



FIGURE 197-2 Nodular lesion of bacillary angiomatosis with superficial ulceration in an AIDS patient with advanced immunodeficiency. (Reprinted with permission from DH Spach and E Darby: *Bartonella Infections, Including Cat-Scratch Disease*, in *Harrison's Principles of Internal Medicine*, 17th ed, AF Fauci et al [eds]. New York, McGraw-Hill, 2008, p 989.)

cells that can be several millimeters in size. Peliotic lesions are surrounded by fibromyxoid stroma containing inflammatory cells, dilated capillaries, and clumps of granular material. Warthin-Starry silver staining of bacillary angiomatosis and peliosis lesions reveals clusters of bacilli. Cultures are usually negative.

DIAGNOSIS

Bacillary angiomatosis and bacillary peliosis are diagnosed on histologic grounds. Blood cultures may be positive.

TREATMENT BACILLARY ANGIOMATOSIS AND PELIOSIS

(Table 197-2) Prolonged therapy with a macrolide or doxycycline is recommended for both bacillary angiomatosis and bacillary peliosis.

PREVENTION

Control of cat-flea infestation and avoidance of cat scratches (for prevention of *B. henselae*) and avoidance and treatment of body louse infestation (for prevention of *B. quintana*) are reasonable strategies for HIV-infected persons. Primary prophylaxis is not recommended, but suppressive therapy with a macrolide or doxycycline is indicated in HIV-infected patients with bacillary angiomatosis or bacillary peliosis until CD4+ T cell counts are >200/ μ L. Relapse may necessitate lifelong suppressive therapy in individual cases.

CARRIÓN'S DISEASE (OROYA FEVER AND VERRUGA PERUANA)

DEFINITION AND ETIOLOGY

Carrión's disease is a biphasic disease caused by *B. bacilliformis*. *Oroya fever* is the initial, bacteremic, systemic form, and *verruca peruana* is its late-onset, eruptive manifestation.

EPIDEMIOLOGY AND PREVENTION



Infection is endemic to the geographically restricted Andes valleys of Peru, Ecuador, and Colombia (~500–3200 m above sea level). Sporadic epidemics occur. The disease is transmitted by the phlebotomine sandfly *Lutzomyia verrucarum*. Humans are the only known reservoir of *B. bacilliformis*. Sandfly control measures (e.g., insecticides) and personal protection measures (e.g., repellents, screening, bed nets) may decrease the risk of infection.

PATHOGENESIS

After inoculation by the sandfly, bacteria invade the blood vessel endothelium and proliferate; the reticuloendothelial system and various organs

may also be involved. Upon reentry into blood vessels, *B. bacilliformis* invades, replicates, and ultimately destroys erythrocytes, with consequent massive hemolysis and sudden, severe anemia. Microvascular thrombosis results in end-organ ischemia. Survivors sometimes develop cutaneous hemangiomas characterized by various inflammatory cells, endothelial proliferation, and the presence of *B. bacilliformis*.

CLINICAL MANIFESTATIONS

The incubation period is 3 weeks (range, 2–14 weeks). Oroya fever may present as a nonspecific bacteremic febrile illness without anemia or as an acute, severe hemolytic anemia with hepatomegaly and jaundice of rapid onset leading to vascular collapse and clouded sensorium. Myalgia, arthralgia, lymphadenopathy, and abdominal pain may develop. Temperature is elevated but not extremely so; high fever may suggest intercurrent infection. Subclinical asymptomatic infection also occurs. In *verruca peruana*, red, hemangioma-like, cutaneous vascular lesions of various sizes appear either weeks to months after systemic illness or with no previous suggestive history. These lesions persist for months up to 1 year. Mucosal and internal lesions may also develop.

DIAGNOSIS AND APPROACH TO THE PATIENT

Systemic illness (with or without anemia) or the development of cutaneous lesions in a person who has been to an endemic area raises the possibility of *B. bacilliformis* infection. Severe anemia with exuberant reticulocytosis—and sometimes thrombocytopenia—can occur. In systemic illness, Giemsa-stained blood films show typical intraerythrocytic bacilli, and blood and bone marrow cultures are positive. Serologic assays may be helpful. Biopsy may be required to confirm the diagnosis of *verruca peruana*. Differential diagnosis includes the spectrum of coendemic systemic febrile illnesses (e.g., typhoid fever, malaria, brucellosis) as well as diseases producing cutaneous vascular lesions (e.g., hemangiomas, bacillary angiomatosis, Kaposi's sarcoma).

TREATMENT CARRIÓN'S DISEASE

(Table 197-2) Antibiotic therapy for systemic *B. bacilliformis* infection usually results in rapid defervescence. Additional antibiotic treatment of intercurrent infection (particularly salmonellosis) is often required. Blood transfusion may be necessary. Treatment of *verruca peruana* usually is not required, although large lesions or those interfering with function may require excision. Patients with numerous lesions, especially lesions that have been present for only a short period, may respond well to antibiotic therapy.

COMPLICATIONS AND PROGNOSIS

Mortality rates associated with Oroya fever have been reported to be as high as 40% without treatment but are considerably lower (~10%) with treatment. Complications such as bacterial superinfection and neurologic and cardiac manifestations occur frequently. Generalized massive edema (anasarca) and petechiae are associated with poor outcome. Permanent immunity usually develops.

198e Donovanosis

Nigel O'Farrell

This is a digital-only chapter. It is available on the DVD that accompanies this book, as well as on Access Medicine/Harrison's Online, and the eBook and "app" editions of HPIM 19e.

Donovanosis is a chronic, progressive bacterial infection that usually involves the genital region. The condition is generally regarded as a sexually transmitted infection of low infectivity. This infection has been known by many other names, the most common being *granuloma inguinale*.