may be an associated LCV. Arteritis leads to an infarct of the skin, and this explains the irregular outline of the purpura (see below).

Several types of infectious emboli can give rise to palpable purpura. These embolic lesions are usually *irregular* in outline as opposed to the lesions of LCV, which are *circular* in outline. The irregular outline is indicative of a cutaneous infarct, and the size corresponds to the area of skin that received its blood supply from that particular arteriole or artery. The palpable purpura in LCV are circular because the erythrocytes simply diffuse out evenly from the postcapillary venules as a result of inflammation. Infectious emboli are most commonly due to gram-negative cocci (meningococcus, gonococcus), gram-negative rods (Enterobacteriaceae), and gram-positive cocci (*Staphylococcus*). Additional causes include *Rickettsia* and, in immunocompromised patients, *Aspergillus* and other opportunistic fungi.

The embolic lesions in *acute meningococcemia* are found primarily on the trunk, lower extremities, and sites of pressure, and a gunmetal-gray color often develops within them. Their size varies from a few millimeters to several centimeters, and the organisms can be cultured from the lesions. Associated findings include a preceding upper respiratory tract infection; fever; meningitis; DIC; and, in some patients, a deficiency of the terminal components of complement. In *disseminated gonococcal infection* (arthritis-dermatitis syndrome), a small number of inflammatory papules and vesicopustules, often with central purpura or hemorrhagic necrosis, are found on the distal extremities. Additional symptoms include arthralgias, tenosynovitis, and fever. To establish the diagnosis, a Gram stain of these lesions should be performed. *Rocky Mountain spotted fever* is a tick-borne disease that is caused by *Rickettsia rickettsii*. A several-day history of fever, chills, severe headache, and photophobia precedes the onset of the cutaneous eruption. The initial lesions are erythematous macules and papules on the wrists, ankles, palms, and soles. With time, the lesions spread centripetally and become purpuric.

Lesions of *ecthyma gangrenosum* begin as edematous, erythematous papules or plaques and then develop central purpura and necrosis. Bullae formation also occurs in these lesions, and they are frequently found in the girdle region. The organism that is classically associated with ecthyma gangrenosum is *Pseudomonas aeruginosa*, but other gram-negative rods such as *Klebsiella*, *Escherichia coli*, and *Serratia* can produce similar lesions. In immunocompromised hosts, the list of potential pathogens is expanded to include *Candida* and other opportunistic fungi (e.g., *Aspergillus*, *Fusarium)*.

ULCERS

The approach to the patient with a cutaneous ulcer is outlined in Table 72-17. Peripheral vascular diseases of the extremities are reviewed in Chap. 302, as is Raynaud's phenomenon.

Livedoid vasculopathy (livedoid vasculitis; atrophie blanche) represents a combination of a vasculopathy plus intravascular thrombosis. Purpuric lesions and livedo reticularis are found in association with *painful* ulcerations of the lower extremities. These ulcers are often slow to heal, but when they do, irregularly shaped white scars form. The majority of cases are secondary to venous hypertension, but possible underlying illnesses include cryofibrinogenemia and disorders of hypercoagulability, e.g., the antiphospholipid syndrome (Chaps. 142 and 379).

In *pyoderma gangrenosum*, the border of untreated active ulcers has a characteristic appearance consisting of an undermined necrotic violaceous edge and a peripheral erythematous halo. The ulcers often begin as pustules that then expand rather rapidly to a size as large as 20 cm. Although these lesions are most commonly found on the lower extremities, they can arise anywhere on the surface of the body, including sites of trauma (pathergy). An estimated 30–50% of cases are idiopathic, and the most common associated disorders are ulcerative colitis and Crohn's disease. Less commonly, pyoderma gangrenosum is associated with seropositive rheumatoid arthritis, acute and chronic myelogenous leukemia, hairy cell leukemia, myelofibrosis, or a monoclonal gammopathy, usually IgA. Because the histology of pyoderma gangrenosum may be nonspecific (dermal infiltrate of neutrophils when in untreated state), the diagnosis requires clinicopathologic correlation, in particular, the exclusion of similar-appearing ulcers such as necrotizing vasculitis, Meleney's ulcer (synergistic infection at a site of trauma or surgery), dimorphic fungi, cutaneous amebiasis, spider bites, and factitial. In the myeloproliferative disorders, the ulcers may be more superficial with a pustulobullous border, and these lesions provide a connection between classic pyoderma gangrenosum and acute febrile neutrophilic dermatosis (Sweet syndrome).

TABLE 72-17 CAUSES OF MUCOCUTANEOUS ULCERS

I. Primary cutaneous disorders
  A. Peripheral vascular disease (Chap. 302)
    1. Venous
    2. Arterial[a]
  B. Livedoid vasculopathy in the setting of venous hypertension[b]
  C. Squamous cell carcinoma, e.g., within scars, basal cell carcinomas
  D. Infections, e.g., ecthyma caused by *Streptococcus* (Chap. 173)
  E. Physical, e.g., trauma, pressure
  F. Drugs, e.g., hydroxyurea
II. Systemic diseases
  A. Lower legs
    1. Small-vessel and medium-vessel vasculitis[c]
    2. Hemoglobinopathies (Chap. 127)
    3. Cryoglobulinemia,[c] cryofibrinogenemia
    4. Cholesterol emboli[c]
    5. Necrobiosis lipoidica[d]
    6. Antiphospholipid syndrome (Chap. 141)
    7. Neuropathic[e] (Chap. 417)
    8. Panniculitis
    9. Kaposi's sarcoma, acral angiodermatitis
    10. Diffuse dermal angiomatosis
  B. Hands and feet
    1. Raynaud's phenomenon (Chap. 302)
    2. Buerger disease
  C. Generalized
    1. Pyoderma gangrenosum, but most commonly legs
    2. Calciphylaxis (Chap. 424)
    3. Infections, e.g., dimorphic fungi, leishmaniasis
    4. Lymphoma
  D. Face, especially perioral, and anogenital
    1. Chronic herpes simplex[f]
III. Mucosal
  A. Behçet's syndrome (Chap. 387)
  B. Erythema multiforme major, Stevens-Johnson syndrome, TEN
  C. Primary blistering disorders (Chap. 73)
  D. Lupus erythematosus, lichen planus
  E. Inflammatory bowel disease
  F. Acute HIV infection
  G. Reactive arthritis (formerly known as Reiter's syndrome)

[a]Underlying atherosclerosis. [b]Also associated with underlying disorders that lead to hypercoagulability, e.g., factor V Leiden, protein C dysfunction/deficiency, antiphospholipid antibodies. [c]Reviewed in section on Purpura. [d]Reviewed in section on Papulonodular Skin Lesions. [e]Favors plantar surface of the foot. [f]Sign of immunosuppression.

Abbreviation: TEN, toxic epidermal necrolysis.

FEVER AND RASH

The major considerations in a patient with a fever and a rash are inflammatory diseases versus infectious diseases. In the hospital setting, the most common scenario is a patient who has a drug rash plus a fever secondary to an underlying infection. However, it should be