

Staphylococcus aureus causing sporotrichoid lymphangitis in an immunocompetent patient

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ABSTRACT:

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Sporotrichoid lymphangitis or nodular lymphangitis can be attributed to infection with various pathogens. The common organisms are *Sporothrix schenckii* and nontuberculous mycobacterium. Pyogenic Bacterial infection can cause sporotrichoid lymphangitis albeit rare.

To our knowledge, there are only few cases of Sporotrichoid lymphangitis due to *Staphylococcus aureus*. We report a case of Sporotrichoid lymphangitis due to *Staphylococcus aureus* in an immunocompetent patient. With oral administration of Amoxicillin/clavulanic acid, the cutaneous lesions significantly improved in our case.

Key words: Sporotrichoid lymphangitis, *Staphylococcus aureus*

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Introduction

Sporotrichoid lymphangitis is an uncommon infectious process characterized by tender, erythematous, nodular lesions that distributed linearly along lymphatic systems or sporotrichoid pattern. A single of papule at the injured site is the initial presentation then new lesions developing along the course of the lymphatic drainage weeks later, depend on the host immune response. Non-infectious causes including lymphoma, langerhans cell histiocytosis, and in-transit metastases can be the causes of sporotrichoid pattern. For infectious causes, the common organisms are *Sporothrix schenckii*, a dimorphic fungi, and nontuberculous mycobacterium while pyogenic bacteria is rare. We described a case of *Staphylococcus aureus* infection that developed in to sporotrichoid lymphangitis in an immunocompetent patient.

Case report

A 21-year-old healthy man presented with painful erythematous nodules on his right leg. Two weeks before, he fell down while playing football on the artificial turf football field, causing two superficial abrasion wounds on his right ankle and right shin. One week later, he developed first purulent erythematous nodule 1 cm above the healed abrasion wound spreading upward in linear fashion along lymphatic

drainage [figure 1 (A)]. Systemic symptoms were absent.

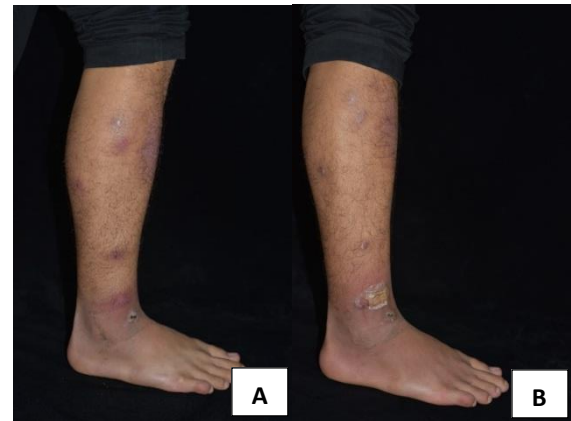


Figure 1 Linear painful erythematous nodules in a sporotrichoid pattern on right leg of the patient (A).

After 1 week of oral Amoxicillin/clavulanic acid (2 g/day) (B).

Skin biopsy was performed and demonstrated dense mixed inflammatory infiltration, predominantly neutrophils, in the entire dermis, especially deep dermis. Neither multinucleated giant cell nor epithelioid granuloma was present. Reactive changes were noted at the overlying epidermis [figure 2].

Tissue Gram stain showed gram-positive cocci in clusters with numerous polymorphonuclear cells. Periodic acid-Schiff (PAS), acid-fast staining (AFB), modified acid-fast staining (mAFB) and Polymerase Chain Reaction (PCR) for *Mycobacterium tuberculosis* complex were all

negative. Bacterial culture with antibiotics susceptibility showed methicillin-susceptible *Staphylococcus aureus* (MSSA). Fungal culture was negative. Blood for anti-HIV test was negative. He was treated with oral Amoxicillin/clavulanic acid (2 g/day) as an empirical therapy. The nodules disappeared completely after treatment leaving post-inflammatory hyperpigmentation [figure 1 (B)].

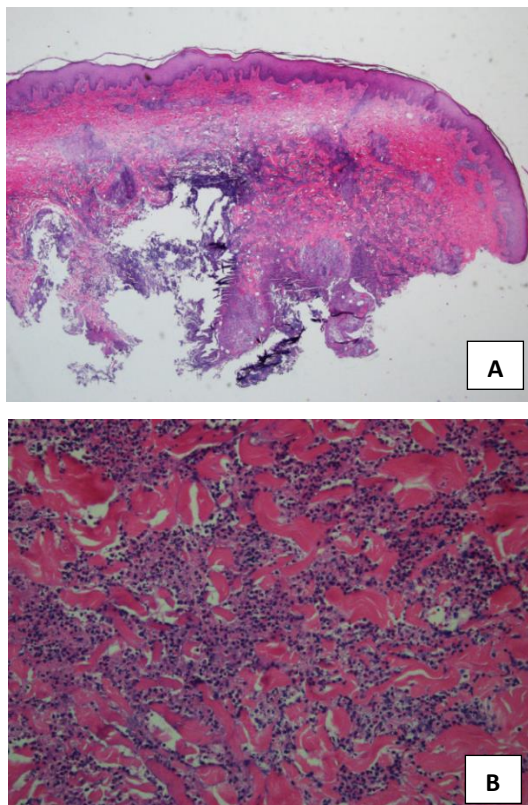


Figure 2 Hematoxylin and eosin stain demonstrating dense mixed inflammatory

infiltrate, predominantly neutrophils, in the entire dermis, especially deep dermis (x20 [A] and x200 [B])

Discussion

Sporotrichoid lymphangitis or nodular lymphangitis is a cutaneous infection characterized by painful, erythematous, nodules that appeared linearly along lymphatic systems. The presence of lesions suggests a limited ranges of causative agents including *Sporothrix schenckii*, *Mycobacterium sp.*, *Nocardia sp.*, and pyogenic bacteria.

Besides geographic setting and exposure history, incubation periods are suggested to be one of the important clues in determining the etiology of sporotrichoid lymphangitis.

Sporotrichoid lymphangitis caused by bacteria are commonly associated with short incubation periods (<1 week)^{1, 2}, 4-10 days for *Staphylococcus aureus*, 1-6 days for *Francisella tularensis*. However, *Nocardia* species and *Coccidioides immitis* are occasionally associated with subacute incubation periods (<2 weeks). In case that incubation periods >2 weeks, mycobacterial, fungal and leishmanial infections should be considered^{3, 4}.

Table 1 Previous reports of sporotrichoid presentation of *Staphylococcus aureus* infection

| Case | Age years/ gender | Underlying diseases | Immunosuppre- ssion | Methicillin susceptibility | Hemoculture | Systemic symptoms | Incubati- on periods | Treatment | Treatment Outcomes |
|----------------|----------------------|------------------------|-----------------------------------|-------------------------------|------------------|----------------------|----------------------------|--|------------------------|
| 1 ⁵ | 43/M | None | None | MSSA | Not performed | None | 75 days | Oral cefaclor (1 g/day) | Completely resolved |
| 2 ⁵ | 68/M | None | None | MSSA | Not performed | None | 15 days | Oral cefaclor (1 g/day) | Completely resolved |
| 3 ⁶ | 23/M | Diabetes | None | MSSA | Negative | present | 1 month | IV ampicillin/sul- bactam single dose Amoxicillin/cl- avulanic acid for 2 weeks Oral dicloxacillin (1 g/day) for 2 weeks | Completely resolved |
| 4 ² | 58/F | Dermatom- yositis | MMF Methyprednisol- one | MSSA | Negative | Not mentioned | 3 days | Oral trimethoprim sulfamethoxa- zole | Completely resolved |
| 5 ¹ | 37/M | Heart transplant | MMF Tacrolimus Prednisolone | MSSA | Negative | None | few weeks | IV Ceftazidime (3 g/day) IV cefazolin (3 g/day) for 5 days Oral cefadroxil (2 g/day) for 4 weeks | Completely resolved |
| 6(CR) | 21/M | None | None | MSSA | Not performed | None | 1 week | Oral Amoxicillin/cl- avulanic acid (2 g/day) for 2 weeks | Completely resolved |

M, male; F, female; MMF, mycophenolate mofetil; IV, intravenous; methicillin-susceptible *Staphylococcus aureus*, MSSA; CR, current report

Table 1 demonstrates the previous reported cases of *Staphylococcus aureus* causing sporotrichoid lymphangitis. Of the 6 patients, three were immunocompetent hosts (case 1,2,6, Table 1)⁵, while two underwent immunosuppressive therapy (case 4-5, Table 1)^{1, 2}. The other one patient had insulin-dependent diabetes mellitus (case 3, Table 1)⁶. All cases were caused by methicillin-susceptible *Staphylococcus aureus* (MSSA). Systemic symptoms were present only in one case (case 3, Table 1)⁶. The incubation periods ranged from day to months and unrelated to host status. We firstly started oral Amoxicillin/clavulanic acid (2 g/day) as an empirical therapy to cover unknown pathogens in the football field and the lesion was disappeared within one week.

Conclusion

Staphylococcus aureus should be considered as one of the differential diagnosis of pathogens causing sporotrichoid lymphangitis as it could be found in both immunocompromised and immunocompetent patients with vary incubation periods. Besides fungal culture, AFB, mAFB, and tissue biopsy, bacterial culture with antibiotics

susceptibility along with tissue gram-stain should be performed as routine work-up for sporotrichoid lymphangitis for pyogenic bacterial recognition.

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