



# Research Week 2020

## Does Surgical Delay Impact Blood Loss During Acetabular Fracture Surgery?

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### Keywords

Surgical Delay, Acetabular Fractures, Trauma, Blood Loss

### Abstract

#### Purpose

The dogma in acetabular fracture care is that delaying surgery allows for intrapelvic clotting. Existing literature insufficiency utilizes surgeon reported blood loss (BL) as a variable. The purpose of this study is to use a novel, quantitative, formula-based approach to determine the impact of surgical delay on intraoperative BL during acetabular surgery.

#### Methods

Adult patients presenting to our Level 1 trauma facility receiving unilateral acetabular ORIF were reviewed (2008-18, n=372) for surgical details, pre- and postoperative hematocrit, and intraoperative transfusions. Intraoperative BL was estimated using adaptations of the Gross and Nadler Formulas:

$$\text{Blood loss} = \text{BV} \times ((\text{Hct0} - \text{HctF} + \text{Units Transfused} \times 1.9) / \text{HctAVG})$$

$$\text{Blood volume(Male)} = 0.3669 \times \text{H}^3 + 0.03219 \times \text{W} + 0.6041$$

$$\text{Blood volume(female)} = 0.3561 \times \text{H}^3 + 0.03308 \times \text{W} + 0.1833$$

Univariate and stepwise multivariate linear regression was used to determine the association between hospital day and calculated BL.

#### Results

Of 349 eligible patients (94%), 67% (233/349) sustained associated patterns of acetabular fractures. There was a statistically significant association between the hospital day of surgery and calculated BL (-400mL, SE 0.02, p=0.002), translating to 40 +/- 20 mL less BL per day. Using a maximally selected rank statistic, the optimal cut-point for early vs delayed surgery was set at 1 day. Early surgery was associated with an increase in 403 mL

of BL relative to delayed surgery ( $p=0.0002$ ) and specifically, 50 +/- 13 mL less BL per day ( $p<0.0001$ ).

#### Conclusion

Formula-derived values for intraoperative blood loss rather than surgeon opinion indeed appears to decrease with surgical delay. It indeed may be beneficial to delay surgery for specific, fragile patients.

