

Intramedullary versus Extramedullary Fixation for Basicervical Femoral Fractures: Which Is Better?

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Purpose: Basicervical femoral fractures (BCFs) (AO classification: 31B3) are a rare type of hip fracture and the optimal choice of fixation is unknown. Our primary objective was to determine whether an extramedullary fixation with the dynamic hip screw (DHS) or an intramedullary fixation with the proximal femoral nail antirotation (PFNA) would provide a better fixation. Our secondary objective was to compare the outcomes of these 2 fixation methods. We hypothesized that the PFNA would cause a “wedge effect,” described as a medial displacement with a resultant varus neck-shaft angle (NSA), and therefore have worse outcomes.

Methods: All BCF fixations with the DHS and the PFNA over 5 years were reviewed. The NSA before and after insertion of the implants were measured from the intraoperative image-intensifier and compared. The images were also reviewed for adequacy of fracture reduction, any intraoperative loss of reduction, and whether there was any qualitative change in the NSA after the insertion of the implants. Outcomes compared were the Modified Barthel Index (MBI) at 1 year postsurgery and complications.

Results: 49 BCFs were identified from 2745 hip fractures in the institution’s hip fracture registry. 31 DHS and 18 PFNA fixations were performed. The mean age was similar in both groups (79.1 ± 9.4 vs 81.3 ± 8.4 , $P = 0.420$). The distribution of gender (81% vs 61% female, $P = 0.135$), laterality (52% right vs 72% left, $P = 0.157$), bone mineral density (T-scores: -3.3 ± 1.0 vs -3.4 ± 0.9 , $P = 0.926$), and the NSA before the insertion of implants were also similar ($137.2^\circ \pm 5.1^\circ$ vs $134.8^\circ \pm 5.6^\circ$, $P = 0.191$). The preoperative MBI was significantly higher in the DHS group (92.8 ± 11.5 vs 76.6 ± 31.6 , $P = 0.019$). The NSA after the insertion of the DHS was significantly larger than the PFNA group ($138.7^\circ \pm 5.1^\circ$ vs $133.6^\circ \pm 5.6^\circ$, $P = 0.003$). The mean NSA increased with the DHS but decreased with the PFNA ($1.6^\circ \pm 2.3^\circ$ vs $-1.2^\circ \pm 2.3^\circ$, $P < 0.001$). The NSA after fixation was significantly different from the NSA before fixation in both groups ($P = 0.001$ and $P = 0.035$). There was no significant difference in the proportion of patients with adequate reduction (80.6% vs 66.7%, $P = 0.272$), intraoperative loss of reduction (25.8% vs 38.9%, $P = 0.338$), and qualitative change in the NSA after the insertion of the implant (9.7% vs 0%, $P = 0.288$). At 1 year postsurgery, the MBI had reduced significantly in both groups ($P < 0.001$ and $P = 0.002$) but remained higher in the DHS group (83.5 ± 21.4 vs 72.5 ± 25.0 , $P = 0.025$). However, the mean change in MBI over the year was similar between both groups (-9.3 ± 21.1 vs -4.1 ± 23.2 , $P = 0.670$). The DHS group had no complications while there was 1 patient in the PFNA group with a peri-implant infection. The complication rates were similar ($P = 0.367$).

Conclusion: In BCFs, fixation with the DHS increased the NSA while the PFNA caused a wedge effect. However, the 1-year clinical outcomes were similar.