Orthopedic Infections: Important Issues in Prevention and Diagnosis

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Infections in orthopedic patients are among the most frequent postoperative complications and are known to cause significant morbidity, increased healthcare costs, and prolonged hospital stays.[1] Infections of implanted hardware can be especially devastating and difficult to treat, usually requiring removal of the hardware and prolonged courses of antibiotics; in some cases, amputation becomes necessary. In this month's E-publishing section of *The American Journal of Orthopedics* focusing on infections in orthopedic practice, several types of these infections are discussed.

Taken together, these papers highlight two distinct concepts that pertain to orthopedic practice:

1. The prevention and management of infections of primary joint arthroplasties and the importance of following evidence-based practice guidelines to minimize the risk of postoperative infections
2. The need to consider underlying risk factors when formulating a differential diagnosis in a patient with an atypical orthopedic presentation; in these cases, a careful history and physical examination by the surgeon can lead to timely diagnosis and may reveal other medical conditions requiring referral.

In "Wichita Fusion Nail for Patients With Failed Total Knee Arthroplasty and Active Infection," Barsoum and colleagues highlight the management dilemmas of treating failed total knee arthroplasties due to active infection and present their experience using a modular fusion nail. Kuper and Rosenstein review the literature in "Infection Prevention in Total Knee and Total Hip Arthroplasties" and present their experience in reducing the risk of infection after total knee and hip arthroplasties. Rates of infections after joint arthroplasty have declined substantially since the introduction of such prevention measures as antimicrobial prophylaxis and "ultraclean" air in operating rooms.[1] Data collected from approximately 300 hospitals participating in the National Nosocomial Infection Surveillance System (NNIS, now the National Healthcare Safety Network) from 1992 to 2004 showed that pooled mean rates of infection for total knee and hip arthroplasties were < 1 per 100 operations for the lowest-risk patients and slightly more than 2 per 100 for the highest-risk patients.[2] Hospitals performing these procedures can use these aggregated data to evaluate their own rates of infection.

The importance of prevention measures cannot be overemphasized. In a multicenter study involving over 8000 total hip and knee replacements, Lidwell and colleagues[3] found that while both ultraclean air and antimicrobial prophylaxis reduced the incidence of surgical site infection (SSI), antimicrobial prophylaxis alone led to a greater reduction (reducing SSI from 3.4% to 0.8%) than ultraclean air. While data strongly support that the first dose of cefazolin should be given within 1 hour (preferably within 30 minutes) of incision, the optimal duration of prophylaxis remains unclear; current data do not support continuing beyond 24 hours.[1] Following evidence-based guidelines, conducting close surveillance for SSI appropriately stratified by risk and reporting operation-specific, risk-stratified infection rates to surgical team members are critical measures to prevent these devastating complications.[4]

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The issue of diagnosing patients with atypical orthopedic

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presentations is highlighted in "Psoas Abscess: A Diagnostic Dilemma" by Ebraheim and colleagues. Patients with a psoas abscess often present with vague signs and symptoms in the buttock, hip, or thigh. Psoas abscesses most commonly result from direct extension of an adjacent source of infection, such as an intra-abdominal infection, perinephric abscess, infected retroperitoneal hematoma, or vertebral osteomyelitis, or less commonly by hematogenous seeding.[5] Close attention to the patient's history in all the cases presented revealed previous conditions or procedures that may have predisposed them to psoas abscess. The authors point out that computed tomography is the best modality for diagnosing the abscess and often the source of the infection.

In "Atypical Presentation of Soft-Tissue Mass With Gonococcal Infection in the Hand," Hurst and colleagues present a case of gonococcal infection manifested by an atypical presentation of a soft-tissue mass in the thenar eminence with focal flexor tenosynovitis in an otherwise healthy man. Culture of purulent fluid from incision and drainage revealed *Neisseria gonorrhoeae*. Further questioning revealed a history of unprotected sex. The diagnosis of one sexually transmitted disease necessitates appropriate workup for other sexually transmitted coinfections, such as HIV and syphilis, as well as education and screening of sexual partners. Although this is typically outside the realm of the orthopedic surgeon's practice, the appropriate referral can have a major impact in the life of patients and their contacts.

References

1. ASHP Commission on Therapeutics Task Force. ASHP therapeutic guidelines on antimicrobial prophylaxis in surgery. American Society of Health-System Pharmacists. *Am J Health-Syst Pharm.* 1999;56(18):1839-1888.
2. CDC NNIS System. National Nosocomial Infections Surveillance (NNIS) system report, data summary from January 1992 through June 2004, issued October 2004. *Am J Infect Control.* 2004;32:470-485.
3. Lidwell OM, Elson RA, Lowbury EJ, et al. Ultraclean air and antibiotics for prevention of postoperative infection. A multicenter study of 8,052 joint replacement operations. *Acta Orthop Scand.* 1987;58(1):4-13.
4. Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR, The Hospital Infection Control Practices Advisory Committee. Guideline for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol.* 1999;20:250-278.
5. Pasternack MS, Swartz MN. Myositis. In: Mandell GL, Bennett JE, Dolin R, eds. *Principles and Practice of Infectious Diseases.* 6th Ed, Vol. 1. Philadelphia: Churchill Livingstone, 2005:1200-1201.