A Modern Collared Cementless Femoral Stem for the Arthroplasty Treatment of Femoral Neck Fractures

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INTRODUCTION:
Cemented femoral fixation during hip arthroplasty for femoral neck fracture (FNF) is traditionally favored due to reduced early perioperative fracture and reoperation rates. However, modern cementless, collared, triple-tapered femoral stems may provide similar benefits with potential advantages over traditional press-fit implants. This study aimed to evaluate 30-day stem survivorship using a collared cementless stem in FNF patients treated via the direct anterior (DA) approach.
METHODS: We retrospectively reviewed all patients who underwent hemiarthroplasty (HA) or total hip arthroplasty (THA) for isolated displaced FNF between 2019 and 2023. All procedures utilized the DA approach and a modern collared cementless triple-tapered femoral stem. The primary outcome was 30-day femoral stem survivorship. Secondary outcomes included reoperation, medical, and surgical complications. Descriptive statistics were used to report outcomes.
RESULTS: A total of 202 patients were included, with a mean age of 76.4 years (range, 43–100); 70.8% were female. THA was performed in 74.3% of cases and HA in 25.7%. At 30 days, no patients required revision of the femoral stem. The overall reoperation rate across all time points was 5.4% (9/166), including three periprosthetic joint infections, two dislocations, one adverse suture reaction, and three periprosthetic fractures. One intraoperative greater trochanter fracture occurred due to errant retractor placement; it was stable and managed nonoperatively.
DISCUSSION AND CONCLUSION:
Short-term outcomes demonstrate that a modern, collared cementless triple-tapered stem provides safe and effective fixation for FNF treated through a DA approach. The absence of early stem revision and a low periprosthetic fracture rate are comparable to outcomes seen with cemented stems. Further research with long-term follow-up is warranted to assess implant survivorship and functional outcomes in this population.

Figure 1: 90-year-old woman with a femoral neck fracture. Fall eight days later causes a periprosthetic Vancouver B1 fracture. The fracture is fixed with 3 cerclage cables and shown healed at 3 months postop. **a)** femoral neck fracture AP view; **b)** Intraoperative AP view; **c&d)** 8 days postop Vancouver B1 periprosthetic fracture AP and frog leg lateral view; **e&f)** 3 months postop with 3 cerclage cables AP and shoot-through view.

Table 1

Patient Demographics

	Patients (N= 184)
Age (years, mean ± SD)	76.1 ± 10.1
Gender	
Female	129 (70.1%)
Male	55 (29.9%)
Mechanism of Injury	
Ground level fall	177 (96.2%)
Trauma	4 (2.2%)
Other	3 (1.6%)
ASA Classification	
2	36 (19.6%)
3	130 (70.7%)
4	18 (9.8%)
Dorr Classification	
A	50 (28.1%)
B	111 (62.4%)
C	17 (9.6%)

SD, standard deviation; ASA Classification, American Society of Anesthesiologists Classification