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CORR Insights®: Is Single-stage Revision According to a Strict Protocol Effective in Treatment of Chronic Knee Arthroplasty Infections?

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Where Are We Now?

Despite considerable controversy and investigation during the past three decades, the appropriate selection criteria for performing single-stage versus

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two-stage exchange have not been clearly elucidated. Given the morbidity of two-stage revision for the infected TKA, I certainly understand the motivation to use (or to evaluate) the single-stage approach to this difficult problem. In the current manuscript by Haddad and colleagues, strict patient selection criteria for the use of a single-stage procedure resulting in selection of 28 of 102 patients with infected TKAs are consistent with the majority of earlier studies and current expert opinion. These criteria call for selection of only the healthiest of patients, with more easily treatable micro-organisms, and minimal disruption of anatomy (ie, minimal bone loss and an excellent soft tissue envelope). It is interesting to note that in a highly specialized referral center, this single-stage procedure was performed on average only once every other month during the timeframe of this study.

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Where Do We Need To Go?

Importantly, though, in this small group of highly selected patients, these authors demonstrated eradication of infection in all patients and a high level of function. However, it should not be surprising that these results were better when compared with the two-stage patients, as that group included the sickest hosts, undesirable micro-organisms, and more severe bone and soft tissue loss. If one assumes the same success with a two-stage procedure for these highly selected patients, the overall success rate would have been 95% in all 102 patients with delayed reconstruction. The real question is, what would the success rate have been if a one-stage procedure had been used for all patients? This question is worth asking because it is highly doubtful whether the described selection criteria for this relatively rare procedure is easily translatable to most surgeons in a variety of different patient settings. Future studies may need to consider what the unintended consequences of a

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gradual expansion of selection criteria and indications for the single-stage procedure will be, as no doubt results like those of Haddad et al will tempt surgeons in that direction.

How Do We Get There?

Clearly, some patients can successfully undergo a single-stage procedure, and with this recent report there will likely be renewed interest in this approach. The question is, using the selection criteria of Haddad et al., who should attempt to reproduce these results in their clinical practice? Certainly anyone considering this procedure should be experienced in

the treatment of the infected knee arthroplasty, while also having enough patient referrals to feel comfortable performing this procedure on a more routine basis. This suggests to me that relatively few individuals in specialty or tertiary centers should be the first line of expansion of this concept, to be certain that these results can be reproduced. Based on their results, we may or may not find that the selection criteria ought to be refined. Such studies might also give us a clearer and more generalizable sense of what proportion of patients may be eligible for single-stage revision for the infected TKA. Ideally, these results should be done with the use of a large multicenter study group.

I would propose that academic specialty societies associated with knee surgery and care of musculoskeletal infection consider a large organized effort to study this issue before the single-stage procedure becomes routine. The true success rate of a single-stage procedure will require a large number of patients treated by a variety of surgeons. In my opinion, there is enough evidence to warrant the allocation of resources and effort to create a large study group to evaluate this issue. The time to organize this type of study is now, but this is not the time for the widespread use of the single-stage procedure throughout orthopaedic clinical practice.