

Mycobacterium abscessus Infection Following Home Dermabrasion

Justin Grubbs, MD; Casey Bowen, MD

PRACTICE POINTS

- Atypical mycobacteria are included in the differential for cutaneous abscesses.
- At-home cosmetic treatments often carry unrecognized risks for adverse events.
- Obtain culture prior to initiation of empiric antibiotics.

With an ever-increasing prevalence of cosmetic treatments, there also have been increasing rates of skin and soft tissue infections due to cosmetic procedures and other popular procedures such as acupuncture. We report a case of a 32-year-old woman who presented with a tender lump on the face of 6 weeks' duration that developed acutely after using an at-home microdermabrasion device. She was eventually diagnosed with a skin infection due to *Mycobacterium abscessus*, which is part of a more specific group known as rapidly growing nontuberculous mycobacteria. Due to multidrug resistance, treatment of the solitary lesion required combination intravenous (IV) antibiotic therapy for more than 2 months. This report considers the significance of these infections within the context of cosmetic procedures that are generally considered to be minimally invasive.

Cutis. 2019;104:79-80.

Case Report

A 32-year-old woman presented to the dermatology clinic with a tender lump overlying the right maxilla of 6 weeks' duration. The lesion developed acutely 1 to 2 months after the patient began using an at-home microdermabrasion device, which she routinely cleaned with tap water. The physical examination was notable for a 1.5-cm, soft, superficially indurated plaque on the right cheek without associated lymphadenopathy (Figure).

A punch biopsy revealed underlying necrotic fat. Computed tomography of the neck showed 20-mm skin thickening overlying the right zygomatic arch, with minimal adjacent subcutaneous soft tissue stranding and

reactive lymph nodes. Further histologic examination of the biopsy specimen revealed inflamed granulation tissue with granulomatous inflammation.

Acid-fast bacterial culture was positive. Subsequent speciation revealed the causal agent to be multidrug-resistant *Mycobacterium abscessus*. The patient was initially treated with trimethoprim-sulfamethoxazole, which was switched to a combination of doxycycline and levofloxacin a few days later after initial culture returned. The following week, after the specific microorganism was confirmed with specific sensitivity, treatment was changed to intravenous (IV) tigecycline and amikacin. This regimen was continued for 2 more months through a peripherally inserted central catheter, then discontinued after complete resolution of the skin lesion.

Comment

Mycobacterial Infection—Nontuberculous mycobacteria were not identified as human pathogens until the 1950s. They are known to cause skin disease, lymphadenitis, skeletal infection, pulmonary disease, and disseminated infection, with pulmonary disease being the most



A 1.5-cm, soft, superficially indurated plaque on the right cheek without associated lymphadenopathy, which was caused by *Mycobacterium abscessus* infection following home dermabrasion.

From the Department of Dermatology, Ehrling Bergquist Clinic, Offutt Air Force Base, Bellevue, Nebraska.

The authors report no conflict of interest.

The opinions or assertions contained herein are the private views of the authors and not to be construed as official or as reflecting the views of the US Air Force or the Department of Defense.

Correspondence: Casey Bowen, MD, Department of Dermatology, Ehrling Bergquist Clinic, Offutt Air Force Base, 2501 Capehart Rd, Bellevue, NE 68113 (casey.d.bowen.mil@mail.mil).

common clinical form overall.¹ *Mycobacterium abscessus* is a member of a more specific group known as rapidly growing nontuberculous mycobacteria, which also includes *Mycobacterium fortuitum* and *Mycobacterium chelonae*.² Commonly found in water, soil, and dust, *M abscessus* causes skin and soft tissue infection after skin injury by inoculation, minor trauma, or surgery.²⁻⁴ An increased rate of infections recently has been attributed to an increase in cosmetic procedures such as tattooing, liposuction, mesotherapy, pedicures, and body piercing. Mycobacterial infections transmitted through acupuncture also have been documented.^{5,6}

Causes of Skin and Soft Tissue Infections—Skin and soft tissue infections due to rapidly growing mycobacteria often are associated with systemic comorbidities that cause immunosuppression and with immunosuppressive medications.⁷ Our patient did not have a preexisting comorbidity and did not take any long-term medication. When multiple lesions have been reported, patients were more likely to either have a systemic comorbidity or be taking immunosuppressive medication compared to patients with a single lesion. A history of penetrating trauma or an invasive surgical procedure has been reported more often in patients with a single lesion.⁷

Our patient had a solitary lesion on the face; improper sterile technique while using an at-home microdermabrasion device was thought to be the cause of infection. Although generally considered a minimally abrasive treatment modality, microdermabrasion caused enough trauma to create a nidus of infection in our patient.

Presentation—Cutaneous infection from rapidly growing mycobacteria can manifest as a nonhealing ulceration, subcutaneous abscess, draining sinus, or subcutaneous fluctuant or firm nodules. Erythema may be found in association with ulcers or chronic drainage from a surgical wound.^{2,7}

Histopathologic appearance varies, depending on the evolution of the disease and host immunologic status. Tuberculoid, palisading, and sarcoidlike granulomas; a diffuse infiltrate of histiocytic foamy cells; acute and chronic panniculitis; nonspecific chronic inflammation; cutaneous abscess; suppurative granuloma; and necrotizing folliculitis all can be seen.⁸ Immunosuppressed patients are less likely to form granulomas.⁶ Diagnosis often is delayed because acid-fast bacterial culture is not typically performed on skin biopsy specimens or surgical wound infections.⁷ Fortunately, a high index of suspicion in our patient's case allowed for prompt diagnosis and expeditious management.

Management—*Mycobacterium abscessus* tends to be resistant to conventional antituberculous medications; overall, it is considered a highly drug-resistant pathogen that is difficult to treat.^{9,10} Treatment usually requires 3 to 6 months of therapy, with oral clarithromycin considered the first-line agent for localized infection.⁵ Because cases of clarithromycin resistance have been reported in patients with *M chelonae* infection, caution is warranted when deciding between monotherapy or combination

therapy.⁷ Multidrug resistance often necessitates prolonged IV therapy. Amikacin is the mostly commonly used IV agent for *M abscessus* infection. Adverse effects of treatment are common, often leading to a change in or discontinuation of therapy.¹¹

Our patient was initially given trimethoprim-sulfamethoxazole before being switched to doxycycline and levofloxacin prior to final results of susceptibility testing. Ultimately, due to the multidrug-resistant nature of *M abscessus*, clarithromycin was not a viable option. Therefore, the patient was administered tigecycline and amikacin through a peripherally inserted central catheter until symptoms fully resolved.

Surgery can be an important adjunctive measure for certain patients, especially those with a single lesion.⁷ Our patient did well with medical treatment alone.

Conclusion

Given the difficulty of treating skin and soft tissue infections caused by *M abscessus* and related mycobacteria, it is worth noting that these infections are increasingly caused by procedures generally considered to be minimally invasive. Microdermabrasion—performed at home in an unsterile environment and not by a trained medical professional—was the causal procedure in this case. An important consideration is whether clinicians can be comfortable with the use of these treatments at home or whether they should be advising patients against at-home treatments that have potentially serious complications.

REFERENCES

1. Lee WJ, Kang SM, Sung H, et al. Non-tuberculous mycobacterial infections of the skin: a retrospective study of 29 cases. *J Dermatol*. 2010;37:965-972.
2. Fitzgerald DA, Smith AG, Lees A, et al. Cutaneous infection with *Mycobacterium abscessus*. *Br J Dermatol*. 1995;132:800-804.
3. Moore M, Frerichs JB. An unusual acid-fast infection of the knee with subcutaneous, abscess-like lesions of the gluteal region; report of a case with a study of the organism, *Mycobacterium abscessus*, n. sp. *J Invest Dermatol*. 1953;20:133-169.
4. Inman PM, Beck A, Brown AE, et al. Outbreak of injection abscesses due to *Mycobacterium abscessus*. *Arch Dermatol*. 1969;100:141-147.
5. Ryu HJ, Kim WJ, Oh CH, et al. Iatrogenic *Mycobacterium abscessus* infection associated with acupuncture: clinical manifestations and its treatment. *Int J Dermatol*. 2005;44:846-850.
6. Wentworth AB, Drage LA, Wengenack NL, et al. Increased incidence of cutaneous nontuberculous mycobacterial infection, 1980 to 2009: a population-based study. *Mayo Clin Proc*. 2013;88:38-45.
7. Uslan DZ, Kowalski TJ, Wengenack NL, et al. Skin and soft tissue infections due to rapidly growing mycobacteria: comparison of clinical features, treatment, and susceptibility. *Arch Dermatol*. 2006;142:1287-1292.
8. Bartralot R, Pujol RM, García-Patos V, et al. Cutaneous infections due to nontuberculous mycobacteria: histopathological review of 28 cases. comparative study between lesions observed in immunosuppressed patients and normal hosts. *J Cutan Pathol*. 2000;27:124-129.
9. Morris-Jones R, Fletcher C, Morris-Jones S, et al. *Mycobacterium abscessus*: a cutaneous infection in a patient on renal replacement therapy. *Clin Exp Dermatol*. 2001;26:415-418.
10. Jeong SH, Kim SY, Huh HJ, et al. Mycobacteriological characteristics and treatment outcomes in extrapulmonary *Mycobacterium abscessus* complex infections. *Int J Infect Dis*. 2017;60:49-56.
11. Novosad SA, Beekmann SE, Polgreen PM, et al. Treatment of *Mycobacterium abscessus* infection. *Emerg Infect Dis*. 2016;22:511-514.