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Notification of High-Risk Opiate Prescriptions Reduces Dangerous Practices

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Notification of High-Risk Opiate Prescriptions Reduces Dangerous Practices

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A Unique Mode of Failure in the Non-Contact Bridging Periprosthetic Plating System

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Mentors: Matthew Mormino, Justin Siebler

Program: Orthopaedic Surgery Residency Program

Type: Case Report

Background: Although lateral locking plates are often a preferred and successful fixation construct for the treatment of periprosthetic proximal and distal femur fractures, certain complications and modes of failure have been well-described with their use. We experienced two cases of a unique mode of failure in the Non-Contact Bridge Periprosthetic Plating System (Zimmer Biomet) in which a nonlocked screw fretted through the annular seating of the plate. Appropriate patient consent was obtained for the use of these cases for educational purposes.

Case 1: An 85-year-old woman with a history of dementia and osteoporosis sustained a right proximal femur periprosthetic fracture after suffering a ground level fall. Open reduction and internal fixation were performed and there were no identified complications on radiographs obtained 7 weeks post-operatively. Radiographs obtained 11 weeks post-operatively demonstrated fretting of the distal-most screw through the plate (Fig. 1a).

Case 2: A 73-year-old man with a history of multiple myeloma, diabetes, and chronic left lower extremity weakness sustained a right periprosthetic supracondylar distal femur fracture after suffering a ground level fall. Open reduction and internal fixation was performed and there were no identified complications on radiographs obtained 8

weeks post-operatively. Radiographs obtained 14 weeks post-operatively demonstrated fretting of the distal-most screw placed proximal to the fracture site (Fig. 1b).

Conclusion: Periprosthetic fractures are complex orthopaedic injuries. Lateral locking plates are often the preferred treatment because of their excellent stability and ability

to be placed in a minimally invasive manner. Plate or screw fracture and screw pull-out are well-documented complications, however no literature exists demonstrating the unique mode of failure exhibited in our clinical cases. ■

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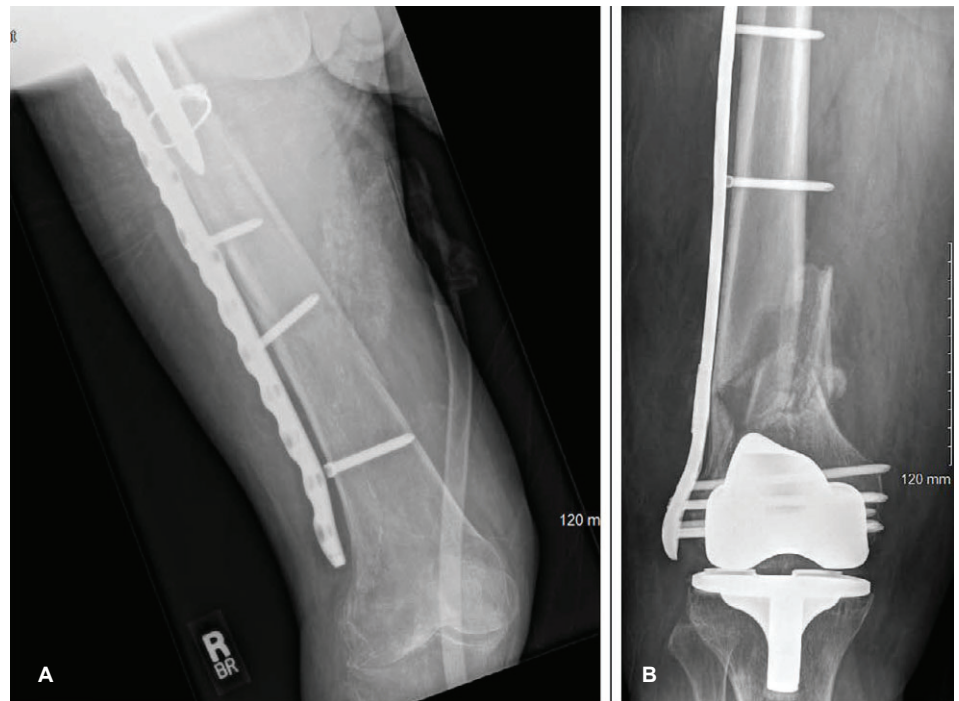


Figure 1. (A) Case 1. AP radiograph of the right femur obtained 11 weeks post-operatively demonstrates fretting of the distal most screw through the annular seating of the plate. (B) Case 2. AP radiograph of the right femur obtained 14 weeks post-operatively demonstrates fretting of the distal-most screw placed proximal to the fracture site.

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Notification of High-Risk Opiate Prescriptions Reduces Dangerous Practices

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Program: Emergency Medicine Residency Program

Type: Original Research

Background: The U.S. is still experiencing an opioid epidemic. Current guidelines from the Centers for Disease Control (CDC) recommend no more than 50 Morphine

Milligram Equivalent (MME) per day for initial prescriptions, but familiarity with conversion may be preventing providers from following these guidelines. A standard (MME) calculator was implemented in our Electronic Health Record. We sought to determine whether inclusion of this calculator and an associated warning for prescriptions above 50 MME were effective in reducing high-risk opiate prescriptions.

Methods: An IRB approved this study. A retrospective chart review was performed, and all opiate prescriptions from the emergency department for three months preceding and three months following the calculator was included. Discharge prescriptions were then converted to MME per day utilizing the CDC's conversion table. Statistical calculations were performed with a two-sample T-test with unequal variance and Chi-Square statistic in Excel.

Results: A total of 22,794 charts were queried resulting in 2,513 prescriptions before and 2,648 prescriptions after the inclusion of the calculator. The number of high-risk opiate prescriptions fell by 42% ($p < 0.001$), and the average number of MMEs per day decreased from 32.5, to 31.4 after the intervention ($p = 0.01$).

Conclusion: Our data show that a likely barrier to complying with the CDC's guidelines regarding safe opiate prescription practices may familiarity with converting narcotic prescriptions to MME, and that embedding a conversion calculator is effective in assisting safe prescription habits. ■

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Neuropsychological Predictors of Surgical Outcomes in Medically Refractory Epilepsy

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Program: Neurology

Type: Original Research

Background: Resective surgery may be an option for some patients with medically refractory epilepsy. Pre-surgical evaluations including electrophysiology, imaging and neuropsychological tests identify epileptogenic foci and limit risk of post-operative cognitive changes. Our aim is to determine neuropsychological predictors of surgical outcomes to aid in clinical decision making and allow for individually tailored pre-surgical counseling.

Methods: This is a retrospective study of 47 patients who had resective surgery and were followed for 2 years post-operatively. Exclusion criteria included prior epilepsy

surgery, lack of neuropsychologic assessment, and neuromodulation device placement or repeat surgery within the follow-up period. Outcome was based on degree of seizure freedom by Engel score with good = I or poor \geq II. EEG, MEG, MRI, or intracranial study abnormalities bilateral or contralateral to the surgical resection were discordant. Non-lateralizing neuropsychologic profiles were not considered to be discordant. Hemispheric dominance was determined by neuropsychologic profile.

Results: A larger proportion of patients had poor outcomes if they had dominant hemisphere resection ($p=0.26$) or discordant pre-surgical data ($p=0.29$). There were varying outcomes associated with Wada and specific neuropsychological testing subsets. Median IQ was higher in patients with good outcomes ($p=0.47$).

Conclusions: There were no statistically significant associations to suggest that pre-surgical neuropsychological testing can predict post-operative seizure freedom. Limitations include small sample size and that post-surgical neuropsychologic function and quality of life indices were not included. Additional research is needed with larger sample size to further explore the above associations and determine whether these neuropsychological parameters may predict outcomes in other domains. ■

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A Holistic Systems Approach to Characterize the Impact of Chronic Midazolam Exposure on Neurodevelopment and Behavior

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Program: Pediatric Anesthesiology

Type: Original Report

Background: Recent trends in pediatrics are showing increased prevalence of preterm births, as well as significant improvements in neonatal intensive care unit (NICU) mortality. Many of these patients suffer from long term impairments in physical, cognitive, and psychological functions. Midazolam is a short acting benzodiazepine used frequently in the NICU that binds the GABAA receptor causing sedation, anxiolysis, and amnesia. Preclinical studies have correlated early exposure to benzodiazepines with

neuroapoptosis and suppressed neurogenesis, however, there are also retrospective studies suggesting pain and stress during the newborn period negatively affect long term neurodevelopment. We hypothesize that chronic midazolam use during early stages of life negatively impacts the developmental trajectory and such changes could extend into adulthood. Using a preclinical rodent model, we are performing a comprehensive characterization of changes in overall physical growth and behavior during adolescence and adulthood.

Methods: Pups were injected with subcutaneous midazolam at escalating doses similar to those seen in the NICU daily from P3 through P21. The control group received

isovolumetric saline. Body weight, length, and head circumference were measured. The pups underwent behavioral testing comprised of marble burying and hot/cold plate (nociception) assays. For future molecular studies, brains and blood plasma were isolated from the two groups.

Results: We found a significant reduction in body weight and head circumference in the midazolam group. The marble burying assay demonstrated significantly more obsessive compulsive and anxious behaviors in the midazolam group. Hot and cold plate assays did not show any significant differences in nociception.