriaxone. The examination of the pus showed polymorph-nuclear cells and no microorganisms. On culture, various antibiotics and non-steroidal anti-inflammatory drugs (NSAIDs), the fever and the swelling did not relieve. Her past and familial medical histories were unremarkable.

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Discussion

Soft-tissue infections of S. typhi are caused by the hematogenous or lymphatic dissemination of primary gastrointestinal tract...
Table 1. The laboratory data of the case

| Test                  | Result | Normal range | Test                  | Result | Normal range |
|-----------------------|--------|--------------|-----------------------|--------|--------------|
| WBC (10^3/μl)         | 40↑    | 6.2–17       | ESR (1 h)(mm/h)       | (48, 110)↑ | 0–10         |
| Neutrophils (%)       | 94↑    | 40–60        | Glucose (mg/dl)       | 80     | 70–100       |
| Lymphocyte (%)        | 4      | 20–40        | Urea (mg/dl)          | 30     | 15–36        |
| Hb (g/dl)             | 11.7   | 11–13        | Creatinine (mmol/L)   | 0.5    | 0.5–1.3      |
| MCV(fl)               | 72     | 70–85        | K (mmol/L)            | 4.5    | 3–4.5        |
| PLT (10^3/μl)         | 515    | 150–450      | Na (mmol/L)           | 135    | 135–145      |
| CRP (mg/dl)           | 200↑   | < 5          | TSH (miU/L)           | 3      | 0.5–5.0      |
| AST (U/L)             | 15     | 5–40         | Blood culture         | negative |             |
| ALT (U/L)             | 20     | 7–55         |                        |        |              |

WBC: White blood cell, HB: Hemoglobin, MCV: Mean corpuscular volume, PLT: platelets, ESR: erythrocyte sedimentation rate, CRP: C-reactive protein, ALT: Alanine aminotransferase, AST: Aspartate Aminotransferase, Na: sodium, K: potassium, Glu: glucose, TSH: thyroid-stimulating hormone. The initial Laboratory data of the case.

The diagnosis of the neck abscess is confirmed by lateral neck radiograph, neck US, CT scan or magnetic resonance scanning. Neck US is a widely available, quick and cheap tool that could be used for both diagnosis and therapy [5]. CT scan is sensitive (90%) in the detection of the neck abscess with 60% specificity, which differentiates the abscess from lymphadenopathy or cellulitis [4].

Treatment of S. typhi neck abscess may be medical or surgical. The first stage includes antibiotics, when without response incision and drainage in addition to antibiotics according to culture and sensitivity is recommended. The ideal period of treatment according to current recommendations is 7 to 14 days to prevent recurrence [7].

In the literature review, most of the cases of S. typhi neck abscess were in adults with immunocompromised diseases. Only two cases were in healthy children [8, 9]. Our case is the third case in the literature that described S. typhi neck abscess in a child (Table 2).

This case demonstrates a rare case of S. typhi neck abscess and provides additional evidence of the ability of Salmonella to invade the neck region even in healthy children.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This case report did not require review by the Ethics Committee Tishreen University Hospital, Lattakia, Syria.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient’s parents for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor.

DATA AVAILABILITY

All data generated or analyzed during this study are included in this published article.

COMPETING INTERESTS

All of the authors declare that they have no competing interests.

FUNDING

No funding was obtained for this study.
Figure 2. Chest CT showed a large cystic mass with a thick wall on the right side of the vertebrae extending from the first cervical vertebra to the entrance of the chest.

Table 2. The literature cases of Salmonella typhi neck abscess in childhood

| Author/Year | Patient | Manifestation | Diagnosis | Treatment |
|-------------|---------|---------------|-----------|-----------|
| Murray 1994 | 10 year-old healthy female | Granuloma, cervical adenitis | Laboratory and culture with radiological findings | Excision and antibiotics |
| Fu-Hsiung Su 2003 | 10 year-old healthy male | Left retropharyngeal space | Laboratory and culture with radiological findings | Incision and drainage with widespread antibiotics |

AUTHORS’ CONTRIBUTIONS

All authors have read and approved the manuscript.

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