Authors: Ilker Uçkay, David Pedowitz, Mathieu Assal, Justin D. Stull

QUESTION 6: What is the optimal protocol for performing debridement, antibiotics and implant retention (DAIR) in an infected total ankle arthroplasty (TAA) (type and volume of irrigation solution, and so on)?

RECOMMENDATION: DAIR in acute TAA infections may be an acceptable treatment option. If performed, DAIR should be done meticulously, ensuring that all necrotic or infected tissues are removed and modular parts of the prosthesis, if any, exchanged. The infected joint should also be irrigated with antiseptic solutions.

LEVEL OF EVIDENCE: Consensus

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

RATIONALE

For total hip and knee periprosthetic joint infection (PJI), the DAIR procedure is a viable alternative to explantation or one-stage revision in cases of early infections by a relatively antibiotic-susceptible bacteria, in the absence of mechanical problems or a sinus tract. Concerning TAA infections, these general prerequisites for DAIR are not different than for other PJIs, but the success of DAIR in TAA infection is relatively poor (see Table 1). The best evidence is reported by Kessler et al. [1]. The authors investigated 34 cases of TAA infection, of which 21 were treated by DAIR. Remission using the DAIR procedure was achieved only in two-thirds of all cases (14 of 21, 67%) [1].

The reason for failure of DAIR in hip and knee PJI cases has been linked to resistance of bacteria, poor host and inability to remove modular components, which would then compromise the ability to perform meticulous debridement. Most surgeons will agree that the aforementioned factors are important ones influencing the outcome of DAIR. They will also posit that one of the most important metrics governing the success of DAIR is the method used by the surgeon to perform the procedure. Meticulous debridement and the use of copious antiseptic solutions are all believed to be an important part of bioburden reduction, which in turn affects the outcome of this procedure [4–6]. When DAIR is attempted, available literature infrequently gives in-depth insight into the surgical details – approach, volume and type of irrigation solution or, perhaps most importantly, the frequency of poly exchange versus retention.

Practically, the anterior approach is most commonly described [1–3] and poly-exchange frequently endorsed [3,4]. The duration of concomitant antibiotic prescription is most commonly six weeks of therapy (most commonly intravenous); however not all routes of administration or duration is conveyed in the literature reviewed [1–4,6]. The use of vacuum-assisted devices is not reported in the treatment of TAA infections, rather in the promotion of wound healing and the prevention of infection after primary elective arthroplasty [7,8].

REFERENCES

[1] Kessler B, Sendi P, Graber P, Knupp M, Zwicky L, Hintermann B, et al. Risk factors for periprosthetic ankle joint infection: a case-control study. J Bone Joint Surg Am. 2012;94:1871–1876. doi:10.2106/JBJS.K.00593.

[2] Ferrao P, Myerson MS, Schuberth JM, McCourt MJ. Cement spacer as definitive management for postoperative ankle infection. Foot Ankle Int. 2012;33:173–178. doi:10.3113/FAI.2012.0173.

[3] Myerson MS, Shariff R, Zonno AJ. The management of infection following total ankle replacement: demographics and treatment. Foot Ankle Int. 2014;35:855–862. doi:10.1177/1071100714543643.

[4] Patton D, Kiewiet N, Brage M. Infected total ankle arthroplasty: risk factors and treatment options. Foot Ankle Int. 2015;36:626–634. doi:10.1177/1071100714568869.

[5] Spirt AA, Assal M, Hansen ST. Complications and failure after total ankle arthroplasty. J Bone Joint Surg Am. 2004;86-A:1172–1178.

[6] Hsu AR, Haddad SL, Myerson MS. Evaluation and management of the painful total ankle arthroplasty. J Am Acad Orthop Surg. 2015;23:272–282. doi:10.5435/JAAOS-D-14-00017.

[7] Matsumoto T, Parekh SG. Use of negative pressure wound therapy on closed surgical incision after total ankle arthroplasty. Foot Ankle Int. 2015;36:787–794. doi:10.1177/1071100715574934.

[8] DeCarbo WT, Hyer CF. Negative-pressure wound therapy applied to high-risk surgical incisions. J Foot Ankle Surg. 2010;49:299–300. doi:10.1053/j.jfas.2010.01.002.

TABLE 1. Investigation of 34 cases of TAA infection

Author	Number of TAA Infections	Number of Attempted DAIR	Remission
Kessler et al. [1]	34	21	14/21 (67%)
Ferrao et al. [2]	6	0	6/6 (100%)
Myerson et al. [3]	19	4	All DAIR patients developed later infection and failed
Patton et al. [4]	29	5	Unknown for DAIR

TAA, total ankle arthroplasty; DAIR, debridement, antibiotics and implant retention