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F- 27 - OPTIMAL ABX TAA

F- 27 - What is the optimal (type, dose and route of administration) antibiotic treatment for patients with infected total ankle arthroplasty?

Response/Recommendation:

The choice of antibiotic should be made based on the identification and sensitivities of the infecting organism(s). Dosing, frequency, and route of administration of antibiotics should be determined by the infectious disease specialist taking into account the patient weight, co-morbidities, such as renal impairment, and the antibiogram.

Strength of Recommendation: Consensus

Rationale:

There is a paucity of literature regarding the treatment and outcomes of periprosthetic joint infection (PJI) in total ankle arthroplasty (TAA). The two largest studies on post-TAA infection from the United States report the use of 6 weeks of intravenous (IV) antibiotic therapy following surgical treatment of the infection.[1,2] In a study from Europe, Kessler et al. reported the use of 1-2 weeks of IV antibiotics followed by 3 months of oral antibiotics following surgical treatment for infection.[3] In all of these studies, the choice of antibiotic(s) was made based on the identified infecting organism(s) and its antibiotic sensitivity and with the assistance of an infectious disease specialist. In general, the most common pathogens responsible for PJI are *Staphylococcus aureus* (methicillin-susceptible or -resistant), coagulase-negative staphylococci, and other constituents of the skin's bacterial flora.[4,5]

The timing of PJI following TAA is also important in determining infection management. If the infection developed within 6-12 weeks of implantation, this is considered an acute infection and debridement with retention of the implants (DAIR) and antimicrobial treatment are the most desirable approach. Conversely, for a device that has been present for more than 3 months, a chronic infection is presumed to be present and a one- or two-stage exchange with antimicrobial treatment is the desired course of action.[5–7]

In the hip and knee literature, there has been debate with regards to the duration of antibiotic treatment. Some studies have recommended as many as 3-6 months of antimicrobial therapy following surgical intervention, depending on the organism.[6,8] However, other studies have shown 6 weeks of IV antibiotics to be a sufficient duration of treatment.[9–11] The theoretical benefit of a shorter course of antibiotics, aside from patient convenience, includes a reduced risk of adverse drug events (ADEs), including anaphylaxis, nephrotoxicity, hepatotoxicity, and infectious colitis, as well as bacterial resistance.[12] The Musculoskeletal Infection Society (MSIS)'s International Consensus on Periprosthetic Joint Infection stated that the duration of

antibiotic therapy following removal of implants is inconclusive but recommended a period of antibiotic therapy between 2-6 weeks.[13]

The authors of the Infectious Diseases Society of America (IDSA) Guidelines for the Diagnosis and Management of Prosthetic Joint Infection make the following recommendations for the management of hip and knee arthroplasties, while suggesting that similar recommendations can be extended for the management of TAA infections.[6] The IDSA recommends 4-6 weeks of pathogen-specific IV or highly bioavailable oral antibiotic therapy following removal of implants, regardless of organism, or in non-staphylococcal PJI treated with DAIR. They recommend 2-6 weeks of IV antibiotic in combination with oral rifampin, followed by 3 months of rifampin plus a companion oral antibiotic for a staphylococcal TAA PJI treated with DAIR. If rifampin cannot be used because of an allergy or toxicity concern, the IDSA recommends 4-6 weeks of IV antibiotic therapy. Of note, the IDSA recommendations are the same in the setting of a one-stage exchange as they are following DAIR.[6]

Further studies on the treatment and outcomes of infection in total ankle arthroplasty are needed. For now, we must rely on the hip and knee arthroplasty literature as well as the recommendations of the MSIS and IDSA.

References:

1. Patton D, Kiewiet N, Brage M. Infected total ankle arthroplasty: risk factors and treatment options. *Foot Ankle Int*. 2015;36(6):626-634. doi:10.1177/1071100714568869
2. Myerson MS, Shariff R, Zonno AJ. The management of infection following total ankle replacement: demographics and treatment. *Foot Ankle Int*. 2014;35(9):855-862. doi:10.1177/1071100714543643
3. Kessler B, Knupp M, Graber P, et al. The treatment and outcome of peri-prosthetic infection of the ankle: a single cohort-centre experience of 34 cases. *Bone Joint J*. 2014;96-B(6):772-777. doi:10.1302/0301-620X.96B6.33298
4. Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Surg Infect (Larchmt)*. 2013;14(1):73-156. doi:10.1089/sur.2013.9999
5. Del Pozo JL, Patel R. Clinical practice. Infection associated with prosthetic joints. *N Engl J Med*. 2009;361(8):787-794. doi:10.1056/NEJMcp0905029
6. Osmon DR, Berbari EF, Berendt AR, et al. Executive summary: diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis*. 2013;56(1):1-10. doi:10.1093/cid/cis966
7. Alrashidi Y, Galhoum AE, Wiewiorski M, et al. How To Diagnose and Treat Infection in Total Ankle Arthroplasty. *Foot Ankle Clin*. 2017;22(2):405-423. doi:10.1016/j.fcl.2017.01.009
8. Zimmerli W, Widmer AF, Blatter M, Frei R, Ochsner PE. Role of rifampin for treatment of orthopedic implant-related staphylococcal infections: a randomized controlled trial. Foreign-Body Infection (FBI) Study Group. *JAMA*. 1998;279(19):1537-1541.
9. Chaussade H, Uçkay I, Vuagnat A, et al. Antibiotic therapy duration for prosthetic joint infections treated by Debridement and Implant Retention (DAIR): Similar long-term remission for 6 weeks as compared to 12 weeks. *Int J Infect Dis*. 2017;63:37-42. doi:10.1016/j.ijid.2017.08.002
10. Bernard L, Legout L, Zürcher-Pfund L, et al. Six weeks of antibiotic treatment is sufficient following surgery for septic arthroplasty. *J Infect*. 2010;61(2):125-132. doi:10.1016/j.jinf.2010.05.005
11. Farhad R, Roger P-M, Albert C, et al. Six weeks antibiotic therapy for all bone infections: results of a cohort study. *Eur J Clin Microbiol Infect Dis*. 2010;29(2):217-222. doi:10.1007/s10096-009-0842-1
12. Meropol SB, Chan KA, Chen Z, et al. Adverse events associated with prolonged antibiotic use. *Pharmacoepidemiol Drug Saf*. 2008;17(5):523-532. doi:10.1002/pds.1547
13. Parvizi J, Gehrke T, Chen AF. Proceedings of the International Consensus on Periprosthetic Joint Infection. *Bone Joint J*. 2013;95-B(11):1450-1452. doi:10.1302/0301-620X.95B11.33135