



FIGURE 94-1 Ill-defined erythema and edema with bullae formation is characteristic of lower extremity cellulitis. (From Pride HB: Cellulitis and erysipelas. In Zaoutis LB, Chiang VW, editors: Comprehensive pediatric hospital medicine, Philadelphia, 2007, Mosby, Fig. 156-1.)



FIGURE 94-2 Sharply defined erythema and edema is characteristic of erysipelas. (From Pride HB: Cellulitis and erysipelas. In Zaoutis LB, Chiang VW, editors: Comprehensive pediatric hospital medicine, Philadelphia, 2007, Mosby, Fig. 156-2.)



FIGURE 94-3 Spontaneous necrotizing fasciitis due to *Clostridium septicum*. The patient developed sudden onset of severe pain in the forearm. Swelling rapidly ensued, and he sought medical treatment. Crepitus was found on physical examination, and gas in the soft tissue was verified with routine radiographs. Immediate surgical débridement revealed necrotizing fasciitis but sparing of the muscle. Notice the purple-violaceous appearance of the skin. (From Stevens DL, Aldape MJ, Bryant AE. Necrotizing fasciitis, gas gangrene, myositis and myonecrosis. In Cohen J, Powderly WG, Opal SM, editors: Infectious diseases, ed 3, London, 2010, Mosby, Fig. 10-11.)

infection can result from injection drug use or from secondary seeding by *S. aureus* or group A β -hemolytic streptococci from an incidental bacteremia or a hematoma caused by nonpenetrating trauma.

Ecthyma is an ulcerative pyoderma of the skin that extends into the dermis (unlike impetigo). It is caused by group A streptococci and *Pseudomonas* species.

ETIOLOGY AND CLINICAL PRESENTATION

Causative Organisms

A multitude of organisms can cause SSTIs. However, three are most common: *S. pyogenes*, *S. aureus*, and *Streptococcus agalactiae*.

S. pyogenes (i.e., group A β -hemolytic streptococci) is a gram-positive coccus that may cause erysipelas, streptococcal cellulitis, necrotizing fasciitis, myositis, myonecrosis, and streptococcal toxic shock syndrome. Streptococcal cellulitis arises from infection of wounds, burns, or surgical incisions and may progress to involve large areas. Injection drug users and individuals with impaired lymphatic drainage are at high risk. Systemic manifestations include fever, chills, malaise with or without associated lymphangitis, and bacteremia. In contrast to erysipelas, the affected area is not raised, and the demarcation between involved skin and uninvolved skin is indistinct. The lesions tend to be more pink than fiery red.

Streptococcal toxic shock syndrome manifests with hypotension and is associated with acute kidney injury, elevated aminotransferases, rash or soft tissue necrosis, and coagulopathy. It may be complicated by the acute respiratory distress syndrome. Isolation of the organism from a sterile site provides a definite diagnosis.

S. aureus is a gram-positive coccus that is found in the anterior nares of up to 30% of healthy people. It is responsible for a variety of invasive and suppurative infections. Localized SSTIs include furuncles, carbuncles, bullous and nonbullous impetigo, mastitis, ecthyma, cellulitis, and wound and foreign body infections. Bacteremia may be complicated by septicemia, endocarditis, pericarditis, pneumonia, empyema, osteomyelitis, and abscesses of the soft tissue, muscle, and viscera.

Staphylococcal toxic shock syndrome is typically associated with tampon use but may occur after childbirth or surgery and can be associated with cutaneous lesions. It manifests with the acute onset of fever, erythroderma, hypotension, and multisystem involvement (e.g., acute kidney injury, elevated levels of aminotransferases, coagulopathy, nausea, vomiting, diarrhea).

Community-associated MRSA is the most common identifiable cause of SSTIs in the emergency department. Isolates contain genes encoding for multiple toxins, including cytotoxins that result in leukocyte destruction and tissue necrosis.

S. agalactiae (a group B streptococcus) is a gram-positive diplococcus. It may account for up to one third of SSTIs among adults. Cellulitis, foot ulcers, and infection of decubitus ulcers are common manifestations. Cellulitis has been associated with foreign bodies such as breast or penile implants. Less commonly, polymyositis, blistering dactylitis, and necrotizing fasciitis may occur.

