Closed Reduction and Percutaneous Pinning (CRPP) of Low-Energy 31B1 and 31B2 Femoral Neck Fractures Has Decreased 1-year Mortality Compared to Hemiarthroplasty

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Purpose: Our objective was to compare 1-year mortality rates after closed reduction and percutaneous pinning (CRPP) versus hemiarthroplasty (HA) of OTA 31B1 and OTA 31B2 femoral neck fractures. Secondarily, the purpose was to compare other quality metrics between the cohorts.

Methods: A retrospective review of a hip fracture database from 2014 to 2024 at a single institution was performed. Patients older than age 55 years with low-energy mechanisms and OTA 31A-B, 32C hip fractures were included. The primary outcome was 1-year mortality. Secondary outcomes included inpatient and 30-day mortality, 90-day readmission, reoperation, and in-hospital complications. Patients were stratified into Score for Trauma Triage in the Geriatric and Middle-Aged (STTGMA) risk groups: low risk (<50th percentile), moderate risk (50th–80th percentile), high risk (80th–95th percentile), and very high risk (95th–100th percentile), using cutoffs from the HA cohort. Demographics, injury characteristics, and primary and secondary outcomes were compared using t-tests and $\chi 2$ tests, with significance set at $p<0.05$.

Results: A total of 842 patients met the inclusion criteria: 701 (83%) underwent HA and 141 (17%) underwent CRPP. In the CRPP cohort, there were 137 31B1 and four 31B2 fractures compared to 619 31B1 and 82 31B2 fractures in the HA cohort. In the CRPP group, 63.1% were low risk, 22.0% moderate risk, 11.3% high risk, and 3.5% very high risk. There were no demographic differences among similar risk groups between cohorts. Moderate risk, high risk, and very high risk CRPP groups demonstrated consistently lower 1-year mortality rates than similar risk HA groups (moderate: 20.0% vs 8.5%, $p = 0.014$, high risk: 28.5% vs 15.0%, $p = 0.056$, very high risk: 35.0% vs 18.5%, $p = 0.041$). These same CRPP groups demonstrated consistently lower inpatient and 30-day mortality rates compared to similar risk HA groups.

Conclusion: CRPP of OTA 31B1 and 31B2 femoral neck fractures has lower rates of 1-year mortality compared to HA in moderate risk, high risk, and very high risk STTGMA cohorts. The reoperation rate for CRPP is low (<1%). For high risk and very high risk patients, consideration should be given to CRPP over HA to minimize risk of mortality.