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QUESTION 9: What are the predictors of treatment failure in patients who have undergone two-stage exchange for infected total ankle arthroplasty (TAA)?

RECOMMENDATION: Predictors for treatment failure in patients undergoing two-stage exchange for infected TAA include compromised soft tissues (e.g., sinus tract, exposed hardware, etc.), significant bone involvement/osteomyelitis and insufficient timing of antibiotic course before reimplantation.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 100%, Disagree: 0%, Abstain: 0% (Unanimous, Strongest Consensus)

RATIONALE

The optimal management of patients with infected TAA is not well-known due to a limited number of studies [1–5]. While comparisons and deductions can be made from the knee and hip periprosthetic joint infection (PJI) literature on two-stage exchange, the management of infected TAA can differ from hip and knee arthroplasty because of the precarious soft tissue coverage around the ankle, the common history of multiple preceding operations in patients, and arthroplasty design updates coupled with limited surgical experience [3]. Two-stage exchange is a well-accepted surgical management approach for PJI.

There is limited detail in the TAA literature on two-stage exchange failure. A study by Patton et al. reported on 12 cases of two-stage revision for infected TAA but offered no details of the cases that failed [3]. Another study by Kessler et al. reported on 34 patients undergoing surgical management for infected TAA [6]. Of the patients treated for infected TAA, 10% (1/10) of two-stage exchanges resulted in failure. This two-stage failure is not described in detail. However, in the described cohort, the presence of compromised soft-tissue significantly increased the rate of failure after revision.

Another problem with the soft tissues surrounding the ankle is the presence of a sinus tract. Not only do sinus tracts often have indurated soft tissue around the ankle, but they also have the potential to limit preoperative cultures and organism identification, which in itself may predispose the patient to a future failure [7–11]. Furthermore, certain comorbidities such as metastatic disease, renal and/or liver dysfunction, and advanced cardiac disease are indicated to influence the rate of PJI [6,7], but these comorbidities may not necessarily be tied to treatment failure after two-stage exchange arthroplasty.

In North America patients undergoing two-stage exchange arthroplasty for the treatment of PJI are often subjected to six weeks of an antibiotic course. Based on data from hip and knee PJI, inadequate administration of antibiotics has been linked to the presence of positive cultures during reimplantation that, in turn, increase the risk of failure after reimplantation [8,13]. While inadequate antibiotic therapy has been linked with subsequent failure, the exact duration of antibiotic treatment, the benefit of intravenous (IV)-to-oral (PO) antibiotics, and the timing of IV-to-PO switch has not been determined. Recent PJI literature suggests that a short IV antibiotic period lasting at least five to seven days followed by pathogen-specific PO therapy may be a viable option for treatment of patients with PJI [14,15].

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