ELSEVIER
SAUNDERS

Clinical Techniques in
Equine
Practice

Etiology, Diagnosis, and Treatment of Septic Arthritis, Osteitis, and Osteomyelitis in Foals

Joanne Hardy, DVM, PhD, Dip ACVS, Dip ACVECC

Septic arthritis and osteomyelitis is a serious complication of septicemia in foals. Within a given joint, the disease can involve the synovial membrane, the epiphysis, the physis, the metaphysis, and/or the small cuboidal bones of the tarsus or carpus. Early identification and early institution of an aggressive therapeutic protocol can result in a successful outcome. Concurrent systemic illness, type of septic arthritis, multiple joint involvement, pathogenicity of the organism, presence of osteomyelitis, and expected use of the foal are factors that can help formulate a prognosis.
Clin Tech Equine Pract 5:309-317 © 2006 Elsevier Inc. All rights reserved.

KEYWORDS septic arthritis, osteomyelitis, equine, foal

Incidence and Risk Factors

Septic arthritis in foals can result from a periarticular wound infection, inoculation of the joint by a puncture wound, or by hematogenous inoculation (Fig. 1). The hematogenous route is the most common avenue of inoculation of organisms in a joint in foals, and bacteremia and septicemia is the most important risk factor for septic arthritis in foals. In one study, septicemia was the most common cause of death (30%) in foals under 7 days of age.[1] In the same study, septic arthritis was identified as the cause of death in 12.5% of foals aged 8 to 31 days. Establishment of infection depends on several factors including size of inoculum, host defense, virulence of the organisms, and local joint factors. In foals, host defense is mainly associated with passively acquired immunity. Failure of transfer of passive immunity (FTPI) is the highest risk factor for development of septicemia in foals.[2] The incidence of disease resulting from FTPI has been reported to be as high as 78%. Organism virulence is related to the ability to establish infection. Attachment factors, ability to resist phagocytosis, or resistance to cell killing all contribute to the establishment of infection. Local joint factors that may predispose to establishment or maintenance of infection include low blood flow, particularly in end-loop capillaries, or poor blood supply, which is more a factor in bone. Although not commonly used in foals, certain intraarticular medications such as corticosteroids, hyaluronan, and polysulfated glycosaminoglycans have been associated with a higher risk for septic arthritis potentially by decreasing articular defense.

Department of Veterinary Large Animal Clinical Sciences, Texas A&M University, College Station, TX.
Address reprint requests to Dr. Joanne Hardy, Department of Veterinary Large Animal Clinical Sciences, Texas A&M University, 4475-TAMU, College Station, TX. E-mail: jhardy@cvm.tamu.edu

Pathogenesis

Articular blood supply is provided through a main arteriole that branches to the synovial membrane and epiphysis (Fig. 2). Blood supply to the metaphysis is provided by the nutrient artery, but in young foals, transphyseal vessels exist that connect the metaphyseal and epiphyseal blood supply.[3] Experimental intravenous injection of bacteria results in rapid inoculation of articular and periarticular capillaries. Four types of hematogenous articular infection have been described[3]: type S (synovial), where a septic arthritis resulting from inoculation of the synovial membrane is present; type E (epiphysis) where subchondral bone infection is present (Fig. 3); type P (physis) where infection of the physis on the metaphyseal side of the growth plate is identified (Fig. 4); and type T observed in premature foals, where infection of the small tarsal or carpal bones is seen (Fig. 5). In young foals, functional transphyseal vessels allow communication of the metaphysis and epiphysis, such that bacteria localize preferentially in the synovial membrane and subchondral bone. Thus young foals suffer predominantly from infectious arthritis types S and E. Closure of transphyseal vessels occurs approximately after 7 to 10 days of age, such that localization of infection to the metaphyseal vessel loops occurs in older foals.[3] Although bone inoculation can occur simultaneously to synovial inoculation in young foals, identification of bone involvement can be delayed because of a delay in radiographic identification of lesions.

Diagnosis

Septic arthritis, osteomyelitis, or physitis should be ruled out in any lame foal. Foals with septicemia are at high risk of developing septic arthritis, which generally is noted clinically hours to days after the initial signs of septicemia. Although

1534-7516/06/$-see front matter © 2006 Elsevier Inc. All rights reserved.
doi:10.1053/j.ctep.2006.09.005

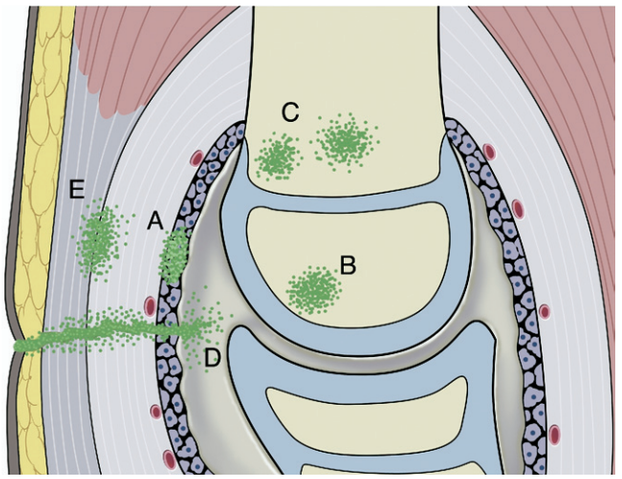

Figure 1 Possible routes of bacterial inoculation of a joint: A, B, and C are hematogenous, resulting in synovial membrane infection (A), epiphyseal infection (B), and physeal infection (C). In C, the joint capsule attachment includes the physis; therefore, inoculation of the physis will result in septic arthritis. If the physis is extraarticular, then septic arthritis does not always occur concurrently to septic physitis. (D) Joint inoculation from a puncture wound. (E) Joint inoculation from a contiguous soft tissue infection. (Color version of figure is available online.)

owners often complain of external trauma, septic arthritis is the most common cause of lameness in foals. In young foals with types S and/or E arthritis, inoculation of the synovial membrane is the first event, which can be identified by the astute clinician as periarticular edema. Joint effusion rapidly follows. Multiple joint involvements are common, and identification of all affected joints is essential for successful management. Effusion of the shoulder, elbow, or hip joints is more difficult to detect by palpation; therefore, arthrocentesis of these joints should be performed in foals with an unidentified lameness. In the stifle, femoropatellar joint involvement results in marked effusion; however, femorotibial joint effusion is usually more difficult to discern. Because of

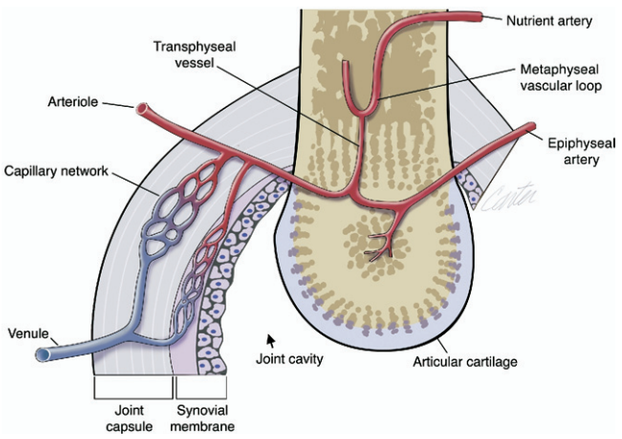

Figure 2 Illustration of the arterial blood supply to an equine neonatal joint showing the relationship between the nutrient artery, the synovial capillary network, and the epiphyseal vessels (Modified from Firth EC. Current concepts of infectious polyarthritis in foals. Equine vet J 1983;15:5-9.) (Color version of figure is available online.)

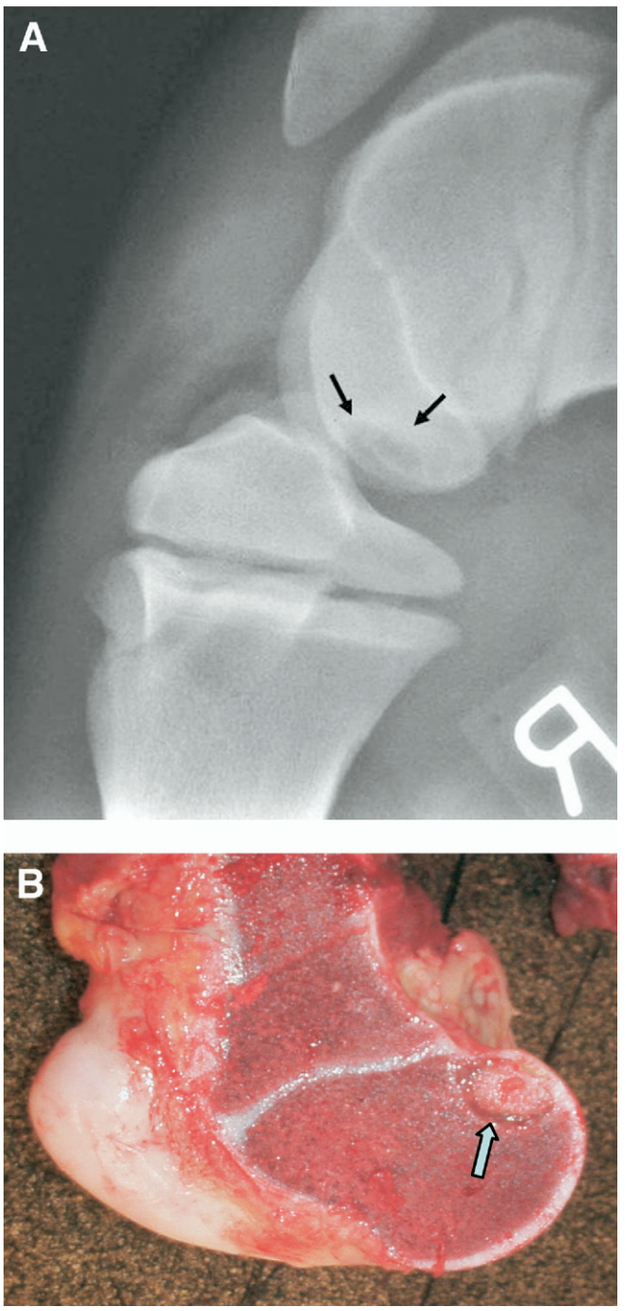

Figure 3 (A) Lateromedial projection of the stifle of a foal with type E septic arthritis. A lytic lesion (arrows) is identified on the caudal femoral condyle. (B) Postmortem section of the distal femur of the same foal showing the osteomyelitis lesion in the femoral condyle (arrow). (Color version of figure is available online.)

the usual communication between the femoropatellar and the medial femorotibial joint, both are usually involved concurrently. Lateral femorotibial infection is more subtle to identify and can occur separately. Distension of the long extensor pouch is often present in lateral femorotibial infection, and is a clue to involvement of that joint. In foals older than 7 days, physeal infection may be observed. With physeal infection, the presence of concurrent synovial effusion depends on the intra- or extraarticular localization of the growth plate. For example, distal metacarpal physeal infection results in periphyseal edema, initially without joint effu-

Download English Version:

https://daneshyari.com/en/article/2393222

Download Persian Version:

https://daneshyari.com/article/2393222

Daneshyari.com