Subtrochanteric Fractures as a Complication of Femoral Neck System

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Purpose: Femoral neck fractures pose many challenges for treatment. Some form of fixation is necessary to reduce the unacceptable risk of osteonecrosis and nonunion. Since 2017 our institution has used 3 cannulated screws, dynamic hip screw (DHS), and a newly developed femoral neck system (FNS) implant for closed reduction and internal fixation of femoral neck fractures. Early literature for the FNS shows promising biomechanical properties as well as a decreased amount of fracture collapse during follow-up. There are no reports of subtrochanteric fracture as a complication of the FNS; however, we have noticed a propensity for these fractures at our institution after implanting an FNS. This study is designed to detect an association in fixation method and peri-implant subtrochanteric femoral neck fractures.

Methods: All patients treated with femoral neck fracture with closed reduction and internal fixation from January 2017 to December 2021 were included in the study. We compared patient demographics between treatment groups using t tests for numeric variables and exact tests for categorical variables. A Fisher's exact test was used to test for association between implant selection and subtrochanteric fractures.

Results: 69 patients with a mean age of 64 years who were treated at a single Level I trauma institution were included in this study. Fixation included cannulated screws (n = 23, 32.4%), DHS (n = 11, 18.3%), and FNS (n = 35, 49.3%). Nine surgeons provided treatment during this period. No differences were detected in patient age, sex, or body mass index between groups. Peri-implant subtrochanteric fractures were recorded in the FNS (4), DHS (0), cannulated screw (0) groups. Using Fisher's exact test, we found FNS was associated with subtrochanteric fractures compared to the DHS and 3 cannulated screw implants combined (P = 0.061) and incomplete nondisplaced fractures were associated with subtrochanteric peri-implant fractures (P = 0.003).

Conclusion: There may be an association with FNS and peri-implant subtrochanteric fractures. Continued caution should be used when using this implant. Further studies are warranted.