Journal of Pakistan Association of Dermatologists. 2021;**31(2)**:301-303.

Case Report

Cutaneous Ulcer infected with *Salmonella typhi*

Jianning SUN, Qazi Syed Irfanullah Shah, Farhan Younas*, Xuefeng WAN

Department of Dermatology, The First Affiliated Hospital, Xinjiang Medical University, Urumqi, China.
* Centre for Interdisciplinary Research in Basic Sciences, International Islamic University, Islamabad.

Abstract Chronic skin ulcer can rarely be caused by *Salmonella typhi* and it is a very uncommon condition to be noticed. 41 years old male patient with a skin ulcer at the xiphoid process was resistant to antibiotics, incision and drainage was admitted. No diagnosis was made through investigations for 5 months. Local skin tissue culture showed growth of *Salmonella typhi,* which was sensitive to Ceftriaxone (Rocephin). The ulcer was successfully treated by the usage of Ceftriaxone for 2 weeks. A chronic skin ulcer is expected to be the result of *Salmonella typhi* as a rare condition. It can occur in an immunocompetent person and diagnosis is only made by local skin tissue culture.

Key words
Bacterial Infection, cutaneous infection, *Salmonella*, *Salmonella typhi*, ulcer.

Introduction

Salmonella species can cause a range of different infections in humans including gastroenteritis, typhoid, bacteremia, and local infections.[1] Local infection is a rare complication of *Salmonella*.[2] It is often seen in individuals with some other diseases like sickle cell anemia, Bartonella disease, and immunocompromised persons.[1] Although there are reports of intraperitoneal, spleen, breast, and subcutaneous abscesses, local infection is mostly seen in bone and joint. Skin ulcer caused by colonization of *Salmonella* is extremely rare.[1-6] Here, we are reporting a case of cutaneous ulcer manifested by *Salmonella typhi* infection.

Case report

A 41-year-old male patient suffered from skin trauma at the xiphoid process of the sternum with local pain in April 2014. A sternal computed tomography (CT) scan showed a fracture of the lower sternum. Three months later, due to the local redness and pain of the skin in the lower part of the sternum, diagnosis with abscess of the chest wall and fracture of the lower part of the sternum was made by the plastic reconstruction surgeons. Incision and drainage of an abscess was done, the dressing was changed daily for one month, then the diagnosis of chest wall abscess was confirmed by a thoracic surgeon. During the illness, there were no symptoms of fever, fatigue, abdominal pain, diarrhea, and systemic rash, and no significant weight loss was observed. Physical examination revealed the xiphoid process of the sternum was about 2cm long with a small amount of yellow-brown mucus, local skin swelling, and tenderness. Blood routine examination, liver and kidney function, infectious disease screening, humoral immunity, and ECG were normal. Blood and fecal fat test were negative. A sternal CT scan showed an abscess of the left anterior chest wall that also invaded the left fourth costal cartilage.

Address for correspondence
Dr Xuefeng WAN, MD,
Department of Dermatology,
Dushanzi District People's Hospital, Karamay,
Xinjiang, ChinaThe First Affiliated Hospital,
Xinjiang Medical University, Urumqi, China.
Email: xjwanxuefeng@sina.com

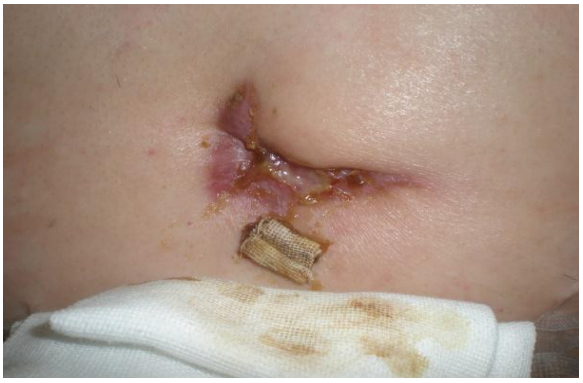

Figure 1 Deep skin ulcer with irregular secretion.

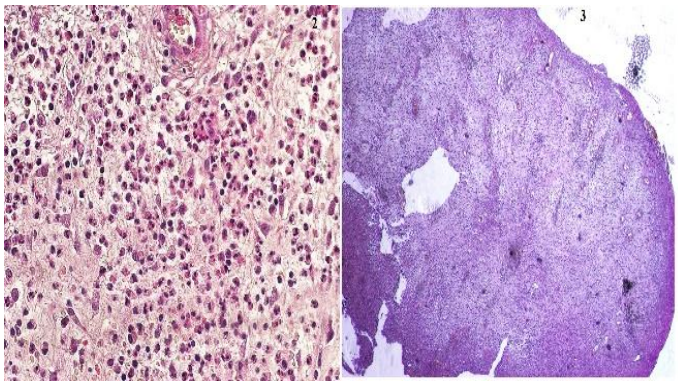

Figure 2,3 Histopathological examination of a large number of neutrophils, lymphocytes, plasma cells, and a small number of multinuclear giant cells infiltrated in the dermis. Absence of epidermis and a large number of inflammatory cells infiltrated in the dermis.

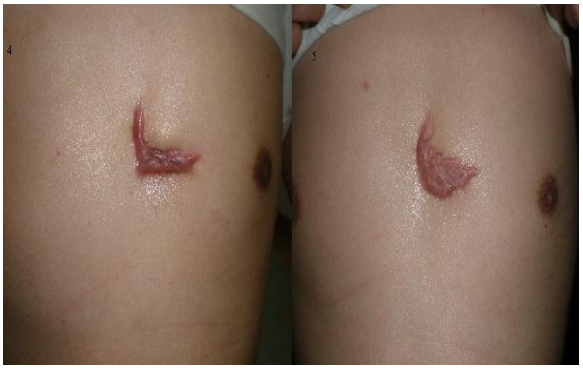

Figure 4, 5 Scar healing on May 17, 2015, follow up on December 6, 2017, the patient recovered from skin lesion with scar formation.

The diagnosis and treatment process was started on August 16, 2014, that included local debridement, drainage, and daily dressing in the plastic and prosthetic departments. The purulent secretion was reduced and the patient was discharged half a month later. After 6 weeks of continuous treatment, the local wound was not healed. Surprisingly there was no associated fever and other symptoms of general discomfort. This patient with a chronic skin ulcer of the chest wall was treated by debridement and VSD suction. Four months later, a CT scan again showed the left anterior chest wall was infected and the left fourth costal cartilage was involved. The local wound was not improving even after 5 months of treatment. Physical examination showed around 3cm diameter lesion at the xiphoid process with yellow secretion. The surrounding skin was slightly red, swollen and tender **(Figure 1)**. Histopathological examination showed that there were a large number of neutrophils, lymphocytes, plasma cells, and a small number of multinuclear giant cells infiltrated in the dermis **(Figure 2)**. Skin tissue culture showed *Salmonella typhi* and it was sensitive to ceftriaxone sodium and sulfanilamide, while resistant to ciprofloxacin and ampicillin. Ceftriaxone (Rocephin) was given IV 1.0g/ day for 2 weeks, local wound healing started **(Figure 3)**. Following up on May 17, 2015 **(Figure 4)** and December 6, 2017, the patient recovered from the skin lesion with scar formation **(Figure 5)**.

Discussion

Bacteremia is a typical feature of typhoid. Systemic hematogenous dissemination may lead to one or more persistent focal infections of the tissues that are more prone to infection. In this case, there was no fever, diarrhea and other bacteremia symptoms, blood, and fecal culture were also negative, so it can be said that there was no intestinal disease.[2-4] Therefore, this patient may be infected by *Salmonella typhi* due to skin trauma. Chest CT showed the abscess of the anterior chest wall with costal cartilage

involvement, which was consistent with that of *Salmonella typhi*. The skin-based abscess of *Salmonella* is a very rare clinical manifestation.[3,5] The special feature of this case is that it occurred in an immunocompetent patient. A skin ulcer is the only clinical manifestation of *Salmonella typhi* infection.[6]

Salmonella typhi is a rare cause of skin and soft tissue infection and abscess, especially in patients with normal immune function.[7,8] The possibility of *Salmonella* infection should be taken into account in the rare and long-term ulcerative lesions of chest skin with costal cartilage involvement.[9]

Conclusion

Chronic skin ulcers may be the result of *Salmonella typhi* in rare conditions. It can occur in an immunocompetent person and diagnosis is only made by local skin tissue culture.

References

1. González Quintela A, Sanchez Leira J, Torre JA, Barrio E. Isolation of Salmonella typhi in a cutaneous ulcer. *J Infect*. 1995;**31(1)**:81-2. doi:10.1016/s01634453(95)91767-5
2. Wlodek C, Ng Y, Bovill B, Johnson EM, Bhatt N, Shipley D. An unusual cause of cutaneous ulceration. *Clin Exp Dermatol*. 2017;**42(2)**:226-9. doi:10.1111/ced.13007
3. Hager K, Albrecht D, Häring R, Hamm B. Kasuistik zur extraintestinalen Manifestation einer Salmonelleninfektion [Case report of extra-intestinal manifestation of salmonella infection]. *Zentralbl Chir*. 1994;**119(7)**:511-4.
4. Bahar G, Dansuk Z, Kocatürk S, Cakir T, Mert A. Abscess of the neck caused by Salmonella enteritidis. *Otolaryngol Head Neck Surg*. 2003;**129(4)**:445-7.
5. Marzano AV,Mercogliano M,Borghi A,Facchetti M,Caputo R. Cutaneous infection caused bySalmonella typhi. *J Eur Acad Dermatol Venereol*. 2003;**17(5)**:575-7.
6. Sfeir M,Youssef P, Mokhbat JE. Salmonella typhi sternal wound infection. *Am J Infect Control*. 2013;**41(12)**:e123-4.
7. Greenwood D, Slack R, Peutherer J. Medical microbiology. 15th ed. Edinburgh:Churchill Livingstone; 1997.
8. Minohara Y, Kato T, Chiba M, Doi K, Kurihara Y, Kusakado M, Miyamoto Y, Miyazaki O, Kawaguchi F. A rare case of Salmonella soft-tissue abscess. *J Infect Chemother*. 2001;**8(2)**:185-6.
9. Dimitra P, Julian K, Faisal B, Stephen M, Robert M. Focal Salmonella enteritidis infection in a patient with HIV infection and other multiple causes of immunodeficiency. *Int J STD AIDS*. 2008;**19(7)**:491-2.