

Cement Augmentation of the Proximal Femur Nail Antirotation: Is It Worth the Cost?

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Purpose: Proximal femur fractures in the elderly are common and are rising in incidence over the last decade. The most common used implants are proximal femur nails and dynamic hip screws. As an advantage, the perforated blade of the proximal femur nail can be augmented with cement to increase the implant's stability in the femoral head. This study investigates if there is a benefit for cement augmentation of the blade of the proximal femur nail in a large cohort of over 600 patients.

Methods: Between January 2014 and December 2020, 207 male and 413 female aged 20 to 102 years (mean 80 years; standard deviation [SD] 13) were treated in a Level I trauma center for proximal femur fractures. In all cases a proximal femur nail with a perforated blade was used (PFNA, DePuy Synthes). The decision for cement augmentation (Traumacem V + Bone Cement, DePuy Synthes) was made by the attending surgeon based on patient age, fracture pattern, and bone quality. Primary outcome measure were cut-out rate, tip apex distance, and blade positioning in the femoral head. Secondary outcome measures were length of hospital stay, mortality, and nonsurgical complications.

Results: Out of 620 patients cement augmentation of the blade was performed in 299 cases. The patients in the cement augmented group (CAB) were significantly older (CAB 85.7 ± 2.9 vs NCAB 75.3 ± 16.1 ; $P < 0.05$), had a significantly longer operating time (CAB 62.6 ± 21.2 hours vs NCAB 54.01 ± 7.1 hours; $P < 0.05$) and higher hospital B (8.7% vs NCAB 4.1%; $P < 0.05$). There was no difference between the mortality (CA groups) regarding tip apex distance (CAB 15.97 vs NCAB 15.69; $P = 0.64$) or rate of optimal blade position (CAB 81.6% vs NCAB 83.2%; $P = 0.341$). Only 6 cut-outs were found with 3 patients in each group. There was no difference between the groups for surgical complications (hematoma, infection), nonsurgical complications, time to surgery, and hospital stay.

Conclusion: In older patients with potential severe osteoporosis, augmentation of the blade might have prevented implant failure. More important, if the principles of a tip apex distance less than 25 mm and optimal blade position is combined with a modern implant, a cut-out rate less than 1% is achievable.