POSNA

The Core Curriculum

Septic arthritis, hip

Objectives

1. Describe pathogenesis of septic arthritis of the hip
2. Describe presenting symptoms suggestive of septic arthritis of the hip in the newborn and older child
3. Describe evaluation and treatment of the child with suspected hip sepsis
4. Describe the natural history of septic arthritis of the hip
5. Discuss variable affecting outcome
6. Describe late sequelae of septic arthritis of the hip
7. Discuss the association of septic arthritis of the hip and osteomyelitis of the contiguous femoral metaphysis
8. Discuss the differential diagnosis of septic arthritis of the hip

Discussion

Septic arthritis was a life threatening condition in the pre-antibiotic era; while this is rarely the case at present, it can still have longterm effects if not treated promptly. The pathophysiology of septic arthritis is the same for the hip as any other joint - bacteria gain access across the synovial membrane, and incite an inflammatory reaction, manifested by the presence of plasma proteins and polymorhonuclear cells in the joint, producing an effusion. If untreated, proteolytic enzymes initiate articular cartilage destruction, eventually monocytes release interleukin-a to trigger further release of proteases from chondrocytes. In animal studies, proteoglycan is lost at 5 days, collagen at 9 days. This would seem to correlate well with sequelae of septic arthritis in humans.

The newborn may demonstrate no obvious symptoms other than a pseudoparalysis of the affected lower limb. Older children will complain of pain and refuse to weightbear. Soft tissue swelling may be palpable, even though the hip is a deep joint. The leg is held in a characteristic position of flexion, abduction, and external rotation, the position with the minimum intra-articular pressure. Guarding against motion from this position is usually marked with septic arthritis of the hip. Temperature is usually > 38 degrees and ESR > 40mm. This constellation of signs and symptoms is highly suggestive of septic arthritis of the hip. Immediate aspiration, and drainage if aspiration is positive, is the only acceptable course of treatment at this point. Ultrasonography has been used to differentiate between pus and the transudate of transient synovitis, but the only way to make a definitive diagnosis is by direct examination of joint fluid. Operative drainage can be performed through a posterior, anterolateral, or anterior approach; most pediatric orthopaedists now use an anterior or anterolateral approach to spare any possible intraoperative insult to the important end vessels of the medial femoral circumflex artery, and maintain the posterior capsule for joint

stability. A window of capsule can be removed to allow more effective drainage. Arthroscopy has even been described, the morbidity of anterior arthrotomy is so minimal and the consequences of inadequate drainage are so severe that it is hard to believe arthrotomy will not remain standard. In the neonate, streptococcus is now most common, followed by staphylococcus and gram negatives. The vaccine for hemophilus influenza has greatly diminished its prevalence as a causative agent for septic arthritis, but kingella kingae, a fastidious organism to identify, has emerged to take its place in children. In endemic areas, klebsiella and brucellosis must be considered. Blood cultures should be obtained when the child's temperature is increasing to aid in identification of the offending organism. The proximal metaphysis is intracapsular in the infant, and there is some vascular penetration of the physis at this age, so metaphyseal osteomyelitis is more prevalent in the newborn than the older child. Systemic antibiotics, nafcillin or oxacillin are started until specific culture results might indicate a revision. When patient response has responded clinically, administration of oral antibiotics can replace the intravenous route. A recent series of 20 cases of hip sepsis in children was managed in this way without any recurrence of infection. Only culture positive patients were included in the series.

The most significant variable by far affecting outcome is the delay from the onset of symptoms until surgical drainage, a 4-day delay seems to be the most delay compatible with good outcome. Because of importance of the intraarticular vasculature of the hip joint, continued intra-articular effusion has a particularly deleterious effect. Osteomyelitis accompanying septic arthritis is much more common with diagnostic delays. Sequelae are related to destruction of articular cartilage and the proximal femoral physis. There is obviously a gradation in severity of permanent sequelae, from mild fragmentation of the epiphysis to complete destruction of the head and neck, accompanied by leg length discrepancy. Treatment of the more severe complications is complex, possibly requiring trochanteric arthroplasty, pelvic and/or femoral osteotomy, and leg lengthening.

Differential diagnosis includes pelvic osteomyelitis, psoas abscess, and abscess of the obturator internus. Ultrasound was helpful in detecting psoas abscess, suspected because of swelling and pain, but no pain with hip motion. MRI and CT are helpful for diagnosis of obturator internus abscess.

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