

The Use of Gentamicin-Coated Tibial Nail Decreases Infection Risk in Closed Tibial Fractures Previously Treated With External Fixation

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Purpose: Our objective was to investigate the efficacy of using a gentamicin-coated nail (GCN) as a prophylactic measure to reduce the risk of fracture-related infection (FRI) in closed tibial fractures initially treated with external fixation (EF). Tibial fractures pose an inherent risk of infection due to their subcutaneous location and the likelihood of open fractures. Additionally, the risk increases with multiple surgeries and prior treatment using EF. Given this susceptibility, the study aims to assess whether definitive treatment with a GCN decreases the incidence of FRI in closed fractures initially managed with EF.

Methods: This was a prospective cohort of patients treated at a single center between 2017 and 2023. Patients with closed tibial fractures (CTFs) were included. FRI incidence in patients with prior treatment with EF (due to polytrauma, transfer from other facilities, gross soft-tissue swelling) was measured and compared with a control group (non-GCN, as done prior to this protocol). This study aims to assess whether the subgroup of patients treated with GCN had a decrease in the observed FRI rate.

Results: Out of 638 patients with a minimum 6-month follow-up, 353 closed tibial fractures (CTFs) were assessed. Among these, 72 (20%) initially underwent EF: 50 received a GCN, and 22 a non-GCN (control). The control group exhibited a higher FRI incidence (13.6% vs 2.0%). The duration of EF before definitive surgery was comparable between both cohorts (11.98 vs 12.24 days). No confounding variables were identified. Data analysis revealed no significant FRI difference between GCN after EF (2.0%) and conventional intramedullary nailing (IMN) (3.3%). The GCN cohort reported no nephrotoxicity or ototoxicity cases.

Conclusion: The data in this cohort suggest that patients with CTF with prior EF, and subsequently treated with a GCN, have less risk of FRI than those managed with non-GCN, and have a similar infection risk as those with CTF initially treated with conventional (non-GCN) IMN, without secondary effects reported. Further studies with larger number of patients and longer follow-up are needed to better support this conclusion.