Lower Extremity Long Bone Fractures in Individuals With Sickle Cell Disorders: Unique Considerations in an At-Risk Population

***Clayton Farris, BA**; Anthony L. Wilson, MS; Caleb Von Hayes, BS; Shelby C. Hodges, BA; Matthew T. Yeager, BA; Clay A. Spitler, MD*

Purpose: Sickle cell disorders (SCDs), including sickle cell disease, sickle cell trait, sickle C disease, and thalassemia, affect a relatively small population of individuals but the impact of SCDs on outcomes is relatively unknown in orthopaedic trauma surgery. The purpose of this study was to assess the effect of SCDs on outcomes in orthopaedic trauma patients. We hypothesized that fractures in patients with SCDs would have similar outcomes to individuals without SCDs.

Methods: A retrospective cohort study was performed of all patients over a 6-year period (2016-2022) at a single academic Level I trauma center. All adult patients with an SCD presenting with lower extremity fractures managed with fixation were identified via an institutional database. A control group was then created from the same institutional database matching fracture type, age, and sex, but without an SCD over the same time period. A 2:1 match was created based on these variables. Outcomes measured include unplanned reoperation, soft-tissue reconstruction or coverage, nonunion, compartment syndrome, and deep infection (requiring return to the operating room).

Results: A total of 96 patients were included with 32 (33%) individuals with SCD. Demographically, patients in the sickle cell cohort were less likely to use alcohol (40.6% vs 60.4%, P = 0.029), were more likely to have comorbidities (68.8% vs 39.1%, P = 0.006), including being immunocompromised (6.3% vs 0%, P = 0.043) and having chronic kidney disease (25% vs 1%, P<0.001). Patients with an SCD were significantly more likely to develop a deep infection requiring operative intervention (34.4% vs 7.8%, P<0.001) or develop a pulmonary embolus (15.6% vs 0%, P<0.001). There were no statistically significant differences in rates of unplanned reoperation, soft-tissue reconstruction, compartment syndrome, nonunion, deep vein thrombosis, or superficial infection.

Conclusion: Individuals with an SCD are more likely to develop deep infection requiring reoperation and are at an alarmingly high risk of pulmonary embolus. We recommend aggressive venous thromboembolism prophylaxis to try to prevent this life-threatening complication with close follow-up and appropriate antibiotic prophylaxis in order to optimize outcomes in these patients.