

## Open Reduction is Associated with Greater Propensity-Stratified Hazard of Reoperation After Internal Fixation of Femoral Neck Fractures in Adults 18-65 Years of Age

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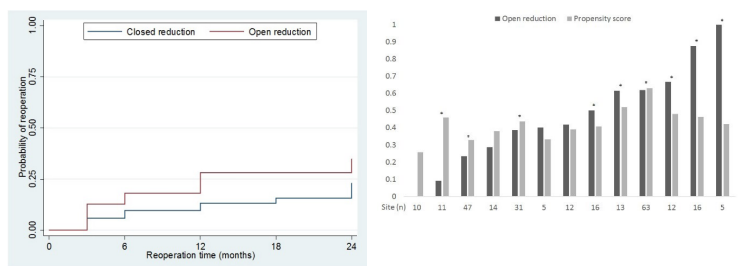
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**Purpose:** The purpose of this study was to explore the association of open versus closed reduction technique with complications and reoperation after internal fixation displaced femoral neck fractures in young adults, adjusting for patient and injury factors associated with the choice to perform an open reduction.

**Method:** Retrospective review, 13 Level 1 trauma centers. Inclusion: patients 18-65 years with OTA Type 31-B2/B3 displaced femoral neck fractures treated with internal fixation with minimum 2-year follow-up or reoperation. Exclusion: pathologic fracture, associated femoral head or shaft fractures, and primary arthroplasty. A propensity score for treatment (open versus closed reduction) was calculated by stepwise logistic regression of covariates associated with treatment selected from an a priori set of demographic, comorbidity, radiographic, and surgical potential confounding variables. A Cox proportional hazard model of reoperation-free survival stratified on quintiles of the propensity score was regressed on treatment to obtain a pooled adjusted hazard ratio for reoperation.

**Results:** Of 255 patients with median 1.5 year follow-up, 117 (46%) underwent open reduction. The estimated propensity score was based on age, sex, injection drug use, osteoporosis, OTA classification, posterior fracture comminution, application of preoperative skin or skeletal traction, and surgery delay. Rates of open reduction varied markedly between centers, after controlling for case mix. 39 (33%) versus 30 (22%) reoperations occurred after open versus closed reduction ( $p = 0.038$ ). Femoral head arthroplasty accounted for 42% of reoperations. Open reduction was associated with a significantly greater propensity-adjusted hazard ratio of reoperation of 2.40 (95% CI 1.36-4.23,  $p = 0.003$ ).

**Conclusion:** Open reduction versus closed reduction of displaced femoral neck fractures in adults 18-65 years is associated with a significantly greater propensity-adjusted hazard of reoperation within 2 years. Prospective randomized clinical trials are indicated to confirm a causative effect of open versus closed reduction on reoperation after femoral neck fracture in this population.



The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.