

What is the Fate of Undisplaced Femoral Neck Fractures Treated with Cannulated Screws? The Garden Classification Should be Revisited

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INTRODUCTION:

The aims of this study were 1) to determine implant survival in a consecutive cohort of elderly patients with Garden type I-II femoral neck fractures treated with cannulated screws, as well as 2) to calculate the cumulative incidence of implant failure using posterior tilt angle $\geq 20^\circ$ as a cut-off value to differentiate between two groups ($<20^\circ$ and $\geq 20^\circ$). Also, we aimed 3) to determine patient survival over time, since mortality is expected to be high in this group of patients.

METHODS:

We retrospectively studied 232 consecutive unilateral Garden I-II fractures (232 patients) treated with cannulated screws. Mean age was 81 ± 8.8 years, with a mean BMI of 25 ± 4.5 . Two observers measured baseline radiographic variables with good-to-excellent inter-observer reliability. The posterior tilt angle, measured on a cross-table lateral x-ray, was used to classify the cohort into $<20^\circ$ ($n=183$) and $\geq 20^\circ$ ($n=49$). No between-group differences were found in demographic variables as well as in baseline measurements ($p>0.05$). Mean follow up was 36.4 ± 30 months. The cumulative incidence with competing risk analysis was used to predict association between posterior tilt and subsequent conversion to arthroplasty (i.e., failure). Patient survival was calculated with the Kaplan-Meier estimate.

RESULTS:

Implant survival over time was 86.3% (95%CI 80-90) at 12 months and 77.3% (95%CI 64-86) at 70 months. The 12-month cumulative incidence failure was 12.6% (95%CI 8-17). After controlling for confounders, posterior tilt $\geq 20^\circ$ had a significantly higher risk of subsequent arthroplasty when compared to posterior tilt $<20^\circ$ (38.78% [95%CI 25-52] vs. 5% [95%CI 2.8-9], subhazard ratio 8.3, 95%CI 3.8-18), without any other radiologic or demographic factor being associated with failure. Patient survival was 88.2% (95%CI 83-91.7) at 12 months, 79.5% (95%CI 73-84) at 24 months, and 57% (95%CI 48-65) at 70 months.

DISCUSSION AND CONCLUSION:

Cannulated screws were a safe, reliable treatment option for Garden I-II fractures, except when there is posterior tilt $\geq 20^\circ$, where arthroplasty should be considered.

