Predicting the Drop in Hemoglobin Following Hip Fracture Surgery

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Purpose: Hip fractures are becoming increasingly prevalent secondary to aging populations, with a large burden on health-care systems globally. Timely operative intervention is essential to reduce morbidity and mortality. Hip fracture surgery can be associated with significant blood loss with concomitant risk of postoperative anemia in an already frail population. To date, the expected drop in hemoglobin (Hb) secondary to hip fracture surgery is yet to be determined. The aims of this study were (1) to assess Hb drop in patients undergoing hip fracture surgery, and (2) to identify any independent factors that influence this.

Methods: Retrospective analysis was carried out of all patients that underwent hip fracture surgery at a UK trauma unit over a 9-month period (1 July 2020 to 31 March 2021). Data collected included patient demographics, use of anticoagulants or antiplatelets, time from injury to surgery, fracture subtype, operation performed, operative time, and Hb pre- and postoperatively. Change in Hb was analyzed using the Student t test. Ordinary 1-way analysis of variance and Tukey's multiple comparisons test were used to analyze the change in Hb between multiple variables.

Results: 415 patients were identified (mean age 81.6 years), with an average time from injury to surgery of 1.9 days. Mean preoperative Hb was 119 g/L and mean day 1 postoperative Hb was 100 g/L, indicating a drop of 19 g/L (16%) across all patients. There was a significant drop in Hb with hemiarthroplasty (18 g/L, 14.5%), total hip arthroplasty (23 g/L, 18.4%), dynamic hip screw fixation (23 g/L, 19.7%), and intramedullary nail fixation (23 g/L, 20.5%) ($P<0.0001$), with no significant difference in reduction between these procedures. A nonsignificant reduction ($P = 0.0585$) in Hb was seen with cannulated screw fixation (9 g/L, 7.3%) ($P = 0.0585$). There was a trend toward lower drop in Hb with shorter operative time; however, this did not reach statistical significance ($P = 0.109$). There was no significant difference in Hb drop if patients were on anticoagulant or antiplatelet medication preoperatively ($P = 0.433$).

Conclusion: Hip fracture surgery is associated with significant drop in Hb regardless of procedure type, with the exception of cannulated screw fixation. A trend toward lower drop in Hb is seen with shorter operative time. Use of anticoagulants or antiplatelets are not independent risk factors for increased perioperative blood loss. This study provides an average drop in Hb that can be expected with hip fracture surgery, and therefore aids in predicting which patients may require preoperative transfusion in order to optimize recovery.