

Early Clinical and Radiographic Outcomes of the Femoral Neck System in Comparison to Closed Reduction and Percutaneous Pinning for the Treatment of Hip Fractures

Jake X. Checketts, DO; Arjun Reddy, BA; Grayson Norris, BS; Byron Nice Detweiler, DO; Mark Stewart Johnson, DO; Mark Merrill Calder, MD; Azad Dadgar-Dehkordi, DO; Brent L. Norris, MD

Oklahoma State University, Tulsa, OK, United States

Purpose: Although common, treatment of femoral neck fractures with cannulated screws (closed reduction and percutaneous pinning [CRPP]) is not without limitations. Recent studies have demonstrated that non-union and subsequent reoperation can occur at a rate of nearly 15% to 20%. A new implant for treatment of these fractures called the Femoral Neck System (FNS) has emerged; however, it is still novel and published literature is scant. In this study, we aim to analyze the reoperation and complication rates of the novel FNS in comparison to CRPP for treating femoral neck fractures.

Methods: This study was a retrospective chart review of the patients treated by our practice from January 2019 (the FNS was released in 2019) to the present time. All adult patients treated with the FNS or CRPP were included in this analysis. Data collection was conducted in a retrospective manner from the patient charts at our practice. Patient follow-up was conducted at 4, 8, 12, and 16 weeks following surgery. Data such as patient demographics, union, comorbidities, and complications/hardware failure were extracted. Statistical analysis was conducted using comprehensive meta-analysis software.

Results: Since the start of 2019 we have adequate follow-up to assess the outcomes of 37 patients treated with the FNS and 49 patients treated with CRPP. The average age of each cohort was 70.1 and 71.9 years, respectively. In the FNS group there were 27 Garden 1 (55.1%), 9 Garden 2 (33.3%), and 1 Garden 3 (2.04%), whereas in the CRPP cohort there were 42 Garden 1 (85.71%) and 7 Garden 2 (14.29%). The rate of revision surgery for the FNS cohort was 1 of 37 (2.70%) compared to 12 of 49 (24.48%) for the CRPP cohort ($P = 0.021$). The reason for the revision surgery (occurring 5 weeks after initial surgery) in the FNS cohort was hardware failure, and the reasons in the CRPP group (average of 19.9 weeks following initial surgery) were prominent/painful/loosening hardware (7), nonunion (3), hardware failure (1), and osteonecrosis (1). The rate of nonunion in the FNS cohort was 2 of 37 (5.40%), and 7 of 49 (14.28%) for the CRPP group ($P = 0.199$). Lifestyle factors such as diabetes, smoking, and illicit drug use did not increase the odds of complications in a statistically significant manner. 9 of 37 patients (24.3%) in the FNS cohort reported pain associated with their surgery/hardware whereas 24 of 49 (49.0%) reported pain in the CRPP cohort ($P = 0.022$).

Conclusion: Based on our results from hip fractures treated by the FNS and CRPP during the same time period in our practice, the FNS was associated with a statistically significant decrease in reoperation rate and postoperative pain at the surgical site. It appears the utility of the FNS for treating femoral neck fractures is promising. The additional costs of the FNS may be cost-effective due to the smaller incidence of reoperation found among the patients in our study. Prospective studies and cost analyses are necessary to elucidate this information.