Triple-Tapered Stems Show Excellent Survivorship and Low Fracture Rates, With or Without a Collar

Brian Edward Kelley[1], Baochao Ji, Nicholas Bedard, Michael J Taunton, Mark W Pagnano, Matthew Philip Abdel, Charles Patrick Hannon
[1]Orthopedic Surgery

INTRODUCTION:
Femoral component positioning and design in primary total hip arthroplasty (THA) influence implant survivorship and risk of periprosthetic fracture. Several large database studies suggest that collared femoral components are protective against early periprosthetic fracture. In recent years, shorter triple-tapered femoral components have become widely adopted. The purpose of this study was to compare early periprosthetic fracture incidence, implant survivorship, and clinical outcomes between collared and collarless uncemented triple-tapered femoral components.
METHODS: We identified 1,730 primary THAs performed with one of three uncemented, triple-tapered femoral components between 2015 and 2024 at a single tertiary care academic center. Of these, 899 were collared and 831 were collarless. Patients in the collared group were older (67 vs 61; $p<0.01$) and more likely to be female (50% vs 39%; $p<0.01$). Femoral component coronal alignment was measured at 3 months postoperatively. Mean follow-up was 2 years.
RESULTS: There were 15 total periprosthetic fractures (12 intraoperative and 3 within 1 year postoperatively). There was no difference in the incidence of periprosthetic fracture between collared (1.1%; n=10) and collarless (0.6%; n=5) femoral components ($p=0.25$). When comparing femoral components in varus to neutral, coronal alignment did not influence the incidence of periprosthetic fracture ($p=0.1$). However, 4 of 5 greater trochanter fractures were associated with valgus stem position. The 5-year survivorship free of any revision was 98.5% and 99.2% in collared and collarless femoral components, respectively ($p=0.2$). The 5-year survivorship free of any reoperation was also similar between groups ($p=0.60$). Mean HHS improved from 53 preoperatively to 92 at 2 years postoperatively ($p<0.01$) with no clinical difference between groups.
DISCUSSION AND CONCLUSION: Periprosthetic fractures with uncemented triple-tapered femoral components were rare and there was no difference between collared and collarless stems. Uncemented triple-tapered femoral components with and without a collar were durable and reliable with excellent survivorship and clinical outcomes.