



Figure 26-20 Resected femur in a person with draining osteomyelitis. The drainage tract in the subperiosteal shell of viable new bone (involucrum) reveals the inner native necrotic cortex (sequestrum).

Clinical Course. Hematogenous osteomyelitis sometimes manifests as an acute systemic illness with malaise, fever, chills, leukocytosis, and marked-to-intense throbbing pain over the affected region. In other instances, the presentation is subtle, with only unexplained fever (most often in infants) or localized pain (most often in adults). The diagnosis is strongly suggested by the characteristic radiographic findings of a lytic focus of bone destruction surrounded by a zone of sclerosis. In some untreated cases blood cultures are positive, but biopsy and bone cultures are required to identify the pathogen in most instances. The combination of antibiotics and surgical drainage is usually curative.

In 5% to 25% of cases, acute osteomyelitis fails to resolve and persists as chronic infection. Chronic infections may develop when there is delay in diagnosis, extensive bone necrosis, inadequate antibiotic therapy or surgical debridement, or weakened host defenses. The course of chronic infections may be punctuated by acute flare-ups; these are usually spontaneous and may occur after years of dormancy. Other complications of chronic osteomyelitis include pathologic fracture, secondary amyloidosis, endocarditis, sepsis, and development of squamous cell carcinoma in the draining sinus tracts and sarcoma in the infected bone.

Mycobacterial Osteomyelitis

Mycobacterial osteomyelitis, historically a problem in developing countries, has increased in incidence in the developed world due to immigration patterns and immunocompromised patients. Overall, approximately 1% to 3% of individuals with pulmonary or extrapulmonary tuberculosis have osseous infection.

The organisms are usually blood borne and originate from a focus of active visceral disease during the initial stages of primary infection. Direct extension (e.g., from a pulmonary focus into a rib or from tracheobronchial nodes into adjacent vertebrae) or spread via the circulation

may also occur. The bone infection may persist for years before being recognized. Typically, affected individuals present with localized pain, low-grade fevers, chills, and weight loss. Infection is usually solitary except in immunocompromised individuals. The histologic findings, namely caseous necrosis and granulomas, are typical of tuberculosis elsewhere (Chapter 8). Mycobacterial osteomyelitis tends to be more destructive and resistant to control than pyogenic osteomyelitis.

Tuberculous spondylitis (Pott disease) is particularly destructive. The spine is involved in 40% of cases of mycobacterial osteomyelitis. The infection breaks through intervertebral discs to affect multiple vertebrae and extends into the soft tissues. Destruction of discs and vertebrae frequently results in permanent compression fractures that produce scoliosis or kyphosis and neurologic deficits secondary to spinal cord and nerve compression. Other complications of tuberculous osteomyelitis include tuberculous arthritis, sinus tract formation, psoas abscess, and amyloidosis.

Skeletal Syphilis

Syphilis (*Treponema pallidum*) and yaws (*Treponema pertenue*) can involve bone. Currently, syphilis is experiencing resurgence; however, bone involvement remains infrequent because the disease is usually diagnosed and treated before this complication develops.

In congenital syphilis, the bone lesions appear about the fifth month of gestation and are fully developed at birth. The spirochetes tend to localize in areas of active enchondral ossification (osteochondritis) and in the periosteum (periostitis). The syphilitic *saber shin* is produced by massive reactive periosteal bone deposition on the medial and anterior surfaces of the tibia. In acquired syphilis, bone disease may begin early in the tertiary stage, usually 2 to 5 years after the initial infection. The bones most frequently involved are those of the nose, palate, skull, and extremities, especially the long tubular bones such as the tibia.

MORPHOLOGY

Syphilitic bone infection is characterized by edematous granulation tissue containing numerous plasma cells and necrotic bone. The spirochetes can be demonstrated in the inflammatory tissue with silver histochemical stains or immunohistochemistry. Typical gummas may also form in both congenital and acquired syphilis (Chapter 8).

Bone Tumors and Tumor-Like Lesions

The rarity of primary bone tumors and the often disfiguring surgery required to treat a malignancy make this group of disorders especially challenging. Although metastases and hematopoietic tumors far outnumber primary bone neoplasms, about 2400 new cases of bone sarcoma are diagnosed annually, accounting for less than 1% of all bone disease in the United States. While not very common, bone sarcomas are lethal in 50% of cases. Therapy aims to optimize survival while maintaining the function of affected