



Atypical Skin Abscess Caused by Nontuberculous *Mycobacterium*

Urgent message: Cutaneous abscesses are common presentations in urgent care. While either methicillin-sensitive or methicillin-resistant *Staphylococcus aureus* accounts for up to 75% of skin abscesses, atypical organisms such as nontuberculous mycobacteria (NTMB) can also lead to abscess formation. Urgent care providers should be aware that the clinical presentation may be atypical and require specialized treatment.

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Case Presentation

A 26-year-old female with no known past medical history other than depression presented to urgent care with a complaint of a nonhealing sore on her thigh for 2 months. She was most concerned for a possible spider bite. A red sore had been present on her right thigh for 2 months, but in the preceding 2 days had become bigger and more tender. She denied systemic symptoms or drainage from the lesion. She denied a history of recurrent abscesses, methicillin-resistant *Staphylococcus aureus* (MRSA), IV drug use, new tattoos or piercings, recent travel, or known insect bites. She worked as an administrator in a tattoo parlor but did not handle tattoo equipment.

On exam, patient was afebrile and well-appearing with normal blood pressure and pulse rate. She had multiple, well-healed facial piercings and body tattoos. On her right thigh was a 2x2 cm oval purplish macule in raised indurated edges. There was spongy fluctuance in the center of the lesion with a small area of central erosion. (Figure 1.)

An incision-and-drainage (I&D) procedure performed with a 3 mm punch blade revealed a minimal amount of sanguine-purulent fluid from an empty wound cavity.



Differential diagnosis at the time included simple cutaneous abscess, folliculitis, insect bite/sting with necrosis, infected abrasion or skin trauma, or infected epidermal inclusion cyst. The most likely pathogen was thought to be *Staphylococcus* or *Streptococcus* species, given the typical

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Figure 1.

The satellite erythematous papules on the right thigh appeared after adhesive bandaging. The patient reported this was a typical reaction to adhesive.

prevalence of these organisms in skin infections. However, a gram stain and culture were obtained given the indolent course and atypical appearance of the lesion. Patient was given local wound care instructions and prescribed doxycycline 100 mg daily twice daily for 7 days to cover for methicillin-sensitive *S aureus* and MRSA.

Gram stain initially resulted with 2+ WBCs and no organisms seen. However, preliminary culture results on the same day revealed rapidly growing *Mycobacterium*. Fourteen days after the preliminary culture, *Mycobacterium chelonae* was reported along with sensitivity results. (Table 1.)

The patient was referred to Infectious Disease for consult, given the atypical organism identified and case reports of complicated antibiotic regimens required to effectively treat mycobacterial skin infections.

Further history revealed the patient did have a history of IV drug use with recent relapse (though this occurred after the abscess appearance), as well as chronic untreated hepatitis C. She also revealed that she was shaving her legs in an outdoor hot tub prior to developing the skin lesion. She continued to deny systemic symptoms including fever, chills, fatigue, respiratory symptoms, or weight loss that would indicate progression or dissemination of *M chelonae* infection. On exam, the infection

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remained localized to the soft tissue of her right thigh though without significant progression of healing.

Treatment, Outcome, and Follow-Up

Given the localized nature of infection, the patient was treated with linezolid 600 mg daily and clarithromycin 500 mg twice per day for 4-6 months, pending clinical improvement. Baseline CBC and CMP were checked for linezolid monitoring.

Discussion

M chelonae is a non-motile, non-spore-forming, gram-positive, acid-fast bacillus. It is classified as a rapidly growing NTMB, class IV in the Runyon classification. Cases of infection have been reported globally with no seasonal trend or association with a specific sex, race, or age group. Pertinent to our case, *M chelonae* has been shown to be resistant to chlorine and identified in water systems, though typically grows at lower temperatures (30°-32°C).¹

M chelonae infections present most often as a pustule, hemorrhagic crust, or abscess in areas of puncture wounds or skin trauma, often on the extremities. It has been reported after tattoos, acupuncture, sclerotherapy, injectable medication, and other injection procedures. The eye is the second most frequent site of infection. Disseminated skin involvement and invasive infections (such as infection of bone, joint, or muscle) can occur in immunocompromised patients. Pulmonary infection is rare but patients with cystic fibrosis can be colonized with *M chelonae*.^{1,2}

Treatment of *M chelonae* and NTM can be challenging. Expert consultation and sensitivities should be pursued given the potential for resistance patterns, multidrug regimens, and need for prolonged antibiotic treatment durations. The American Thoracic Society and Infectious Diseases Society of America recommend an oral macrolide initially (for example, clarithromycin monotherapy) combined with cefoxitin, amikacin, or imipenem-cilastatin for the treatment of cutaneous infections.³ Com-

Table 1. Susceptibility Testing Results	
	<i>Mycobacterium chelonae</i> MIC susceptibility result
Amikacin	16; susceptible
Cefoxitin	>128; resistant
Ciprofloxacin	4; resistant
Clarithromycin	0.25; susceptible
Doxycycline	>16; resistant
Imipenem	32; resistant*
Linezolid	8; susceptible
Minocycline	>8; resistant
Moxifloxacin	8; resistant
Tigecycline	0.25; no interpretation
Tobramycin	1; susceptible
Trimethoprim + sulfamethoxazole	4; resistant

*Imipenem breakpoints are considered tentative. Activity against rapidly growing mycobacteria is greater for imipenem than for meropenem or ertapenem.

combination therapy with at least two agents is recommended due to potential development of resistance during prolonged therapy.³ For treatment of disseminated or invasive disease, 4-6 months of systemic therapy is recommended. Other treatment modalities include local antiseptic and antibacterial therapy, repetitive surgical debridement, and I&D of abscesses.³

As with our patient, abscesses that do not respond to initial I&D may require further surgical excision or debridement.

The prevalence of *M chelonae* and rapidly growing NTM infections is increasing but they remain a rare cause of skin and soft-tissue infections.

NTM skin infections should be considered in the differential for abscesses with an atypical appearance, in infections that do not respond to initial standard treatment, or if patient presents with skin infection after an invasive procedure. Current IDSA guidelines recommend gram stain and culture of pus from carbuncles and abscesses, but treatment is also reasonable without culture in typical cases. In addition, I&D is the recommended treatment for abscesses (as opposed to antibiotics alone). Antibiotics against *S aureus* can be used as an adjunct to I&D, especially if the patient has features concerning for systemic inflammatory response syndrome (SIRS). An antibiotic against MRSA is recommended in patients who have failed initial antibiotic treatment, are immunocompromised, or in patients with SIRS and hypotension.⁴

This case highlights the importance of considering gram stain and culture during abscess I&D or before treatment of purulent cellulitis. If initial culture is unrevealing or infection is not responding to typical coverage for gram-positive organisms, then biopsy or acid-fast staining should be considered.

Take-Home Points

- Consider gram stain and culture during abscess I&D or before treatment of purulent cellulitis.
- Consider NTM skin infections with abscesses with atypical appearance, indolent course, or not responsive to typical therapy.
- Obtaining sensitivities is important for appropriate treatment of NTM skin and soft tissue infections given resistance patterns. ■

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