Toxic Shock Syndrome Secondary to a Diabetic Foot Infection in a HIV Positive Patient: A Case Report and Review of the Literature

Yusuf A. Opakunle, DPM, Sara E. Lewis, DPM and Joshua J. Mann, DPM, FACFAS
DeKalb Medical Center, The Podiatry Institute

DeKalb Medical

Statement of Purpose

Toxic shock syndrome (TSS) has been rarely reported from a primary foot infection. TSS remains a devastating condition with a high mortality rate, especially among immunocompromised patients. This case study describes a patient with an unknown HIV serostatus who presented to our institution with a right hallux infection and gas gangrene who subsequently was diagnosed with TSS. Our aim was to highlight the importance of utilizing clinical acumen in delineating, diagnosing and managing TSS.

Literature Review

•TSS is caused by staphylococcal or streptococcal exotoxins

•Rapid onset of hypotension, fever, and a diffuse macular erythroderma are clinical signs and symptoms

•The most common etiology of TSS includes:
- menstruating women with tampon use
- respiratory infection
- burns
- post-surgical wounds

•Few reports have been written about TSS originating from the foot

• Arnold et al reported a case study of TSS originating from serous blisters to both feet caused by wearing tight shoes 3 days prior (1)

•Miller et al published a case report of a 35-year- old male with TSS originating from a puncture wound. He underwent multiple surgeries including a transmetatarsal amputation to prevent spread of the infection (2)

•Strenge et al reported a case report of a 45-year old dentist who developed post-operative TSS after excision of a ganglion cyst from the left ankle (3)

•To date, no case reports have been published describing TSS caused by a diabetic foot infection in an HIV positive patient

Case Study

HPI: 48 year-old African American male presented to the emergency department with a 5 day history of lethargy, fever and right foot ulcer with increased pain.

Past Medical History: HIV, Hepatitis B, HPV, Herpes Zoster, CVA, peripheral vascular disease, neuropathy, thrombocytopenia, glaucoma, peptic ulcer, chronic anemia, chronic pain syndrome

Physical Exam: Full thickness ulcer distal plantar tip of right hallux that probed to bone. Purulent, malodorous drainage with multiple bullae (*Figure 1*).

Imaging/Diagnostics: Radiographs of the right foot were obtained which demonstrated subcutaneous emphysema *(Figure 2*).

Emergency Department Course: The patient's systolic blood pressure dropped to 86, his heart rate varied from 120-130. The patient was given a total of 7 liters of normal saline and was started on empiric Vancomycin and Zosyn. WBC was 9.0. Based on the clinical examination and visible gas on radiographs, the patient was quickly taken for emergent debridement.

Treatment: Patient underwent an incision and drainage with right hallux amputation under MAC and local anesthesia (*Figure 3*). He was closely monitored during the procedure and given albumin secondary to hypotensive episodes. Following the surgery the patient was transferred to the ICU and started on a Cardene drip. Cultures resulted as below.

- Wound culture: Proteus mirabilis
  Coagulase-Negative Staphylococcus

Three days post-op, the antibiotics were changed to Ceftriaxone and Clindamycin. The patient remained in the ICU continued with aggressive supportive treatment. Once patient was stabilized, he was transferred to the surgical floor and underwent a partial first ray resection with delayed primary closure.

The patient was discharged to an outside facility on PO Augmentin 500mg three times a day for seven days with the assumption surgical cure was obtained. Following discharge the patient was unfortunately lost to follow-up .

Figure 1: Right Hallux Ulcer Upon ED Arrival

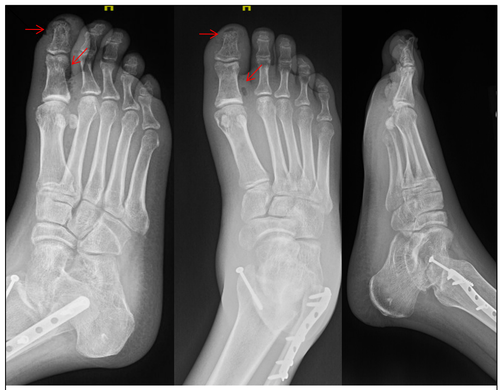

*Figure 2: Radiographs of the Right Foot (*Red Arrows demonstrate Gas)*

Figure 3: Status Post Right Hallux Amputation

Discussion

•This case study details the aggressive steps and treatment that must be taken in patients presenting with TSS.

- •Secure airway, providing supplemental O2 if needed
- •Establish a venous access
- •Provide rapid restoration of perfusion with IV fluids, some patients may also need vasopressors
- •Start empiric IV antibiotics
- •Follow patient clinically, as well as mean arterial pressure, urine output, HR, RR, temperature, pulse oximetry and mental status
- •Provide prompt and aggressive debridement of necrotic tissue or irrigation of potentially naturally colonized regions, such as sinuses or vagina (4)

•Although uncommon, our patient is a case of TSS caused by coagulase negative staphylococcus. Coagulase negative staphylococcus (CoNS) are normal flora of the human body found on the skin and mucous membrane.

•There are several exotoxins that may be responsible for causing TSS such as staphylococcus enterotoxin A-H. However, the vast majority of TSS are associated with exotoxin TSST-1 produced by staphylococcus aureus. CoNS can also produce TSST-1 (5).

•When exotoxins are produced, they can be absorbed into the systemic circulation, thereby causing significant damage to organs and tissues. This occurs in patients who do not have a protective antitoxin antibody or those who are immunocompromised such as the patient in this case who has HIV (6).

•Diagnosis is made based on clinical evaluation and cultures. Clinicians must have a high index of suspicion.

•The goal of this case report is to show that early diagnosis and aggressive supportive treatment of TSS can help prevent permanent organ damage and even death in severe cases.

References

1 Arnold J, Lucarelli M, Cutrona AF, DiDomenico LA, & Karlock, L. Toxic shock syndrome originating from the foot. The Journal of Foot and Ankle Surgery 40(6): 411-413, 2001
2. Miller JH, Nath RL, StoughtonJ, Carpenter BB, & Mostone E. Streptococcal toxic shock syndrome from a puncture wound to the foot. The Journal of Foot and Ankle Surgery. 35(6): 578-584, 1996
3. Strenge KB, Mangan DB, Idusuyi O. Postoperative Toxic Shock Syndrome After Excision of a Ganglion Cyst From the Ankle. The Journal of Foot and Ankle Surgery, 45(4): 275-277, 2006
4. Bush, Larry M., et al. "Toxic Shock Syndrome (TSS) - Infectious Diseases." *Merck Manuals Professional Edition*, 17 Sept. 2017, www.merckmanuals.com/professional/infectious-diseases/gram-positive-cocci/toxic-shock-syndrome-tss.
5. Crass BA and Bergdoll MS. Involvement of Coagulase-Negative Staphylococci in Toxic Shock Syndrome. Journal of Clinical Microbiology. 23 (1): 43-45, 1986
6. Kotler DP, Sandkovsky U, Schlievert PM, Sordillo EM. Toxic Shock-Like Syndrome Associated with Staphylococcal Enterocolitis in an HIV-Infected Man. Clinical Infectious Diseases, 44(12): e121-e123, 2007