Anatomic Reduction of Acetabular Fracture: When Is the Best Time to Operate?

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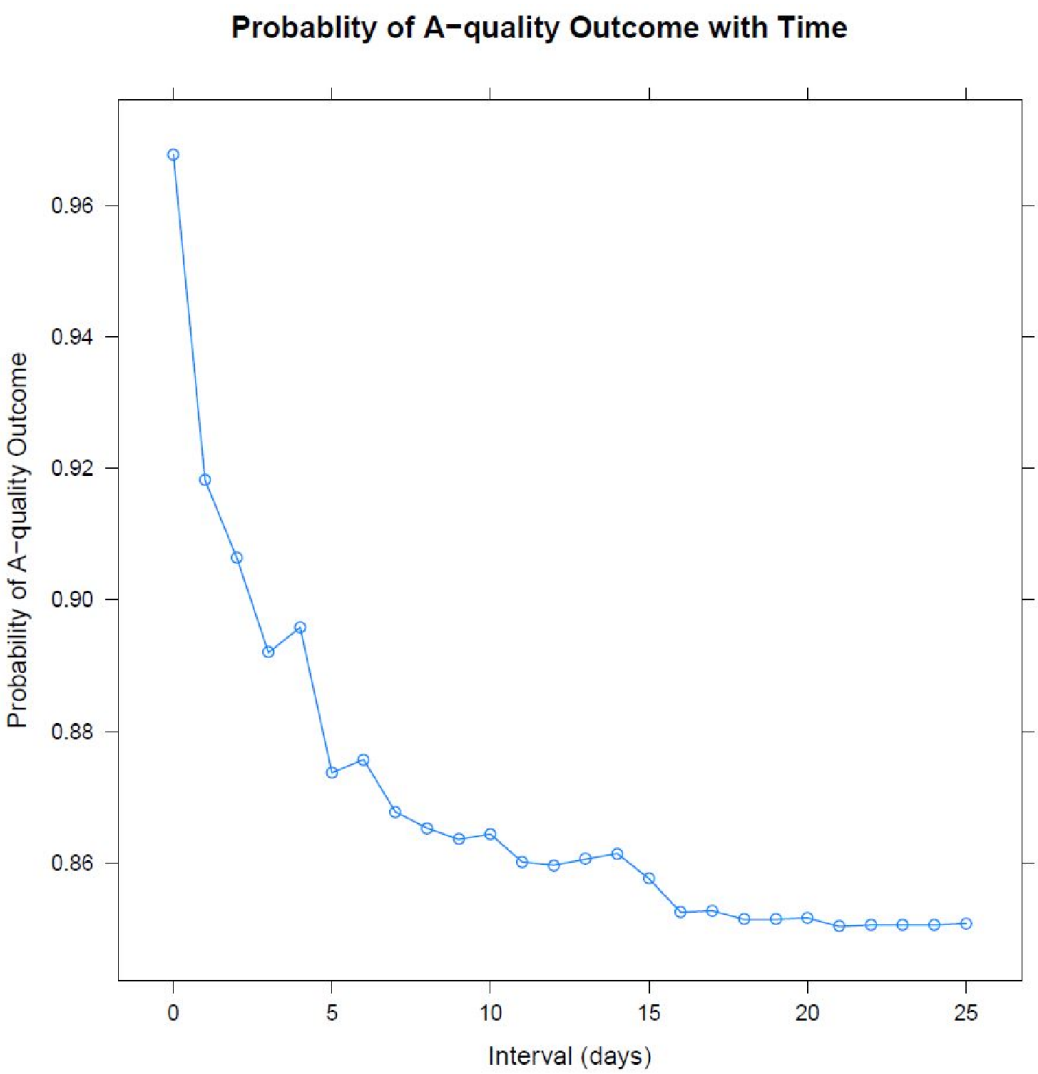
Purpose: Quality of reduction following surgical intervention for displaced acetabular fractures directly correlates with functional outcomes. Matta reported an increased rate of anatomic acetabular reduction when surgical fixation was performed within 2 weeks from injury (P = 0.06). The purpose of this study was to further stratify the timing of surgical intervention as it relates to the quality of reduction for acetabular fractures. We hypothesize that earlier intervention improves the probability of achieving an anatomic reduction.

Methods: This is an IRB-approved evaluation of a prospectively collected acetabular fracture database from a single surgeon at a Level I trauma center. Reduction quality of all acetabular fractures treated via open reduction and internal fixation (ORIF) between September 2001 and February 2014 was assessed using three standard postoperative radiographs (AP and two 45° oblique Judets) as well as intraoperative fluoroscopy. Displacement of >1 mm was considered an anatomic reduction (A), 2-3 mm imperfect (I), and >3 mm poor (P). A total of 729 fractures were available for analysis. 79 of these fractures underwent percutaneous fixation in situ and were excluded, leaving a cohort of 650 fractures. The primary outcome measurement was quality of reduction as it relates to the interval from injury to ORIF (OR interval). Secondary outcome measurements included demographic and injury characteristics. The correlation between OR interval and quality of reduction was evaluated using a pairwise Wilcoxon rank-sum test and logistic regression analysis.

Results: There were no statistically significant differences between anatomic reductions (A) and nonanatomic reductions (I, P) in regards to gender, body mass index, mechanism of injury, use of skeletal traction, marginal impaction, wall comminution, or femoral head injury (P >0.05). Nonanatomic reduction was related to increased age, increased ISS, fracture pattern, surgical approach, the absence of a hip dislocation, and increased OR interval (P <0.05). A reductions were observed in 85% (n = 553) of cases, I reductions in 11% (n = 74) of cases, and P reductions in 4% (n = 23) of cases. Patients with A reductions had significantly shorter OR intervals (median, 3 days) when compared to either I (median, 4.5 days; P = 0.02) or P reductions (median, 7 days; P < 0.001) reductions. The OR interval of I reductions was also significantly shorter than that of P reductions (P = 0.02). Logistic regression analysis demonstrated that OR interval had an effect of -0.12, meaning that the log odds of anatomic reduction decreases by 0.12 with each day from injury to ORIF.

Conclusion: The interval from injury to operative fixation of acetabular fractures affects quality of reduction. Earlier intervention improves the probability of achieving an anatomic reduction. Acetabular fixation should be performed within 5 days of injury when possible.

See pages 47 - 108 for financial disclosure information.



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