Retrospective Analysis of the Non-Union Rate Associated with the Peri-operative use of Toradol in Osseous Foot and Ankle Surgery

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Disclosures

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    - In2bones
    - Stryker
    - Integra
    - Depuy/Synthes
    - Smith & Nephew
    - KCI
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Purpose

To evaluate the risk for non-union in patients who received Toradol in the perioperative period following osseous foot & ankle surgery.
We propose there is NO significant difference in non-union rate between patients who received Toradol in the perioperative period following osseous surgery, compared to those the literature reports of using NSAIDs in the post operative period.
Procedures

● Level of Evidence: III

● Study Design: Random, Retrospective Chart Review of a single surgeon
  ● 527 patients-186 meeting inclusion criteria
  ● 172 complete charts available for review

● Procedure:
  ● Osseous foot and ankle surgery including osteotomies, fusions, and fracture repair. (1st MTP fusions, Lapidus, Ankle, TTC)

● Inclusion Criteria:
  ● Undergo osseous surgery including osteotomies, fusions, or fracture repair
  ● Received Toradol in the perioperative period
  ● Complete chart with radiographs

● Outcomes:
  ● Radiographic and chart analysis for non-union between the initial post-operative visit and the final visit
Perioperative use of NSAIDs, mainly Ketorolac, have been utilized among orthopedic and podiatric surgeons for many years. Due to its potent pain relief effects and reduced side effect profile compared to narcotics, it is useful and generally safe in the perioperative and postoperative window (1, 2, 3). Increased awareness of opioid abuse and addiction from not only the CDC, but educated patients, the use of NSAIDs is being encouraged (4). Although its use in bone or fracture surgery is still being challenged, doctors are facing pressure to avoid excessive narcotics to control postoperative pain, and beneficial modalities to do so are limited (1, 2, 5). Non-steroidal anti-inflammatory drugs function by inhibiting cyclooxygenase isoenzymes and prostaglandins in the inflammatory pathway. Through the inhibition of prostaglandin synthesis, the inflammatory pathway is halted (6). Inhibition of the inflammatory prevents mesenchymal cell differentiation to osteoblasts and angiogenesis, the result is a decreased bone healing (7). Because prostaglandins play a vital role in other processes throughout the body, inhibition can result in some undesirable effects such as GI irritation, anemia, and platelet function (7). Selective COX-2 medications have reduced this side effect profile since they target only inflammatory prostaglandins, but still have the potential to impact bone (8). The majority of the data and research available in human subjects pertains to spinal fusions in adult and pediatric populations (9-15). Most animal data follows similar guidelines, and despite similar protocols, conflicting results persist. Few articles were identified pertaining to the upper and lower extremities, primarily focused on the humerus and tibia, which also displayed no consensus (16-18). To this writer’s knowledge, no retrospective study of Ketorolac usage in foot and ankle surgery has been performed.
Results

A total of 186 patients were identified in having undergone a bony procedure and having received Toradol in the post-operative period.

Out of the 186 patients, 172 charts were available for review. 165 of the 172 patients underwent unremarkable post operative healing.

Seven patients (4.1%) were identified to have a clinical, radiographic or advanced imaging confirmed non-union.
Discussion

• NSAIDs have been first line therapy for acute pain and inflammation in foot and ankle injuries for many years. Due to their low side effect profile, low cost, and high efficacy, patients are amenable and compliant with their use in the outpatient setting. In the perioperative period, large studies have shown the reduction of opioid need, as well as, nausea and vomiting with Ketorolac use (19). Despite these clear benefits, use of NSAIDs in the perioperative window is still limited for foot and ankle surgery. Even though the literature available is contradictory, the stigma of potentially harming the patients healing process exists (7-18). Since the mainstream data available has been unable to draw a clear conclusion regarding NSAID use in bone surgery cases, our study aimed to present a large patient group that had no ill effects from its usage post operatively in osseous foot & ankle surgery. As the data demonstrates, there was no correlation that post operative use of potent NSAIDs increased the risk of non-union in the patient group. The most influential limiting factor of this study was the exclusion criteria of patient selection. The patients age, co-morbidities (DM, Rheum, CKD), medications, or smoking status were not considered. These factors could have falsely elevated the non-union group, as they all grossly impact bone healing on a systemic level. Additionally, it should be noted that the patients in this study were not given prolonged NSAID therapy. Therapy was only performed immediately post-operatively, as therapy courses longer than 2 weeks can correlate with bone healing complications (21).
References


