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Authors

Fisher, Jonathan M.
Younes, Ramee
Vazirnia, Aria
et al.

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CLINICAL VIGNETTE

Diffuse Cutaneous *Mycobacterium abscessus* Following Sodium Deoxycholate Cosmetic Injections

Jonathan M. Fisher, MD, MPH, Ramee Younes, MD, Aria Vazirnia, MD, MAS and Claire E. Brown, MD

Department of Medicine, David Geffen School of Medicine, University of California, Los Angeles

Introduction

Deoxycholate mesotherapy injection is used for the purpose of fat reduction. Though infection is a known complication, mesotherapy-associated infections tend to be focal to a particular anatomic site. To the best of our knowledge, we describe the first case of diffuse cutaneous nodular abscesses due to *Mycobacterium abscessus* following sodium deoxycholate mesotherapy injections.

Case

A 24-year-old healthy woman presented to a community dermatology clinic with numerous painful papules and nodules throughout her trunk and arms, with no systemic symptoms. These sites had been injected two weeks prior with Lipo Lab PPC, a Korean-formulated compound containing sodium deoxycholate, phosphatidylcholine, and L-carnitine, by a non-medical professional at a spa. The differential diagnosis included infection versus foreign body granulomas versus sodium deoxycholate-induced panniculitis. Punch biopsy for histology was obtained, and doxycycline was started empirically. Biopsy revealed granulomatous dermatitis and stains for organisms were negative.

Three weeks later, the patient presented again for worsening of lesions. Daily prednisone 60 mg was started for suspected deoxycholate-induced panniculitis with minimal improvement. She presented to the university dermatology clinic three days later. Examination revealed violaceous tender nodules with purulent crust (Figure 1a). Punch biopsies were obtained for histology and tissue cultures. Empiric clarithromycin was started for suspected Mycobacterial infection and prednisone was continued.

Biopsies revealed deep dermal granulomatous inflammation (Figure 1b). Though infectious stains were negative, both the acid-fast bacterial and fungal tissue cultures grew *Mycobacterium abscessus* on culture day 14. The prednisone was stopped. Further testing classified the organism as the subspecies *M. Massiliense.* The patient's isolate was susceptible to macrolides, amikacin, imipenem, and linezolid on broth microdilution MIC testing but was resistant to trimethoprim-sulfamethoxazole and doxycycline.

Two weeks later, the patient developed fevers, increased purulence, and worsening pain. She was admitted for treatment with azithromycin, linezolid and imipenem, as amikacin was poorly tolerated. Larger lesions were incised and drained. A central line was placed for long-term intravenous antibiotic therapy. Over the next month, lesions progressed with enlargement and increased drainage and pain. At two months, she developed polyarticular arthralgias, edema and continued worsening of the diffuse skin lesions, prompting readmission. Rheumatologic evaluation was negative. Her antibiotic regimen was modified to azithromycin, clofazamine, omadacycline, ceftaroline, and imipenem. Over the following eight months, her symptoms gradually improved. Due to the extent of disease and slow response to therapy, she remained on a 5-drug regimen for 15 months. She also underwent surgical debridement of larger lesions and puncture drainage of over 80 abscesses.

Discussion

Mycobacterium abscessus, *Mycobacterium chelonae*, and *Mycobacterium fortuitum* comprise the major species of rapidly growing mycobacteria (RGM). Cutaneous infections by RGM are usually caused by direct traumatic inoculation, often in a nosocomial setting.[1] Presumably, these infections occur due to contact with contaminated medical instruments, or contamination of injected or implanted substances. These organisms have multiple environmental sources, including tap water.[1] Recently reported settings of cutaneous RGM infections include liposuction, breast implants, tattooing and in a skin graft.[1-3] At least two outbreaks of *Mycobacterium chelonae* have been reported after mesotherapy.[4] However, to our knowledge, no report of mycobacterial infection after sodium deoxycholate injections has been published.

Cutaneous *Mycobacterium* infections present with variable morphology, inclusive of patchy erythema, violaceous nodules, abscesses, ulcers, and draining sinus tracts.[5] Treatment of *Mycobacterium abscessus*, and mycobacterium infections in general, is difficult due to intrinsic and acquired antimicrobial resistance and slow response to therapy. Susceptibility patterns differ between species and identification of RGM may be imprecise. Once the species/subspecies has been identified,

successful treatment of these infections necessitates a unified multidisciplinary approach, often with infectious disease and surgical consultations. Surgical debridement with removal of foreign bodies is indicated in patients with extensive cutaneous disease in addition to antibiotic therapy. Despite best efforts at source control and prolonged parenteral and oral antibiotic regimens, these infections can be treatment-refractory and may result in substantial scarring.

Conclusion

We report the first case of diffuse cutaneous nontuberculous mycobacterial infection associated with sodium deoxycholate injection. This patient's progressive, prolonged disease course, complicated by adverse effects related to her antimicrobial regimen, serves as an alarming reminder of the risk associated with elective off-label procedures, especially outside of the supervision of trained medical professionals. Proper technique and infection prevention measures are essential to minimize risk of post-procedural infection. Patients must be counseled on the importance of pursuing care by those with adequate training in settings equipped to address possible complications. Treatment of *M abscesses* remains challenging and requires many months of therapy.

Figures

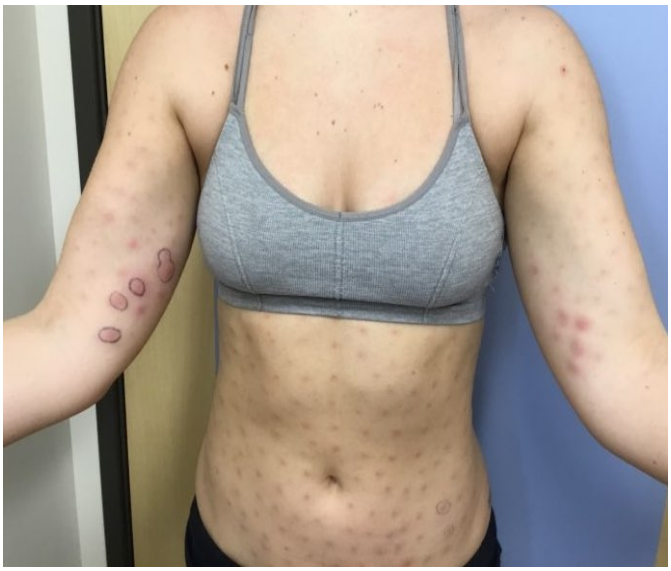

Figure 1a. Erythematous papules at injection sites (initial presentation).

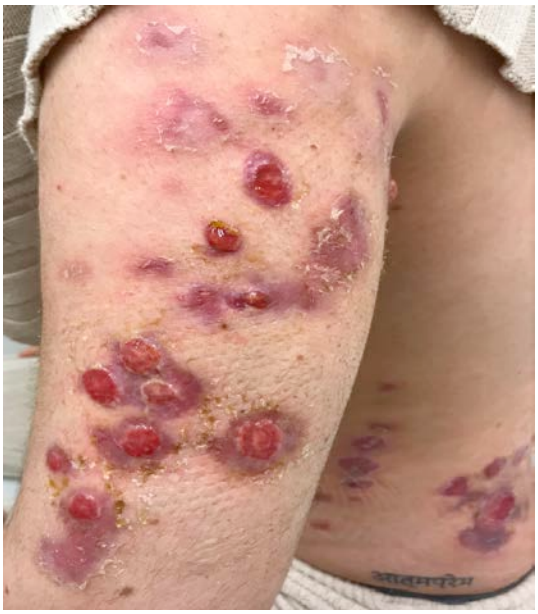

Figure 1b. Subsequent bullae and ulcerated abscesses give way to crusted nodules (see Figure 1c.)

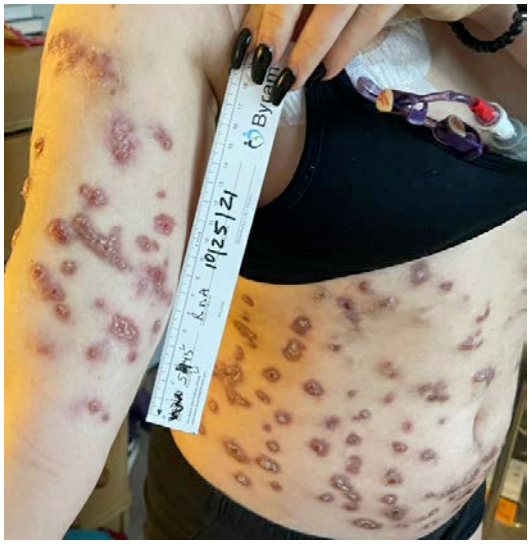

Figure 1c. Crusted nodules with prominent scarring

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