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CORR Insights®: Single-stage Acetabular Revision During Two-stage THA Revision for Infection is Effective in Selected Patients

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Where Are We Now?

Periprosthetic joint infection (PJI) occurs in approximately 1% of patients who undergo THA. The complication causes considerable morbidity for patients and the ideal treatment is still debated.

This CORR Insights® is a commentary on the article “Single-stage Acetabular Revision During Two-stage THA Revision for Infection is Effective in Selected Patients” by Fink and colleagues available at: DOI: [10.1007/s11999-017-5334-5](https://doi.org/10.1007/s11999-017-5334-5).

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Perhaps the best-accepted options are one- and two-stage revision.

Selective use of one-stage revision has the obvious advantages of avoiding a second major surgical procedure and the period of decreased mobility between the revision operations, but seems to perform better if the surgeon is able to isolate the infecting pathogen, and in most series has a lower likelihood of success than does two-stage revision [2, 8]. Another concern is that many single-stage series employed cemented stems to allow for local delivery of antibiotics, which may result in less-durable fixation over the longer run [10, 13].

Two-stage revision with an antibiotic-cement spacer should be considered the standard treatment because it is the more common approach, it's an established technique, and all new techniques are compared to it. Although articulating (mobile)

cement hip spacers can cause mechanical complications including dislocation, spacer fracture, and further deterioration of already bone-deficient acetabuli, severe acetabular bone loss does not preclude a two-stage revision, and there are several well recognized solutions for such a problem including provisional cages, antibiotic-loaded cement shelves, and nonarticulating spacers [1, 4].

The technique presented by Fink and colleagues offers a new option—a compromise between two-stage and single-stage revision—for the management of some of the mechanical problems related to cement spacers in the face of severe acetabular deficiency. One concern with this option is that a portion of the definitive reconstruction is performed prior to confirming that the infection has been completely eradicated.

Alternative approaches, such as component retention of the femoral cement mantle in one- or two-stage procedures, have shown encouraging results [5–7, 9]. The apparent success of these case series contradict traditional teaching that safe reimplantation

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requires the removal of all foreign material followed by thorough débridement. Similarly, the technique described by Fink and colleagues is another “new thinking” option.

Where Do We Need To Go?

Better understanding of the advantages, disadvantages, success rates, and complications of these novel techniques may help define the best indications and contraindications for their use. Future studies should establish and evaluate a detailed algorithm based on clinical presentation, isolated pathogens, host factors, bone deficiency, and implant stability.

How Do We Get There?

Designing a randomized controlled study may be difficult due to the specific patient indications required. Even in specialized centers, recruiting enough patients for comparative studies will be a challenge. Few specialized centers perform septic revisions on a regular basis and patients who have already undergone multiple revisions or who do not have severe enough bone defects may not be considered good candidates for a single-stage acetabular revision such as Fink and colleagues evaluated here.

Although Fink and colleagues used septic revisions in 15% of their revisions, other studies reported using single- or two-stage revisions with one implant retention selected in only 3% to 7% of septic revisions [5, 6]—further proving that recruiting patients will be a difficult task. Additionally, with comparable infection-free rates reported for all techniques, achieving statistically significant results may be even more challenging.

As with many other surgical debates concerning the management of uncommon problems, we will probably have to wait for more quality evidence. Realistically, this evidence will come in the form of a larger case series with more patients and longer followup; perhaps a historically-controlled comparative series or national registries will provide further insight.

Laboratory research examining the tension between biofilm forming on infected prosthetic surfaces and the impressive success rates of partial-retention techniques may be of value as well. Although several animal models of PJI have been reported [3, 11, 12], animal models representing septic revision have not, to my knowledge, been developed. The ideal model would compare the different revision options in different situations, including different pathogens, varying degrees of osteointegration, and bone loss.

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