

Triple-taper collared stems potentially reduce periprosthetic fracture rates following primary total hip arthroplasty

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INTRODUCTION:

Periprosthetic fractures following primary total hip arthroplasty (THA) are rare but catastrophic complications. Triple taper wedge and collared stems have shown reduced periprosthetic fracture rates compared to collarless stems. The purpose of this consecutive cohort study was to analyze periprosthetic fracture rates between single taper wedge designs and triple-taper collared stems at a single institution.

METHODS:

This is a retrospective data analysis consisting of 2,942 consecutive subjects who received primary THA at a single institution. The original hip system was used from the start of the study until mid-May 2024, and consisted of a single taper wedge design stem. From mid-May 2024 until present there was a consensus to switch to a triple taper wedge collared stem. Intraoperative calcar fractures which were immediately caught and cabled were excluded from the study. The volume of Vancouver B periprosthetic fractures following only primary THA was recorded during both time periods and were compared using chi-square tests with 95% confidence intervals.

RESULTS:

Overall, 14 periprosthetic Vancouver B fractures were recorded (0.48%). Ten fractures occurred while using the single taper wedge type stems out of 1,648 subjects (0.61%). Four fractures occurred while using the triple-taper collared stem out of 1,294 subjects (0.31%) ($p = 0.291$).

DISCUSSION AND CONCLUSION:

Triple-taper, collared stems presented with nearly half the rate of periprosthetic fractures when compared to single taper wedge stems. This decrease was not significant, however under further analysis, this study is underpowered. Our data suggests a promising trend towards fracture reduction, further data is required to confirm these findings.

