

Treatment of Infected Nonunion of the Lower Extremity with an Antibiotic Cement-Coated Intramedullary Rod: A Case Series of 38 Patients

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Purpose: Infected nonunion of the long bones is a notoriously complex condition to treat. Eradication of the infection prior to definitive internal or external fixation involves multiple washout procedures and/or exchange(s) of antibiotic-coated delivery devices. Antibiotic cement-coated intramedullary (ACCIM) rods can deliver a high concentration of antibiotics while maintaining stability of the nonunion site. Our study highlights the efficacy and practicality of using ACCIM rods as a dual-purpose treatment modality to clear infection and work toward union.

Methods: This study is an IRB-approved retrospective case series of 38 patients with an infected nonunion of the lower extremity treated with an ACCIM rod between 2001 and 2019 at a Level I academic trauma center. We reviewed chart notes, laboratory data, and radiographs to determine our primary outcomes of number of procedures and time needed to eradicate infection, and to subsequently achieve union. We collected information on the type of antibiotic used for the ACCIM rod and complications during rod removal or exchange. All patients have a minimum 1-year follow-up.

Results: Infection was successfully treated in 36 of 38 patients (94.7%) with only 4 patients experiencing infection relapse. Patients required an average of 6.5 months (range, 1-20 months) to eradicate their infection. Union was achieved in 30 of 38 patients (78.9%) with or without additional procedures, requiring an average of 9.6 months (range, 1-20 months) to achieve union. 23 of 38 patients (60.5%) required an average of 1.2 (range, 1-2) additional procedures to achieve successful union. 7 of 38 patients (18.4%) had successful union without the need for additional procedures other than ACCIM nailing. Of the 8 patients who did not achieve union, 4 patients had an implant-dependent union and 4 had persistent nonunion. Debonding of cement during removal of ACCIM nail was seen in only 1 case. Mean follow-up was 33.7 months.

Conclusion: ACCIM rods are an effective and efficient treatment modality to manage infected nonunion of the lower extremity. Here we present a simple method to construct an ACCIM rod using widely available instrumentation with a low rate of complications during insertion and removal. This is a cost-effective construct that may allow some bony healing along the same timeline as infection treatment, and thus may reduce the number of procedures needed to manage such a complex disease.