Chapter 21
Total Ankle Replacement Infections

Michaela Maria Schneiderbauer

Abstract Total ankle replacements have some peculiarities in comparison to other artificial joints. The workout and the algorithm to evaluate a suspicion of an artificial ankle infection is presented and discussed in the chapter.

Keywords Total ankle replacement • Complications • Infections • Algorithm

21.1 Total Ankle Replacements

Total ankle replacements of various designs (Fig. 21.1) are becoming more common since many patients and doctors assume a superiority of ankle replacements over ankle fusions over time. Ankle replacements might have the advantage of protecting adjacent joints from early arthritis since range of motion in the ankle is somewhat preserved. So far larger studies and a literature review have failed to demonstrate a superior outcome of total ankle replacements over ankle fusions [1–3]. The infection rates of ankle replacements seem to be higher than in ankle fusions [3]. This is most likely caused by wider surgical exposure and larger foreign body. Of note it is often easier to revise an infected fusion than an infected ankle replacement. With an infection fusion suppression of the infection until the fusion heals and then removal of the hardware (usually a few screws) is a valid option. This is not a choice in infected ankle replacements.

21.2 Scope of Problem

Recent studies have shown that the rate of infection in total ankle replacements is significantly higher than in total knee and total hip replacements with rates published as high as 6 % [3]. There are multiple reasons why this might be the case.

M.M. Schneiderbauer, M.D., Ph.D.
Miller School of Medicine, University of Miami,
1400 NW 12th Avenue, Miami, FL 33136, USA
e-mail: mschneiderbauer@gmail.com; mschneiderbauer@med.miami.edu

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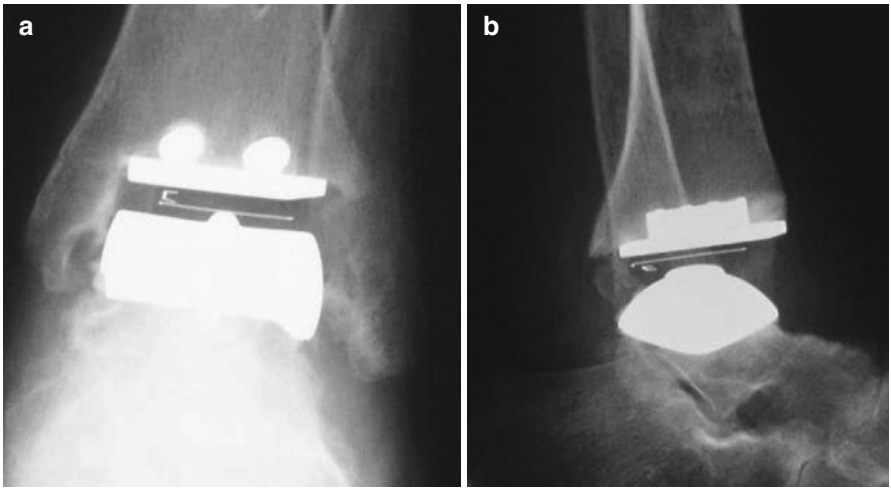

Fig. 21.1 Scandinavian total ankle replacement (STAR) (R. Trebše archive). (**a**) a.p. view, (**b**) lateral view

Many patients who are candidates for total ankle replacements have an underlying diagnosis of posttraumatic arthritis often with multiple previous surgeries, multiple surgical scars, and therefore compromised soft tissues. Additionally, many patients have comorbidities including diabetes and peripheral vascular disease that can cause poor blood supply due to microangiopathy as well as macroangiopathy. Overall the soft tissue coverage over the prosthesis is scarce, even scarcer than in total knee replacements. Limited soft tissue coverage is an argument why the rate of infection in total knee replacements is higher than in total hip replacements. Down at the ankle, this problem is even more pronounced.

21.3 Diagnostic Problems

Many patients with major surgery around their ankle will have a significant degree of soft tissue swelling and even some warmth and erythema. These signs do not necessarily indicate an infection. They could just reflect a prolonged healing process. In the immediate postoperative period, it is hard to distinguish. Sequential CRP, ESR, and white blood cell monitoring are good indicators with rising parameters after a few days postoperatively constituting a warning sign. Drainage that persists past 7 days after surgery is certainly a reason for concern. In case of doubt, it is better to intervene early and do an appropriate irrigation and debridement with liner exchange and harvest of intraoperative cultures. Antibiotics should only be started at the time of this surgery. Starting antibiotics randomly without surgical intervention might suppress the infection subclinically for some time but in the end lead to a more resistant infection in the total ankle prosthesis with a patient that is often in chronic pain.

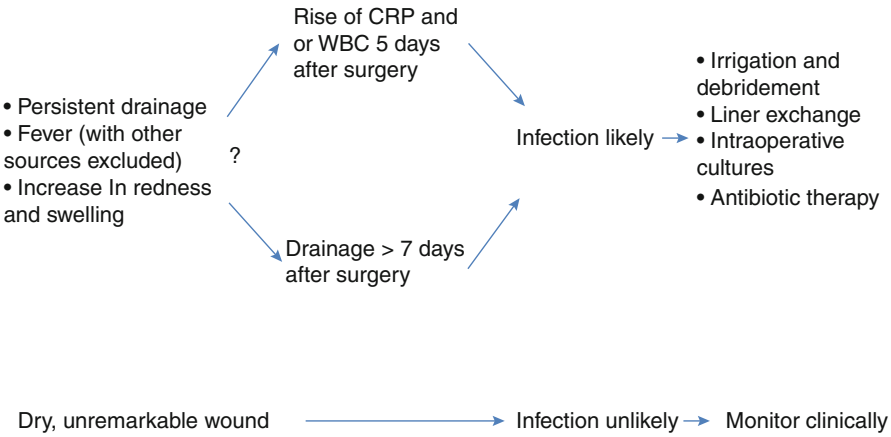

Fig. 21.2 Suggested diagnostic and treatment algorithm if symptoms last less than 3 weeks

Infection rates of total ankle arthroplasties in registry-based data are stated as less than 1 % with significantly higher aseptic loosening complication rates [4–6]. A doubt arises if all aseptic loosenings in the literature are truly aseptic or if they might encompass some septic loosenings with low-grade or suppressed pathogens that were not properly diagnosed. An important question to clarify in the patient's history is if he or she received oral antibiotics at any time after implantation for a presumed cellulitis in the area of surgery. Well-meaning primary care physicians often initiate antibiotic therapy for this kind of clinical picture. In order to guarantee the best long-term outcome for patients with loose ankle replacements or suspicious soft tissues, all efforts should be undertaken to rule in or rule out an infection with the help of the diagnostic algorithms presented in this chapter (Figs. 21.2 and 21.3). Oral antibiotics that are given without the proper diagnosis of an infection should be stopped and determination of the pathogen should be attempted after discontinuation of antibiotics for at least 5 days.

21.4 Treatment Problems

Many patients with infected total ankle replacements do present with a significant soft tissue problem and even dehiscence and large defects around the prosthesis. Along with the necessary orthopedic surgery and antibiotic treatment, these patients often do require coverage with flaps and skin grafts. It is recommendable to involve plastic surgery early in the treatment course of infected ankle replacements in order to improve the outcomes. Vacuum seals are very popular in wound infections and to treat soft tissue defects. They can be used for wound management where the fascia is closed over the implant or no implant is in place. Vacuum seals are not recommended directly on bone or on an implant, since they will maintain the colonization

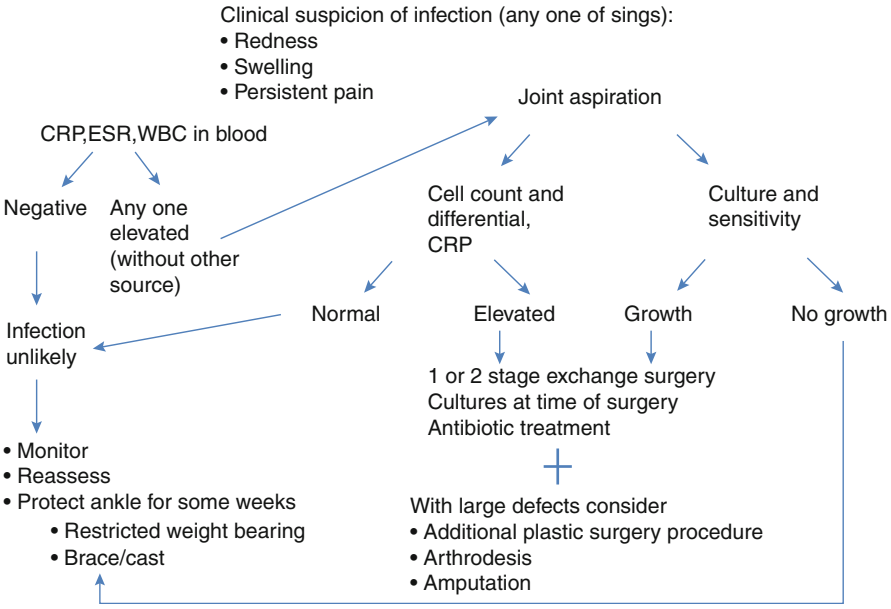

Fig. 21.3 Suggested diagnostic and treatment algorithm if symptoms last more than 3 weeks

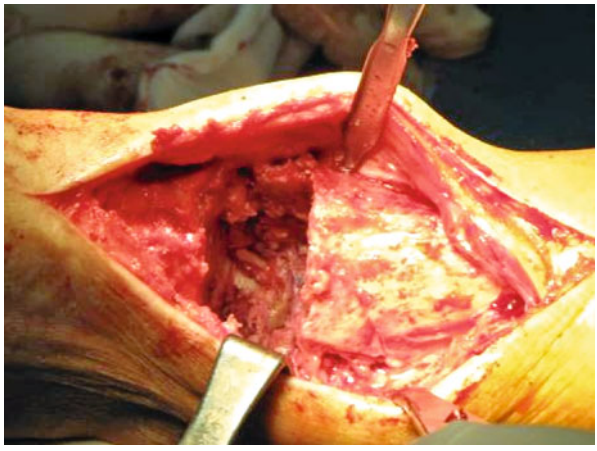

Fig. 21.4 The defect after the removal of the prosthetic ankle (R. Trebše archive)

with skin bacteria on foreign materials or bradytrophic tissue and lead to resistant bacteria on these structures if used with antibiotic therapy. In some patients, the joint is not salvageable, and an arthrodesis, often with large osseous defects (Figs. 21.4 and 21.5), will have to be attempted. Rarely even below the knee amputation will be necessary if multiple revision surgeries and targeted antibiotics do not render the ankle infection free.

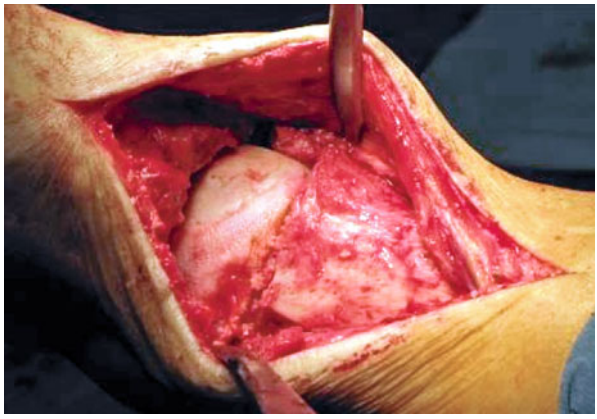

Fig. 21.5 The defect after the removal of the prosthetic ankle filled with femoral head bone graft (R. Trebše archive)

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