Deep Surgical Site Infection After Fracture has a Profound Effect on Functional Outcome

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Purpose: Fracture-related infection is one of the most challenging complications in orthopaedic trauma surgery. However, the effect of infection on functional and pain-related outcomes has not been well established. The aims of this study are to evaluate functional recovery for fracture patients with a deep surgical site infection (dSSI) compared to those without infection and evaluate whether pain severity, social support, and pre-injury mental health have a moderating effect on the magnitude and direction of the relationship between dSSI and functional recovery.

Methods: This is a secondary retrospective cohort study using prospectively collected data from the VANCO and OXYGEN trials. 2116 patients with tibial plateau, pilon or calcaneus fractures at high risk of infection were included. Patients were divided into cohorts of patients who experienced a deep surgical site infection and those who did not. Primary outcome measure is functional outcome using Veterans RAND 12-Item Health Survey (VR-12).

Results: After controlling for covariates, dSSI and BPI (Brief Pain Inventory) pain severity were independently associated with functional outcome (associated with a 3.3-point reduction and 2.5-point reduction in VR-12 physical component score, respectively). Furthermore, BPI pain severity demonstrated an important moderating effect on the relationship between infection and functional outcome. In patients with lower pain scores, infection had a large negative impact on functional outcome whereas in patients with higher pain scores, infection had no significant impact on functional outcome. Furthermore, functional outcome in the entire cohort remains far below baseline at only 69% recovery to baseline.

Conclusion: This study documents the profound negative impact of postoperative infection on functional recovery after injury with the novel finding of pain severity as an important moderating factor. This work emphasizes the importance of developing effective interventions designed to reduce not only postoperative infection, but also the role that moderating factors of pain severity play in limiting physical function recovery.