Reduced Periprosthetic Fracture Rates Using Collared Stems in Uncemented Primary Total Hip Arthroplasty

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INTRODUCTION:
Periprosthetic femur fracture (PPF) is becoming the most common complication following total hip arthroplasty (THA) with an incidence up to 4%. Uncemented femoral stems are highly preferred in primary THA, but are associated with higher risk of PPF compared to cemented stems. Collared stems have been linked to reduced PPF rates compared to collarless stems, while maintaining similar prosthetic designs. This study aims to analyze PPF rates between collarless and collared stem designs in a consecutive cohort of posterior approach THAs with a minimum follow-up of 1 year.
METHODS: This retrospective study included 4,661 uncemented primary THAs using the posterior approach, performed by four surgeons from February 2016 to May 2023. Between mid-2020 and mid-2022 each surgeon switched from a collarless to a collared femoral stem, which was the only change in their surgical practice. Periprosthetic fractures were identified using medical records and radiographic imaging. Power analysis confirmed 90% power of the sample to detect a significant difference in complication rates.
RESULTS: A total of 2,606 patients received a collarless stem, and 2,055 patients received a collared stem. There were no significant differences between the groups in terms of age, sex, BMI, laterality, ASA status and prior diagnosis of osteoporosis. Collared stems were associated with significantly lower rates of PPFs (0.1% vs 1.1%, $p < 0.001$), and significantly lower reoperations for PPF (0.05% vs 0.9%, $p < 0.001$). Most fractures (n= 26, 83.8%) occurred within 30 days following THA. No differences were identified in terms of aseptic loosening, dislocation and infection ($p > 0.05$).
DISCUSSION AND CONCLUSION:
Conclusion: Collared stems were associated with significantly lower rates of PPFs and reoperation rates for PPFs compared to collarless stems in uncemented primary THA with a minimum follow-up period of 1 year. These findings support the routine use of collared stems in an effort to reduce PPF risk.