Allogenic Blood Transfusions Increase Surgical Site Infection Rates, but Not Nonunions in Distal Femur Fractures

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INTRODUCTION:
Distal femur fractures present a challenge to orthopedic surgeons with observed nonunion rates between 10-22% despite improvements in surgical technique. Several risk factors have previously been identified including open fractures, diabetes mellitus, and tobacco use. Allogeneic blood transfusions have been associated with increased wound complications and infections after total joint arthroplasty, which is attributed to the creation of a transient immunocompromised state. The effect of allogenic blood transfusions has not been evaluated in patients undergoing fracture care. The purpose of this study was to investigate whether allogenic blood transfusions are associated with nonunion or surgical site infection in patients undergoing operative management of distal femur fractures.
METHODS:
Four hundred eighteen patients with operatively treated distal femur fractures at two academic Level I trauma centers from January 2013 to January 2021 were retrospectively reviewed. Patients were divided into groups based the administration of allogeneic blood products. Patient demographic information was collected including age, gender, BMI, medical comorbidities, and smoking status. Injury and treatment information was also collected including open fracture, polytrauma status, implant type, SSI, and nonunion. Patients were excluded from final analysis if they did not have at least six months of follow up.
RESULTS:
A total of 269 patients met inclusion criteria and were included in final analysis. Ninety-three (34.6%) patients received a perioperative blood transfusion, while 173 did not. There was no statistically significant difference between the two groups with respect to age, gender, BMI, smoking status, diabetes, osteoporosis, or implant type. The blood transfusion group was more likely to be a polytrauma patient, have an open injury, and a concomitant head injury. Fourty-four (16.4%) nonunions and 22 (8.2%) SSI infections were identified. Allogenic blood transfusion was not associated with increased rates of nonunion (17.3% vs 16.3%, P=0.82), but was associated with increased rates of SSI (14.2% vs 3.3%, P<0.001). Further, binary logistic regression analysis identified blood transfusion as an independent risk factor of SSI (RR=1.23–8.28, P=0.019). Open injury, polytrauma patient, and head injury were also associated with SSI, but regression analysis only identified polytrauma patient as an additional independent risk factor (RR=1.47- 11.88, P=0.01). Smoking status, osteoporosis, and infection were additionally identified as risk factors for nonunion. However, only osteoporosis was identified as an independent risk factor on regression analysis (RR=1.56-4.95).
DISCUSSION AND CONCLUSION:
This is the first study to examine the effects of allogenic blood transfusions on patient outcomes following operative management of distal femur fractures. This study found these patients are at increased risk of surgical site infection, but not the development of a nonunion if they receive perioperative blood products. While preventing all blood transfusions is impossible, surgeons treating these patients should recognize this risk factor and aim for minimization of perioperative blood transfusions through proper surgical technique, use of TXA, and strict adherence to transfusion guidelines.