

**Antibiotic Cement Nails Manufactured with Threaded Rods or Cannulated Intramedullary Nails Are Better than Those Made with Guidewires**

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**Purpose:** Antibiotic nails are frequently used as an adjunct treatment for infected long bones. This delivery method allows high doses of local antibiotic with minimal risk for systemic effects. Various forms of antibiotic nails are currently used in practice. Nails constructed out of polymethylmethacrylate mixed with antibiotics are thought to provide great elution profiles. We have found debonding of the cement from the structural core can be a problem during removal of the rod, which leaves cement in the intramedullary canal. Removing this cement can be a challenge necessitating the use of reamers osteotomes and long pituitary rongeurs. The purpose of this study is to compare antibiotic cement nails with cores made with an intramedullary guidewire (\$120), a regular intramedullary nail (\$1100), or a threaded rod from the Ilizarov set (\$60) for debonding at the time of removal.

**Methods:** An IRB-approved retrospective study was performed on 33 antibiotic nails that had been implanted for a tibial infection after intramedullary nailing. All antibiotic nails were manufactured intraoperatively by the treating surgeon using 2 g vancomycin and a single package of tobramycin cement. The powder, antibiotic, and polymer was hand mixed in a bowl then poured into an antibiotic cement mold. The core device was inserted and the mold ripped off with the tabs once the cement had hardened. There were 12 intramedullary nails (8 mm), 7 threaded rods, and 14 guidewires. The nails were imbedded from 6 weeks to 10 months. At the time of removal, the nails were assessed for cement debonding.

**Results:** Debonding occurred in 0 of the 12 cement nails manufactured with an intramedullary nail, 0 of 7 threaded rod nails, and 6 of 14 guidewire nails. Removal of the remnant cement was accomplished with thin osteotomes, long pituitary rongeurs, or a series of reamers. The canal was visualized using an arthroscopy camera to ensure complete removal of the cement.

**Conclusion:** Polymethylmethacrylate antibiotic nails manufactured with a standard intramedullary nail or threaded rods did not lead to any debonding. Debonding of the cement from the inner core of an antibiotic nail often requires a significant effort to remove the remnant cement. The use of a standard intramedullary nail coated with antibiotic cement allows static locking in cases of nonunion associated with infection. In healed infected tibias, the choice of an antibiotic cement nail manufactured with a threaded Ilizarov rod is cheaper (\$60 vs \$120), leads to no debonding, and can be inserted or removed with a threaded Ilizarov attachment.