Hannah Bauguess  
Faculty Mentor: Alice F. Gooding, PhD
Department of Geography and Anthropology

**Osteomyelitis in Past Populations**

The first case of osteomyelitis seems to have occurred in the posterior dorsal spine of a Permian reptile, which was in existence over 250 million years ago, indicating the disease has been encountered at an early point and has had a long history. Associated with open wounds and not really able to be treated until the advent of antibiotics, osteomyelitis should have frequently infected early man, but the literature does not provide much proof of its existence prehistorically. Even later in cases of ancient Egyptian mummies that frequently had open fractures, evidence of bone infection was extremely rare. However, it is not clear whether bone in early man and even in Egyptian mummies is just not well preserved enough to provide evidence on osteomyelitis or if those who had osteomyelitis died from other factors like open fractures lived long enough for the disease to show up pathologically on the bones (Eid 2003, 95).

**Osteomyelitis Contemporarily**

Advances in diagnostics have highlighted a need to review the current treatment practices. Early treatment is especially important in children, as a delay in diagnosis may cause growth disturbance, bone deformities, or even death. Osteomyelitis occurs between 1 and 13 years of age and accounts for around 1% of all hospital admissions in children. Notably, boys are nearly twice as commonly affected as girls (Harik et al. 2010, 177-178). In recent years, the current understanding of the etiology of osteomyelitis has changed, as Kingella kingae becomes an increasing causative agent in young infections, and there has also been an increase in Methicillin-resistant Staphylococcus aureus (MRSA) infections (Jaramillo et al. 2017, 630). It is important to understand the etiology of the disease as it determines the causative agent, which not only allows for the most definitive diagnosis, but also determines specific treatment that can be created.

**Pathophysiology**

Osteomyelitis is a general term for a group of diseases that cause inflammation of the bone. In most cases, the cause is infectious agents entering the bloodstream from other infected areas, especially traumatic or surgical wounds. The main causative agents are Staphylococcus aureus (staph) and Streptococcus (strep). Other causes of osteomyelitis include indirect infection from soft tissue infections or sepsis (Ortner 2003, 181). Although osteomyelitis may occur at any age, acute hematogenous osteomyelitis (AOH) is typically prevalent among juveniles. Osteomyelitis is usually located in the metaphysis of long bones, specifically the femur, tibia, or in the humerus, about 75% of cases, (Figure 1). After gaining entry into the bone, resulting increased pressure leads to ischemia, vascular compromise that causes the bone to die, and forus sequestrum (dead tissue). Eventually involucrum will also form, which is a layer of new bone growth outside of existing bone (Figure 2). Paleopathological recognition and analysis of skeletal remains is typically incomplete even though osteomyelitis is considered to be frequent in prehistoric times. In skeletal remains, the criteria for diagnosis of osteomyelitis include the presence of cloaca (opening in bone that allows for drainage), sequestrum, and involucrum (Flensborg et al. 2013, 128-129) (Figure 3).

**Figure 1.** Skeletal distribution of osteomyelitis in children (Jaramillo et al. 2017, 630).

**Figure 2.** Development of osteomyelitis infection with involucrum and sequestrum (Harvey 2016).

**Figure 3.** Osteomyelitis of the left tibia compared with the normal right tibia of a child about 7 years of age from an archaeological site near La Oroya, Peru. [(a) Anterior view, note the sequestrum (arrow) and cloaca; (b) Detail of sequestrum and cloaca (arrow) in left tibia (Ortner 2003, 201)].

**References**


