

Postoperative Analgesics Increase Long Bone Fracture Nonunion Rates

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Purpose: Although studies have reported an association between postoperative nonsteroidal anti-inflammatory drugs (NSAIDs) and nonunion rates for various fractures, the effects of postoperative opioids are undetermined. Recent animal models suggest that opioids may contribute to decreased bone fusion integrity, although these findings have yet to be translated into human studies. We sought to assess the relationship between postoperative opioid prescriptions and nonunion in openly treated long bone fractures.

Methods: Patients were identified using a national insurance claims database. All patients who underwent open procedures for fractures of the humerus, femur, radius and/or ulna, and tibia and/or fibula were stratified by the presence of opioid prescriptions in the 3-month postoperative period. Nonunion rates in the 18-month postoperative period were compared between the opioid cohort and a control group without any opioid prescriptions in the postoperative 18-month period. We performed a multiple logistic regression analyzing the independent risk factors of postoperative opioids, NSAIDs, and other comorbidities on nonunion.

Results: Out of 2374 fracture patients, 1532 had opioid prescriptions within 3 months following surgery, while 842 had no opioid prescriptions in the 18-month postoperative period. We observed a significant association between postoperative opioid prescriptions and increased nonunion rates in openly treated long bone fractures (odds ratio: 1.789 [1.255-2.551]; $P = 0.001$). For each specific long bone fracture, the opioid cohort experienced consistently increased rates of nonunion compared to the control populations. In our pooled regression analysis, we report a significant association between nonunion and postoperative opioids, NSAIDs, tobacco use, and history of diabetes.

Conclusion: Our findings suggest that postoperative opioids may be associated with higher rates of nonunion in openly operatively treated long bone fractures. This represents an important first step in translating animal models to human outcomes, indicating the necessity of further research into the effects of postoperative analgesics on fracture healing.