Early Periprosthetic Femur Fracture Risk Following Total Hip Arthroplasty Based on Collar Status

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INTRODUCTION:
Periprosthetic femur fracture (PFF) is a known complication following primary total hip arthroplasty (THA). Recent biomechanical and clinical studies have investigated whether or not the absence of a collar increases the risk of early PFF. The primary aim of this study was to evaluate collar status as a risk factors for PFF requiring surgical intervention within 90 days of index THA at a high-volume orthopedic surgical hospital.
METHODS: A retrospective review of all patients undergoing elective primary THA from January 1, 2016 through July 31st, 2021 at a single orthopedic surgical hospital was completed. Twenty-three surgeons performed 8,523 uncemented THAs using 6,823 collared (80%) or 1,700 collarless (20%) stems. Modular stems and THA performed for acute fractures were excluded. The mean age was 66 years, mean body mass index (BMI) was 27 kg/m^2, and 52% were female. Surgery was performed through either a direct anterior (n=6,169, 72%) or posterior approach (n=2,353, 28%). All patients subsequently treated surgically for a PFF within 90 days of their THA were analyzed. Differences in PFF rates relative to collar status, surgeon, surgical approach, and baseline demographics were assessed using Cox regression analysis.
RESULTS:
The overall 90-day incidence of PFF requiring surgical intervention was 0.23% (n=20), with 0.09% (n=6) in the collared and 0.82% (n=14) in the collarless groups. Cox regression analysis confirmed that collarless stems were 5.1 times more likely than collared stems to result in PFF (p=0.01). Additionally, females were 15.8 times more likely than males to suffer a PFF (p=0.008). Age>65, BMI>25, American Society of Anesthesiologist classification>1, surgeon, and surgical approach were not independent risk factors.
DISCUSSION AND CONCLUSION: The overall incidence of 90-day PFF requiring surgical intervention at a high-volume orthopedic hospital is low. The risk of PFF is significantly higher in females and those implanted with collarless stems.