Case Report: Atypical Mycobacterial Infection in Rural Kentucky

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Introduction

Atypical Mycobacteria chelone infections are rare (1:1,250,000 people) yet globally prevalent and known to cause clinically significant skin and soft tissue infections as well as invasive infections in immunocompromised patients (1). Here we present a case of Mycobacteria chelone infection in a patient in rural Kentucky after being on long term high dose steroids.

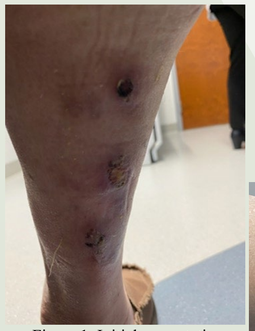

Figure 1: Initial presentation

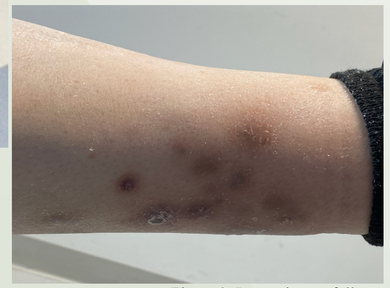

Figure 2: Improving on follow up

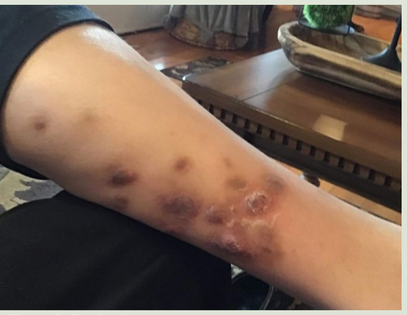

Figure 3: Beginning to worsen

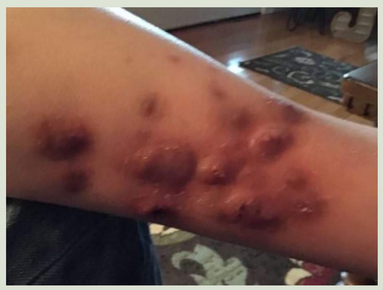

Figure 4: Worsened after failed abx tx

References

(1) Akram SM, Rathish B, Saleh D. Mycobacterium Chelonae. [Updated 2021 Jan 31]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430806/

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Case Presentation

A 66-year-old Caucasian male was directly admitted from the primary care office due to worsening skin lesions of the left leg over the past 7 weeks that could be described as multiple bullae with nodular areas. The patient described pain, swelling and serous weeping of the wounds and erythema at the bases and necrosis of the central portions of several lesions was noted on physical exam.

He had a complicated clinical course leading up to this presentation including a diagnosis of large B cell lymphoma of the left kidney with paraaortic nodal metastases 2 years prior for which he was treated with 6 cycles of CHOP chemotherapy as well as Rituximab and local radiation resulting in almost complete resolution and no evidence of disease progression at that time. A few months later he was diagnosed with immune thrombocytopenia (ITP) which was treated with 2 months of 80 mg Prednisone as well as a 4 week course of Rituximab followed by a prednisone taper for a total of approximately 3 months of continuous steroid use. This patient was on high dose corticosteroids for only approximately 3 weeks before beginning to develop an infection that reportedly began as a single lesion on his leg and continued to worsen over about a month before he presented with this complaint to his primary care physician (Figure 1). At this time he was evaluated and directly admitted to the hospital for further evaluation and antibiotic treatment of his lower extremity lesions.

Upon admission the patient was initially thought to have pyoderma gangrenosum by the hospitalist team and started on IV vancomycin. Infectious disease consult was obtained and the differential diagnosis of this patient's case expanded to include sporotrichosis, Nocardia infection, and mycobacterial infection. On hospital day three surgical consult was obtained and 3.0 punch biopsies were taken and sent for pathologic evaluation and AFB testing. The AFB culture showed 2+ AFB organisms which supported the differentials of either Nocardia or mycobacterial infection. These organisms are known to infect immunocompromised individuals and can both cause skin and soft tissue infections as well as lung infections. The patient was subsequently started on doxycycline and clarithromycin as well as IV cefepime but the IV vancomycin that was previously being used to treat the suspected pyoderma gangrenosum was discontinued at this time. On hospital day four the patient was discharged home on oral doxycycline and clarithromycin.

The patient returned to the primary care office for a number of follow ups after his hospital admission. His first follow up visit was approximately 3 weeks later at which time his leg lesions were improving. The bacterial culture results were finally reported and identified an infection with the atypical mycobacterium, *M. chelone.* Susceptibilities at this time showed that the organisms were only susceptible to clarithromycin, linezolid, and tobramycin. The patient was continued on Clarithromycin. Over the next few follow up visits he was showing clinical improvement of his lesions on the Clarithromycin (Figure 2) until about 3 months later when it was noted that his lesions were generally improved but that there was one lesion that was worse and the primary care provider suggesting careful watching and told the patient to inform the office if any of his leg lesions were worsening. About 3 weeks later the patient returned complaining of further worsening of his leg lesions and admitted to not being compliant with his clarithromycin at that time due to severe nausea (Figure 3). He was then switched from clarithromycin to linezolid 600 mg BID. Patient returned a month later with complaints of nausea on linezolid as well and was started on azithromycin 500 mg daily. The need for compliance was discussed with the patient at this time as the lesions had clinically worsened again (Figure 4). This is an active patient case.

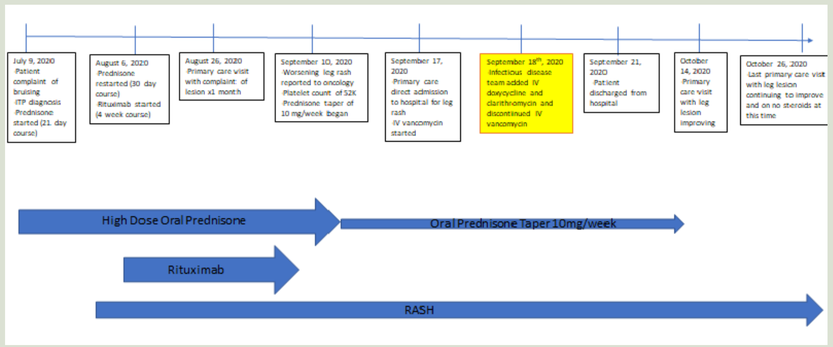

Figure 5: Time course diagram of patient visits, treatment, and steroid use correlation prior to subsequent worsening of clinical presentation. *This is an ongoing patient case.

Discussion

Non-tuberculous mycobacteria (NTM) include a variety of species including the most pathogenic species, *M. chelone*. Prevalence of these infections is not well studied due to the rare nature of these pathogens in causing clinically significant infections as well as them being non-reportable in the US. The rarity of these infections often leads to this diagnosis not being considered early on in a disease course which can lead to further clinical complications if not recognized and treated appropriately.

This patient's condition was initially thought to be pyoderma gangrenosum upon evaluation by the hospitalist team upon admission. Pyoderma gangrenosum generally presents as one or more rapidly increasing inflammatory lesions most commonly seen on the trunk or lower extremities that progresses to form an ulcer usually with associated pain out of proportion to exam. Pyoderma gangrenosum has a strong association with hematologic disease, and with the patient's history of large B cell lymphoma and his current diagnosis of ITP, this diagnosis was high on the differential (2). The reason that this diagnosis was not likely was due to the fact that the treatment of pyoderma gangrenosum is with immunosuppressive therapy, and the patient was already on high dose corticosteroid therapy at the time of his hospital admission.

Other diagnoses that were considered at the time of Infectious Disease consult included Sporotrichosis, nocardia, and mycobacterial infections. Sporotrichosis which is caused by the dimorphic fungus Sporothrix schenckii after environmental exposure most commonly reported after gardening. This infection is known to follow the pattern of lymphatic drainage and with the pattern of lesions on this patient's lower extremity, it appeared in this pattern and was therefore considered. The later finding of AFB positive organisms supported the possible diagnoses of nocardia and mycobacterial infections. Nocardia can take about 2 to 3 weeks to culture (3) and mycobacteria can take up to 4 to 6 weeks to culture in the laboratory (1).

Treatment of *M. chelone* infections specifically should be based on antibacterial susceptibilities when possible. Some of the most common antibiotics that are most active against these pathogens include Tobramycin, Clindamycin, and Linezolid (1).

Conclusion

Since it is known that atypical mycobacteria are ubiquitous in nature, the index of suspicion for these infections needs to be higher in patients who are immunocompromised for any reason, particularly in more rural areas where there is more potential for outdoor exposures. This case highlights the importance for consideration of the possibility of infections caused by atypical pathogens in patients on any number of immunosuppressive therapies, including high dose corticosteroids and cancer treatments, by healthcare professionals, particularly in rural areas. It further highlights the difficulties in treatment of atypical infections or those for which antibiotic treatment options are limited and the importance of compliance in medical treatment of these conditions.