Necrotizing Fasciitis in a Plaster-Casted Limb: Case Report

By Giora Netzer, MD, MSCE, and Barry D. Fuchs, MD

Abstract Casts may be associated with, and mask, serious life-threatening complications, including infection, compartment syndrome, and deep vein thrombosis with or without pulmonary embolism. A 43-year-old woman had necrotizing fasciitis associated with a closed-reduction casting of a tibial fracture. Her treatment highlights the importance of removing a cast and assessing the skin and tissue underneath for signs of infection in patients with suspected infection. Thorough assessment, early diagnosis, and early intervention in necrotizing fasciitis and sepsis are important to improve patients' outcomes. (American Journal of Critical Care. 2009;18:288,287)

A 43-year-old woman from an outside hospital was admitted to our hospital because of septic shock and multiorgan dysfunction syndrome. She had systemic lupus erythematosus, which she managed with azathioprine and prednisone, for 15 years. Several weeks before she was brought to our hospital, she sustained a fracture of the left tibia, which was treated by closed reduction and immobilization in a plaster, full-leg cast. Ten days before admission, she began experiencing progressive malaise and weakness. In the 3 days before admission, the weakness increased rapidly, and she could not walk without assistance.

At the outside hospital, she was tachypneic and hypotensive, with altered mental status. She had hypotension unresponsive to fluid replacement, respiratory failure, and low urine output. The diagnosis was septic shock. She was intubated and treated with mechanical ventilation. Treatment with vasopressors was started. Broad-spectrum antibiotics and drotrecogin alfa were administered. Subsequently, metabolic acidosis, disseminated intravascular coagulation, anuric acute kidney injury, and anasarca developed. Because of the severe acidosis, a sodium bicarbonate infusion was started. Because of concern about compartment syndrome from the resultant edema (third spacing) from fluid replacement and inflammation of sepsis, the cast was removed from the left leg 3 days after admission.

The patient was subsequently transferred to a tertiary medical center for further management, where physical examination revealed diffuse erythema and edema of the left lower extremity. Plain radiographs of the extremity showed a fracture of the distal tibia. The area of erythema of the left leg increased during the ensuing 8 hours of observation, and a surgical consultation was obtained. The diagnosis was necrotizing fasciitis.

Necrotizing fasciitis is a polymicrobial infection of the soft tissue that most commonly affects the limbs, groin, and trunk. The infection can spread rapidly and is associated with marked mortality. The classic manifestation of early necrotizing fasciitis is...
severe pain out of proportion to the physical findings. As the infection progresses, erythema develops, which can then darken as necrosis develops, with bullae forming. Crepitus can be palpated, although it occurs in only about half of patients with necrotizing fasciitis. The diagnosis is based primarily on clinical findings, but laboratory values (ie, increased white blood cell count, evidence of metabolic acidosis, elevated levels of glucose and creatinine) and imaging studies (computed tomography and magnetic resonance imaging) can be helpful in making the diagnosis. Because most cases of necrotizing fasciitis are due to polymicrobial infections, patients should receive broad-spectrum antibiotics, including drugs against anaerobic organisms. In addition to antibiotics and adequate fluid replacement, early and aggressive surgical debridement is the mainstay of treatment. Most patients with necrotizing fasciitis have underlying chronic disease, such as diabetes, peripheral vascular disease, or drug use, or are older or immunosuppressed. Infection is the most common cause of death among patients with systemic lupus erythematous, and necrotizing fasciitis in these patients has been described.2

Closed reduction and casting of bone fractures have been associated with a variety of medical complications, including skin and soft tissue infection. Serious infections have been reported,18 including toxic shock syndrome, clostridial gangrene, limb-threatening staphylococcal abscess, pseudomonal soft tissue infection, mucormycosis, and necrotizing fasciitis. A small case series22 suggests that the skin and soft tissue infection rate in patients with closed ankle fractures who have diabetes is higher than that of patients without diabetes, and may even be higher in patients treated conservatively with casting compared with those who undergo surgical intervention. Other serious complications of nonsurgical casting include deep venous thrombosis, pulmonary embolism, and compartment syndrome, which also has been associated with rhabdomyolysis.11-13 Clinicians should be aware that casts may be associated with, and mask, serious life-threatening complications. Evaluation of patients with casts who have clinical signs or symptoms of infection or sepsis should include removal of the cast and examination of the skin and tissue underneath. Although prompt administration of empiric, broad-spectrum antibiotics is essential, early identification and removal of the source of infection and, in this case, early surgical debridement are essential for successful treatment of severe sepsis.11

FINANCIAL DISCLOSURES
Giora Netzer is supported by a Clinical Research Career Development Award from the NIH (K12RR022350).

REFERENCES

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AMERICAN JOURNAL OF CRITICAL CARE, May 2009, Volume 18, No. 3

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Am J Crit Care 2009;18 288-287 10.4037/ajcc2009363
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