MARC WILLIAMS, MD, EDITOR

ANTHONY K. LEUNG, DO
Department of Infectious Disease,
The Cleveland Clinic Foundation

WENDY S. ARMSTRONG, MD
Department of Infectious Disease,
The Cleveland Clinic Foundation

The Clinical Picture

A 73-year-old woman with chronic nonhealing cellulitis

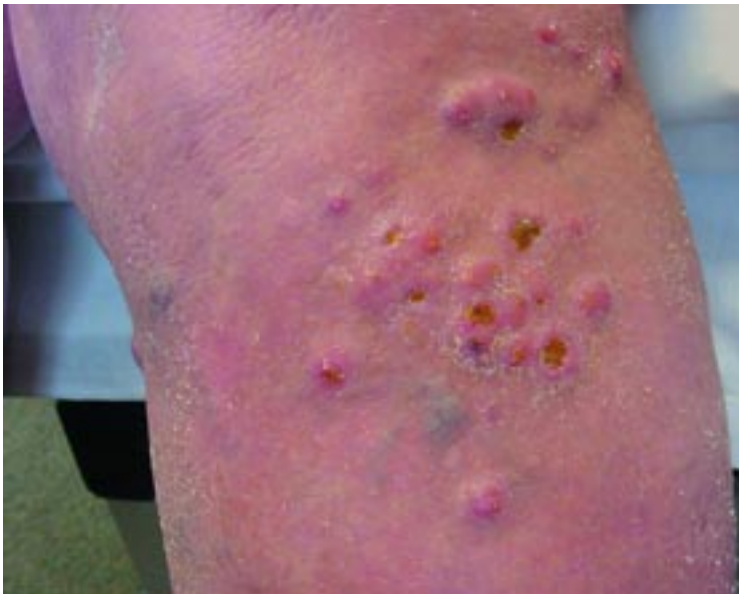

FIGURE 1

73-YEAR-OLD WOMAN presented for evaluation of painful nonhealing cellulitis of the lower left leg (FIGURE 1). Nine months before, she had hit her shin on the corner of a dishwasher, causing a superficial wound, for which she underwent extensive treatment with several courses of antibiotics and corticosteroids, but without success.

Which is the correct diagnosis, based on her history and clinical presentation?

- ❑ Leprosy
- ❑ Pyoderma gangrenosum
- ❑ Leukocytoclastic vasculitis
- ❑ Nontuberculous mycobacterial infection
- ❑ Sporotrichosis

Our workup of this patient included biopsy, and tissue culture subsequently grew *Mycobacterium chelonae*, a nontuberculous mycobacterium.

CHRONIC NONHEALING CELLULITIS

Cellulitis is an infection of the subcutaneous tissue or the underlying dermis, or both, and is characterized by rubor (redness), calor (heat), tumor (swelling), and dolor (pain), the classic signs of inflammation. Although the organism is rarely isolated, cellulitis is most often caused by streptococcal and staphylococcal species and can be treated successfully with oral antibiotics by a primary care physician.

However, a history of chronic, nonhealing cellulitis after a trial of antibiotics requires further evaluation. Patients with chronic swelling of the legs due to venous insufficiency, heart failure, malnourishment, or peripheral vascular disease can present with chronic nonhealing ulcers, and these conditions must be ruled out. The possibility of an alternate diagnosis or infection caused by an unusual pathogen arises when the clinical course is atypical despite appropriate treatment.

LEPROSY

Leprosy is common worldwide, especially in Asia, Africa, and Latin America, but is relatively rare in Western Europe, Canada, and the United States. Presentation is diverse, ranging from lepromatous leprosy, characterized by erythematous nodules, papules, and macules, to tuberculoid leprosy, in which patients present with a few hypopigmented,

anesthetic macular lesions. This patient's presentation was not typical of leprosy.

PYODERMA GANGRENOSUM

Pyoderma gangrenosum is a chronic superficial skin inflammation and ulceration of unknown cause. The lesion is sterile and is usually associated with a systemic illness such as inflammatory bowel disease. In some patients, the diagnosis of pyoderma gangrenosum can be based on the appearance of the classic lesions. Skin biopsy may be helpful in atypical cases and in immunosuppressed patients, in whom deep fungal or mycobacterial infections, malignancy, and vasculitis need to be excluded.

LEUKOCYTOCLASTIC VASCULITIS

Leukocytoclastic vasculitis is associated with a wide variety of clinical syndromes, including drug hypersensitivity, infection, and even malignancy. It is caused by immune complex deposition in small vessels, which in turn causes inflammation in those vessels. Leukocytoclastic vasculitis can present as purpura or even ulceration.

SPOROTRICHOSIS

Sporotrichosis is infection caused by *Sporothrix schenckii*, a ubiquitous dimorphic fungus that exhibits mold-like morphology at room temperature and exists as yeast at body temperature. Patients are most often infected by traumatic inoculation of the organisms in soil-contaminated materials.

The clinical presentation is distinctive. A papule occurs at the site of inoculation, and this papule may become nodular and may even ulcerate. Another feature is lymphatic spread of the lesions, a feature also found in M *marinum* infection, nocardial infections, leishmaniasis, and tularemia. This patient did not have a history of exposure to any of the above organisms.

NONTUBERCULOUS MYCOBACTERIAL INFECTION

In addition to organisms that cause tuberculosis and leprosy, the genus *Mycobacterium* includes nontuberculous organisms that can cause a variety of clinical syndromes and diseases in humans. In 1959, Runyon classified these nontuberculous mycobacteria into four groups based on growth rate, colony morphology, and pigmentation in light or dark. M *chelonae*, M *abscessus*, and M *fortuitum* are classified together as "rapid growers," as colonies can be cultured within 2 weeks with the use of proper culture media.

Rapid-growing nontuberculous mycobacteria are found everywhere in the environment and have been isolated from soil, from treated and untreated water, and even from contaminated reagents. They are the most common cause of nontuberculous mycobacterial infections of the skin and soft tissues. The usual route of infection is direct inoculation into tissue via trauma such as a scrape or a puncture wound.

Clinical features

Our patient's clinical presentation was typical of skin infection caused by rapid-growing nontuberculous mycobacteria. She had significant lymphedema, as well as multiple nodular lesions with draining pustules. Ulceration or abscesses are common, but our patient did not have these. The infection may progress to involve bone, although this had not yet occurred in our patient.

In nontuberculous mycobacterial infection, the organism often cannot be identified on microscopy

Wound culture

Biopsy specimens typically show granulomatous inflammation, but not always. The causative organism often cannot be identified on microscopic examination, and so mycobacterial wound culture remains the gold standard for diagnosis.

Treatment

Antimicrobials with activity against these organisms include amikacin, cefoxitin, imipenem, tobramycin, doxycycline, ciprofloxacin, sulfonamide, and clarithromycin. However, clarithromycin is now considered the first-line agent. Standard antitubercular drugs (isoniazid, rifampin, ethambutol, and pyrazinamide) have no role in the treatment of this condition. For serious or disseminated disease the minimum duration of treatment is 4 months, and 6 months or more in patients with bone involvement.

CONCLUSION OF OUR CASE

Because our patient had a prolonged course of infection and widespread disease likely exacerbated by corticosteroids, we recommended at least 6 months of oral therapy, and we prescribed clarithromycin 500 mg twice daily and ciprofloxacin 750 mg twice daily for at least 6 months. After 1 month of treatment, the swelling and induration of her lower leg had much improved.

Clinicians should consider mycobacterial infection as a possible diagnosis when patients have been treated extensively with antibiotics for "nonhealing" cellulitis.

SUGGESTED READING

Brown BA, Wallace RJ. Infections due to nontuberculous mycobacteria. In: Mandell GL, Bennett JE, Dolin R, et al, editors. Principles and Practice of Infectious Diseases. 5th ed. Philadelphia: Churchill Livingstone; 2000:2630–2636.

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ADDRESS: *Wendy S. Armstrong, MD, Department of Infectious Disease, S32, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195; e-mail: armstrw@ccf.org.*