

## Topical Vancomycin Powder Decreases the Incidence of *Staphylococcus aureus* Infections in Operatively Treated Fractures

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**Purpose:** Topical vancomycin powder has demonstrated efficacy in decreasing infections in multiple retrospective spine surgery studies, but has not yet been examined in orthopaedic trauma surgery. Our primary hypothesis was that topical vancomycin powder will decrease the rate of *Staphylococcus aureus* infections in operatively treated fractures. Our secondary hypothesis was that topical vancomycin powder would decrease the surgical site infection rate in "high-risk" operatively treated bicondylar tibial plateaus, pilons, and calcanei.

**Methods:** We retrospectively reviewed all fracture fixation cases at one academic medical center that were treated with topical intrawound vancomycin powder. The study group was 91 patients with 99 distinctive injuries treated between October 2012 and November 2014. Deep infections were defined by CDC (Centers for Disease Control and Prevention) criteria and all had positive intraoperative cultures. Our baseline rates of *S. aureus* were determined from a recently published control group (n = 214) at the same institution prior to use of vancomycin powder. Our baseline rate of deep infection in high-energy pilon, plateaus, and calcanei was also determined from a recently published control group (n = 116) at the same institution. Fisher exact test was used to compare categorical values.

**Results:** The rate of *S. aureus* was significantly lower in patients receiving vancomycin powder cohort than the cohort of infections before vancomycin powder was used (12.5% [1 of 8] vs 58% [124 of 214], P = 0.03). A trend was observed for a lower rate of methicillin-resistant *S. aureus* (0% vs 32%, P = 0.06). We observed a lower infection rate in the 34 calcaneus, pilon, and/or plateau fractures treated with vancomycin powder than in the control group of patients prior to use of vancomycin powder (0% vs 13%, P = 0.02).

**Conclusion:** Our data demonstrate that vancomycin powder may alter the bacteriology of surgical site infections and perhaps lower the rate of surgical site infection. Although our results are statistically significant (P < 0.05) these findings must be confirmed in larger randomized controlled trials. These initial data do present provocative evidence that vancomycin powder may have an important role in our attempts to prevent the devastating complication of surgical site infection after fracture fixation surgery.