

# Are Drains Associated with Infection after Operative Fixation of High-Risk Tibial Plateau and Pilon Fractures?

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## INTRODUCTION:

The primary aim of this study was to determine the association of closed suction drainage on postoperative infection rates for high-risk tibial plateau and pilon fractures. We hypothesized that drains would be associated with fewer infections.

## METHODS:

This is a substudy to the VANCO trial (randomized controlled trial of topical vancomycin powder during operative fixation of a high-risk tibial plateau or pilon fractures). The primary outcome was deep surgical site infection within six months. The use of a closed suction drain was based on surgeon discretion. The use of one gram of intra-wound vancomycin powder at the time of definitive fixation was randomized. Patients were categorized based on the presence of a drain and use of vancomycin powder. We analyzed the additive interaction between drain usage and intrawound vancomycin powder using a Kaplan-Meier estimator.

## RESULTS:

Of the 978 study patients, 197 (20%) were treated with drains. When comparing deep infection rates between patients with and without drain use, there was no significant association (8% versus 8%,  $p=0.88$ ). However, if vancomycin powder use was considered, strong associations were observed. The highest deep infection rate of 13% (95% CI 6% to 20%) was observed in patients treated with drains but had no vancomycin powder placed in the wound. In contrast, patients treated with drains and vancomycin powder placed had the lowest incidence of infection (3%, 95% CI 0 to 7%,  $p=0.01$ , Figure 1). The combination of vancomycin powder and drains was associated with a greater benefit than vancomycin alone (incidence, 6%; 95% CI, -1% to 13%).

## DISCUSSION AND CONCLUSION:

Closed suction drains after operative fixation of high-risk tibia fractures appear to be associated with a large reduction in infection if topical vancomycin powder is used, but associated with an increase in infection if vancomycin powder is not used. Clinicians should be aware of this surprising association that the effect of drains on infection may be strongly influenced by the use of topical antibiotics.

Figure 1. Kaplan-Meier curve by treatment strata.

